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UT of Dadra and Nagar Haveli.



International Multidisciplinary Conference
On
“Integrating Wisdom and Technology: IKS, AI,
and Human Resilience for a Sustainable Future”

17 - 18th March 2025

Director & Chief Editor
Dr. Meena P. Kute

Managed by
Swargheeya Sanjibhai Rupjibhai Memorial Trust
Sayli, Silvassa

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SSR College of Education, Sayli, Silvassa,
UT of Dadra and Nagar Haveli.**

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**International Multidisciplinary Conference
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"Integrating Wisdom and Technology: IKS, AI, and Human
Resilience for a Sustainable Future"**

17 - 18th March 2025

Director of International Multidisciplinary Conference

Dr. Meena P. Kute

Principal

SSR College of Education, Silvassa

Convener of Conference

Dr. Sarika M. Patel

Assistant Professor

SSR College of Education, Silvassa

Co-Convener of Conference

Dr. Vinu Agarwal

Assistant Professor

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Mrs. Nilima Kamlu

Mrs. Snehal Mahajan

Dr. Rakesh Ramraje



Heartfelt Tribute



Late Shree Mohanbhai Sanjibhai Delkar

(19-12-1962 to 22-02-2021)

Founder Chairman SSR Memorial Trust

*To visionary leader, a guiding light and a pillar of strength -
Late Shree Mohanbhai Sanjibhai Delkar dedicated his life to
the noble cause of education and service. Our hearts are
filled with a deep sense of respect and reverence as we
remember our visionary leader.*



Message from Hon'ble Member of Parliament



Smt. Kalaben Mohanbhai Delkar
Trustee, SSR Memorial Trust, Silvassa

It is with great pride and enthusiasm that I extend my heartfelt greetings to all the distinguished Scholars, Researchers, Academicians and participants of the International Multidisciplinary Conference on "Integrating Wisdom and Technology: IKS, AI, and Human Resilience for a Sustainable Future."

At SSR Memorial Trust, we are committed to fostering academic excellence, innovation and transformative learning. We believe that knowledge, when shared and applied thoughtfully, has the power to create meaningful change. I am confident that the deliberations in this conference will inspire new ideas, challenge perspectives, and lead to impactful solutions.

I extend my sincere appreciation to the Principal Dr. Meena Kute and her team, esteemed speakers and all the participants for their contributions. May this conference be a source of inspiration and progress for all.

Wishing you a successful and enriching academic experience.



Message from Hon'ble Chairman



Shri. Abhinav Delkar
SSR Memorial Trust, Silvassa

My heartfelt greetings to all the contributors, researchers, and readers of the International Multidisciplinary Conference on "Integrating Wisdom and Technology: IKS, AI, and Human Resilience for a Sustainable Future."

This conference, and the insightful researchers presented within this journal, symbolizes a meaningful endeavor to bridge ancient wisdom with modern technology, fostering innovations that are both progressive and harmonious with nature.

At SSR Memorial Trust, we are dedicated to promoting education that inspires thought leadership and transformative solutions. We believe that true progress is achieved when we honor traditional knowledge while embracing technological advancements. This journal, capturing the essence of multidisciplinary collaboration, reflects our vision of nurturing intellectual growth and fostering sustainable development.

I extend my sincere appreciation to the Principal Dr. Meena Kute and her team for their continuous efforts to maintained quality in education field. The editorial team for their dedication, and the organizing committee for their unwavering commitment. May the knowledge shared within these pages inspire new ideas, spark constructive dialogues, and contribute positively to the global quest for sustainability.



Message from Hon'ble Secretary



MS. Divita Delkar
SSR Memorial Trust, Silvassa

It is with great pride and enthusiasm that I extend my warmest greetings to all the esteemed participants, researchers, and contributors of the International Multidisciplinary Conference on "Integrating Wisdom and Technology: IKS, AI, and Human Resilience for a Sustainable Future."

At SSR Memorial Trust, we are committed to fostering academic excellence, innovation, and research-driven solutions for a better tomorrow. This conference serves as a platform to bring together diverse perspectives, stimulate intellectual discourse, and encourage meaningful collaborations across disciplines.

I extend my heartfelt gratitude to the organizing committee, esteemed speakers, and all contributors who have made this event possible. I am confident that the discussions and research shared here will inspire new pathways for a more sustainable and resilient world.

Wishing the conference and this journal great success!



Message from Hon'ble Public Relation Officer (PRO)



Dr. Pankaj Sharma
SSR Memorial Trust, Silvassa

It is an honor to extend my warmest greetings to all the distinguished guests, scholars, researchers, and participants of the International Multidisciplinary Conference on "Integrating Wisdom and Technology: IKS, AI, and Human Resilience for a Sustainable Future."

This conference is a testament to the power of collaboration, bringing together experts from diverse fields to explore the intersection of Indigenous Knowledge Systems (IKS), Artificial Intelligence (AI), and human resilience. As we navigate the complexities of the modern world, the integration of wisdom and technology becomes essential in shaping a sustainable and inclusive future.

At SSR Memorial Trust, we take pride in fostering academic excellence, research, and innovation. This conference serves as a dynamic platform to exchange groundbreaking ideas, build meaningful connections, and contribute to global progress. The insights shared here will undoubtedly inspire new perspectives and drive impactful solutions for society.

I extend my sincere appreciation to the organizing committee, esteemed speakers, researchers, and attendees for their invaluable contributions. May this conference be a milestone in advancing knowledge and reinforcing our collective commitment to sustainability.

Wishing everyone a successful and enriching experience!

Message from Hon'ble Vice Chancellor



Prof. Vishnu N. Magare

**University of Pravara Institute of Medical Sciences
Loni, Dist. Ahilyanagar, Maharashtra**

I am delighted to extend my best wishes to the organizers, esteemed speakers, and participants of the International Multidisciplinary Conference on "Integrating Wisdom and Technology: IKS, AI, and Human Resilience for Sustainable Futures."

This conference serves as a significant platform for intellectual discourse, bringing together scholars, researchers, and professionals to explore the synergy between Indigenous Knowledge Systems (IKS), Artificial Intelligence (AI), and Human Resilience in shaping a sustainable future. The integration of traditional wisdom with cutting-edge technology is a crucial step toward addressing global challenges and fostering a more harmonious and sustainable world.

I commend the efforts of the organizing committee for curating such a thought-provoking and relevant theme. I am confident that this conference will generate insightful discussions, innovative ideas, and meaningful collaborations that will contribute to academic and societal progress.

Wishing the conference great success and hoping that it paves the way for new perspectives and solutions for a sustainable and resilient future.



Message from Director's Desk



Dr. Meena Prakash Kute

Principal, SSR College of Education, Silvassa.

It is my immense pleasure to hand over the peer-reviewed indexed journal with ISSN -2278 – 5639, Impact Factor 7.00(IIFS) of Two days International Multidisciplinary Conference on the theme Integrating Wisdom and Technology, IKS, AI, and Human Resilience for a Sustainable Future.

I would like to extend my sincere thanks to our management for giving consent to organize the international level conference and for their kind support as usual for the success of this event. Since last two years, we are organizing national level conferences on current, genuine themes which give output and useful results of it. This year, we have invited the speakers from abroad. I take pleasure in bringing out this international event which is enriched with scholastic and thought-provoking research papers received from all over India and from other countries. These revelation, qualitative and quantitative approach as well as pain's taking efforts are the chief characteristics of the research articles published in this journal. The researchers' overwhelming response led us to the way of good quality publication. It is not usual to see a passionate bunch of scholars, professors, meticulously penning down the extraordinary researches on current issues at global level like Artificial Intelligence, Indian Knowledge System, and NEP 2020, Human Resilience for Sustainable World, Integration of Wisdom and Technology, Gurukul System and Modern Education System, Viksit Bharat 2047, Transforming Life Through Sustainable Development, etc.

Artificial intelligence has entered in every field, whether it will be boon or curse, for all human beings. This conference will serve as a dynamic platform for all intelligent delegates and research scholars. It aims to highlight the relevance of IKS and AI and the role of human resilience in fostering sustainability. Innovative solutions for global issues are focused. Experts from diverse fields will throw light on all sub-themes in the panel discussions as well as in technical sessions. Thus, the Multidisciplinary International Conference will provide valuable insights into how the integration of ancient wisdom and modern technology can contribute to a sustainable and resilient future for a better world.

More than 135 researchers, professors, and students of multi-disciplines had gathered here to ponder over the main theme. So, I am really happy to share that from seven to eight states of India and abroad have contributed their thoughts through research papers and articles.

I express my sincere gratitude towards the keynote speaker, Prof. Dhirawit from Mahachulalongkornrajavidyalaya University, Bangkok, Thailand. The resource person, Prof. Ananta Risal from Kathmandu University, Nepal. I am thankful to Prof. Ni Ni Hlaing from Myanmar, Prof. Rejina from Nepal for accepting our invitation as resource person and to deliver Speech on subthemes. The resource person, Prof. Vandana Punia from Guru Jambheshwar University of Science and Technology, Hisar, Haryana and Prof. Vaibhav Sabnis from Maharashtra. I express my sincere gratitude towards all the speakers for giving their valuable time and their expertise, contributions.

I extend my sincere thanks to all chairpersons for technical session held for two days. I extend my thanks to the judges for their transparent process of evaluating the Best Research Paper Presenter Award for Professor and Research Scholars. I would like to welcome all speakers, resource persons, chairpersons, directors, principals, teacher educators, research scholars, UGs, PG students, and extend my warm regards for contributing their scholarly views in this multidisciplinary conference.

I extend my sincere gratitude to Hon'ble Vice Chancellor of University of Pravara Institute of Medical Science, Prof. Vishnu N. Magare, for his inaugural speech. We all are inspired by his profound knowledge and guidance on the various current issues. We are honoured by his gracious presence and invaluable inaugural speech.

I thank all my dear advisory members, dear colleagues, organizing team of SSR Memorial Trust Colleges and Institute non-teaching staff for their positive, active support and cooperation for the success of the event.

I express my sincere gratitude to our Chairman of SSR Memorial Trust, Hon. Abhinav Delkar, Hon. Secretary Divita Delkar, Hon. Public Relation Officer Dr. Pankaj Sharma, Principal Dr. Rajiv Singh, Director of SSRIMR Dr. Rakesh Patil, Principal Dr. Chandrakant Bonde, Vice Principal Dr. Alpana Sharma for their support and cooperation.

I thank the convener Dr. Sarika Patel and co-convener Dr. Vinu Agarwal, the editorial team, and Dr. Rakesh Ramraje to bring this journal into concrete form.

I thank our sponsors who contributed wholeheartedly for the success of educational cause without any hesitation. It is possible for us to organize such a grand-level International Multidisciplinary Conference only because of the support and cooperation from all SSR family. We are really blessed by our founder chairman, late Shri Mohanbhai S. Delkar and Honourable MP, Smt. Kalaben Delkar.

I am really thankful to all those who directly or indirectly contributed for the successful organization of this International Conference.



Message from Convener



Dr. Sarika Patel

IQAC Coordinator, SSR College of Education, Silvassa

Dear Participants,

It is with great enthusiasm and a deep sense of purpose that I welcome all esteemed scholars, researchers, academicians, and participants to this International Multidisciplinary Conference. This event marks a significant step toward bridging the gap between Indigenous Knowledge Systems (IKS), Artificial Intelligence (AI), and the ever-evolving resilience of humanity in the pursuit of sustainability.

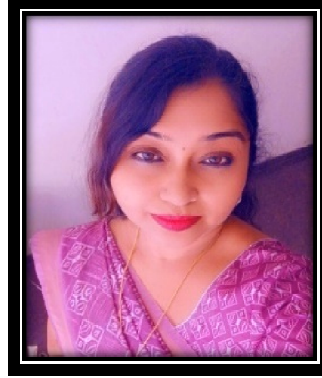
In today's world, where rapid technological advancements redefine our ways of thinking and working, it is imperative to integrate wisdom from traditional knowledge systems with cutting-edge innovations. This conference aims to create a platform for meaningful discussions, exchange of groundbreaking ideas, and collaborative research that can contribute to a sustainable and inclusive future.

I extend my sincere gratitude to SSR Memorial Trust, director of the conference, our distinguished keynote speakers, session chairs, researchers, and the organizing committee for their unwavering support and dedication. Your contributions have made this conference a reality, and I am confident that the insights shared will inspire transformative change across disciplines.

Wishing everyone an intellectually stimulating and successful conference!



Message from Co-Convener



Dr. Vinu Agrawal

Assistant Professor, SSR College of Education, Silvassa

Dear Esteemed Participants,

It is my great pleasure to extend a warm welcome to all esteemed researchers, academicians, and participants of this International Multidisciplinary Conference. This event is a testament to our collective commitment to exploring the synergy between Indigenous Knowledge Systems (IKS), Artificial Intelligence (AI), and human resilience in shaping a sustainable future.

As we navigate an era of rapid technological transformation, it is essential to integrate the wisdom of the past with the innovations of the present. This conference provides a unique platform for scholars and experts from diverse disciplines to exchange ideas, share research findings, and collaborate toward sustainable solutions for global challenges.

I extend my heartfelt gratitude to SSR Memorial Trust, our keynote speakers, paper presenters, and the dedicated organizing team for their invaluable contributions. I am confident that the discussions and insights shared in this conference will inspire new perspectives and drive impactful change.

Wishing everyone a fruitful and enriching academic experience!

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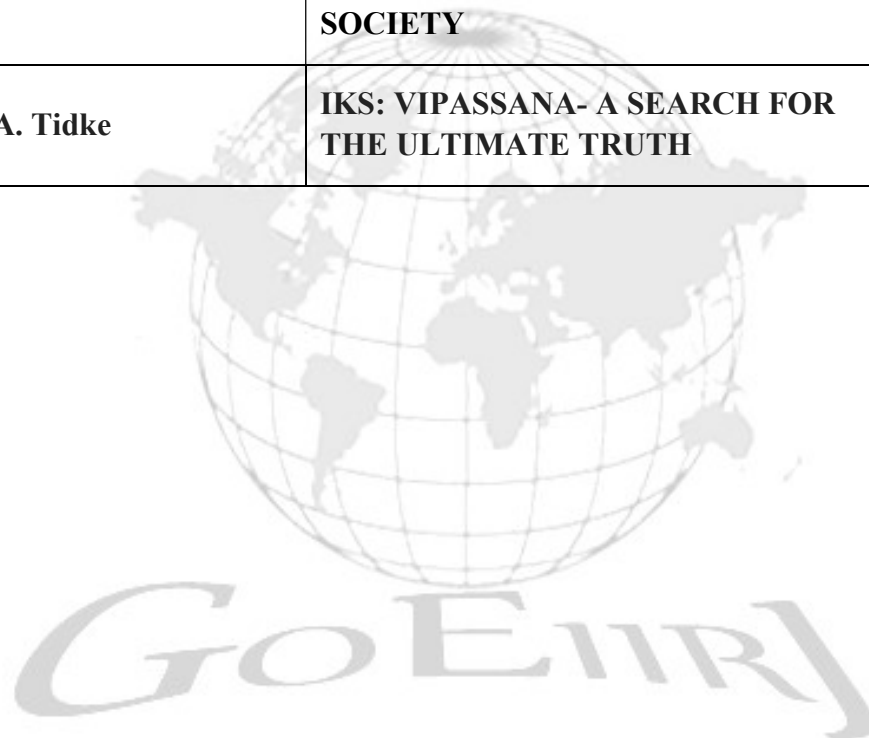
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INTEGRATION OF ANCIENT WISDOM AND MODERN TECHNOLOGY FOR A BETTER WORLD

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Abstract:

The rapid expansion of AI is consuming data at an unprecedented scale. However, as pretraining on raw Internet data reaches diminishing returns and downstream applications grow increasingly complex, the question arises: What data paradigm will sustain the next generation of more powerful AI systems? This requires a systematic rethinking of how we structure, create, and share data. In this talk, I will focus on rapid technological advancement, where society often finds itself at a crossroads where ancient wisdom confronts modern innovation. This intersection offers profound insights into how the integration of timeless principles can enhance contemporary practices, particularly in addressing significant global challenges. Ancient philosophies, steeped in the understanding of human nature and ecological balance, provide a holistic framework that can inform the design and use of modern technologies. For instance, the sustainable practices of indigenous cultures highlight the importance of stewardship over resources, while modern technologies offer powerful tools for efficiency and connectivity. By blending these two realms, we can foster an environment that not only prioritizes progress but also honors the lessons of our past, ultimately leading us toward a more compassionate and sustainable world. This essay explores the necessity and benefits of this integration, illustrating a pathway toward a future enriched by both ancient insights and cutting-edge advancements.

Introduction:

Overview of the significance of blending ancient wisdom with modern technology

The integration of ancient wisdom with modern technology represents a vital paradigm for addressing contemporary challenges, bridging the gap between traditional practices and cutting-edge innovations. Ancient wisdom often encompasses sustainable practices developed over centuries, informed by an intimate understanding of local ecosystems and cultural nuances. For instance, the collective appreciation for cultural heritage and natural beauty in rural landscapes reflects a deep-rooted connection to sustainable environmental practices, which can enhance modern conservation efforts (Ali M et al.). Conversely, modern technology provides the tools and methodologies necessary to improve efficiency and broaden the impact of these ancient practices,

especially in contexts such as agriculture and water management. However, these technologies need to be adapted for local realities, as seen in Ethiopia, where reliance on inherited agricultural methods still prevails due to the inaccessibility of complex modern solutions (Gizaw et al.). Thus, blending these two realms not only preserves tradition but also fosters innovation that can adapt to a rapidly changing world.

The Role of Ancient Wisdom in Sustainable Practices

The interplay between ancient wisdom and contemporary sustainable practices presents a compelling framework for addressing modern environmental challenges. Historical construction methods, rooted in local materials and traditional craftsmanship, exemplify a harmonious relationship with the surrounding ecosystem. For instance, vernacular architecture, characterized by climate-responsive designs, showcases how ancient civilizations designed structures that organically complemented their environments, ultimately promoting sustainability. Such practices are critical today as modern architecture often prioritizes cost-efficiency over environmental considerations, leading to increased resource depletion and urban heat effects (Sujeet et al.). By revisiting these ancient methodologies, we can glean insights valuable for today's construction processes. As posited in comprehensive studies, integrating lessons from international construction and quality management can enhance current building practices, thereby reducing carbon emissions and fostering resilient communities (Low et al.). This synthesis of ancient wisdom and modern technology offers a pathway toward sustainable development that respects both our ecological footprint and cultural heritage.

Lessons from traditional ecological knowledge and its relevance today

In examining the intersection of traditional ecological knowledge and contemporary environmental practices, the wisdom gleaned from past societies emerges as crucial for addressing modern challenges. Historical land use systems provide invaluable insights into sustainable practices that foster environmental resilience. For instance, the concept of Anthropogenic Dark Earths (ADE), which were created and managed by ancient cultures, serves as an exemplary model for enhancing soil fertility and stability, thereby contributing to climate change mitigation strategies (Dotterweich et al.). Furthermore, as modern agriculture contends with the ramifications of conventional farming techniques, a shift towards organic practices—rooted in ecological understanding—becomes vital. Such an approach underscores the necessity of aligning modern farming methodologies with historical insights on soil health and the carbon cycle, encouraging a co-adaptive framework that respects both tradition and innovation (cox et al.). Thus, integrating ancient wisdom with current technological advancements is pivotal for cultivating a sustainable future.

Modern Technology as a Tool for Enhancing Ancient Practices

The interplay between modern technology and ancient practices is increasingly evident as societies strive to harness traditional wisdom in contemporary contexts. Innovations such as digital platforms and online learning opportunities enable the dissemination and preservation of ancient knowledge, such as that found in the Indian Knowledge System (IKS), which draws from Vedic literature. This system seeks to address modern challenges and is being integrated into educational frameworks through tailored teacher training and specialized modules, thereby enhancing classroom instruction (Khan et al.). Moreover, the exploration of wisdom across cultures, scrutinizing its definitions and qualities, provides a broader understanding of how ancient knowledge can inform today's ethical and psychological frameworks (Walsh et al.). By utilizing technology to promote and revitalize these time-honored practices, we create pathways for sustainable development, bridging the gap between past and present for a more holistic approach to addressing global issues.

Innovations that facilitate the preservation and dissemination of ancient knowledge

The intersection of ancient wisdom and modern technology represents a vital avenue for preserving and disseminating historical knowledge. Innovations such as digital archiving and generative artificial intelligence (GAI) are pivotal in safeguarding artifacts and texts that define our cultural heritage. For instance, advancements in digital twin mapping allow for the recreation of historical sites, enabling detailed analysis and virtual experiences that transcend physical limitations. Moreover, educational technologies have evolved from ancient practices, showing that historical educational philosophies can inform contemporary learning methods, as highlighted in the essential contributions of ancient China to Educational Technology (Li et al.). Furthermore, the application of GAI in conservation efforts can automate and enhance preservation strategies, ensuring that ancient artifacts remain accessible and intact for future generations (Ghaith et al.). By leveraging these innovations, we can create a synergistic relationship between past and present that fosters a deeper understanding and appreciation of ancient knowledge.

The potential impact of integrating ancient wisdom and modern technology on future societal development

The synthesis of ancient wisdom and modern technology holds transformative potential for future societal development, forging pathways to sustainable living and holistic well-being. Ancient philosophies, often steeped in environmental stewardship and communal integrity, emphasize interconnectedness—principles that resonate powerfully with contemporary ecological challenges. By integrating such insights into technological innovations, societies can create solutions that prioritize long-term health over short-term gains. For example, utilizing traditional agricultural practices alongside cutting-edge farming technologies can bolster food security while

enhancing biodiversity. Moreover, the emphasis on mindfulness and ethical considerations rooted in ancient cultures can guide the responsible development of artificial intelligence and automation, ensuring these tools serve humanity's collective good. Ultimately, this integration encourages a balanced approach to progress, fostering a future where technology and timeless wisdom coalesce to address pressing global issues, paving the way for a more equitable and prosperous world.

Noam Chomsky and AI Creativity

Noam Chomsky, world-renowned linguist, recently referred to AI and Language Models as “plagiarism software because it doesn't create anything, but copies existing works of existing artists modifying them enough to escape copyright laws.” Chomsky's critique of artificial intelligence and language models as “plagiarism software” stems from a broader concern regarding the originality and ethical implications of AI-generated content. Chomsky, a pioneering linguist and a keen observer of societal trends, argues that these technologies merely replicate and slightly alter existing works to sidestep copyright infringement, thus lacking genuine creativity. However, this perspective, while rooted in valid concerns about copyright and creativity, may not fully encompass the potential and complexities of AI as a tool for innovation and artistic expression.

To address Chomsky's critique, it's crucial to understand the mechanisms of AI and language models. At their core, these systems analyse vast amounts of data to identify patterns, relationships from being a mere exercise in copying, allows for the synthesis of new combinations of ideas, styles, and expressions that can transcend the sum of their parts. In the context of creativity, AI systems do not simply “copy” but recombine and innovate within the constraints of their programming and the datasets they have been trained on. Using Generative AI to make art, poetry, and music is akin to building with LEGO blocks. The AI doesn't plagiarise but creatively assembles. Just as LEGO builders use standard blocks to craft unique structures, AI combines existing data elements into novel creations. The blocks themselves aren't new, but the designs they yield can be original and innovative. This process reflects not the copying of individual pieces, but the inventive assembly of those pieces into something uniquely imaginative.

Bruce Schneier says we need a public AI option and a regulatory agency to ensure that artificial intelligence becomes a public good.

Kennedy School Adjunct Lecturer in Public Policy Bruce Schneier says artificial intelligence has the potential to transform the democratic process in ways that could be good, bad, and potentially mind-boggling. The important thing, he says, will be to use regulation and other tools to make sure that AI tools are working for everyone, and just not for Big Tech companies—a hard lesson we've already learned through our experience about social media and other tech tools.

Bruce Schneier's policy recommendations:

- Create a public AI option that is managed in the public interest by the government or an NGO
- Establish a new federal regulatory agency to ensure that AI is a societal benefit while limiting potential harms

When ChatGPT and other generative AI tools were released to the public late last year, it was as if someone had opened the floodgates on a thousand urgent questions that just weeks before had mostly preoccupied academics, futurists, and science fiction writers. Now those questions are being asked by many of us—teachers, students, parents, politicians, bureaucrats, citizens, businesspeople, and workers. What can it do for us? What will it do to us? How do we use it in a way that's both ethical and legal? And will it help or hurt our already-distressed democracy? Schneier, a public interest technologist, cryptographer, and internationally known internet security specialist whose newsletter and blog are read by a quarter million people, says that AI's inexorable march into our politics is likely to start with small changes like using AI to help write policy and legislation. The future, however, could hold possibilities that right now we may have a hard time wrapping our minds around—like AI systems leading political parties or autonomously fundraising to back political candidates or causes. Overall, like a lot of other things, it is likely to be a mixed bag of the good and the bad.

Conclusion

In conclusion, in the process of our exploration of the integration of ancient wisdom and modern technology for a better world, it becomes evident that synergizing these two domains offers a holistic pathway to sustainable development. The lessons drawn from ancient practices, emphasizing harmony with nature and community well-being, can inform contemporary technological solutions, fostering a more equitable society. As demonstrated through various case studies, the strategic development of the built environment can benefit significantly from the insights provided by historical methodologies in construction management and economics. Such insights not only enhance productivity but also contribute to significant reductions in carbon emissions, aligning with the principles of total quality management (Low et al.). Furthermore, the global economic paradigms shaped by historical thinkers underscore the importance of a balanced approach to globalization that respects cultural heritage while embracing innovation, reinforcing the need for an integrated framework that draws upon the wisdom of the past to tackle modern challenges (Das et al.).

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HUMAN RESILIENCE: A GUIDE FOR A SUSTAINABLE FUTURE**Dr. Meena Prakash Kute***Principal**SSR College Of Education, Saily, Silvassa.*

Abstract

Resilience is the process and outcome of successfully adapting to difficult or challenging life experiences, especially through mental, emotional and behavioural flexibility and adjustment to external and internal demands: American Psychological Association. A number of factors contribute to how well people adapt to adversities, including the ways in which individuals view and engage with the world, the availability and quality of social resources and specific coping strategies. Resilience will not make our problems go away. But resilience can help us to see our past and then find ways to enjoy life and better handle stress. Emmy Werner was one of the early scientist to use the term resilience. Holling (2006), is considered as the father of resilience theory.

Key Words :- Human Resilience, adaptability, APA, Sustainable, Competence, Connection, Coping, Control, Community

Introduction :-

Resilience means being able to cope with tough events. When something bad happens, we still feel anger, grief and pain. But physically and psychologically, we are able to keep move on. Because Resilience build skills to endure hardships. When we have resilience, we harness the inner strength that help us rebound from a set back or challenges, such as job loss, an illness, natural disaster or any type of disaster or death of loved ones. If we lack resilience, we might get stuck on problems, or feel like a Victim. We feel burdened or turn to ways to cope that are not healthy such as drug or use of alcohol, eating disorders or risky behaviours.

Thats why it needs to acquire skills to be more resilient.

- A) Adapting to tough times.
- B) Resilience and mental health

There are many ways to improve resilience.

- 1) **Get Connected** :-Building strong, healthy relationship with dear ones and friends, neighbours can give us needed support and help, guide in good and bad times.
 - 2) **Make everyday meaningful..**:-Do something that give us a sense of success and purpose every day. Set clear goals so that we can reach to achieve the goals.
 - 3) **Learn from the Past** :-If we think of our past life, troubles, hardships, we are surprised how we faced tough times.
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- 4) **Stay Hopeful** :-We can not change the past but always we look toward the future. So we must try to change ourselves that make it easier to adapt and view the new challenges.
- 5) **Take care of ourselves** :-We must do activities, or our hobbies which we enjoy. That may be physical activity in our daily life, get enough sleep, eat healthy food, practice how to manage stress, do yoga for getting relaxed, meditate, take deep breathing or pray to our faithful, almighty.
- 6) **Take Action** :-Never ignore our problems. On the contrary, we have to figure out, What we need to do, prepare a plan and take proper action. It may take time to recover from a major setback, trauma or loss.
- 7) **Develop Self Awareness** :-We have to understand how can we respond to stress and adversity, that is the first step toward learning more adaptive strategies. Self awareness includes understanding our strategies and knowing our weaknesses.
- 8) **Build Self Regulation Skills** :-Remaining focused in the face of stress and adversity is important but not easy. Stress reduction techniques such as guided imagery, breathing exercises and mindfulness training can help us, regulate our emotions, thoughts and behaviours.
- 9) **Learn Coping Skills** :-Many coping skills that can help in dealing with stressful challenging situations. For eg. Reframing thoughts, exercising, spending time out doors, socializing, improving sleep hygiene and tapping into creative outlets.
- 10) **Increase Optimism** :-People who are more optimistic, tend to feel more in control of their outcomes. To build optimism, focus on what you can do when faced with challenges and identify positive, problem solving steps that you can take and develop coping skills.
- 11) **Strengthen Connections** :-Support system can play a vital role in resilience, so bolster your existing social connections and find opportunities to build new ones.
- 12) **Know your Strengths** :-people feel more capable and confident when they can identify and draw on their talents and strengths.

Resilience is not a permanent stage, We may feel equipped to manage one stressor and overwhelming by another. So practise gratitude, take care of physical health to be resilient.

Importance of Resilience :-

As we have experienced, public health shocks such as Ebola Virus Disease and Covid 19, and every day stressors highlight the vulnerability of health systems across the world and the need for an integrated approach to health system, strengthening bringing together health security, disease -specific and life course -specific programmes make progress towards Universal Health Coverage and healthy security goals. Health professionals face numerous stresses like the time pressure, workload, several roles and emotional concerns that they need to be resilient. So

resilience refers to the capacity for suitable responding to stress in achieving the objectives at the least physical and psychological costs.

To face life challenges following skills need to be developed.

- 1) Acknowledge and accept your emotions.
- 2) Reframe challenges as opportunities.
- 3) Breakdown problems into manageable tasks.
- 4) Seek support and guidance.
- 5) Practice Self compassion.
- 6) Celebrate your successes.

We can take help of other resources to become Resilient. That is Books, online courses, mobile apps, support groups. All will help to face life challenges.

Seven C s of Resilience :-

Ken Ginsburg, MD, a paediatrician specializing in adolescent medicine at the children 's hospital of Philadelphia, developed seven C s Model of resilience to help kid and teens build the skills to be happier and more resilient.

The seven C s model is centred on two key points.

- 1) Young people live up or down to the expectations that are set for them and they need adults who love them unconditionally and told them to high expectations.
- 2) How are model resilience for young people is more important that what we say about it.

Seven C s are as following :

- 1) **Competence** :-This is the ability to know how to handle situations effectively. To build competence, individuals develop a set of skills to help trust their judgement and make responsible choices.
- 2) **Confidence** :-Ginsburg says that true self confidence is rooted in competence. Individuals gain confidence by demonstrating competence in real life situations.
- 3) **Connections** :-Close ties to family, friends and community provide a sense of security and belonging.
- 4) **Coping** :-When people learn to cope with stress effectively, they are better prepared to handle adversity and set backs.
- 5) **Character** :-Individuals need to fundamental sense of right and wrong to make responsible choices, contribute to society and experience self worth.
- 6) **Contribution** :-Ginsburg says that having a sense of purpose is a powerful motivations, contributing to your community reinforces positive reciprocal relationships.
- 7) **Control** :-Developing an understanding of internal control helps individuals act as problem solvers instead of victims of circumstance. When individuals learn that they can control the

outcomes of their decisions, they are more likely to view themselves as capable and confident.

The seven C s of Resilience illustrate the interplay between personal strengths and outside resources, regardless of age.

Types of Resilience :-

- 1) **Psychological Resilience** :-It is defined Psychological Resilience as the ability to cope with or adapt to uncertainty, challenges and adversity. It is some times referred to as Mental Fortitude. People who exhibit Psychological resilience develop coping strategies and skills that enable them to remain calm and focused during a crisis and move on without long terms, negative consequences including distress and anxiety.
- 2) **Emotional Resilience** :-How people cope emotionally with stress and adversity varies from person to person, according to the children's society, some people are by nature, more or less sensitive to change. A situation can trigger a flood of emotions in some people and not in others.
- 3) **Physical Resilience** :-It refers to the body 's ability to adapt to challenges, maintain stamina and strength and recover quickly and efficiently. It is a person's ability to function and recover when faced with illness, accidents or other physical demands.
- 4) **Community Resilience** :-It refers to the ability of groups of people to respond to and recover from adverse situations, such as natural disasters, acts of violence, economic hardship and other challenges to the group as a whole.

People who show resilience in combinations with coping capabilities and emotional intelligence are more likely to have better overall well-being and life satisfaction than these with lower resilience.

If emotional Resilience linked to stress have lesser negative effect on social adaptation and life satisfaction.

There are some examples which demonstrates Important of Resilience.

Anand Mahindra had shared one photo of a fallen tree on Twitter and pointed out that the change in position of fallen tree, embraces its new form and finds fresh growth opportunities. It does not view its fall as the end. This example shows tree's transformation that is nothing but adaptability, Resilience, new perspectives, growth through transformation, letting go, embracing uncertainty with faith and confidence. Mahindra's tweet beautifully illustrates the wisdom that can be gleaned from nature. It is powerful Metaphor for life.

Another example of one successful woman to share the secret behind her achievements. Her answer was, she began to succeed the day, she learned to choose her battles of life wisely. She stopped wasting energy on petty fights, she stopped arguing on gossips, she stopped fighting unnecessary attention. She gave up trying to live up to every one's expectation of her. She stopped

fighting with foolish people over the rights because she realised that such fights distract those with nothing better to do. Instead she began channelling her energy into the battles that truly mattered. She fought for her vision, her dreams, her ideas, her destiny and she realised, Choose your battles, The Secret To Success!. What truly matters is Goals, Growth and Purpose.

Dr. A. Jagan Mohan Reddy use to quote regarding Resilience.

- Built a community spirit, overcome hesitation.
- Love is an eternal bridge between time and timelessness, an ever present force that pervades human existence yet remains independent of it, shaping our relationships and aspirants. It is quoted by Satish Kapoor, through, The speaking tree, in Times of India.
- Do remember for being Resilient, the following quotes.
- A calm mind is the main ingredient of success.
- Selfless work paves the path to salvation.
- Always choose forgiveness, no matter whatever challenge you face.
- When we connect, more we live better life.
- YOG is mindful movement, a journey of self discovery. It erases all mental and emotional disturbances.
- We can transform our reality through soul consciousness.
- Desireless performance can produce the best results always.
- For troubled mind, seeking informal therapy is the best solution.
- If we want Harmony in relationships, be a giver and not demander or taker.
- Logging out is beneficial in personal conflicts.
- For, Resilience, a journey of love, light and inner Transformation, Conscious love are rare Phenomenon.

For better world and for sustainable future, Human Resilience is very important factor, which must be implemented from the childhood stage.

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**CHALLENGES, OPPORTUNITIES, AND PATHWAYS OF COMMUNITY
MANAGEMENT IN EDUCATION FOR SUSTAINABLE DEVELOPMENT****Professor Ni Ni Hlaing***Myanmar**ninihlaing59@gmail.com*

Abstract :

Community management in education involves building relationships with stakeholders and creating a learning environment that extends beyond the classroom. Community participation can help to ensure that sustainable development projects are inclusive and benefit all members of the community, regardless of their social or economic background. This talk provides a comprehensive overview of community management in education, offering insights and recommendations for policymakers, practitioners, and researchers. Education is a foundation of national development. Community management in education plays a critical role in addressing the unique challenges of a diverse and complex society. This talk presents the current state of education management at the community level, focusing on the community participation. Education aims to develop the basis of intelligence, knowledge, personality, noble character, and skills among students. Thus, community involvement in education is fitting, because education is part of the essence of people's lives. The community has interests not just in education, but primarily to improve quality in the framework of forming social roles through various forms of participation in education institutions. In this talk, the challenges faced by stakeholders are highlighted, including limited resources, ethnic and linguistic diversity, and political instability, while also it identifies opportunities for sustainable development by drawing on existing literature, case studies, and stakeholder perspectives. It also explores the role of decentralization, community participation, and non-state actors in shaping the future of education. The talk concludes with recommendations for strengthening community management in education to ensure equitable access to quality education for all.

Keywords: Community management, Education, Sustainable Development

FROM PRINT TO PIXELS: LITERATURE IN THE DIGITAL AGE**Dr. Vaibhav Sabnis***Professor, Dept. of English**Dr. Babasaheb Ambedkar Memorial**College of Law, Dhule, Maharashtra .*

Abstract:

Our lives have been surrounded by technology as it has become the integral part of living. It is because of this that today's age is termed as the Digital Age where there are some digital natives and some digital migrants. With the advent print technology, literature reached the masses. In today's era where technology plays an important role in our lives, it has taken language and literature to a different level altogether.

Though still there is a friction between the digital literates and illiterates, technology-driven life has gained momentum and hence digital humanity is the new buzz word. E-books, audio books, pdf books, websites, digital storytelling, online platforms for various programmes and events, the social media platforms have fostered and enhanced communication among various sections of society and have revolutionized the role of literature.

Keywords: AI, technology, e-books, literature, Digital Age.

1. Introduction:

Technology has become the part and parcel of our life. It has not just touched but affected all the spheres and sectors of life. It is no wonder that it has affected the language and literature also. Today's era is rightly called as Digital Age as Alexa, Google Assistant, ChatGPT, AI, mobile phones and computers have become the essential members of our family. The way we create, consume, and engage with language and literary works is being profoundly impacted by technology, especially the internet and digital platforms.

Life cannot be imagined without technology and its assisting tools. It has facilitated communication and literature like never before. However, it is not in the traditional form and obviously so. Now there are emojis, stickers, smileys and abbreviations which have replaced the traditional full and complete sentences. For most people, literature used to be untouchable because of their high-cost, unavailability and their restricted use of libraries. However, the digital humanities have made it touchable and accessible to all that too in minimum time and money. Today because of e-libraries and digitalisation of books and literature, it has become an easy access for anybody. Hence, the terms like digital humanity have got momentum in the recent times.

It is said that technology is a necessary evil; there are bad effects of it. It has disturbed the conventional reading cult and habits and because of more screentime, it has affected the mental health of millions of people. Because of AI, many unhealthy and unethical practices in the realm of literature have been taken place. It is the time to take the pros of the technology and work on minimising the cons of it. We have to understand that technology is for us and we are not for technology.

So, by minimising the digital slavery, we need to resurrect our literature, our culture reflected in literature and our society with its chain of actions and reactions duly mirrored in literature by using the smart gadgets and tools smartly. The present paper throws light on the evolution of literature in the digital age. It highlights the concerns that it has brought in train in today's age. It has been hypothesised that literature in the digital age is more accessible than before but marred by the technology with reading cult on the decline. However, there is a positive picture where the untraceable and unreachable books have been reproduced in the digital form making it accessible to millions of readers and researchers. The analysis and interpretation are based on the own experience as well as the review of literature especially in the internet database.

2. Technology and Literary Production: A Reflection of Dynamic Society

Whether the literature is in the print form or in the pixel form it has been a faithful mirror to the happenings, actions and reactions in the society. There was no need to read history but to go through the literature of the times to know the socio-political conditions of the era and country. Technology has added new dimensions to the literature. The torn pages of books have been available in PDF. Novels and dramas have been adapted for films and serials. During travelling also people can enjoy literature through audio books. The world-famous stories like *Alice in Wonderland*, *Sherlock Holmes* are available in print form, digital form as well as in a movie form. So, literature in the digital age has been more accessible to more people though the reading cult is diminishing. Literature has crossed the geographical boundaries. Because of translation that too with the help of technology or the apps like Grammarly and AI tools, translation has become easier. There has been collaboration between the AI and a human mind.

Because of technology things have got momentum and pace. The oral literature and folk literature are available in written form. The tribal songs or folk songs that we used to listen to are available on social media platforms. Moreover, literature of a particular region or language has been translated into English and other languages and has got acknowledgement and recognition from the international scholars. The best example is the academy run by professor Ganesh Devi in Baroda, Gujarat where he helped to work on the tribal language and literature and give it a global platform.

For a long time, we were restricted to the British and American literatures but now is a time that we have Commonwealth Literature, Sri Lankan literature, Asian literature, African

literature, Afro-American literature, Tribal literature, Women's literature, Black Literature, Dalit literature, Children's literature and so on. Because the seven seas have been crossed and this is only because of the digital age.

Throughout history, literature has been a major force behind social development. Authors expose injustices, question accepted conventions, and spark social reform movements with compelling stories. By tackling urgent problems like social injustice, climate change, and technology ethics, literature still acts as a catalyst for change in the modern period. It has been rightly argued,

Literature has been a fundamental aspect of human culture for centuries, serving as a repository of knowledge, a vehicle for cultural expression, and a means of communication. In the modern era, characterized by rapid technological advancements and globalization, the role of literature has evolved to meet the changing needs of society. The digital age has revolutionized the way literature is created, consumed, and disseminated. (Vee, 2016)

There are online publishing houses like Kindle where without affecting our environment we have the PDF versions or Kindle versions of our books. This has helped the new readers to access to the potential of the new writers and the new writers can showcase their creative genius through the social media platforms. Hence, technology has enhanced the creativity in the modern Digital Age. It has been rightly pointed out that “The digital age has ushered in new opportunities for literary creation. Authors now have diverse mediums at their disposal, including blogs, social media, and self-publishing platforms” (Vee, 2016). Readers can now access a greater variety of authors and genres at any time and from any location- thanks to digital platforms like e-books and online libraries.

In the digital age, the confluence of language, literature, and technology has changed literary studies, pedagogy, and communication. The literary creation, intellectual participation, and linguistic change have been impacted by digital innovations. The online platforms, digital humanities, and artificial intelligence (AI) are changing textual interactions and knowledge availability. (Shahand Khaskheli, 2023)

Challenges like the digital divide, moral dilemmas, and the evolving function of authorship in a time of machine-assisted creativity are some of the concerns that require thorough and serious discussion. From the printing press to the internet, language and literature have historically changed in tandem with technical advancements. This change has been sped up by the emergence of the digital age, which has made it possible for new kinds of literary expression, interactive education, and international dialogue.

3. Digital Platforms and Literary Landscapes:

The impact of AI, digital platforms, and emerging technologies on linguistic and literary landscapes is worth being considered. AI generated literature is the new sort of literature which is

drawing attention today. The genuineness is at stake but it has garnered creative activity like never before. Humans can take the help from the AI to generate the ideas and foster their creative genius. Voice chat and voice typing have enabled faster and smoother typing where the budding authors can write effortlessly. Evolution of Siri, Alexa, and Google Assistant has helped to get the things done with a voice command. It saves time and energy and can have anything anytime anywhere with least efforts. If the prompt is given properly, if proper inputs are given to AI like ChatGPT, it is easier to work with pace and peace.

Project Gutenberg and self-publishing platforms have made publication easier and also freed from the shackles of printing cost and distribution hurdles. With the least need of the printing copies or hard copies, the kindle editions or the e-copies and their publication on the online platforms makes it cost-efficient. This is actually the boon of the Digital Age. Because of the online reading, it is easier to locate a text in a context and have multiple interpretations with the help of AI. Linguistic nuances also can be found. This inspires the critical sensibility as well. Often there have been instances of collaboration with the AI tools.

This has brought widespread criticism but the fusion of AI and OI (Original Intelligence) has to be a welcome change. In order to have a closer look at the criticism against AI, the AI ChatGPT has been used which makes the claim more relevant. The first criticism is by the renowned theoretical physicist Stephen Hawking who is highly critical of AI. He says, “The development of full artificial intelligence could spell the end of the human race. It would take off on its own, and re-design itself at an ever-increasing rate. Humans, who are limited by slow biological evolution, couldn’t compete, and would be superseded” (<https://www.cam.ac.uk/research>). The world-famous linguist and philosopher Noam Chomsky is also apprehensive of the AI and the related nuances. He says, “AI is not the problem; it’s the systems of power that deploy it” (<https://stormgrass.com>).

Though there is criticism against the AI and related things and even though the older generation is against it as it fears it is killing the human potential, it has to be borne in mind that the human-AI collaboration can prove to be a great boon if used judiciously. The field of AI with human collaboration in literary production is developing; under human supervision, AI can function as an assistant, co-creator, or even an independent writer. There are some interesting examples of collaboration as far as AI-Assisted Poetry and Fiction Writing are concerned. *Sunspring* written in 2016 is a short film based on sci-fi written entirely by an AI named Benjamin. A dataset of science fiction screenplays has been used in its creation. Even though the script was surreal and a little illogical, it showed how AI might produce original material that people could edit and modify.

Another interesting example of collaboration is *Poem Portraits*. It is project by Google’s AI Lab and Es Devlin where AI combines human intent with computational creativity to create

poetry from a single word entered by a person. Besides, there are examples of AI-Generated Novels and Co-Writing with Authors. The foremost example is that of *I the Road* (2018). It is an innovative novel written by Ross Goodwin's AI. The sensors and real-time data (GPS, weather, and time) have been utilised to generate a literary travelogue which is thought to be stimulated by Jack Kerouac's *On the Road*. *The Day a Computer Writes a Novel* (2016, Japan) is a novel generated with the help of AI which made it past the first round of a national literary competition, showcasing the potential of machine-generated storytelling. More interesting creation with the assistance of Artificial Intelligence is AI-Powered Interactive Storytelling. *AI Dungeon* is a text-based role-playing game that combines machine-generated content and human improvisation to let players co-create stories with AI. These examples demonstrate how, even while AI aids in the development of literature, human control is essential to giving the finished product depth, emotion, and coherence. It shows that AI enhances and reassures the creative and constructive role of AI in the literary creation. The literary output produced by humans has been made more refined by the AI. It helps reduce the errors in grammar and style. It also helps to enhance the linguistic style of a text. AI as a co-creator is a good boost but has raised ethical concerns as well. AI should be used to enhance the human creativity. If it replaces it, it will be dangerous.

4. Digital Humanities and Literary Studies:

The buzzword that has gained popularity recently is digital humanities. It is an interdisciplinary field that integrates humanistic disciplines with computational approaches. To analyse, conserve, and advance languages, it blends digital techniques with conventional linguistic research. It is because of the boon of digital tools that the old texts have been preserved and are accessible to the common public. These days with the advent of NEP 2020 there have been stronger talks of IKS. Digital Humanities foster the IKS. India has been a fertile land of saints, treatises and mythologies. The preservation, reproduction and reinterpretation are possible under the arena of digital humanities. The age-old but highly precious manuscripts can be preserved and made available to the public. Revival of old languages and literatures, and oral traditions is possible through the digital tools. Endangered languages can be protected. However, it is imperative to maintain the cultural identity while adopting AI. There should be a balance between tradition and technology. Technology must be utilised for the preservation of tradition and not otherwise.

Text mining, archive research, and remote reading are made possible by the area of digital humanities. It smartly combines literary analysis with computational technologies. Comparative studies and intertextual analyses are made easier by the unparalleled access to historical texts that digital archives offer. Researchers can find hidden connections, thematic trends, and linguistic patterns in literary corpora with the help of AI-driven techniques. However, it is not without

concerns. Concerns about interpretive bias, algorithmic control, and the marginalization of conventional critical techniques are also brought up by the dependence on digital methodologies.

5. Concerns, Challenges and Ethical Considerations:

Although technology makes linguistic and literary resources more accessible, there are drawbacks as well. Inequalities in access to literary and educational resources are made worse by the digital divide. The digital migrants may find it difficult to balance between tradition and technology. The digital natives are more engrossed and are overdependent on the digital tools or AI generated things which have badly affected their own intelligence. The concerns regarding information overload, screentime and technology addiction are surfacing rather realistically.

The older generation might find the overuse of AI as a threat and danger to the human creativity. There has been a fear of AI replacing the human resources. This is genuine in many contexts like translation and interpretation where AI has proved to be quicker and smarter though it is less reliable. Cultural narratives are shaped by algorithmic biases in AI models that affect textual analyses and content recommendations. The rise in AI-generated content calls for conversations about data protection, ethical authorship, and how automation is affecting creative industries. It has rightly observed that “Digital platforms have democratized access to literature, allowing readers to explore a vast array of works from around the globe. However, this increased accessibility also presents challenges such as information overload and the potential dilution of literary standards” (McCosker, Wilken, & Wilken, 2017).

Information overload is one of the top concerns because there is so much information available online, it can be challenging to determine its reliability and quality. Copyright Concerns is justifiable as the digital content distribution and sharing give rise to worries about copyright violations. There have been serious issues related to plagiarism as paraphrasing tools are available with the blessings of AI. This has badly affected the individual creativity and it has become too difficult to locate the performance and the performer. Amidst this, the reading cult is dwindling and addition to it are reading habits and attention span. AI is proving almost everything and it is not much necessary to read the original texts. Besides, the rapid pace of digital consumption may affect reading concentration and depth. Despite all these concerns, we ought to welcome the positives of the AI generated things as even though one feels it is evil, it is imperative to say that it is a necessary evil.

6. Conclusion:

Because of the technological advancement, literature has gone closer to the hearts. However, in the train of development and dynamism came many ills and evils. The ethical concerns are worth being discussed because in the age of artificial intelligence, the original intelligence has been overshadowed. It will be the best time when the AI and OI come together and

create something wonderful and healthy for the society. Our journey started with the oral tradition followed by the hand written literature and then came the print technology. Now is the time to accept and respect the change brought by the digital age because we are the digital natives now. This is the age of digital technology and those who do not use it may be called the uncivilised people of this century.

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WORK CULTURE FOR TEACHERS IN CONTEXT OF ARTIFICIAL INTELLIGENCE

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Abstract

AI has changed the education system and teaching-learning pedagogy in education institutions drastically. AI can automate lectures, freeing up teachers to focus on facilitating discussions, providing feedback, and guiding students. AI has transformed the work culture for teacher completely. It has changed teachers from lecturer to facilitator. From grader to mentor: AI can automate grading, enabling teachers to focus on mentoring students, providing individualized feedback, and supporting their learning journeys. From content provider to learning designer: AI can provide personalized learning pathways, enabling teachers to focus on designing engaging learning experiences, developing curriculum, and creating assessments. With these changes in teaching practices and role of teacher the work culture for teachers must be focused on.

Key Words: Work culture, Teachers, Artificial Intelligence

Introduction

Present era is the time of changes regarding every profession with the inclusion of Artificial Intelligence and teachers are not an exceptional to that. AI is proven as advance tool for saving time money and energy and doing smart work. AI has influenced work culture of teachers tremendously. However, AI can not replace teachers but the teachers acquainted with AI may replace traditional teachers. Positive and negative aspects of AI are like two sides of coin. There is a scope for mitigating the negative Impacts of AI on Teacher Work Culture.

Some successful implementation of AI

1. AI-powered teacher training programs: Implementing AI-powered teacher training programs that provide personalized feedback, coaching, and support to teachers.
2. Collaborative AI development projects: Collaborating with teachers, administrators, and AI developers to design and develop AI-powered educational tools and resources.
3. Innovative AI-infused curricula: Developing innovative AI-infused curricula that integrate AI, data science, and other emerging technologies into traditional subjects and disciplines.

Impact of AI on Teacher Work Culture

AI is Changing role of teachers. It is transforming the role of teachers from mere knowledge providers to facilitators, mentors, and learning coaches. AI has Increased focus on

human skills. It is emphasizing the importance of human skills, such as empathy, creativity, and critical thinking, in teaching and learning. It has transformed traditional teaching methods. AI is encouraging teachers to adopt more innovative and flexible teaching methods, incorporating technology and data-driven approaches.

Positive Impacts of AI on Teacher Work Culture

- Enhanced productivity: AI can automate administrative tasks, freeing up teachers' time to focus on teaching and learning.
- Personalized learning: AI-powered tools help teachers tailor instruction as per students' needs, abilities, and learning styles.
- Data-driven decision making: AI can provide teachers with real-time data and insights to inform their instruction and improve student outcomes.
- Professional development opportunities: AI can facilitate teacher professional development by providing personalized coaching, mentoring, and training.

Negative Impacts of AI on Teacher Work Culture

- Job displacement concerns: The increasing use of AI in education has raised concerns about job displacement and the potential for AI to replace human teachers.
- Changes in teacher roles and responsibilities: AI may require teachers to take on new roles responsibilities such as AI trainer.
- Increased workload and stress: Integrating AI into teaching practices can increase teachers' workload and stress levels, particularly if they are not adequately trained or supported.
- Depersonalization of teaching:
The over-reliance on AI-powered tools can lead to a depersonalization of teaching, potentially undermining the human relationships and interactions that are essential to effective teaching and learning.

Essential Elements of a Positive Work Culture for Teachers in the Context of AI

➤ Collaboration and Support

Interdisciplinary collaboration: Encourage collaboration between teachers, AI developers, and other stakeholders to foster a sense of community and shared purpose.

Peer support and mentoring: Provide opportunities for teachers to support and mentor each other in their use of AI-powered tools and approaches.

Administrative support: Ensure that administrators provide adequate support and resources for teachers to effectively integrate AI into their teaching practices.

➤ Professional Development and Training

AI literacy training: Provide teachers with training and resources to develop their AI literacy, including understanding AI basics, AI ethics, and AI applications in education.

Pedagogical training: Offer training and support for teachers to develop the pedagogical skills needed to effectively integrate AI-powered tools into their teaching practices.

Ongoing support and coaching: Provide ongoing support and coaching for teachers to help them refine their use of AI-powered tools and approaches.

➤ **Autonomy and Flexibility**

Flexibility in teaching approaches: Encourage teachers to experiment with different teaching approaches and AI-powered tools to find what works best for their students.

Autonomy in curriculum design: Provide teachers with autonomy to design and develop their own curricula, incorporating AI-powered tools and approaches as needed.

Flexible work arrangements: Offer flexible work arrangements, such as telecommuting or flexible hours, to help teachers balance their work and personal responsibilities.

➤ **Recognition and Rewards**

Recognition for innovative teaching practices: Recognize and reward teachers for their innovative use of AI-powered tools and approaches in their teaching practices.

Professional growth opportunities: Provide opportunities for teachers to engage in professional growth and development, such as attending conferences, workshops, or pursuing advanced degrees.

Monetary incentives: Offer monetary incentives, such as bonuses or stipends, to teachers who develop and implement innovative AI-powered teaching practices.

➤ **Emphasis on Human Skills and Relationships**

Emphasis on emotional intelligence: Emphasize the importance of emotional intelligence, empathy, and social skills in teaching and learning. **Fostering positive relationships:** Foster positive relationships between teachers, students, and parents, recognizing the importance of human connections in education.

Prioritizing student well-being: Prioritize student well-being, recognizing that AI-powered tools and approaches should support, rather than undermine, student well-being.

Strategies for Fostering Positive Work Culture for Teachers in the Context of AI

➤ **Establish a Culture of Innovation and Experimentation:** Encourage experimentation: Encourage teachers to experiment with new AI-powered tools and approaches, providing a safe and supportive environment for them to do so. **Provide resources and support:** Provide teachers with the resources and support they need to develop and implement innovative AI-powered teaching practices. **Celebrate successes and failures:** Celebrate teachers' successes and failures, recognizing that both are essential to the learning and innovation process.

➤ **Foster a Growth Mindset:** Emphasize continuous learning: Emphasize the importance of continuous learning and professional development for teachers, recognizing that AI is constantly evolving. **Provide opportunities for growth:** Provide teachers with opportunities

for growth and development, such as attending conferences, workshops, or pursuing advanced degrees. Encourage self-reflection and self-improvement: Encourage teachers to engage in self-reflection and self-improvement, recognizing that AI can support, rather than undermine, teacher autonomy.

- **Build Trust and Transparency:** Communicate clearly and transparently: Communicate clearly and transparently with teachers about the role of AI in education, addressing concerns and providing reassurance. Involve teachers in decision-making: Involve teachers in decision-making processes related to the adoption and implementation of AI-powered tools and approaches. Provide opportunities for feedback and input: Provide teachers with opportunities to provide feedback and input on AI-powered tools and approaches, recognizing that teacher voice is essential to successful implementation.
- **Emphasize Human Skills and Relationships:** Emphasize emotional intelligence and empathy: Emphasize the importance of emotional intelligence and empathy in teaching and learning, recognizing that AI can support, rather than replace, human relationships. Foster positive relationships: Foster positive relationships between teachers, students, and parents, recognizing that human connections are essential to effective teaching and learning. Prioritize student well-being: Prioritize student well-being, recognizing that AI-powered tools and approaches should support, rather than undermine, student well-being.
- **Provide Ongoing Support and Coaching:** Provide ongoing training and support: Provide teachers with ongoing training and support to help them refine their use of AI-powered tools and approaches. Offer coaching and mentoring: Offer coaching and mentoring to help teachers develop the skills and confidence they need to effectively integrate AI into their teaching practices. Encourage peer support and collaboration: Encourage peer support and collaboration among teachers, recognizing that teacher-to-teacher support is essential to successful implementation.
- **Emphasizing teacher well-being:** Prioritizing teacher well-being and providing resources and support to help teachers manage stress, maintain a healthy work-life balance, and cultivate a sense of purpose and fulfillment.

Mitigating the Negative Impacts of AI on Teacher Work Culture

- **Teacher training and support:** Providing teachers with adequate training, support, and resources to effectively integrate AI into their teaching practices.
- **Clear communication and transparency:** Ensuring that teachers are informed and involved in decision-making processes related to the adoption and implementation of AI-powered tools.

- Emphasizing human skills and relationships: Recognizing the importance of human skills and relationships in teaching and learning, and ensuring that AI-powered tools are used to support and enhance these aspects of teaching.
- Fostering a culture of innovation and experimentation: Encouraging teachers to experiment with new AI-powered tools and approaches, and providing a safe and supportive environment for them to do so.

Conclusion

AI has transformed entire education system into the platform to explore, learning and creativity and so the work culture and work environment of every institution is influenced. AI influenced education world with positive and negative impacts. However, negative impacts can be mitigated with efforts. Teacher must be trained and adjusted with the current flow of AI and new dynamic work culture. With these changes in teaching practices and role of teacher the work culture for teachers must be focused on.

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CREATING A FRAMEWORK FOR FUTURE COLLABORATIONS: SCHOLARS VIEW

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Abstract

Collaboration has become an essential driver of innovation and progress across various industries and disciplines. This article explores key strategies for building a robust roadmap for future collaborations, including stakeholder identification, communication frameworks, trust-building mechanisms, and technological enablers. By synthesizing current literature and case studies, this paper provides a structured approach to fostering productive and sustainable partnerships.

Keywords: Collaboration, Success Factors, Digital Tools, Stakeholder Engagement,

Introduction

Collaboration is the cornerstone of modern problem-solving, driving advancements in science, business, and technology. In an increasingly interconnected world, partnerships between diverse entities—ranging from multinational corporations to academic institutions—have become essential in tackling complex global challenges. Whether in the form of research alliances, cross-industry partnerships, or international policy initiatives, collaboration fosters knowledge exchange, resource-sharing, and innovative problem-solving.

However, successful collaborations do not happen organically; they require deliberate planning, well-structured frameworks, and strategic management. Factors such as mutual trust, clear communication, aligned objectives, and technological integration play crucial roles in determining the success and longevity of collaborative efforts. Without these elements, collaborations can face obstacles such as misaligned goals, inefficient workflows, and stakeholder conflicts.

This article aims to provide a comprehensive roadmap for future collaborations by examining best practices, challenges, and enabling factors. It explores key elements that drive successful partnerships, identifies barriers that hinder progress, and highlights strategic approaches to ensure sustainability and impact. By leveraging real-world case studies, data-driven insights, and expert perspectives, this paper offers actionable recommendations for organizations, governments, and research bodies to navigate the complexities of collaboration effectively.

The Need for a Roadmap

A roadmap for collaboration provides a structured approach to navigating the complexities

of partnership-building. It serves as a guiding framework that outlines the essential stages of collaboration, ensuring that all involved parties operate with a shared vision and common objectives. A well-defined roadmap facilitates clarity in decision-making by setting clear expectations, assigning responsibilities, and establishing accountability measures to ensure progress and effectiveness.

One of the primary advantages of a structured collaboration roadmap is that it fosters transparency and alignment among stakeholders. By defining specific roles and responsibilities, it minimizes misunderstandings and redundancies, allowing teams to work more efficiently. Additionally, it incorporates mechanisms for conflict resolution, ensuring that disputes are addressed constructively without jeopardizing the partnership's overall success.

Beyond role clarity and conflict resolution, a collaboration roadmap also aids in risk management. It helps in identifying potential barriers—such as resource constraints, cultural differences, regulatory hurdles, or technological limitations—before they escalate into significant challenges. With a proactive approach to mitigating risks, organizations can develop contingency plans and adaptive strategies that enhance the resilience and sustainability of their collaborative efforts.

Furthermore, a well-structured roadmap facilitates long-term growth and scalability. By integrating evaluation and feedback mechanisms, it enables continuous improvement, ensuring that partnerships remain adaptable to changing circumstances and evolving goals. Whether in scientific research, business ventures, or cross-sector collaborations, a strategic roadmap serves as a blueprint for success, maximizing efficiency and impact in collaborative initiatives

Methodology

This research follows a mixed-methods approach, integrating qualitative and quantitative analysis to develop a robust roadmap for future collaborations. The methodology consists of the following steps:

1. Literature Review

A thorough review of existing literature on collaboration frameworks, stakeholder engagement, communication strategies, and technological enablers was conducted. Sources included peer-reviewed journals, industry reports, and case studies from various sectors.

2. Case Study Analysis

Three case studies from different industries—biotechnology, infrastructure development, and climate change initiatives—were analysed to identify common factors that contribute to successful collaborations. These case studies were selected based on their impact, scalability, and the diversity of stakeholders involved.

3. Surveys and Interviews

Primary data was collected through structured surveys and in-depth interviews with industry experts, researchers, and organizational leaders. The survey focused on identifying key barriers, trust-building strategies, and the role of digital tools in modern collaborations.

4. Data Analysis

Qualitative data from interviews were thematically analysed to extract recurring themes and patterns. Quantitative data from surveys were analysed using statistical techniques to determine trends and correlations between collaboration success factors.

5. Framework Development

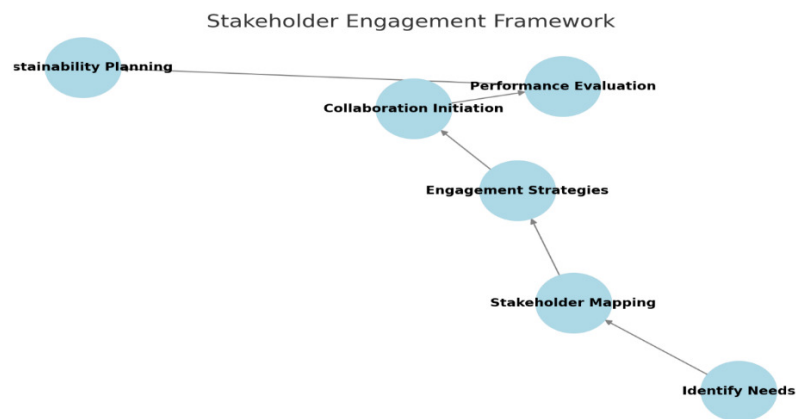
Based on findings from the literature review, case studies, and data analysis, a structured roadmap for future collaborations was developed. This framework incorporates best practices, risk management strategies, and performance evaluation metrics to enhance long-term partnership effectiveness.

Key Components of a Collaboration Roadmap

1. Identifying Stakeholders and Defining Objectives

Successful collaborations begin with the identification of relevant stakeholders. These may include businesses, academic institutions, governmental bodies, and non-profit organizations. The involvement of diverse stakeholders ensures a well-rounded approach that integrates different perspectives, expertise, and resources. Once stakeholders are identified, clear objectives must be established to align efforts toward common goals. Clearly defined objectives help in creating a unified direction, ensuring that all participants contribute effectively to the collaboration's success. In addition to goal-setting, stakeholder engagement strategies should be implemented to encourage active participation and commitment. Regular communication, shared decision-making, and transparent information-sharing mechanisms help in building trust among partners. Establishing key performance indicators (KPIs) allows for continuous monitoring and assessment of progress, ensuring that collaborations stay on track and adapt to evolving circumstances.

Moreover, collaborations benefit from a structured governance model that outlines decision-making hierarchies, responsibilities, and accountability measures. Such a model facilitates smooth operations and prevents conflicts by providing a clear framework for resolving disputes and managing differing stakeholder interests. By fostering an inclusive and structured approach, organizations can maximize the effectiveness of their partnerships and drive sustainable, long-term success.



Here is a flowchart illustrating the stakeholder engagement framework

2. Establishing Effective Communication Strategies

Communication is the foundation of any successful collaboration. Effective communication strategies involve:

- Regular meetings and updates to ensure that all stakeholders are informed and aligned with the collaboration's progress and goals.
- Clear documentation of agreements and expectations, which provides a reference point for all parties and minimizes misunderstandings.
- Use of collaborative tools such as project management software, shared workspaces, and real-time communication platforms to enhance coordination and workflow efficiency.
- Open feedback channels to facilitate continuous improvement, allowing for timely resolution of concerns and ensuring that all voices are heard in the decision-making process.

By integrating these strategies, teams can foster transparency, maintain engagement, and strengthen the collaborative process, ultimately leading to more effective and sustainable partnerships.

Effective communication strategies involve:

- Regular meetings and updates
- Clear documentation of agreements and expectations
- Use of collaborative tools such as project management software
- Open feedback channels to facilitate continuous improvement

3. Trust-Building Mechanisms

Trust plays a critical role in long-term collaborations. Strategies for trust-building include:

- Transparency in decision-making to ensure that all stakeholders have visibility into processes, fostering an environment of openness and honesty.

- Equitable distribution of responsibilities, ensuring that each participant contributes fairly and that no single entity bears a disproportionate burden.
- Commitment to shared values and ethics, creating a foundation of mutual respect and understanding that strengthens collaborative relationships.
- Performance accountability and evaluation metrics, which provide a framework for measuring success, addressing inefficiencies, and promoting continuous improvement.

By fostering trust through these strategies, organizations can enhance collaboration sustainability, improve stakeholder relationships, and drive long-term success.

4. Leveraging Technology and Digital Tools

Modern collaborations are increasingly dependent on digital tools for seamless interactions.

Technologies that facilitate collaboration include:

- Cloud-based document-sharing platforms
- Virtual and augmented reality for remote interactions
- Artificial intelligence for data-driven decision-making
- Blockchain for secure and transparent transactions

5. Funding and Resource Allocation

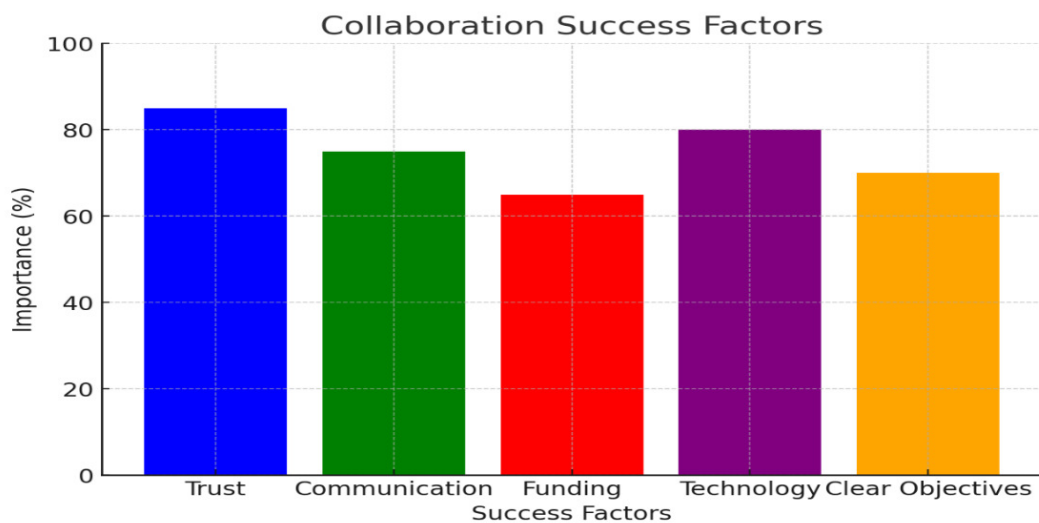
Financial stability is crucial for sustaining long-term collaborations. Ensuring adequate resource allocation requires a diversified approach to identifying funding sources, which may include grants, corporate sponsorships, government programs, and philanthropic contributions. Access to multiple funding streams reduces dependency on a single source and enhances financial resilience.

Additionally, establishing clear budgetary guidelines is essential to prevent financial mismanagement and ensure efficient use of resources. This includes setting transparent financial policies, defining expenditure limits, and implementing regular financial audits. Proper budget planning enables organizations to anticipate funding gaps, allocate resources effectively, and sustain collaborative efforts over extended periods.

Furthermore, financial accountability mechanisms should be integrated to track expenses, measure financial efficiency, and ensure compliance with funding requirements. Utilizing financial management tools and periodic reporting enhances transparency and builds trust among stakeholders and funders. By adopting sound financial planning and oversight practices, collaborations can remain financially stable, supporting long-term success and growth.

6. Conflict Resolution and Risk Management

Disputes and conflicts are inevitable in collaborations. A roadmap should include predefined conflict-resolution mechanisms, such as mediation strategies, arbitration procedures, and contingency plans to address risks proactively.



Case Studies

Case Study 1: Academia-Industry Collaboration in Subject (Biotechnology)

This case study explores how universities, Colleges and biotech firms collaborate to drive research and innovation. By leveraging academic expertise and industry funding, these partnerships have led to groundbreaking advancements in healthcare. Universities provide cutting-edge research, access to top scientific minds, and laboratory resources, while biotech firms offer commercialization pathways, financial backing, and industry expertise. Through these collaborations, novel therapies, medical devices, and pharmaceutical breakthroughs have emerged, accelerating the transition from theoretical research to practical, real-world applications. These partnerships also facilitate knowledge exchange, workforce development, and the translation of scientific discoveries into market-ready healthcare solutions. By fostering long-term alliances, universities and biotech companies continue to push the boundaries of medical innovation, ultimately benefiting global public health.

Case Study 2: Public-Private Partnerships in Infrastructure Development

Public-private partnerships (PPPs) have facilitated large-scale infrastructure projects globally. This study highlights how governments and private entities collaborate to fund, design, and implement critical infrastructure, such as transportation and energy networks. Through PPPs, governments leverage private sector expertise and investment to overcome budget constraints and expedite project execution. These collaborations often involve long-term contracts, ensuring sustainable development and efficient resource management. By fostering innovation and efficiency, PPPs enhance infrastructure resilience, promote economic growth, and improve public service delivery, demonstrating their effectiveness as a model for addressing large-scale societal challenges.

Case Study 3: International Collaboration in Climate Change Initiatives

Addressing climate change requires global cooperation. This case study examines multinational efforts to reduce carbon emissions through collaborative research, policy-making, and technological innovation. Governments, corporations, and research institutions work together to develop and implement sustainable energy solutions, carbon capture technologies, and regulatory frameworks. These collaborations have led to significant policy advancements such as international climate agreements and carbon trading mechanisms. Additionally, investments in renewable energy projects and cross-border environmental initiatives showcase the power of collective action in combating climate change. By uniting expertise and resources, global partnerships play a crucial role in driving environmental sustainability and mitigating the effects of climate change.

Case Study 4: Cross-Border Technological Innovation in Artificial Intelligence

International collaborations in artificial intelligence (AI) have become increasingly vital for advancements in automation, machine learning, and ethical AI development. This case study examines partnerships between major tech companies, research institutions, and governments to develop AI-driven solutions for healthcare, finance, and cybersecurity. By leveraging cross-border knowledge sharing, these collaborations accelerate technological advancements while addressing ethical concerns surrounding AI implementation.

The development of global regulatory frameworks plays a crucial role in ensuring responsible AI adoption. International agreements and ethical guidelines provide standardized approaches for AI governance, helping mitigate biases, enhance transparency, and promote accountability. Additionally, AI research initiatives benefit from multinational funding, allowing for large-scale projects that push the boundaries of innovation while ensuring compliance with ethical and legal considerations.

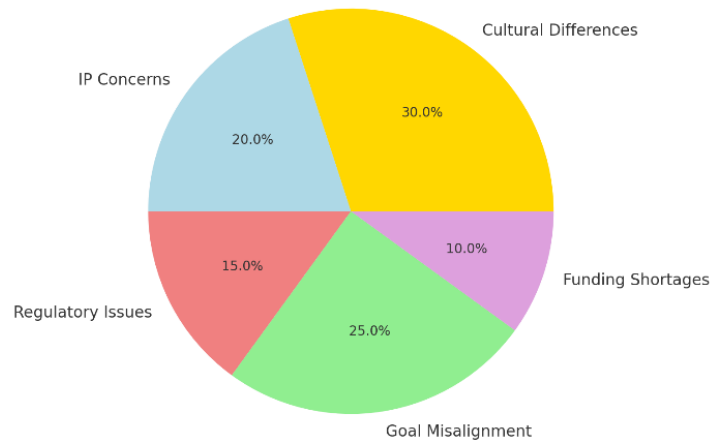
These collaborative efforts also enhance workforce development by creating specialized training programs and research exchanges, fostering an interconnected AI talent ecosystem. By uniting expertise and resources from diverse geographical and institutional backgrounds, international AI collaborations contribute to groundbreaking innovations while ensuring ethical considerations remain a core focus of AI development.

Challenges and Barriers to Collaboration

Despite the advantages, collaborations face challenges such as:

- Cultural and organizational differences
 - Intellectual property and data-sharing concerns
 - Bureaucratic red tape and regulatory compliance
 - Misalignment of goals and priorities
 - Resource constraints and financial limitations
-

Challenges in Collaboration



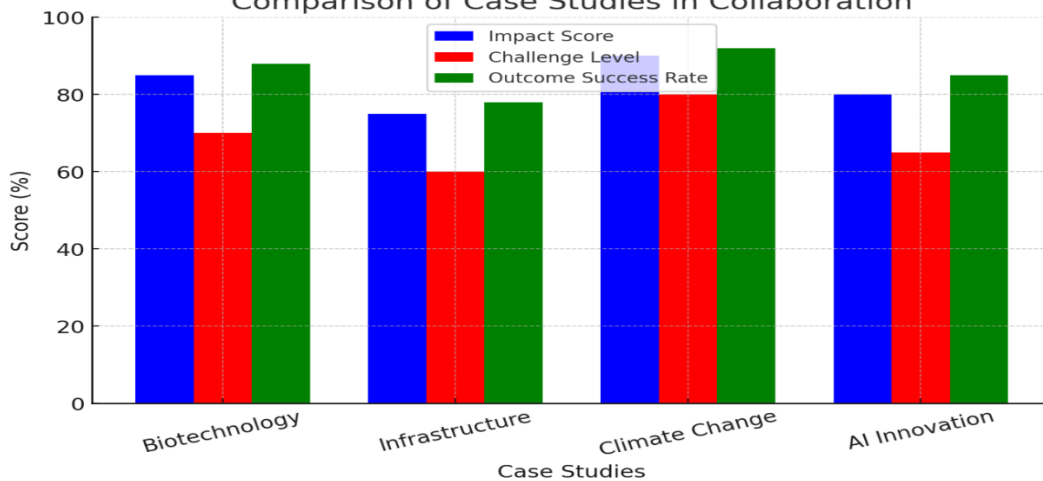
This pie chart visualizes the distribution of common challenges in collaboration.

Strategies for Sustainable Collaborations

To ensure long-term success, collaborations should incorporate:

- Periodic performance assessments and feedback loops
- Flexible and adaptive frameworks to accommodate changing needs
- Capacity-building programs for all stakeholders
- Strong leadership and governance structures

Comparison of Case Studies in Collaboration



Conclusion

Building a roadmap for future collaborations is essential for achieving shared objectives in an increasingly interconnected world. By adopting a structured approach that includes stakeholder engagement, effective communication, trust-building, technology integration, financial planning, and conflict resolution, organizations can maximize the benefits of collaboration. Future research should explore innovative models and frameworks to further enhance collaborative success across different sectors.

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GOEIJR

**A STUDY ON AWARENESS OF RECOGNITION OF PRIOR LEARNING (RPL)
AMONG ADULT WOMEN IN PUNE**

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Abstract

Recognition of Prior Learning (RPL) is a process that assesses and acknowledges the skills and knowledge acquired through informal, non-formal, and experiential learning. This study examines the awareness of RPL among adult women in Pune, identifying factors influencing their knowledge and participation. Using a mixed-methods approach, data was collected through surveys and interviews. Findings indicate a significant gap in awareness, with socio-economic factors playing a crucial role. The study suggests policy interventions and community engagement to enhance RPL accessibility for women.

Keywords : Recognition of Prior Learning, Adult Women, Pune, Skills Assessment, Informal Learning, Vocational Training

1. Introduction

1.1 Background

Recognition of Prior Learning (RPL) is an essential component of skill development and lifelong learning, helping individuals gain formal certification for skills acquired outside traditional education. The National Skill Development Corporation (NSDC), NEP 2020 and UGC and other government initiatives have promoted RPL in India, but its adoption among women remains low.

1.2 Rationale

Adult women often acquire diverse skills through life experiences, work, and informal training. However, the lack of awareness about RPL prevents them from leveraging these skills for career advancement or higher education.

1.3 Objectives

1. To assess the level of awareness of RPL among adult women in Pune.
2. To identify barriers preventing women from accessing RPL.
3. To suggest strategies for improving awareness and participation in RPL programs.

2. Literature Review

2.1 Understanding RPL

RPL is globally recognized as a means to formalize informal learning. Countries such as Canada, Australia, and South Africa have established structured RPL frameworks (Singh, 2020).

2.2 RPL in India

The Government of India, under the Skill India initiative, has promoted RPL through schemes like Pradhan Mantri Kaushal Vikas Yojana (PMKVY). However, studies (Joshi & Patel, 2021) indicate that many potential beneficiaries remain unaware of its benefits.

2.3 Barriers to RPL Among Women

According to Sharma (2019), key barriers include:

- Lack of awareness
- Social and cultural constraints
- Limited access to training centres
- Financial constraints

3. Research Methodology

3.1 Research Design

A mixed-methods approach was adopted, combining quantitative surveys and qualitative interviews.

3.2 Sampling

A total of 50 adult women from Pune were surveyed, with 10 in-depth interviews conducted to understand qualitative perspectives.

3.3 Data Collection

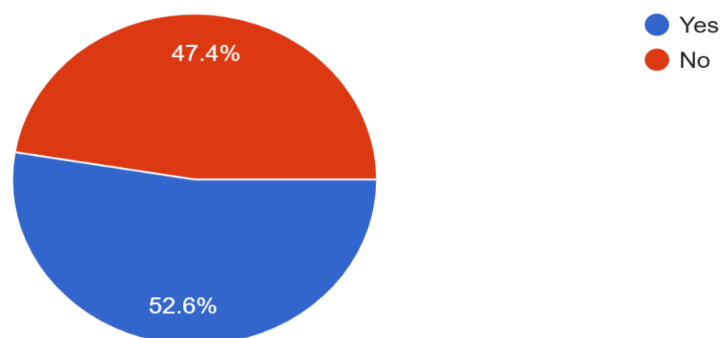
- Survey: Structured questionnaire on awareness and perceptions of RPL.
- Interviews: Semi-structured interviews with women who have and have not accessed RPL.

3.4 Data Analysis

- Quantitative Data: Descriptive statistics, chi-square tests, and graphical representation.
- Qualitative Data: Thematic analysis of interviews.

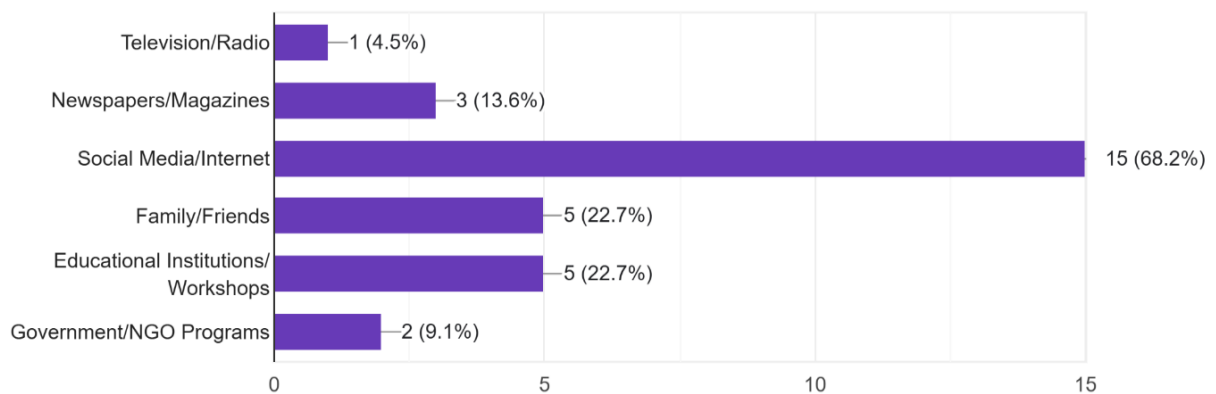
4. Findings and Discussion

4.1 Awareness Levels



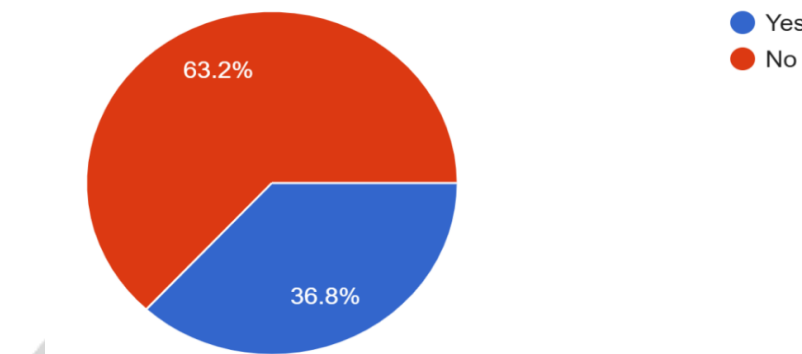
Most respondents (47.6%) were unaware of RPL, indicating a significant gap in outreach efforts.

4.2. Source about get information about RPL



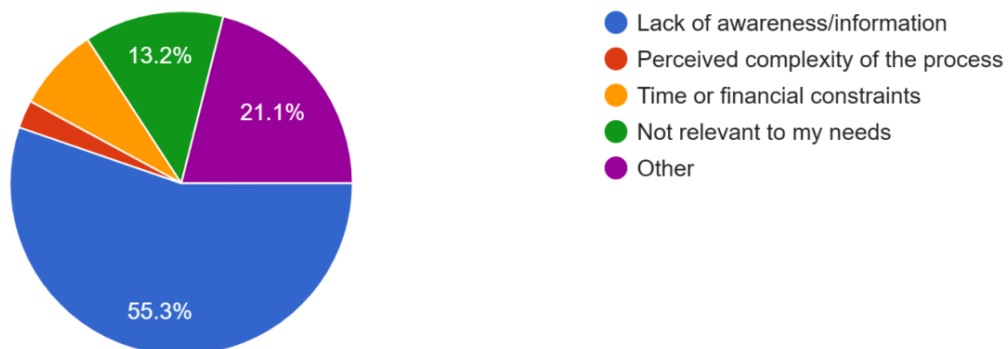
Most respondents (68.2%) were get information about RPL from social media and internet

4.3 Application of RPL



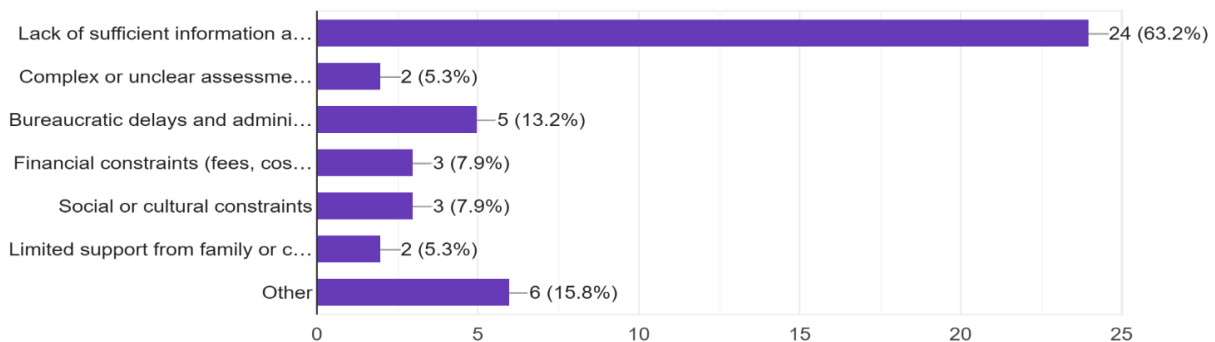
Most respondents (63.2%) were not applied RPL in their life.

4.4 Barriers to RPL Participation



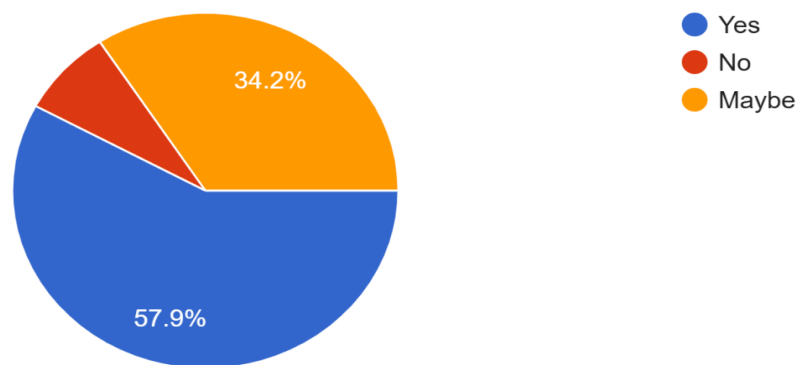
Women cited Lack of awareness / information as significant barriers.

4.5 Challenges in implementation of RPL



Most respondents (63.2%) were agreed that lack of sufficient information among people is main challenge to implement RPL.

4.6 Interest to participate in RPL Training



57.9% respondents were interested to take participation in RPL training and awareness.

5. Recommendations

1. Awareness Campaigns: Targeted efforts using digital and community-based media.
2. Community Engagement: Partnering with NGOs and self-help groups.
3. Financial Support: Government incentives for women enrolling in RPL.
4. Local Training Centres: Increasing accessibility in rural and semi-urban areas.

6. Conclusion

This study highlights a substantial lack of awareness of RPL among adult women in Pune, with socio-economic and cultural barriers limiting participation. Increasing outreach and financial support can enhance women's access to RPL, improving their career and educational prospects.

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THE ROLE OF IKS IN CONFLICT RESOLUTION AND PEACE BUILDING**Dr. Alpana Sharma***Vice-Principal and Head,**Department of Political Science,**SSR College of Arts, Commerce and Science, Silvassa***And****Mrs. Somprity***Assistant Professor**Department of Political Science,**SSR College of Arts, Commerce and Science, Silvassa***And****Mr. Mukund B. Karn***Research Scholar**Department of Political Science,**SSR College of Arts, Commerce and Science, Silvassa*

ABSTRACT

The IKS has been a very much discussed issue that is gaining importance in almost all scenarios. Putting it in simpler terms, we can say the ‘Indian Way’ of doing things would be more than any suitable definitions. India has a very long history of transferring knowledge from generation to generation and we as a result have incorporated various themes in our knowledge system, that are indigenous to us for example mathematics, science and technology, medicine, yoga, arts, literature, philosophy, architecture, astronomy and cultural and social practices.

There have been evidences of maintaining international relations and peace keeping along with external trade in India since ancient times, for e.g. the theory of states found in Arthashastra and other being found in epics such as Ramayana and Mahabharata. The principles of peace and cooperation on the world stage as principles of Panchsheel, have been applied on the religious principles of Hinduism, Jainism and Buddhism; all these owe their origin to the Indian subcontinent. Even the most recent Indian principle ‘Gandhism’ gaining importance in the modern philosophy of International Relations is guided by the IKS. This philosophy can be used for the conflict resolution in the world in as it has its cores in non-violence and non-interference.

The traditional theories acknowledged with modern principles can be a guiding light in promoting international peace and cooperation as there are a lot of gaps that can be filled with

the tactical and diplomatic methods applied by our ancestors who lived in a more peaceful and friendly world than the one, we are living in today.

Keywords : International relations, peacekeeping, Gandhism, cooperation, diplomatic .

Introduction

The IKS consists of gyan, Vignan, and Jeevan Darshan evolving with the experience, observation, experimentation and rigorous analysis. The tradition of validating and putting concepts into practice has impacted our, arts, administration, education law, health, justice, manufacturing, and commerce. “Knowledge of India” in this sense includes knowledge from varieties like, ancient India: its successes and challenges, and a sense of India’s future aspirations specific to education, health, environment and all aspects of life. The IKS has been an ever-evolving concept. The practice of education of the international relations and peace and cooperation among various nations is also one among them. We find its contents in various scriptures, inscriptions and epics as well. With the evolution of the Indian culture and civilization, a long history of IKS can also be noted down.

Many leading canons of India's ancient civilization exemplify inter-community peace and global citizenship norms. They have inspired thoughts and movements during medieval and modern times. ¹ Indian heritage and religious philosophical beliefs have provided an important orientation towards conflict resolution. For example, Mahabharata and Bhagwad Gita focusses that peace and conflict resolution are intertwined. In a similar way Arthashastra pays attention towards realistic approach of international relations. These scriptures have explicitly mentioned about the methods of conflict resolution such as negotiations, non-violence, peace building, mediation through arbitration or diplomacy. The evidence of global citizenship or co-existence has also its origin in the Vedas in the form of ‘Vasudhaiva Kutumbakam’. So, the system of the world order in a very realistic way as we want to witness is not an entirely a new concept, rather it owes its origin to the long history of IKS.

Idea of conflict resolution and peace building to IKS

Today, the nations and individuals are facing different kinds of issues like psychological tensions arising from economic inequities in society and among nations, social conflicts and fragmentation of society originating from conflicts of ideologies and religion, political problems at national and international level as nuclear weapons, biological weapons, war, arms race, terrorism and human survival issues related to production and environmental balance. The world is torn by tension, conflict, crime, corruption and regional fights. Everyone suffers from uncertainty about the upcoming future and absence of peace of mind. Many people, including political and social leaders are trying to find solutions to these problems. In this situation it is realised that scientific research, technological advancement along with IKS is capable of providing solutions to

these problems. IKS stresses that peace of mind comes from tolerance and satisfaction. Ancient knowledge, Morals and spiritual values including noble virtues such as non- violence, truth and tolerance, leads to peace. Indian Vedic, Jain and Buddhist literature etc. are the torch bearers in the path of peace and conflict resolution.

Vedic Literature

Vedic Indian literature is the rich source for conflict resolution and peace building. Our Vedas envisage the core principles of amalgamation and balance. The concept of peace is based on these principles. Our Vedic literature advocates the concept of **peace (Shanti)**. Peace as a highest human value is associated with other values such as with **truth, nonviolence, purity, sociability, affection, kindness, forgiveness, friendliness, compassion, tolerance, respect, negotiation, mediation and acceptance.**

It is believed that real peace can be achieved by overcoming the disturbances of our minds, desires, and egos. Peace is not just the absence of violence but also includes positive potentials of human beings such as love, compassion, forgiveness, and non-attachment.

Our Vedic literature, such as the four **Vedas, Upanishads, and epics like the Ramayana, Mahabharata, and Bhagavad Gita**, preach about conflict resolution methods and ways of peace. As per our Vedic teachings, human desires are the main source of sufferings and conflicts. If a human being renounces all desires and lives a life free from attachment, desires, and ego, they can attain true peace." In the **Bhagavad Gita**, Lord Krishna teaches Arjuna that self-control and selfless action are the keys to inner peace. The basic reason for conflict and disturbance often lies in our unrestrained desires and cravings.

The concept of "**Vasudhaiva Kutumbakam**" is found in the Maha Upanishad, which means "the world is one family.". This phrase encompasses the message of **co-existence, universal brotherhood, humanity, one earth, and one family. Those who do good in life become good; those who do harm to this nature become bad. Good actions makes one pure; bad actions makes one impure.** You become what your deep driving desires are. These moral precepts are the guidelines for peaceful life and conflict resolution.

Jain literature

The Jain literature was compiled by **Srut-kevlis and Ganadharas**. It is known as Agam literature. These manuscripts are the holy scriptures of Jainism. These illustrate great respect for all forms of life and **strict rules of vegetarianism, self-discipline, nonviolence, and disapproval of war.** Jainism gives the message of "**Ahimsa Param Dharmah**"—**nonviolence is the supreme virtue (Dharma).**

In Jain literature, non-violence is not limited to refraining from mental, verbal, and physical harm to human beings; it also includes nonparticipation from harm to all living beings, like all animals and plants. The **Jain scripture, Achaarang Sutra**, shows an extremely sophisticated

discussion on nonviolence. *The Tattvaarth Sutra of Jainism* defines violence as the impediment of life processes through activities of body, speech, and mind contaminated with negligence. It describes **two kinds of violence: mental violence and physical violence**. Harm to physical life processes is physical violence, and bringing about troublesome thoughts and feelings creates mental violence. Which is an obstacle in the path of peace. It preaches that we should follow the morals of peace and non-violence for conflict resolution and peace building.

Buddhist Literature

Buddhist literature is another source of IKS for conflict resolution and peace building. The key scriptures of Buddhism are **the Pali canon**. It is also known as **Tripitaka in Sanskrit**. **Abhidhamma Pitaka, Sutta Pitaka, and Vinaya Pitaka** are the three Pitakas of Buddhism. These Buddhist scriptures emphasize that one should not harm anyone in any manner. It stresses that **right speech** is to refrain from lies and slander; **right acts** include refraining from taking life, from stealing, and from lustfulness; and **right livelihood** involves supporting oneself to the exclusion of wrong methods of livelihood. Buddha used the **Shastrarth practice** to convert people to Buddhism. This is the method of dialogue that is useful for conflict resolution. Buddhist knowledge is guiding this stressful world the hope and methods of peace building.

Gandhian Philosophy

Gandhian philosophy is the major part of the Indian knowledge system in conflict resolution and peacebuilding. The entire idea of Gandhian philosophy is the '**Global Peace**' in the modern world. The Gandhian approach stated that world peace can only be realized through **non-violence**. There is no alternative to non-violence in this modern world.

Gandhian philosophy advocated **truth and non-violence** as a tool for resolving all kinds of clashes in society. Non-violence has the power to unite societies and provide opportunities to human beings for their progress and success. The Gandhian concept of **Satyagraha** is an efficient instrument to deal with all sorts of conflicts. All ideas of Gandhian philosophy are offering the method of a satisfactory and peaceful life.

Intellectuals and social reformers

Indian intellectuals and social reformers contributed a lot to the knowledge-building process of India. **Aryabhata, Raja Rammohan Roy, Swami Dayanand Saraswati, Debendranath Tagore, Keshab Chandra Sen, Atmaram Pandurang, Mahadev Govind Ranade, Mahatma Jyoti Rao Phule, Gopal Krishna Gokhale, Ramakrishna Paramahansa, Swami Vivekananda**, and many others social and religious reformers of the 19th century enriched the IKS through their writings and workings.

The work of these great intellectuals illustrates the path of conflict resolution, where people can live happily without any discrimination. They presented the program for **social equity, justice, liberty, inclusive governance, co-existence, mediation-arbitration, and negotiation**.

Methods as per Indian knowledge systems

Negotiation

Into the IKS, negotiation has been considered a vital method for Conflict Resolutions, based on mutual understanding, discussion and cordial solution. It has been said into the historical scriptures like the Arthshastra, Mahabharata, Ramayana & Vedas, that, to solve any debate, Direct Dialogue and Mutual Agreement are necessary.

Chanakya has prescribed four ways in Arthshastra for conflict resolution: Persuade (Saam), Purchase (Daam), Punish(Dand) & Exploit (Bhed); where, Persuade & Purchase are the forms of negotiation itself, helpful for establishing peace. The teachings of Bhagavad Gita, Buddhist & Jain scriptures also mentions that solutions can be found through discussions and non-violence. The gist of negotiation to find solutions: Tolerance, Mutual Respect and Agreement.

Mediation

The IKS, considers mediation as an effective method for conflict resolution. In this method, solutions are found with the help of a neutral person which establishes discussion between both the sides.

In Mahabharata, to avoid war between the Kauravas & Pandavas, Lord Krishna mediated but failed. Similarly, Hanuman played the role of a mediator between Ram and Sugriva in Ramayana. Even Chanakya has emphasized the role of mediation into Conflict Resolutions in Arthshastra. In Jain & Buddhist scriptures, examples of mediation through saints and sages can be found.

The gist of Mediation: Neutrality, Dialogue & Compromise, Peace & Justice. Through Non-violence and Collaboration, long-term solutions are possible in Mediation.

Mediation-Arbitration

The IKS, considers mediation-arbitration as a joint method for conflict resolutions, in which primarily solutions are found through mediation, followed by making final decision through arbitration.

In Mahabharata, Lord Krishna tried to establish peace between Kauravas and Pandavas through mediation, later the War was arbitrated because of unsuccessful mediation. Chanakya has said in Arthshastra that when solutions can't be found by discussions, then decisions must be taken by Judicial Process.

The gist of Mediation-Arbitration: Primarily Discussion followed by neutral decision, stable and judicial solution, peace & concern on neutrality.

Diplomacy

The IKS, considers Diplomacy as an important method for conflict resolution & international relations. The meaning of Diplomacy is to find the solution of a problem through Intelligence, Dialogue & Strategy.

Chanakya has prescribed four diplomatic methods into Arthshaastra namely Persuade, Purchase, Punish & Exploit, which the King uses to protect & maintain peace over his territory. In Mahabharata, Krishna tried to do a peaceful discussion for the Pandavas, which is an example of successful diplomacy.

The main elements of Diplomacy: Negotiation & Compromise, Balance of Power & Peace. The solution of wars through diplomacy is possible to establish peace.

Creative Peacebuilding

Creative peace building means to establish peace through positive thinking, culture, skills, spirituality and innovation. Creative Solution has been emphasized instead of violence.

It has been said into the Vedas, Upanishads, Jain & Buddhist Scriptures that peace isn't achieved just by avoiding war, but also by encouraging love, empathy and goodwill in society. Mental peace and harmony in society is established by yoga, meditation, music, dance, storytelling and literature.

The root elements of creative peacebuilding: Dialogue & Coexistence, peace through skill, culture & education, yoga, mediation & spirituality.

Inclusive Governance

Inclusive Governancestands for impartial ruling including the thoughts of all the sections, tribes, castes, etc. Every citizen of the society should have a chance to contribute to policy making & administration.

Chanakya in Arthshaastra says that the King must rule according to the public interest and grant equal rights to all citizens. Even Rigveda justifies it : "सर्वजनहितायसर्वजनसुखाय", which lays the base of Inclusive Governance.

The main elements of Inclusive Governance: Equal Opportunities and Contribution, Justice, Transparency & Responsibility, Upliftment of each section of the society.

Co-existence

Co-existencestands for staying together at peace with different ideologies, cultures and sections. This system prioritizes Tolerance, Collaboration and Mutual Respect.

The philosophy of "Vasudev Kutumbakam" (Complete World One Family) is given into the Vedas, which is the main element of co-existence. The Jain & Buddhist scriptures give the message of staying at peace with all beings through non-violence and compassion.

The main elements of co-existence: Cooperation & Harmony, Tolerance & Mutual Respect, Inclusive Growth. This method proves to be helpful at maintaining unity and stabilizing peace.

Non-violence:

IKS considers non-violence as the most effective and moral method for Conflict Resolution. Non-violence means not to cause pain to anybody physically, mentally and vocally.

Jain, Buddha & Vedanta scriptures prescribe non-violence as greatest religion. Even Mahatma Gandhi fought for freedom on grounds of Truth & Non-violence. It has been said into Bhagavad Gita that anger & violence doesn't provide peace, rather, tolerance & love gives balance to the society.

The main elements of Non-violence: Tolerance & Compassion, Dialogue-based Conflict Resolution, Establishment of Peace & Harmony. Non-violence, establishes of long-term peace & stability.

Role of IKS in Conflict Resolution and Peace Building

India has always been a fore-runner in peace building and peaceful existence mechanisms. The educational systems that have developed over the time has ushered the principles of peace and non-violence that are now the core ideas of international relations. For example, when the whole world was being hostile and divided in two power blocks after the Second World War, India chose for a neutral stand along with other nations. India came up with the principles of *Panchsheel* which has been developed over the various religious preaching of ahimsa, tolerance, non-violence, mediation, cooperation and others which all are a result of the Indian teachings and knowledge system. It acts as a guardian among the regional nations and is always ready to guide them for their advancement in any field, mostly driven by the emotional and ideological factor for expressing solidarity with the developing nations.

Even the conflicts arising on various grounds resulting to the conflicts at a larger scale are now being mediated through the peace path taught through the Indian Scriptures and texts. For sustainable peacebuilding we also require that those affected by the conflict need to be addressed along with the psychological and emotional dimensions of the conflict.

Relevance of IKS in peace building in Nuclear Age

India has already gained a strong reputation as a responsible global actor through its efforts in UN peacekeeping and providing developmental aid in areas of conflict and disaster management. The recent steps taken by the Indian Government also witnesses how we can deepen the impact of these peacekeeping missions by helping to resolve conflicts and build sustainable peace in this nuclear age when the world is in continuous conflict and on the verge of wars, aiding India's aspiration to become '*Vishwa Guru*'.

Over the years, India has consistently advocated for universal and comprehensive global nuclear disarmament and has also recognised the importance of deterrence for its own security. This balanced stance underscores India's role as a responsible nuclear power.

The non-alignment policy and longstanding support for peaceful conflict resolution provides a potential framework for India's diplomatic efforts. Multilateral platforms like the UN, where India has consistently promoted dialogue, can also be instrumental. India can contribute to the strategic stability by advocating for global nuclear dialogue to make nuclear non-proliferation

architecture more concurrent, promote cybersecurity norms, and encourage regional dialogues where there are nuclear flashpoints.

Conclusion

The arena of conflict resolution and peacebuilding has traditionally focused on external factors and tried to give institutional solutions, however, there is a growing recognition that the inner development of all stakeholders affected by violence is critical for achieving sustainable peace.

Conclusively we can say that India's role is ever increasing and for the best it can provide a guiding spirit in framing the international community through its peaceful mediation techniques.

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महाकारुणी तथागत गौतम बुद्ध यांची गुरुकुल प्रणाली

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सारांश :-

भारतभूमीत संपूर्ण विश्वातील मानवजातीला दिलेला सर्वात उज्ज्वल प्रकाश म्हणजे भगवान गौतम बुद्ध होय. मन, दया, समता, अहिंसा, प्रज्ञा आणि करुणा ही पंचशीले म्हणजे भगवान गौतम बुद्धांची मानवास दिलेली दैवी देणगी होय. जगातील पहिला विश्व व्यापक धम्म स्थापन करून साऱ्या विश्वाला शांतीचा, अहिंसेचा आणि करुणेचा संदेश दिला. बुद्धसंदेशाचे पालन करण्यातच मानवाची जीवनसफलता सामावलेली आहे. हे गौतम बुद्धांच्या उपदेशाचेच सार आहे. भारताच्या इतिहासावर भगवान गौतम बुद्धांचा प्रचंड प्रभाव निर्माण झाला आहे. त्यांना ज्ञान प्राप्त झाल्यानंतर त्यांनी त्याकाळात सर्वांना शिक्षण प्राप्त व्हावे या हेतूने 'गुरुकुल प्रणाली' स्थापन केली होती. या गुरुकुल प्रणालीचा आढावा आपण या पपेरमध्ये घेणार आहोत.

मुख्य शब्द :- महाकारुणी तथागत गौतम बुद्ध, गुरुकुल प्रणाली.

प्रस्तावना :- भगवान गौतम बुद्ध यांची गुरुकुल प्रणाली ही त्यांनी स्वतः विकसित केलेली प्रणाली होती. ही त्यांच्या तत्वज्ञानाचा आणि अनुभवांचा एक महत्वाचा भाग होती. त्यांनी कोणतीही औपचारिक शिक्षण पद्धती सुरु केली नसली तर, त्यांच्या शिकवणीत आणि अनुयायांच्या प्रशिक्षणात काही विशिष्ट पद्धती आणि तत्वे दिसून येतात. ही प्रणाली पारंपरिक हिंदू गुरुकुल प्रणालीपेक्षा वेगळी होती. ती सर्वांसाठी खुली होती. मग त्यामध्ये कोणत्याही जातीचा, धर्माचा आणि लिंगाचा विचार केल्या जात नव्हता. (त्याकाळामध्ये जातीव्यवस्था प्रचलित होती.) त्यांच्या संघामध्ये सर्व स्तरातील म्हणजे गरीब आणि श्रीमंताना प्रवेश दिल्या जात होता.

गुरुकुल प्रणालीचे ध्येय:- *सर्वांना एका समान व्यासपीठावर आणणे आणि ज्ञान, ध्यान व आत्मनिरीक्षणाद्वारे मानवी समाधानाचे सर्वोच्च स्वरूप प्राप्त करण्यास मदत करणे हे आहे. तसेच आधुनिक काळात समाजावर सतत प्रभाव टाकणाऱ्या संघटित आणि प्रभावी शिक्षण प्रणालीपैकी एक, बौद्ध विचाराचा उद्देश सुसंवाद आणण्याचा होता जो सर्व प्रकारच्या प्रगतीसाठी आवश्यक आहे, त्याची वाढ करणे.

- * मुलाच्या/ मुलीच्या व्यक्तिमत्त्वाचा सर्वांगीण विकास करणे.
- * निर्वाण मिळविण्यासाठी धर्माची तयारी आणि धार्मिक भावनांचा अंतर्भाव करणे.
- * विद्यार्थ्यांना व्यावहारिक ज्ञान देऊन जीवनासाठी तयार करणे.
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गुरुकुल प्रणालीचे वैशिष्ट्ये:- ही त्यांच्या तत्वज्ञानाचा आणि अनुभवांचा एक महत्वाचा भाग होती. केवळ

तत्त्वज्ञान शिकविले जात नव्हते, तर ते आचरणात आणण्यास देखील शिकविले जात असे. ध्यान, शील(नीती) आणि प्रज्ञा(समज) यावर भर दिला जाई. त्यांनी कोणतीही औपचारिक शिक्षण पद्धती सुरु केली नसली तर, त्यांच्या शिकवणीत आणि अनुयायांच्या प्रशिक्षणात काही विशिष्ट पद्धती आणि तत्वे दिसून येतात.

* अनुभव आणि प्रत्यक्ष ज्ञानावर भर :- बुद्धांनी केवळ पुस्तकी ज्ञान किंवा धार्मिक विधींवर अवलंबून न राहता, स्वतःच्या इंद्रियांच्या आणि मनाच्या निरीक्षणातून सत्य शोधण्यावर जोर दिला. त्यांनी आपल्या शिष्यांनाही स्वतःच्या अनुभवातून ज्ञान प्राप्त करण्यास प्रोत्साहित केले.

* ध्यान आणि योग्याभ्यास :- बुद्धांनी ध्यान आणि योग्याभ्यासाला अत्यंत महत्त्व दिले. चित्तशुद्धी आणि एकाग्रता साधण्यासाठी त्यांनी विविध ध्यान पद्धती शिकविल्या.

* समता आणि सर्वसमावेशकता:- बुद्धांनी कोणत्याही जात, धर्म किंवा लिंग भेदाशिवाय सर्वांना समान संधी दिली. त्यांच्या संघात सर्व स्तरातील लोकांना प्रवेश होता. त्याकाळामध्ये शैलभट्टारिका, प्रभूदेवी आणि वियांक या प्रसिद्ध भिक्षुणी होत्या. तसेच सम्राट अशोक राजाची एकुलती एक मुलगी संघमित्रा ही बौद्ध धम्माच्या प्रसार आणि प्रचारासाठी श्रीलंकेत गेली . इतकेच नव्हे तर तिने तेथील राजा 'देवनामपीय तिस्स' यांना बौद्ध धम्म स्वीकारण्यास प्रेरित केले.

* सामूहिक शिक्षण आणि चर्चा :- बुद्ध आपल्या शिष्यांसोबत सतत चर्चा करीत असत. त्यांच्या प्रश्नांना उत्तरे देत आणि त्यांच्या शंकांचे निरसन करत असत. यांमुळे शिष्यांना एकमेकांकडून शिकण्याची संधी मिळत असे. बौद्ध भिक्कू नागसेन आणि भारतीय ग्रीक सम्राट राजा मिलिंद (मेनेदर) यांच्यातील वादविवादात्मक चर्चा आहे. मिलिंद यांनी विचारलेल्या बौद्ध धम्माविषयीच्या व इतरही प्रश्नांचे नागसेन यांनी समर्पक उत्तरे दिली आहेत. याचे संकलन 'मिलिंद प्रश्न' या नावाने ओळखले जाते. या ग्रंथाचे अनेक भाषांतर आणि प्रकाशने उपलब्ध आहेत. उदाहरणार्थ

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२. "मिलिंद प्रश्न" लेखक आचार्य सूर्यकांत भगत, भाषा मराठी, सनय प्रकाशन, पृष्ठसंख्या ५२६.

३. "मिलिंद प्रश्न" लेखक भिक्षू जगदीश कश्यप, भाषा हिंदी, सुधीर प्रकाशन, पृष्ठसंख्या ५६७.

* सरळ आणि सोप्या भाषेत शिक्षण :- बुद्धांनी क्लिष्ट धार्मिक संकल्पना सोप्या आणि लोकांना समजतील अशा पाली भाषेत समजावून सांगितल्या. त्रिपिटक, जसे की सुत्त पिटक, विनय पिटक आणि अभिधम्म पिटक हे ग्रंथ शिक्षणासाठी वापरले जात.धर्म, वैदक, सैन्य इत्यादी नामवंत व्यक्तींना त्यांचे ज्ञान मठातील विद्यार्थ्यांसोबत शेयर करण्यासाठी आमंत्रित केले जात असे. ही प्रथा शैक्षणिक संस्थांमध्ये प्रचलित आहे. ती 'अतिथी व्याख्यान' म्हणून ओळखली जाते.

विद्यार्थ्यांसाठी कौशल्ये शिकणे :- शिकविण्याच्या पद्धतीमध्ये वादविवाद, चर्चा, व्याख्यान, लरनिंग स्किल्स, भाषण ऐकणे, प्रश्न-उत्तर आणि विचारमंथन तसेच विचार, ध्यान आणि स्वअभ्यासावर भर देण्यात आला. तर्कशास्त्राचा समावेश सैद्धांतिक आणि व्यावहारिक पद्धतींचा संतुलित संयोजन वापरला जातो. विद्यार्थ्यांना एकमेकांना शिकविण्याची आणि शिस्त लावण्याची जबाबदारी देखील दिली जाते.

*नियम आणि शिस्त :- बुद्धांनी आपल्या शिष्यांसाठी काही नियम आणि आचारसंहिता तयार केली होती. ज्यामुळे संघातील वातावरण व्यवस्थित राहिल आणि सर्वांना समान संधी मिळेल.

* जीवनोपयोगी शिक्षण:- केवळ धार्मिक शिक्षण नव्हे, तर नैतिकता, ध्यान, आरोग्य आणि समाजसेवा यावरही भर होता. शिष्यांना भिक्षाटन (दान मागून अन्न गोळा करणे) शिकविले जात असे, जेणेकरून त्यांना अहंकाराचा त्याग करता येईल. विहारातील सर्व विद्यार्थी तसेच भिक्षु आणि भिक्षुनी दिवसातून फक्त एक वेळ जेवण घेत असत. त्याला 'एकाभाटिकको' असे म्हणत असत. प्राथमिक स्तरावर वाचन, लिहिणे आणि गणित अशी ३ आर ची सुसूत्रीचा वापर करण्यात येत असे. उच्च शिक्षणामध्ये अध्यात्मिक मार्गदर्शन, धार्मिक शिक्षण, तत्वज्ञान, अर्थशास्त्र आणि वैदकशास्त्र इत्यादी विषयांमध्ये विद्यार्थ्यांना पारंगत केल्या जात असे.

- * भारतातील बौद्ध शिक्षण प्रणाली ही जगातील सर्वात समग्र शिक्षण प्रणाली पैकी एक आहे.
- * शिक्षणाची प्रक्रिया व्याख्याने, प्रश्नोत्तरे, विचारमंथन आणि चर्चेद्वारे केली जाते. जिथे शिष्य त्यांच्या गुरूंना प्रश्न विचारू शकत होते. बुद्ध स्वतः उपदेश (धम्मदेशना) देत आणि त्यावर शिष्य चर्चा करत.
- * या प्रणालीची रचना जीवनातील विविध समस्यांवर ठोस उपाय शोधण्यासाठी करण्यात आली आहे.
- * शिक्षणाचे उद्दिष्ट निर्वाण प्राप्त करणे हे आहे आणि त्यानुसार संपूर्ण व्यवस्था केली जाते.
- * बुद्धांनी गुरुकुलाएवजी संघ (बौद्ध भिक्षुंचे संघटन) ही शिक्षणपद्धती विकसित केली. हे शिक्षण विहारामध्ये भिक्षुंद्वारे किंवा भिक्षुणींद्वारे केले जाते. चीन, जपान, कोरिया, जावा, बर्मा, सिलोन, तिबेट इत्यादी देशांतून बरेच विद्यार्थी ज्ञान मिळविण्यासाठी भारतात येतात. बौद्ध धम्माचा अभ्यास त्याकाळी तक्षशिला, नालंदा, विक्रमशिला, वल्लबी, मिथिला, ओदंतपुरी, नाडीया आणि जगदला इत्यादी विद्यापीठांमध्ये शिकविण्यात येत असे.
- * या शिक्षण पद्धतीमध्ये अध्यापनाकडे व्यापक आणि सकारात्मक दृष्टीकोनातून पहिले जाते.
- * धर्मनिरपेक्ष शिक्षणात धार्मिक आणि तात्विक पैलूंसोबत महत्व दिले जाते.
- * विद्यार्थ्यांमध्ये समान आदर, स्नेह असतो. हे जीवन शिस्तबद्ध जीवन आहे.
- * धर्मनिरपेक्ष शिक्षणाला धार्मिक आणि तात्विक पैलूंसोबत महत्व दिले जाते.
- * कताई, विणकाम, रेखांकन, औषध इत्यादी सारख्या मूलभूत गोष्टी अभ्यासक्रमाचा एक भाग आहेत. ही मूलभूत कौशल्ये विद्यार्थ्यांना स्वतंत्र होण्यास मदत करतात. बुद्धांची गुरुकुल पद्धती ही केवळ ज्ञानार्जनापुरती मर्यादित नव्हती, तर ती व्यक्तीच्या सर्वांगीण विकासावर लक्ष केंद्रित करणारी होती.

परिवर्तनीय शिक्षण प्रणाली :- हा अभ्यासक्रम सांप्रदायिक संकुचतेपासून मुक्त होता आणि तो कला तसेच साहित्याच्या विकासावर आणि संवर्धनावर केंद्रीत होता. अशोकाच्या काळात बौद्ध धम्माची भरभराट झाली आणि देशभरात हजारो मठ बांधले गेले. शिक्षण सुधारण्यासाठी आणि बौद्ध विचारांच्या शाळांना प्रोत्साहन देण्यासाठी, विद्यार्थ्यांना शिष्यवृत्ती, अनुदान आणि इतर फायदे उपलब्ध करून देण्यात आले. विद्यार्थ्यांना अनुदान देणे आणि शिक्षकांना जमिनी आणि पेन्शन भेट देणे ही या दिशेने उचललेली काही पावले होती. प्राचीन, मध्ययुगीन आणि आधुनिक सरकारांद्वारे मठाच्या उन्नतीमुळे एक संघटित प्रणाली तयार करण्यात मदत झाली आहे. ज्याचे तत्वज्ञान जगातील आघाडीच्या विद्यापीठांमध्ये शिकवले जाते. महायान, थेरवाद वज्रयान या ३ शाखांसह, शाळेतील शिकवणी महान तत्वज्ञानांमध्ये पूज्य आहेत आणि त्यांनी एका वेगळ्या शिस्तीचे रूप धारण केले आहे. पुढे आधुनिक शिक्षणतज्ज्ञ, शिक्षक-विद्यार्थी नातेसंबंध हा प्रणालीचा

महत्वाचा घटक मानतात जे दर्जेदार शिक्षण आणि प्रवचनाच्या प्रभावी प्रसारणासाठी देखील महत्वाचे आहे.

शिक्षकाची भूमिका :- शिक्षक आणि विद्यार्थी या दोघांमध्ये एकमेकांसोबत परस्पर आदर आणि स्नेह लक्ष केंद्रित करणारे होते. सर्वच ठिकाणी विद्यार्थी शिक्षकांसोबत आपले सर्व साहित्य घेऊन जात असत. विद्यार्थ्यांना शिष्टाचार, संयम, शिस्त आणि साधेपणा शिकविण्यावर भर असे. औपचारिक शिक्षणावर जास्त भर न देता आजीवन संबंध सुनिश्चित करण्यावर भर देत असत.

प्रवेश आणि शिक्षण केंद्रे :- प्लेटोच्या अकॅडमीसारखे काहीसे काम करतांना बौद्ध मठ किंवा विहार ही शिक्षणाची केंद्रे होती. तिथे भिक्षु/भिक्षुणी विद्यार्थ्यांच्या शिक्षण आणि बौद्धिक संगोपनासाठी जबाबदार होते. विहारात अभ्यास करण्यासाठी, विद्यार्थ्यांना स्वेच्छेने भिक्षु/भिक्षुणींसमोर सादर करावे लागत असे. ज्याने विद्यार्थ्यांचे संपूर्ण परिवर्तन निश्चित केले जात होते. विद्यार्थ्यांची दिक्षा 'पभाईज' द्वारे केली जात असे. विद्यार्थ्यांना शपथ घ्यावी लागत असे.

मी बुद्धाचा आश्रय घेतो.- बुद्धम शरणं गच्छामी.

मी धम्माचा आश्रय घेतो.- धमंग शरणं गच्छामी.

मी संघाचा आश्रय घेतो.- संघम शरणं गच्छामी.

विद्यार्थ्यांना १८ ते २० वर्ष भिक्षूंच्या विचारसरणीपर्यंत पोहोचण्यासाठी लागत असत. त्यानंतर तो/ती भिक्षु/भिक्षुणी म्हणून सन्मानित केले जात असे. या अंतिम नियमाला 'उपसंपदा' म्हणून ओळखले जात असे.

विद्यार्थ्यांचे मूल्यमापन :-विद्यार्थ्यांचे मूल्यमापन हे ज्ञान धारणा, अर्ज आणि वर्तनाच्या आधारे करण्यात येत असे.

भवतु सब्ब मंगलम:- हे एक पाली भाषेतील वाक्यांश आहे, ज्याचा अर्थ "सर्वांचे कल्याण होवो" किंवा "सर्वांना शांती आणि आनंद मिळो" असा होतो. हे वाक्य बौद्ध धम्मात खूप महत्वाचे आहे. जिथे ते जगातील सर्व सजीवांबद्दल प्रेम आणि करुणा व्यक्त करण्यासाठी वापरले जाते.

भवतु सब्ब मंगलमचा अर्थ :-

- * भवतु: होवो
- * सब्ब :सर्व
- * मंगलम:-कल्याण, शांती आणि आनंद
- * भवतु सब्ब मंगलमचा अर्थ :- हे वाक्य बौद्ध भिक्षु आणि अनुयायी आशीर्वाद देण्यासाठी वापरतात. हे वाक्य ध्यान आणि प्रार्थनेमध्ये देखील वापरले जाते.
- * हे वाक्य जगातील सर्व सजीवांबद्दल प्रेम आणि करुणा व्यक्त करण्यासाठी वापरले जाते.
- * **भवतु सब्ब मंगलमचे महत्त्व :-** हे वाक्य आपल्याला इतरांबद्दल दयाळू आणि सहानुभूतीशील होण्यास शिकवते.
- * हे वाक्य आपल्याला जगातील सर्व सजीवांमध्ये एकता आणि बंधुभाव निर्माण करण्यास मदत करते.
- * हे वाक्य आपल्याला शांती आणि आनंदाचा अनुभव घेण्यास मदत करते.

* "भवतु सब्ब मंगलम" हे एक सुंदर आणि शक्तिशाली वाक्य आहे जे आपल्याला चांगले जीवन जगण्यास मदत करू शकते.

* भवतु सब्ब मंगलमचा एक असाही अर्थ आहे की 'मावळणारा प्रत्येक दिवस सांगतो हा तुझा अंत नाही. तसेच उगवणारा प्रत्येक दिवस सांगतो ही तुझी सुरुवात आहे'.

जसे संत ज्ञानेश्वर महाराजांनी ज्ञानेश्वरीच्या शेवटी विश्वाच्या कल्याणासाठी केलेली संपूर्ण विश्वासाठी प्रार्थना म्हणजे "पसायदान" नेमके अगदी तसेच बौद्ध धम्मातील "भवतु सब्ब मंगलम."

अत्त दीप भव :- हा पाली भाषेतील एक वाक्यांश आहे, जो गौतम बुद्धांनी त्यांच्या अनुयायांना दिलेला एक महत्वाचा संदेश आहे. याचा अर्थ "स्वतःचा दिवा व्हा" किंवा "स्वतःचा प्रकाश व्हा" असा होतो.

या वाक्यांशाचा अर्थ आणि महत्व :-

* आत्मनिर्भरता:- गौतम बुद्ध त्यांच्या शिष्यांना स्वतःच्या मार्गावर चालण्यास आणि इतरांवर अवलंबून न राहण्यास प्रोत्साहित करतात.

* आत्मज्ञान:- प्रत्येकाने स्वतःच्या आत प्रकाश शोधला पाहिजे आणि सत्य तसेच ज्ञानाचा मार्ग शोधला पाहिजे.

* नैतिकता :- प्रत्येकाने स्वतःच्या कृतींसाठी जबाबदार असले पाहिजे आणि योग्य मार्गाने जीवन जगले पाहिजे.

* प्रेरणा:- हा वाक्यांश शिष्यांना स्वतःच्या क्षमतेवर विश्वास ठेवण्यासाठी प्रेरणा देतो.

* दुःखातून मुक्ती :- गौतम बुद्धांनी सांगितल्याप्रमाणे, स्वतःचा प्रकाश बनून आपण आपल्या जीवनातील अंधार दूर करू शकतो.

या वाक्यांशाचा उपयोग:-

* हा वाक्यांश शिष्यांना त्यांच्या जीवनातील अडचणींवर मात करण्यासाठी आणि सकारात्मक दृष्टीकोन ठेवण्यास मदत करतो.

* हा वाक्यांश शिष्यांना त्यांच्या ध्येयांवर लक्ष केंद्रित करण्यास आणि यशस्वी होण्यास मदत करतो.

* हा वाक्यांश शिष्यांना इतरांना मदत करण्यास आणि समाजात सकारात्मक बदल घडवून आणण्यास मदत करतो.

"अत्त दीप भव" हा वाक्यांश एक शक्तिशाली संदेश आहे जो शिष्यांना त्यांच्या जीवनात सकारात्मक बदल घडवून आणण्यास मदत करू शकतो.

निष्कर्ष :-

भगवान गौतम बुद्ध यांच्या विहारामध्ये प्रवेश प्राप्त विद्यार्थ्यांना खालील प्रतिज्ञा रोजच म्हणणे अनिवार्य होते. या प्रार्थनेवरून आपल्याला त्यांच्या अभ्यासक्रमाची प्रचिती येते. प्रतिज्ञा खालीलप्रमाणे आहे.

१. प्रतिज्ञा आपण करू या.....

जीवसृष्टी आहे असीम ;

ती भवसागर पार नेण्याची ;

२. प्रतिज्ञा आपण करू या.....

आपणात दोष असंख्य ;

हे नष्ट करण्याची ;

३. प्रतिज्ञा आपण करू या.....

आहेत सत्ये अनंत,

ती पूर्ण आकलण्याची ;

४. प्रतिज्ञा आपण करू या.....

भगवान बुद्धांचा अतुल्य मार्ग,

तो संपूर्ण साध्य करण्याची.

वरील प्रतिज्ञेवरून आपल्या लक्षात येते की,

भगवान गौतम बुद्धांची गुरुकुल प्रणाली ही केवळ ज्ञानार्जनापूर्तीच मर्यादित नव्हती, तर ती व्यावहारिक, तर्कधारित आणि सर्वसमावेशक तसेच व्यक्तीच्या सर्वांगीण विकासावर लक्ष केंद्रित करणारी होती. त्यांनी शिक्षणाला केवळ ग्रंथाधारित ज्ञान न मानता स्वानुभव, मनन आणि नैतिक आचरण यावर भर दिला. त्यांची ही शिक्षण पद्धती पुढे नालंदा आणि तक्षशिला सारख्या विद्यापीठांमध्ये विकसित झाली.

भगवान गौतम बुद्धांच्या गुरुकुल प्रणालीबाबत पुष्कळ विद्वानांनी आपली मते मांडली आहेत. त्यापैकी मोजकी खालीलप्रमाणे आहेत.

- * श्री. आर. जे. जॅक्सन म्हणतात: "भगवान बुद्धांच्या शिकवणीचे अपूर्व स्वरूप भारतीय धार्मिक विचारधारांच्या अध्ययनात प्रतीत होते".
- * श्री. रीड म्हणतात : "भगवान बुद्धांची गुरुकुल प्रणाली कितीतरी वेगळी आहे."
- * युनिटेरिअल ख्रिश्चन पाद्री, रेव्हरंड लेस्ली वोल्टान म्हणतात: " बौद्ध धम्माचे आध्यात्मिक तत्वज्ञान हीच फार सामर्थशाली देणगी आहे, असे मला दिसते."
- * प्रा. डॉईट गोडाई म्हणतात : "जगातल्या सर्व धर्मसंस्थांमध्ये भगवान बुद्धच फक्त एक असे थोर होते, की जे आपली मुक्ती साध्य करण्याच्या मानवी सामर्थ्याचा स्वाभाविक मोठेपणा बरोबर ओळखू शकले."

संदर्भ ग्रंथ

1. डॉ. भीमराव रामजी आंबेडकर, २०२३, 'भगवान बुद्ध आणि त्यांचा धम्म', नागपूर बुद्धिदृष्ट सेंटर, नागपूर.
2. अनुवादक भदंत सदानंद महास्थवीर 'सधदमादित्य', २०१४, 'मिलिंद प्रश्न', प्रबुद्धभारत प्रकाशन, नागपूर.
3. Wikipedia.
4. Chat GPT
5. U Tube
6. Gemini
7. Google

सर्वांगीण उन्नतीचा राजमार्ग: महर्षि पतंजली प्रणित अष्टांग योग

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सारांश :

प्राचीन भारतीय चिंतक, विचारवंत, तत्त्वज्ञ, वैद्य, शास्त्रज्ञ यांनी आपले विचार, तत्त्वज्ञान, शोध याद्वारे ज्ञानाची समृद्ध दालने खुली करून दिली आहेत. या ज्ञानाचा लाभ केवळ भारतीयच नव्हे, तर विश्वातील अखिल मानव जातीला वरदान आहे यामध्ये अष्टांग योग प्रणेता महर्षि पतंजली यांनी अष्टांग योगाचा मार्ग दाखवला आहे, जो केवळ शारीरिक आरोग्यच नव्हे तर व्यक्तिगत आणि सामाजिक स्तरावर मानसिक, भावनिक, आध्यात्मिक उन्नतीचा राजमार्ग आहे.

योगाची आठ अंगे ज्यामध्ये यम, नियम, आसन, प्राणायाम, प्रत्याहार (बहिरंग) याबरोबरच धारणा, ध्यान, आणि समाधी (अंतरंग) या तीन अंगांचा समावेश होतो. अष्टांग योगाची ही जीवनशैली व्यक्ती आणि समाजाला सर्वांगीण उन्नती गाठण्यास प्रेरक दिशा देण्यास समर्थ आहे.

प्रास्ताविक:

'योग'संस्कृतच्या 'युज्' धातूपासून बनला आहे, ज्याचा अर्थ 'जोडणे' असा आहे. योग असे विज्ञान आहे जे जीवात्म्याचे परमात्म्याशी साक्षात्कार घडवून आणते. योग निरपेक्ष शांती ची सर्वाधिक मोठी अवस्था आहे. योग जन्म- मृत्यूच्या फेऱ्यातून मनुष्यास मुक्ती देते. योग शरीर, मन आणि आत्मशक्तीचा सर्वांगीण विकास घडवून आणते. सहजता हा योगाचा सर्वाधिक मोठा गुणधर्म आहे.

"योगश्चित्तवृत्तिनिरोधः", अर्थात मनाच्या वृत्ती नियंत्रित करणे हाच योग आहे. " योगःकर्मसु कौशलम्", कर्मकुशलता हाच योग आहे.

महर्षि पतंजली प्रणित अष्टांग योग:

पतंजलींनी योगाची आठ अंगे सांगितली आहेत. या अंतर्गत बहिरंग योगामध्ये यम, नियम, आसन, प्राणायाम, प्रत्याहार या पाच अंगांचा समावेश होतो. तर अंतरंग योगामध्ये धारणा, ध्यान आणि समाधी या तीन अंगांचा समावेश होतो.

यम: अहिंसा, सत्य, अस्तेय, ब्रह्मचर्य, अपरिग्रह या पाच यमांचा समावेश होतो.

अहिंसा:

"अहिंसाप्रतिष्ठायांतत्सन्निधो वैरत्यागः" पातंजलयोगदर्शन२/३५"

कोणालाही विनाकारण हानी पोहोचवणे हिंसा आहे. कोणत्याही स्थितीत मन, वचन, कर्मा द्वारे कोणालाही इजा न पोहोचवण्याचा प्रयत्न म्हणजे अहिंसा! हिंसा ही शाब्दिक, शारीरिक, मानसिक, भावनिक अशा अनेक अंगांनी होऊ शकते. या सर्व प्रकारची हिंसा टाळून अहिंसेचा मार्ग अनुसरणे ही अहिंसा होय. भगवान महावीर, बुद्ध आणि आधुनिक काळात महात्मा गांधीजींनी अहिंसा तत्वाचे अनुसरण प्राणपणाने

केले होते. कुटुंबापासून ते विश्वाच्या कोणत्याही देशात, क्षेत्रात हिंसा टाळून अहिंसायुक्त आचरण हे शांततेच्या मार्गाने सौहार्द विकसित करण्यासाठी अत्यंत उपयुक्त पाऊल आहे. आज विश्वात सर्वत्र हिंसेचे साम्राज्य पसरले आहे. यातून कोणालाही भयमुक्ती मिळणार नाही. ती केवळ अहिंसेच्या मार्गानेच मिळवता येईल. याकरिता हा प्रथम नियम व्यक्तिगत जीवनात आणि सार्वजनिक जीवनात आपण आचरला पाहिजे.

सत्यः

"सत्यप्रतिष्ठायां क्रियाफलाश्रयत्वम्." पातंजलयोगदर्शन२/३६

मन, वचन आणि कर्माने सत्यपालन करणे आणि मिथ्यात्वाचा त्या करणे हेच सत्य आहे निर्मल मनाने आपण जे कर्म कराल तेच आपणास उत्तम फळ देऊ शकेल गांधीजींनी आपल्या आत्मचरित्राचे नाव 'My Experiment with Truth' 'सत्याचे प्रयोग' असे दिले आहे त्यांच्या जीवनाची वाटचाल ही असत्यापासून-सत्याकडे, अज्ञानापासून-ज्ञानाकडे, अंधारापासून-प्रकाशाकडे होती! तमसोमा ज्योतिर्गमय! प्रयोगात गांधीजी म्हणतात की आरंभी मी म्हणत होतो की ईश्वर हा सत्य आहे परंतु शेवटी निष्कर्षाला आले की सत्य हाच ईश्वर आहे गांधीजींच्या मते केवळ सत्याचा वापर केवळ खरे बोलण्या पुरते मर्यादित ठेवू नका सत्याच्या उच्चारारबरोबरच विचार, उच्चार आणि आचार ही सत्याचेच प्रकटीकरण करणारे असले पाहिजे मनसा, रचना आणि कर्मणा अर्थात मनाने वाणीने आणि कर्माने सत्याचे अनुसरण झाले पाहिजे हा दुसरा नियम जीवनाला मानवी पणाचा आयाम देतो तो त्याला अन्य सर्व प्राण्यांपासून अधिक उदात्त उंची ही देण्याचा मार्ग दाखवितो याकरिता सत्याने अनुसरून सदैव व्यक्तिगत आणि सार्वजनिक जीवनात होईल तर गुन्हेगारी पाशवी वृत्ती लयाला जाऊन माणुसकीचे साम्राज्य पसरेल

• अस्तेय

"अस्तेय प्रतिष्ठान या सर्व रत्नो पस्थानम् तंग जल योग दर्शन २/३७"

अस्तेय याचा अर्थ चोरी न करणे जेव्हा आपण मन, वचन कर्माने कोणत्याही वस्तू हडप करणे. अनैतिक पद्धतीने ती हस्तगत करण्याचा विचार करत नाही जे अस्तेय आहे अस्तेय आणि असंग्रह ही गांधीजींच्या एकादशी व्रतांची दोन तत्वे एकमेकांशी जोडलेली आहेत 'अस्तेय' म्हणजे चोरी न करणे आणि 'असंग्रह' म्हणजे संग्रह न करणे, गांधीजी म्हणतात ज्या समाजात संग्रह आहे, तेथेच चोरीचेही भय आहे! जर समाजात चोरी होऊ नये, असे वाटत असेल तर त्या समाजात संग्रह सुद्धा होता कामा नये! गांधीजी म्हणतात असंग्रह आणि अस्तेय ही व्रते परस्परासंबंधीत मानली पाहिजेत वस्तूतः चोरलेला नसला तरी देखील अनावश्यक संग्रह हा चोरीच्या माला सारखाच असतो जर सारी माणसे गरजेपुरतेच संग्रह करू लागतील तर कुणालाही कशाचीही एक शब्द हे दरार पडणार नाही आणि सारे जण संतोष आणि राहतील !

आज एकीकडे अब्जाधीश आणि दुसरीकडे एका वेळेचे अन्नही न मिळू शकणारा माणूस अशी टोकाची विसंगती यातून चोरीची भावना न झाली तरच नवखे हा टोकाचा विसंवाद विसंगती दूर करणे हे अस्तेयातून घडू शकते

• ब्रह्मचर्य

"ब्रह्मचर्य प्रतिष्ठायां वीर्यलाभः॥ पातंजलयोगदर्शन२/३८"

ब्रह्मचर्याचा अर्थ मन वचन आणि कर्माद्वारे येऊन संयम कोणत्याही गोष्टीचा मर्यादित उपयोग करणे इंद्रियांवर संयम मिळविणे इंद्रियांचा गुलाम न बनणे हे ब्रह्मचर्य होय आणखी एक अर्थ ईश्वर सानिध्य मिळविणे हाही त्यातून उन्नत अर्थ निघतो

गांधीजींच्या मते आचार आणि ब्रह्मचर्य ही दोन व्रते परस्परपूरक आहेत रसने इंद्रियावर ताबा मिळविणे पंचेन्द्रियावर ताबा मिळविण्यासाठी उपयुक्त ठरते या इंद्रियांवर संयम म्हणजेच पूर्ण ब्रह्मचर्य गांधीजींच्या मते अशा ब्रह्मचर्याचे पालन मन वचन कर्म अशा त्रिवेदमार्गाने केले पाहिजे

श्रीमद् भगवत गीतेतील याबाबतच्या श्लोकाचा आचार्य विनोबांनी सुरेख अनुवाद केला आहे तो असा

" विषयाचे करी ध्यान, त्यास तो संघ लाभला!
संगातून फुटे काम, क्रोध कामात ठेवीला ॥
क्रोधातूनी निघे पाहे, पाहेन स्मृती लोपली ॥
स्मृती लोपे बुद्धीनाश, म्हणजे आत्मनाश ॥

आज समाजात जागोजागी संयम सुटून अनाचाराचा अतिरेक होताना दिसतो या पार्श्वभूमीवर प्राचीन समाजाप्रमाणे ब्रह्मचर्याचे महत्त्व समजून घेऊन त्याच्या अनुसरण्याची गरज अधिक तीव्र आहे

• अपरिग्रह

अपरिग्रहस्थैर्ये जन्मकथन्तासंबोध. पातंजलयोगदर्शन२/३९.

आपल्या स्वार्थाकरिता धन संपत्ती आणि भोगाच्या सामग्रीचा संयम न करणे परिग्रह आहे आणि याचा अभाव अपरिग्रह आहे अपरिग्रह आपल्याला हा संदेश देते की अष्टांग योगाचे अनुसरण करण्याने आपल्या गरजेपेक्षा अधिक काहीही संग्रह करू नये धनाचा व भौतिक साधनांचा अमर्यादित संग्रह हा परिग्रह टाळणे जरूरीचे आहे आपल्याला अस्तेय असणारा समाज हवा असेल तर अपरिग्रह युक्त समाज बनवला पाहिजे टोकाची श्रीमंती आणि टोकाची गरीबी ही दरी निर्माण करून आपण त्याद्वारे अनेक गुन्हेगारींना पोसतो आहोत आपल्याला सभ्य सुशील समाज हवा असेल तर आपण या अपरिग्रहाचे अनुसरण करणे ही काळाची गरज आहे.

नियम:

अष्टांग योगामध्ये प्रथम अंग यम तर दुसरे अंग नियम आहेत. हे नियम पाच असून व्यक्तिगत तसेच सार्वजनिक जीवनात अशी कर्मे सांगितली आहेत, ज्यायोगे स्वतःची आंतरिक शुद्धी घडू शकेल. हे पाच नियम- शौच, संतोष, तप, स्वाध्याय आणि ईश्वर प्रणिधान आहेत.

• शौच (Saucha) :

शौच अर्थात मनाने आणि शरीराने पवित्रतेचे शुचितेचे अनुसरण करणे. मनाची अंतःशुद्धी राग, द्वेष इत्यादींचा त्याग करून मनाच्या वृत्ती निर्मळ बनवण्याची प्रक्रिया आहे. संत तुकारामांनी म्हटल्याप्रमाणे "नाही निर्मळ मन ,काय करील साबण?" अंतकरणाची शुद्धता जपण्याची गरज आहे, ज्यायोगे सर्वत्र शुचिता जपली जाईल. संत गाडगेबाबांनी ही झाडू सोबत कीर्तनाद्वारे समाजाला निर्मळ बनवण्याचा मंत्र दिला आहे.

• संतोष (Santosh) :

संतांनी "चित्ति असू द्यावे समाधान" हा संतोषाचा मंत्र जो दिला आहे, त्याद्वारे आपल्या कर्तव्य पालनातून जे प्राप्त होते त्यावर आपण समाधानी असण्यावर भर दिला आहे. याउलट सतत असमाधान हे लालसा आणि अन्य विकारांना जन्म देऊन असंतोषाला जन्म देतो आणि स्वास्थ्य हरवून बसतो.

• **तप (Tapas) :**

तपाचा अर्थ मन आणि शरीराला अनुशासित ठेवणे होय. सुख-दुःख ,ऊन- पाऊस, तहान-भूक यासारख्या संघर्षाला तोंड देणे ही शरीर आणि मनाचे तप आहे. येथे संयमाने या प्रसंगात वागायला शिकणे जरूरीचे आहे.

• **स्वाध्याय (Svadyaya) :**

स्वाध्याय म्हणजे केवळ सर्व धर्मग्रंथांचेच ज्ञान नसून स्वतःचेही चिंतन करणे हा स्वाध्यायाचा भाग आहे. याद्वारे स्वतःमध्ये सुधारणा घडवून आणता येतात. धर्मग्रंथांचे पारायण, सत्संग हाही स्वाध्यायाचा भाग आहे ,ज्यायोगे स्व- सुधारणेचा मार्ग मिळतो.

• **ईश्वर प्रणिधान (Ishvara Pranidhana) :**

मन , वचन आणि कर्माने ईश्वरावर श्रद्धा ठेवणे, आपली सर्व कर्मे ही ईश्वराला अर्पण करणे असे यात अपेक्षित असून यातून समर्पण भावनेने कर्म करण्याची कृती घडते. यामुळे ती कर्मे अधिक कर्तव्य भावनेने आणि सचोटीने केली जातात. श्रेयाच्या अहंकारापासून मुक्त होण्याची स्थिती अनुभवता येते.

आसन:

' स्थिर सुख आसनम् ' अशी आसनाची परिभाषा मांडली असून यामध्ये स्थिर आणि सुख पूर्वक बसण्याची क्रिया आहे याद्वारे लवचिकता शरीर मनात आणून सर्व व्याधीपासून मुक्ती चा मार्ग अनुसरण्याचा आरंभ आहे आसन म्हणजे केवळ हालचालीचे व्यायामाचे पालन नसून आधी अभ्यासलेल्या यम नियमांच्या 'पालनासह आसनांचा अभ्यास आहे म्हणून आसन म्हणजे केवळ बाह्य शरीराचा व्यायाम नाही ते अंतर बाह्य साधना आहे.

प्राणायाम:

प्राणायामेने युक्तेने सर्वरोगक्षयो भवेत् ल
अयुक्ता भ्यास योगेन सर्वरोग समुद् भव
हठयोगप्रदीपिकेतील या श्लोकातून असे

प्रतिपादले आहे की प्राणायामा चा सुयोग्य अभ्यास करतानाच यम आणि नियम हे पायाभूत असून त्यायोगे हा पुढचा प्रवास आहे

प्रत्याहार:

प्रत्याहारात बाह्य वस्तूपासून मनाला रोखणे इंद्रियांवर नियंत्रण मिळवणे इंद्रियांचे माघार घेणे होय बाह्य योगातील हा शेवटचा टप्पा आहे येथून अंतरंग योगाची साधना सुरू होते यामुळे इंद्रिय संयमनाचे महत्त्व यामध्ये आहे.

धारणा:

मनाला एका विशिष्ट बिंदूवर स्थिर करून ठेवणे धारणा असून मनाची सजगता तसेच मनाला अवचलित बनविण्याची ही क्षमता आहे यालाच अविचलित एकाग्रता असेही म्हटले आहे हळूहळू ही अंतरंग साधना प्रत्येक टप्प्यात अधिक सूक्ष्म होत जाते.

ध्यान:

ध्यान शक्ती तुमच्या जीवनाची उंची वाढविते तुमचे आयुर्बल वाढविणे आणि त्यायोगे तुमची तुमची विचार प्रणाली सुधारणे स्वस्थ जीवनातून स्वस्थ ध्यान जमते. ध्यान ही आत्म्याला परमात्म्याची जोडण्याची प्रार्थना आहे.

समाधी:

समाधी ही अष्टांग योगातील अतिउच्च पायरी आहे अर्थातच एकाग्रतेची अवस्था पूर्ण आत्मसात करणे परमानंदाची अनुभूती होणे होय पारलौकिकतेची अनुभूती यानंतर आणखी काय प्राप्त करण्याची कामशा राहत नाही जीवनातील सर्वोच्च आणि अंतिम ध्येय प्राप्ती या अवस्थेतून अनुभवता येते याप्रकारे भारतीय अष्टांग योग हा संपूर्ण मानवतेला सर्वांगीण निरामयतेची नवी दिशा देणारा राजमार्ग आहे वर्तमान परिस्थितीत व्यक्तिगत सामाजिक स्तरावर स्वास्थ्य प्राप्त करणे हे मानवी जीवनासाठी तसेच राष्ट्राच्या सुयोग्य वाटचालीसाठी अत्यंतिक जरूरीचे आहे याकरिता केवळ योगासने नव्हे तर अष्टांग योग जीवनशैली उपयुक्त ठरेल

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INDIAN PERSPECTIVES OF TEACHING LEARNING PROCESS AND ARTIFICIAL INTELLIGENCE

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Abstract

Teaching learning process is having very important role to reach to the various goals of the education. In the Indian knowledge-based teaching learning process proper importance is given on some very important philosophical and psychological aspects like dialogue, question answer process, memory, revision, human touch discipline etc. These are the very essential aspects of the true teaching and learning process. But because of the use of Artificial intelligence some challenges have emerged before the nature of teaching learning process. Artificial Intelligence helps to make teaching learning process more easy, effective and fruitful. But it must be used rationally. Artificial Intelligence is a good servant but bad master. It must be treated as a good servant in the teaching learning process too so that we can get the proper benefits of the Artificial Intelligence. In this paper some important points are discussed related to the Indian knowledge-based teaching learning process and Artificial Intelligence.

Key Words: Indian Knowledge System, artificial Intelligence, Teaching learning process.

Background

Education is always considered as very important tool for the all-round development of the student and through this to create the well-developed society, nation and the world. In every society and country, the importance of education is accepted without any doubt or arguments. Even at the any stage of passage of time too the value of education is always accepted by everyone. Many people, authors and philosophers highlighted the importance of education from their perspectives. Faure (1993) observed that; “Very many countries regard the education of modern man as an exceptionally difficult problem, and all countries regard it as one of the greatest importance. And for all those who want to make the world as it is today better place, and to prepare for the future education is a capital, universal subject.” While Passi (2000) had noted that; “Education is a social process leading to deliberate interactions for enabling the child to satisfy three-fold objectives of personal growth, social development and enhanced harmony with nature.” In these perspectives it could be easily concluded that there is no perfect option of the education.

Indian teaching Learning process – Important part of the IKS

In the preceding paragraph importance of education is described. But to achieve such expectations kept from education, it is required to pass through the teaching learning process. The teaching learning process is the main medium of achieving the expected goals of education. Teaching learning process create opportunity for both the important ends i.e. teacher and learners to interact and exchange information knowledge, wisdom, habits, skills attitude, values etc.... India is known for its education system and ancient teaching learning process. It is evident that Indian knowledge system was very famous all over the world for its value-based teaching learning process. Even the teaching learning process itself is a symbol of Indian knowledge System.

Some aspects of Indian knowledge System based teaching learning process and Artificial Intelligence

There are many aspects which reflects our Indian Knowledge System in teaching learning process.

1. In our Indian Knowledge system, the role and place of Guru is considered very important. All the Shishysa (students) had to respect their Guru like anything. At the present time to the same expectation is alive from the students. In general, Students give due respect to their teachers at present too. But now the discussion is going on all over the world that Artificial would replace teachers. Many educationists and authors are showing their concern and worry in this regard. Forget what is right or wrong but here the author of this paper would like to make a point that When the artificial Intelligence is becoming more and more powerful, we should not ignore our Indian philosophy and maintain the respect and place of every teacher.
2. Our ancient teaching learning process was based on the dialogue.... Samvaad.... was one of the important characteristics of the teaching learning process. Dialogue is always necessary to reach to the solutions of the particular problem. All the learned Gurus were doing dialogue with their shiyshyas and were solving their doubts with great zeal. With the passage of time the process of the teaching learning changed. Now Artificial Intelligence is available to solve the particular problems. In a way dialogue is always possible through the use of Artificial Intelligence but there is a question about its effectiveness. It is one of the important points of the research.
3. As similar to dialogue method, there is a big question mark before the question answer technique which is also a very important part our Indian Knowledge based teaching learning process. Off course it is a part of the dialogue method. In their teaching learning process, our great Gurus were using question answer process to unfold the different layers of knowledge. We are having many popular examples of such question answers. In our great Grnath Bhagavat Geeta too, there is a question answer between Bhagvan Shri Krishna and Arjuna. Uddalak is also known in this regard. Even we are having one Upanishad – Prashnopanishad based on the question and

answer. In the age of Artificial Intelligence, it is to be kept in mind that our great Indian tradition of question answer must not be lost.

4. Human touch is the very important aspect of the teaching learning process. Where live elements are required than it is require. It must be clearly understood that machine can not understand our emotions as human beings. This would be the great challenge for the mankind. Human society is becoming more and more machine oriented. But it must be well understood that No machine can replace human being. Human touch is one of the important integral parts of our Indian teaching learning system.

5. Creativity is another important concern of our Indian knowledge System.it focuses on making every human being more and more creative. Since ancient age our Gurus-Teachers rightly gave importance to the creativity through their teaching and learning process. It compelled us to think creatively and then solve the problems.But Artificial Intelligence is ready to give ready made answers of all the questions. This is also a very important issue of concern. We would have to take care that Artificial Intelligence must not kill the creativity of our coming generations.

6. As another important aspect of the Indian knowledge-based teaching learning process Revision is compulsory. In this context due importance is given on Swadhyaya. It is always required from the student's side to do swadhyay regularly. When we observe the Artificial Intelligence in this context, we could find that it reduces this opportunity for the students. It would make students more dependent on the ready-made tools instead of self-dependent and doing swadhyaya.As for example with the use of Grammarly students rely on it instead of searching correct spellings and making English Grammer more perfect.

7. In the teaching learning process use of memory is very important aspect. More an individual is having memory power then more he or she would learn comfortably and effectively. But use of Artificial intelligence makes dependent on machines instead of own memory. This point is also aa matter of serious concern.

8. Student teacher relationship and discipline are also very important aspects of the Indian knowledge-based teaching learning process. There are many great examples of students and teachers' great relationship. Artificial Intelligence makes question marks on this issue too.

Epilogue

In short in the Indian knowledge-based teaching learning process proper due importance is given on some very important philosophical and psychological aspects like dialogue, question answer process, memory, revision, discipline etc. These are the very essential aspects of the true teaching and learning process. But because of the use of Artificial intelligence some challenges have emerged before the nature of teaching learning process. At last author would like to conclude with the only words that the Artificial Intelligence must be used rationally. Artificial Intelligence is

a good servant but bad master. It must be treated as a good servant in the teaching learning process too so that we can get the proper benefits of the Artificial Intelligence.

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DEVELOPING A CYBERSECURITY COMPETENCY FRAMEWORK FOR TEACHER EDUCATION PROGRAMS

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Abstract

As digital learning environments grow, educators are increasingly exposed to cybersecurity threats that can threaten both institutional data and student privacy. Yet structured cybersecurity training is still missing in many teacher education programs, leaving teachers vulnerable and ill-prepared to cope with cyber risks. In this study, we propose a Cybersecurity Competency Framework (CCF) for teacher education programs that will help understand what educators should know and be able to do in terms of digital safety, cyber hygiene and risk management. This study utilizes a mixed-method approach through a systematic review of existing cybersecurity curricula, expert interviews, and surveys of pre-service and in-service technology teachers. Some of the central skills that emerged included data safety, identifying threats, handling incidents, teaching digital ethics and safe use of technology while integrating it in the classroom. Developed to be compatible with global standards for cybersecurity education, the framework is intended to help address unique challenges found in both K-12 and higher education environments. The paper further discusses how the proposed framework can be integrated in both pre-service and in-service teacher training curricula, recommending interactive workshops, simulated cyber threat scenarios, and policy level interventions. The findings of this study indicate that developing a structured cybersecurity training model will support educators in establishing a secure learning environment, thus improving the cyber resilience of educational institutions.

Keywords: Cybersecurity, Teacher Training, Cyber Hygiene, Digital Safety, Competency Framework, Education Policy.

1. Introduction

1.1 Background

The teaching and learning processes have changed dramatically with the fast integration of

digital technologies in education. Yet, this growing dependency on digital tools also opens up educational institutions to different cybersecurity threats, including data breaches, phishing attacks, and malware infections. Since teachers are the main facilitators of digital learning, they need to provide a safe and secure online environment. However, most teacher education programs are not preparing educators to identify, mitigate, and respond to cyber threats through structured cybersecurity training. Lack of cybersecurity awareness laying teachers open to putting students' data, institutional networks and digital resources at risk creating a greater opportunity during cyber-attacks in schools[1].

To tackle this emerging challenge, a Cybersecurity Competency Framework (CCF) for teacher education programs is very much needed. A robust framework will prepare educators with both foundational and advanced cybersecurity skills, including cyber hygiene, digital ethics, data protection, and responding to threats. The institutions can enhance the cyber resilience of the education sector by embedding cybersecurity training into pre-service and in-service teacher education. In this study, we endeavor to discover basic cyber security skills that teachers should acquire and provide a framework for prepping teachers to secure the digital classroom[2].

1.2 Problem Statement

As K-12 and higher education rely more on digital technology, cybersecurity has become an increasingly pressing concern. But many teachers are not trained to strike a balance between effective instruction and mitigating threats. These underdeveloped cybersecurity competencies pose a risk to institutional security, student privacy and digital security more broadly. To develop this further; Educators' cybersecurity awareness and preparedness require a structured framework. This study attempts to offer an organized framework to address these issues.

1.3 Research Objectives

This study aims to formulate a Cybersecurity Competency Framework (CCF) which would serve as a guide for teacher preparation programs in ameliorating the readiness of teachers to solve cybersecurity problems. The research objectives are to be specific as follows:

- ✓ The purpose of this study is to determine essential competencies relating to cybersecurity that will equip teachers to secure digital learning environments.
 - ✓ For investigating the shortfalls of current teacher training programs as far as cybersecurity awareness and preparedness are concerned.
 - ✓ To create an organized Cybersecurity Competency Framework (CCF) specific to pre-service and in-service teacher education.
 - ✓ To present viable options for the incorporation of cybersecurity training into teacher education curricula, facilitating meaningful and sustainable learning results.
 - ✓ To determine how cybersecurity training effects educators' risk mitigation and student protection in digital learning environments.
-

- ✓ To provide recommendations on policy interventions and best practices for educational institutions to improve cybersecurity awareness amongst teachers.

These goals are aimed at addressing the lack of cybersecurity training offered in teacher education programs and enhancing the digital resilience of educational institutions.

1.4 Significance of Study

As technology continues to be integrated into the classroom, this research is critical to helping teachers in an important preparation for the world of cybersecurity. In this research, a Cybersecurity Fundamental Competency Framework (CFCF) was being constructed for teachers' training programs to equip any teacher with the essential competencies required for safeguarding students' data, institutional networks, and digital learning contents against cybercrimes. This not only gives educators the tools to identify and mitigate risks but also fosters a cyberspace that is safer for students. This study will also help policymakers, educational institutions, and curriculum developers working to understand the need for cybersecurity training in teacher education to create sustainable resilience against cybercrime in the education field. In the end, it results in the creation of a digitally secure and responsible teaching workforce, reducing the susceptibility of educational institutions[3].

2. Literature Review

2.1 Cybersecurity in the Education Sector

The studies graduated together in this systematic analysis on foot have found a serious scarcity of cybersecurity professionals. The lack of cybersecurity professionals impacts the number and experience of mentors for students who wish to become cybersecurity professionals and disturbs the quality of education such students receive. Many students have been discouraged from pursuing cybersecurity as a career due to lack of mentorship, poor training and lack of the necessary cybersecurity skills needed to be employable in the information security field.

This paper sought to examine how the cybersecurity challenges in education can be addressed, such as the shortage of individuals trained in cybersecurity who could teach and train students to ensure interest in pursuing a career in cybersecurity and increase the workforce of cybersecurity professionals. The systematic review of literature showed that game-based strategies are effective in increasing students' cybersecurity awareness and their decision to become cybersecurity professionals.

The researcher found that an effective way to combat the shortage of cybersecurity professionals was to increase the number of students willing to pursue cybersecurity as a career and to assist them till graduation[4].

2.2 Existing Cybersecurity Training Models

Training Model	Target Audience	Focus Areas	Delivery Method	Limitations
Basic Cyber Hygiene Training	General Public, Educators	Password security, phishing awareness, malware prevention	Online modules, workshops	Lacks advanced cybersecurity skills
Certified Cybersecurity Awareness Programs (e.g., ISC2, CompTIA Security+ Basics)	IT Staff, General Workforce	Network security, data protection, cyber ethics	Online courses, instructor-led training	Not specifically designed for educators
K-12 Cybersecurity Education Frameworks	School Teachers, Students	Digital citizenship, cyber threats, safe browsing	Curriculum integration, hands-on activities	Often lacks depth in technical cybersecurity
Higher Education Cybersecurity Curriculum	University Educators, Researchers	Advanced cybersecurity concepts, policy, risk management	University courses, research projects	Not accessible for K-12 teachers
Government-Led Cybersecurity Awareness Initiatives (e.g., Cybersafe, NIST Guidelines)	Public Sector, Educators	Threat prevention, secure data handling, compliance	Webinars, training manuals	Limited customization for teachers' needs
Custom Cybersecurity Training for Educators	Teachers, School Administrators	Cyber hygiene, digital safety, secure classroom practices	Workshops, simulations, gamified learning	Not widely implemented across institutions

Fig. 1. Comparison of Existing Cybersecurity Training Models

2.3 Competency-Based Frameworks in Education

Outcome-based education (OBE) is a well-accepted instructional paradigm in undergraduate medical education, primarily aimed at outcome identification, more so than at content specification. Having its roots in behaviorist theories, OBE is more associated with proficiency measures but lacks a clear correlation with teaching and learning activities. OBE has been embraced by consensus, despite criticism; even if it has resulted in valuable insights into the understanding of knowledge and skills, its transferability to more nuanced domains of clinical performance is still elusive. A well-implemented OBE framework is helpful and even critical for many aspects of the undergraduate medical education curriculum[5].

Using conceptual models and qualitative methodology, the study examined, in three casebook examples, the respective strategies and challenges of developing competency-based education (CBE) business degree programs across three universities. It pinpointed problems such as long-term institutional structure decisions, cost-quality trade-offs, program flexibility, student-faculty interaction, feedback loops and alignment with traditional programs. The findings offer an initial framework for decision-making[6].

The education sector has started tackling the challenges of implementing CBME. Implementation strategies across the continuum of education have been informed by these models and guidance and focus on the more efficient use of resources and technology, and the use of milestones and entrust able professional activities-based frameworks. CBME definitions and frameworks are products of varying interpretations resulting in significant barriers. There may be evolution in assessment approaches from in vitro task-based to in vivo integrated methods of work-place based assessment that respond to many of the theoretical and conceptual critiques of CBME, but moving to the implementation stage of creating work-based assessments that are rigorous and of high quality is still a work in progress[7].

3. Research Methodology

3.1 Research Design

Drawing upon data collected via a mixed-method research design, this study presents a Cybersecurity Competency Framework (CCF) for teacher education programs. The research will use a multimethod approach combining literature reviews, policy analysis, quantitative analysis through survey methods, qualitative analysis through key informant interviews and focus groups, and development and validation of the CCF. It outlines competencies, training levels, and curriculum integration strategies within the framework and once developed, it is peer reviewed by educational and cybersecurity experts[8]. Strategies proposed to address this include cohort-based rotational training programs, gamified learning, and policy initiatives to enhance the understanding and readiness of institutions on safeguards against attacks by malignant actors. The mixed-method implementation permits a thorough investigation of gaps in cybersecurity as they relate to the training of teachers while the iterative validation process ensures that the framework remains contextually relevant in education.

3.2 Data Collection

The mixed-method approach is employed in this study to collect data of cybersecurity awareness and competency needs in the teacher education programs. Data collection involves using structured surveys to measure educators' knowledge, attitudes, and practices regarding cyber security. Setting out for a survey on cyber defense. The structure of the survey was as follows; first section contains demographics. Second section on cyber sec awareness. Third section on self-reported difficulties experiencing attacks. Fourth section on training preferences the qualitative data was collected from interviews and focus groups with cybersecurity experts, education technology specialists, policymakers, and school IT coordinators. The data analysis concerned descriptive statistics and inferential statistics. Ethical considerations such as informed consent, anonymity and confidentiality, and Institutional Review Board approval were obtained. Through this mixed-method approach, the study captures the breadth of cybersecurity competency gaps

while unearthing specific insights through qualitative interviews[9].

4. Development of the Cybersecurity Competency Framework (CCF)

4.1 Identification of Core Cybersecurity Competencies

The Cybersecurity Competency Framework (CCF) is an outcome-based tool designed to prepare teacher education programs with fundamental cybersecurity competencies. The standard is derived from literature review, survey results, and expert consultations. A competency framework is divided into three levels: Basic (fundamental cybersecurity awareness), Intermediate (application of cybersecurity principles in teaching), and Advanced (cybersecurity leadership and risk management in education). It gets peer reviewed and refined based on expert feedback[10].

4.2 Framework Structure

Competency Domain	Description	Example Competencies
Cyber Hygiene & Digital Safety	Basic cybersecurity awareness for educators	Strong password practices, safe browsing, device security
Data Protection & Privacy	Ensuring student and institutional data security	Understanding data encryption, compliance with data protection laws
Cyber Threat Awareness & Response	Identifying and mitigating cyber threats in educational settings	Recognizing phishing attacks, malware response strategies
Safe Online Teaching Practices	Implementing secure digital teaching strategies	Using secure online platforms, managing student access control
Cybersecurity Leadership & Policy Compliance	Leading cybersecurity initiatives in schools	Developing school cybersecurity policies, training other educators

Fig. 2. Structure of Cybersecurity Competency Framework

5. Implementation Strategies for Teacher Education Programs

Our Cybersecurity Competency Framework is a resource to measure improvement of teachers in cyber-criminal investigations. This would encompass incorporating cybersecurity fundamentals into teacher training courses, utilizing interactive learning techniques such as simulations and gamification, and enabling upskilling through ongoing professional development activities such as workshops and certifications. The framework also advocates for partnering with cybersecurity organizations to better share training resources. Some of the anticipated outcomes would be better recognition and response of the cyber threats from the teachers, rewrites of cybersecurity policies, awareness for not only the cyber threats but the importance of cyber security, and ultimately the reduction of cyber risk that impacts students and schools[11].

An implementation strategy that incorporates cybersecurity training within teacher education programs will guard the future. The strategies encompass curriculum integration, interactive and practical approaches to learning, continuous professional development (CPD), collaboration with cybersecurity firms, policy and institutional support, assessment and feedback mechanisms, and anticipated impact. Curriculum integration: Integrating modules on cybersecurity

into pre-service teacher education programs, creating interdisciplinary coursework linking digital literacy, cybersecurity, and pedagogy, and alignment with national and international cybersecurity education standards. Hands-on training through cybersecurity labs, simulations, gamified learning, organization of case studies and real-world scenarios are ways to further facilitate interactive and practical learning approaches. This can be achieved through regular workshops, certification programs, self-paced e-learning courses, and mentorship models when considering Continuous professional development (CPD). Increasing collaboration with existing cybersecurity organizations, supporting the right policy and institutional matters, and also consistent assessment and feedback mechanisms, go hand in hand. This means that the expected impact of this training includes higher cybersecurity awareness among educators and students, a decrease in cyber threats targeting institutions of education, and an increased level of digital safety in classrooms and online learning environments.

6. Discussion and Findings

In this section, we report on the main outcomes of the study and consider the significance of the results for the inclusion of cybersecurity training in teacher education programs. The results of this quantitative study, draw on data derived from surveys, interviews and expert reviews, provide insights into the current landscape of cybersecurity awareness as well as the anticipated effectiveness of the Cybersecurity Competency Framework (CCF) when applied to educators.

Educators' Cyber Security Awareness

- 60%+ of educators have no formal cyber training.
- Cybersecurity competency gap is due to inadequate institutional support and training resources.

Train the Teacher in Cybersecurity: Hight Demand

- 78% of pre- as well as in-service teachers require procedures of cybersecurity training.
- Teachers need practical experience in their training instead of theory.
- Online or interactive learning approaches are favored.

Use of Ransomware and Cybersecurity Context

- There are few formal cyber security policies espoused by educational institutions.
- Only: 30% of schools surveyed have mandatory cybersecurity training programs.

Cybersecurity Competency Framework (CCF) Effectiveness

- The tiered competency model mitigates cyber threats and enhances the protection of student data.
- Educators utilizing the CCF during training processes increased their ability to identify and respond to cyber threats by 35%.

This shows a very large cybersecurity awareness gap among teachers, meaning that it is time to revise the curriculum. Formal policies on cybersecurity is missing in educational organizations, making it necessary to integrate compulsory cybersecurity awareness in teacher training and certification programs. Using the Cybersecurity Competency Framework (CCF) model, the federally funded C3 initiative provides a pathway for educators to integrate cybersecurity training at multiple capability levels. However, challenges may include resistance to change, resource constraints, and the need for regular evaluations and updates to the CCF to keep pace with the changing landscape of cyber threats.

7. Conclusion and Future Work

7.1 Summary of Findings

Findings	Recommendations
Low cybersecurity awareness among teachers	Integrate cybersecurity modules into teacher education curricula
High demand for practical cybersecurity training	Use interactive learning methods such as simulations and case studies
Lack of institutional cybersecurity policies	Develop and enforce cybersecurity policies in schools
Effectiveness of the Cybersecurity Competency Framework	Adopt the CCF in teacher training programs with continuous

Fig. 3. Findings and Recommendations.

7.2 Limitations of the Study

- ✓ **Limited Sample Size and Generalizability:** The data was acquired from a sample of teachers, administrators and institutions that cannot be generalized as being representative of all educational establishments.
- ✓ **Cybersecurity Awareness and Training Needs Differences:** Training methods may difference because of individual background, resource availability and institutional support levels.
- ✓ **Resource-Rich Institutions and Uniform Adaptation:** The need for schools is to adapt to the changing demands of the industry, however a large majority of them lack resources and funding to develop infrastructure that is required for such trainings.
- ✓ **Constantly Changing Cybersecurity Threats:** The suggested CCF framework most likely would need to be updated regularly in order to reflect changing cybersecurity threats and new digital learning technologies.
- ✓ **Resistance to Change and Adoption Challenges:** Specific fears that educators have against adopting new cybersecurity training, such as not understanding technical concepts.
- ✓ **Assessment and Measurement of Long-Term Impact:** The study demonstrates short-term differences in cybersecurity awareness and competency, but additional research is needed to define long-term impact.

7.3 Recommendations for Future Research

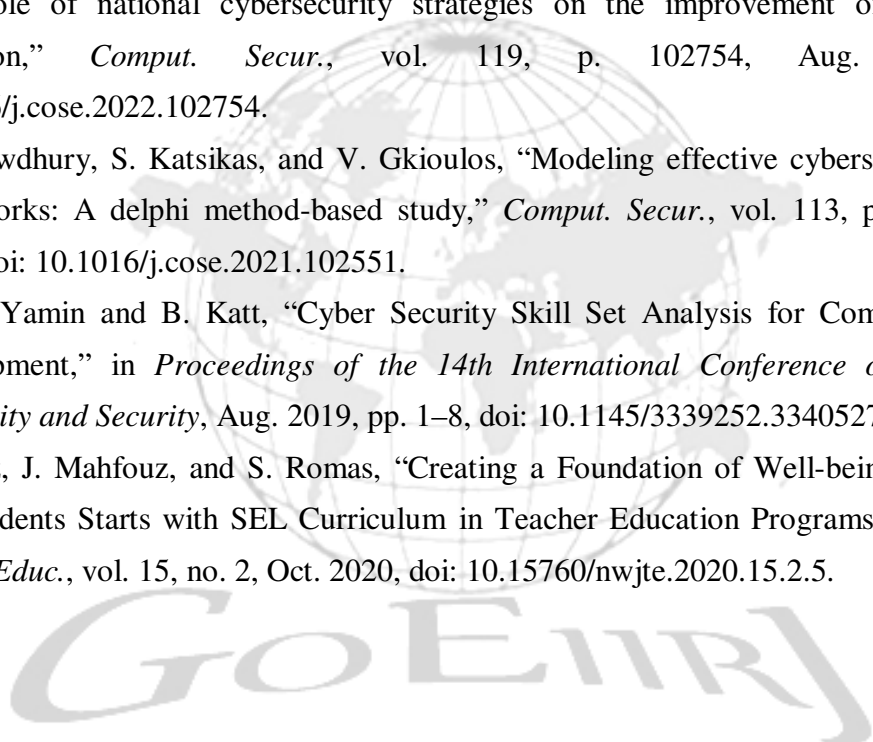
- ✓ Conduct a broader study with a wider and diverse sample of teachers across various educational systems.
- ✓ Longitudinal studies on the long-term implementation impact of the Cybersecurity Competency Framework.
- ✓ Discuss institutional barriers to adopting cybersecurity training and a way to get around it.
- ✓ Review the cyber threat landscape and adjust the framework as necessary.

7.4 Conclusion

The paper emphasizes the importance of embedding cybersecurity education into teacher education programs and introduces a Cybersecurity Competency Framework (CCF) designed to enable educators with the resources and knowledge related to cyber threats in education contexts. Not only do most teachers lack formal cybersecurity training, they also fall prey to cyber risks. To that end, the proposed CCF provides a structured, competency-based education pathway from basic digital security awareness for executives to advanced cyber-leadership for the next cohort of leaders within the cybersecurity space. They put a stress on the importance of institutional support, policies to be enacted, and CPD in order to ensure quality cybersecurity education. However, it continues to face challenges such as disparate levels of digital literacy in teachers, insufficient resources in institutions, and the rapidly changing cyber threat environment. Moreover, further research needs to broaden the scope of study to include a range of educational institutes, to measure the long-term effects produced by security training initiatives, and to continuously update the competency framework to address emerging threats.

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BRIDGING TRADITION AND TECHNOLOGY: THE ROLE OF DIGITAL TOOLS IN THE INDIAN KNOWLEDGE SYSTEM

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Abstract:

India's rich and diverse knowledge system, rooted in ancient traditions, has evolved over millennia, encompassing disciplines such as philosophy, medicine, mathematics, linguistics, and the arts. With the rapid advancement of digital technology, there is an unprecedented opportunity to bridge traditional wisdom with modern digital tools. This paper explores the integration of digital technology into the Indian knowledge system, analysing its role in preserving, disseminating, and enhancing indigenous knowledge.

The study examines various digital tools, including artificial intelligence (AI), machine learning, digital archives, virtual reality (VR), and blockchain, in the context of traditional Indian knowledge domains like Ayurveda, Vedic mathematics, classical literature, and oral traditions. It highlights the transformative impact of digitization in making ancient manuscripts accessible, improving research methodologies, and fostering cross-disciplinary learning. Furthermore, it investigates how digital platforms facilitate the widespread dissemination of knowledge through online learning, e-libraries, and interactive applications, promoting cultural continuity while adapting to contemporary educational demands.

Despite these advancements, the paper also addresses critical challenges, such as the digital divide, issues of authenticity, intellectual property concerns, and the need for cultural sensitivity in technology implementation. Through case studies of successful digital interventions, this research provides insights into best practices for integrating technology with traditional Indian knowledge.

The findings underscore the significance of a balanced approach that respects traditional epistemologies while leveraging technological innovations for greater accessibility and applicability. By fostering collaboration between scholars, technologists, and policymakers, the Indian knowledge system can be revitalized in a way that aligns with modern educational and research paradigms. Ultimately, this paper argues that the fusion of tradition and technology not only preserves India's intellectual heritage but also ensures its relevance in the digital age, fostering global recognition and engagement.

Keywords: Indian Knowledge System, Digital Tools, Traditional Wisdom, Technology Integration, Digital Preservation, Cultural Heritage

Introduction:

The Indian knowledge system (IKS) is one of the oldest and most extensive repositories of intellectual and spiritual wisdom. Rooted in ancient scriptures, oral traditions, and manuscripts, this system has guided India's advancements in various domains such as mathematics, astronomy, medicine, linguistics, and philosophy. However, in the digital age, traditional methods of knowledge preservation and dissemination face challenges due to the loss of manuscripts, language barriers, and limited accessibility.

Digital tools—ranging from Artificial Intelligence (AI) and Machine Learning (ML) to cloud computing and open-access databases—offer innovative solutions to these challenges. These technologies facilitate the digitization of ancient texts, real-time translation, and global accessibility, ensuring the survival and relevance of the Indian knowledge system. This research paper explores the dynamic relationship between traditional knowledge and digital tools, examining their impact on learning, accessibility, and cultural preservation.

Conceptual Definitions:**1) Indian Knowledge System (IKS)**

The Indian Knowledge System refers to a diverse body of knowledge originating from India's ancient civilizations, covering fields such as Ayurveda, Yoga, Vedanta, Sanskrit literature, astrology, and traditional arts. It represents a holistic understanding of nature, human existence, and the universe.

2) Digital Tools

Digital tools include technologies such as cloud computing, Artificial Intelligence, blockchain, Natural Language Processing (NLP), and digital archives that help in preserving, analysing, and disseminating knowledge in a digital format.

3) Technology Integration in Education

Technology integration in education refers to the use of digital tools to enhance learning experiences, facilitate research, and provide accessibility to knowledge. It includes e-learning platforms, Massive Open Online Courses (MOOCs), digital libraries, and AI-driven educational assistants.

Objectives of the Study:

1. To explore the role of digital tools in preserving and promoting the Indian knowledge system.
 2. To examine the impact of digital technologies on accessibility and dissemination of traditional knowledge.
 3. To analyse the challenges and limitations of digitizing ancient Indian knowledge.
 4. To assess the effectiveness of various digital platforms in making traditional knowledge globally available.
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5. To propose strategies for integrating digital advancements with traditional knowledge systems.

1) To explore the Role of Digital Tools in Preserving and Promoting the Indian Knowledge System:

The Indian Knowledge System (IKS) encompasses a vast array of traditional wisdom, including Ayurveda, Yoga, Vedic Mathematics, Sanskrit literature, classical arts, and indigenous sciences. Digital tools play a crucial role in preserving and promoting IKS by making these rich traditions accessible to a global audience, enhancing research, and ensuring their continuity.

1. Digital Archives and Repositories

Example: The National Digital Library of India (NDLI) and Bharatavani Project

These platforms digitize ancient manuscripts, scriptures, and texts, ensuring their preservation and easy accessibility.

NDLI provides access to rare Indian texts and research materials, supporting academic studies.

2. AI and Machine Learning for Language Preservation

Example: Google's Sanskrit OCR and AI-based Translation Tools

Optical Character Recognition (OCR) technology is being used to digitize ancient Sanskrit, Tamil, and Pali manuscripts. AI-powered tools help translate and interpret ancient texts, making them understandable to modern learners.

3. Virtual and Augmented Reality (VR & AR) for Cultural and Historical Education

Example: Virtual Tours of Ajanta & Ellora Caves

AR and VR technologies help students and researchers experience historical and cultural sites without physical travel. These tools enhance engagement with ancient Indian heritage, including temple architecture and traditional art forms.

4. E-Learning Platforms and MOOCs (Massive Open Online Courses)

Example: SWAYAM and NPTEL Courses on Indian Knowledge Systems

These platforms offer free courses on subjects like Vedic Mathematics, Ayurveda, and Indian philosophy. They ensure global outreach and integration of IKS into mainstream education.

5. Digital Tools in Ayurveda and Traditional Medicine

Example: AYUSH Ministry's e-AUSHADHI Portal. The government has created digital databases of medicinal plants and traditional healing practices. AI-based diagnosis tools are being developed for personalized Ayurvedic treatments.

6. Blockchain for Authenticity and Protection of Indigenous Knowledge

Example: CSIR's Blockchain for Medicinal Plants Database. Blockchain technology is used to document and protect India's indigenous medicinal knowledge. It prevents bio-piracy and ensures rightful ownership of traditional knowledge.

7. Social Media and Digital Storytelling

Example: YouTube Channels and Podcasts on Ancient Indian Wisdom

Platforms like YouTube, Instagram, and podcasts share Indian philosophy, yoga, and traditional arts with younger generations. Influencers and scholars use digital storytelling to make ancient wisdom engaging.

2) Examining the Impact of Digital Technologies on Accessibility and Dissemination of Traditional Knowledge

Digital technologies have revolutionized the way traditional knowledge is accessed, preserved, and shared globally. Traditional knowledge, including indigenous practices, folklore, Ayurveda, arts, and historical texts, was historically passed down orally or through manuscripts. Digital tools have enhanced its accessibility, ensuring its survival and integration into modern learning and research.

1. Digital Archives and Online Repositories

Impact: Provides free and easy access to ancient texts, manuscripts, and historical documents.

Example: Bhandarkar Oriental Research Institute (BORI) has digitized ancient Sanskrit manuscripts, making them available to scholars worldwide. National Digital Library of India (NDLI) stores millions of books, including rare Indian texts on philosophy, science, and history.

2. E-Learning Platforms and MOOCs (Massive Open Online Courses)

Impact: Expands access to traditional knowledge through structured online courses.

Example: SWAYAM and NPTEL offer courses on Vedic mathematics, Ayurveda, and Indian philosophy, allowing students worldwide to learn from Indian scholars. Harvard Online Course on Hindu Epics demonstrates how global universities use digital tools to teach Indian traditional knowledge.

3. AI and Machine Learning for Language Translation

Impact: Breaks language barriers and makes traditional knowledge accessible in multiple languages.

Example: Google's AI-powered Sanskrit Translator helps translate ancient Indian texts into modern languages.

Microsoft's Indic Language Translator supports Indian languages, aiding in preserving local dialects and folklore.

4. Virtual Reality (VR) and Augmented Reality (AR) for Cultural Education

Impact: Enhances engagement with traditional knowledge by offering immersive experiences.

Example: Virtual Tours of Ajanta and Ellora Caves help students explore historical sites without physical travel.

AR-based learning apps on Yoga and Ayurveda provide interactive learning experiences for global users.

5. Social Media and Digital Storytelling

Impact: Increases awareness and engagement with traditional knowledge through storytelling and visual content.

Example: YouTube channels like "Bharadwaj Ayurveda" share Ayurvedic remedies and Indian medical traditions.

Instagram pages like "Indian Heritage" use short videos to explain Indian festivals, arts, and rituals

6. Blockchain for Protection of Indigenous Knowledge

Impact: Prevents bio-piracy and ensures rightful ownership of traditional knowledge.

Example: CSIR's Traditional Knowledge Digital Library (TKDL) uses blockchain to protect Ayurveda and tribal medicinal knowledge from patent exploitation.

Blockchain-based patents for indigenous farming practices safeguard the rights of Indian farmers.

7. Digital Tools in Traditional Medicine

Impact: Enables evidence-based research and wider accessibility of traditional medicine.

Example: Ministry of AYUSH's "e-AUSHADHI" portal stores data on Ayurveda, Unani, Siddha, and Homeopathy (AYUSH) medicines. AI-powered Ayurveda Diagnosis Apps help users get personalized health advice based on traditional knowledge.

3) To analyse Challenges and Limitations of Digitizing Ancient Indian Knowledge

Digitizing ancient Indian knowledge is essential for preservation and accessibility, but it comes with various challenges. These challenges range from technical and linguistic barriers to ethical and cultural concerns. Below is an analysis of the key limitations, supported by examples.

1. Language and Script Complexity

Challenge: Ancient Indian texts exist in multiple scripts (Sanskrit, Brahmi, Grantha, Modi, etc.), making digitization difficult.

Example: Sanskrit Manuscripts Digitization: Optical Character Recognition (OCR) for Sanskrit is still not highly accurate due to complex ligatures and grammar rules.

Brahmi and Modi Scripts: These ancient scripts require expert intervention for accurate digital conversion.

2. Loss of Context and Interpretation Issues

Challenge: Many ancient texts require deep cultural and historical understanding, which AI-based digitization often lacks. Example:

Vedic Texts Misinterpretation: AI translation tools may misinterpret philosophical and metaphorical meanings in the Vedas. Ayurvedic Formulas: Without traditional context, dosage and application of ancient medicinal knowledge can be misunderstood or misused.

3. Copyright and Ownership Issues

Challenge: Who owns digitized traditional knowledge? There is a risk of cultural appropriation and exploitation.

Example:Neem and Turmeric Patents: Western companies attempted to patent traditional Indian knowledge of neem and turmeric, leading to legal battles.

Blockchain for Protection: The Traditional Knowledge Digital Library (TKDL) was created to prevent unethical patents but faces difficulties in tracking global misuse.

4. Physical Degradation of Source Material

Challenge: Many manuscripts are fragile, damaged, or incomplete, making digitization challenging.

Example:Palm Leaf Manuscripts in Kerala: Many are decayed or illegible, requiring expert restoration before digitization.Tanjore Saraswati Mahal Library: Houses rare texts that are difficult to scan due to fragile conditions.

5. Lack of Skilled Experts and Funding

Challenge: Digitization requires experts in ancient languages, IT specialists, and proper funding, which are often lacking.

Example:Limited Sanskrit Scholars: Few experts can accurately interpret ancient texts for digitization projects.

Underfunded Initiatives: Many Indian universities struggle with financial support for large-scale digitization projects.

6. Technological Limitations

Challenge: Existing technology struggles with accurate text recognition, translation, and preservation.

Example:Inaccurate OCR for Sanskrit and Pali: Google's AI tools have difficulty recognizing old scripts.

Poor Internet Access in Rural Areas: Many historical knowledge centres in villages lack infrastructure for digitization.

7. Ethical and Cultural Sensitivity

Challenge: Some traditional knowledge is sacred and meant only for specific communities or trained scholars.

Example:Sacred Vedic Chants: Certain mantras require oral transmission under a guru's guidance, making digital accessibility controversial.

Tribal Knowledge of Medicinal Plants: Some indigenous groups resist digitization, fearing exploitation by pharmaceutical companies.

To Assess the Effectiveness of Various Digital Platforms in Making Traditional Knowledge Globally Available

Digital platforms have played a crucial role in preserving and disseminating traditional knowledge, making it accessible to a global audience. Their effectiveness can be assessed based on accessibility, accuracy, user engagement, and integration into education and research. Below is an evaluation of key platforms, along with their impact and challenges.

1. Digital Archives and Repositories

Effectiveness: High accuracy and accessibility but limited interactivity.

Example: National Digital Library of India (NDLI)

Provides access to millions of academic and historical texts, including rare manuscripts.

Global researchers and students benefit from digital copies of Indian scriptures and historical records.

Traditional Knowledge Digital Library (TKDL)

Protects India's traditional medicinal knowledge from biopiracy.

Used in international patent disputes to prevent unauthorized claims on indigenous knowledge.

Limitation: Some texts lack translations, making them difficult for non-native speakers to understand.

2. E-Learning Platforms and MOOCs

Effectiveness: High accessibility, interactive learning, and global reach.

Example: SWAYAM & NPTEL

Offer free courses on subjects like Ayurveda, Yoga, and Indian philosophy.

Global students can learn directly from Indian institutions like IITs and IIMs.

Coursera & edX (International Platforms) Universities offer courses on Indian classical music, history, and Sanskrit. Provides credibility and integration into modern education systems.

Limitation: Limited awareness among rural Indian learners and difficulty in accessing content without digital literacy.

3. AI-Powered Language Translation and OCR Tools

Effectiveness: Improves accessibility but lacks full accuracy.

Example: Google Translate for Sanskrit and Indic Languages Helps translate ancient texts into modern languages, making them globally accessible. Microsoft AI for Indian Scripts . Assists in converting old manuscripts into digital text using OCR. Limitation: AI-based translations sometimes misinterpret complex linguistic structures and philosophical meanings.

4. Social Media and Digital Storytelling

Effectiveness: High engagement, effective in reaching younger audiences.

Example: YouTube Channels (e.g., "Bharadwaj Ayurveda", "Indian Knowledge Systems")

Educate millions on Indian traditions, Ayurveda, and Vedic science.

Instagram & Twitter (Cultural Influencers)

Short videos and infographics make traditional knowledge appealing to the younger generation.

Limitation: Quality control is difficult; misinformation and commercialization can distort traditional knowledge.

5. Virtual Reality (VR) & Augmented Reality (AR) for Cultural Preservation

Effectiveness: Provides immersive learning experiences but requires advanced technology.

Example: Google Arts & Culture – Virtual Tours of Indian Heritage Sites

Allows users to explore Ajanta and Ellora caves, Indian temples, and heritage sites remotely.

AR Yoga & Ayurveda Learning Apps

Help users practice traditional wellness techniques with interactive 3D guides.

Limitation: Requires expensive hardware and strong internet, limiting accessibility in rural areas.

6. Blockchain for Knowledge Protection

Effectiveness: Strong security but limited awareness and adoption.

Example: CSIR's Blockchain for Medicinal Plant Knowledge

Prevents unauthorized patents on indigenous medicinal practices.

NFTs for Traditional Art Preservation

Helps protect intellectual property rights of folk artists.

Limitation: Still in early stages; lacks widespread implementation in academic research.

Body of the Research:

1. The Indian Knowledge System: A Legacy of Wisdom

India's traditional knowledge system is vast and diverse. Some key domains include:

Ayurveda and Siddha Medicine – Ancient Indian healthcare systems based on natural healing and holistic well-being.

Yoga and Meditation – Practices promoting mental and physical well-being, recognized globally.

Vedic Mathematics – Advanced mathematical concepts, including zero and the decimal system.

Sanskrit and Classical Literature – Ancient texts such as the Vedas, Upanishads, Ramayana, and Mahabharata.

Traditional Arts and Architecture – Classical dance, temple architecture, and indigenous art forms.

Despite its richness, much of this knowledge was transmitted orally and later documented in manuscripts, which are now at risk of being lost.

2. Role of Digital Tools in Preserving Traditional Knowledge

A. Digitization of Manuscripts

Organizations such as the National Digital Library of India (NDLI), Google Arts & Culture, and the Bhandarkar Oriental Research Institute have undertaken massive efforts to digitize ancient manuscripts. These digital archives make rare texts accessible worldwide.

B. AI and Machine Learning in Language Translation

Many ancient Indian texts are in Sanskrit, Pali, Tamil, or Prakrit, making them inaccessible to the masses. AI-driven translation tools such as Google Translate and NLP-based models are now helping translate these texts into multiple languages.

C. Virtual and Augmented Reality for Immersive Learning

Virtual Reality (VR) and Augmented Reality (AR) are being used to create immersive experiences for learning traditional Indian arts, architecture, and history. For example, virtual walkthroughs of Ajanta-Ellora caves or Vedic rituals provide an interactive way to experience history.

D. Open-Access Learning Platforms

-MOOCs such as SWAYAM, Coursera, and edX offer courses on Indian philosophy, Sanskrit, and Ayurveda, making traditional knowledge accessible to learners globally.

E. Blockchain for Knowledge Authentication

Blockchain technology is being explored for securing and verifying the authenticity of digital manuscripts and intellectual property in traditional knowledge.

3. Challenges in Integrating Digital Tools with the Indian Knowledge System

Despite its benefits, the digital transformation of traditional knowledge faces several challenges:

1. Loss of Context and Interpretation – Ancient knowledge is often deeply embedded in cultural contexts, which may be lost in digital translations.
2. Language Barriers – Many digital tools struggle to accurately translate Sanskrit and other classical languages.
3. Data Privacy and Intellectual Property Issues – Concerns over the commercialization of traditional knowledge without proper attribution to its origins.
4. Digital Divide – Limited internet access in rural areas hampers the widespread adoption of digital tools.

Findings of the Research:

Digital tools have significantly improved the accessibility of ancient Indian knowledge.

AI-driven translations have helped decode complex Sanskrit texts, making them more accessible.

MOOCs and e-learning platforms have played a major role in popularizing traditional Indian education.

Challenges such as loss of cultural context, data privacy, and the digital divide remain critical concerns

Conclusion:

The integration of digital tools into the Indian knowledge system is a transformative step towards preserving and promoting India's rich intellectual heritage. While challenges exist, advancements in AI, NLP, and digital repositories offer immense potential to make traditional knowledge more accessible to scholars, educators, and the general public. To bridge the gap between tradition and technology, it is crucial to develop inclusive digital policies, enhance AI-driven translations, and ensure ethical preservation of India's cultural knowledge.

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THE ROLE OF IKS IN CONFLICT RESOLUTION AND PEACE BUILDING**Dr. Santosh S. Rukari***Associate Professor,**Department of Education, Mandsaur University, Mandsaur**santoshsrkari@gmail.com*

Abstract

In the recent day Indian Society is facing many challenges due to social change, cultural change and modernization of the Indian Traditions and Culture. Today many amenities are available in the society. Technology is able to provide all door-to-door services to the society. Education is providing new opportunity and platforms to the new generations. AI has made drastic change in the Indian society. Agriculture, Industry, Education, Information and Communication, transport all sectors are providing good services to the society. After looking all these available resources human being should be well satisfied for the amenities. Many surveys are indicating that Indian society is not having good satisfaction index. Norway, Bhutan is the country having very high happiness index of the society. In Indian context when we can look into the past era happiness index and satisfaction index is very high. Reasons behind these is old tradition, culture, philosophy, human relation, respects towards society etc. together we called Indian Knowledge System. Indian Knowledge System is closely associated with the Indian traditions and culture. Oldest Indian literature survey shows that people are very much happy in the limited resources and financial scarcity

Key words- IKS, Conflict, Resolution, Peace Building

Introduction

The main objective of the IKS is to achieve planned and coordinate development of the Indian Society on his ideological prospective

The Ministry of Human Resource Department (MHRD), Department of Social Education and Literacy has authorized curriculum of the Indian Knowledge System by looking problems of the Indian Society. It is suggested by the University Grants Commination, NAAC, AICTE that every education institute should established center of Indian Knowledge System to promote Indian Culture, Traditions, Yoga, Practices, and Medicines etc. Faculty Development Programm, Seminar, Conference, Workshops need to be conduct on Indian Knowledge System to promote Indian Culture and resolve the problems existed in the Indian Society. Education Institutes are the main sources to promote literacy about Indian Culture and traditions. Increasing Human Satisfaction Index and Human Happiness Index IKS will be the masterstroke to resolve the Indian problems

Operational Definition

Indian Knowledge System

The Indian Knowledge System (IKS) is a systematized transmission of knowledge from one generation to the coming. It's a well- organized system and process of knowledge transfer, rather than just a tradition. The Vedic literature – Upanishads, Vedas, and Upvedas are all part of the Indian Knowledge System (Centre of policy exploration & governance, 2023). India's Knowledge System started from Vedic culture. Vedic culture is comprised of four Vedas Rig, Yajur, Sama and Atharva still, in recent decades, the idea of Indian Knowledge System has gained attention, egging leading educationists and scientists to explore its eventuality. The Indian government, admitting the significance of reviving indigenous knowledge, formulated the National Education Policy. The rich heritage of ancient and eternal Indian knowledge and study has been a guiding light for this Policy (Mandavkar, P. 2023). The pursuit of knowledge (Jnan), wisdom (Pragyaa), and verity (Satya) was always considered in Indian study and gospel as the loftiest mortal thing. The end of education in ancient India wasn't just the accession of knowledge as medication for life in this world, or life beyond training, but for the complete consummation and emancipation of the tone.

Conflict Resolution

Conflict resolution is the process of ending a disagreement and finding an agreement that everyone is satisfied with. It involves skills like active listening, compromise, and open dialogue. Conflict resolution is the process that two or more parties use to find a cordial solution to a problem. Conflicts can occur between friends and family members, but also between coworkers, clients, and customers.

Indian knowledge system aims to support and facilitate further research to solve the contemporary societal issues in several fields such as Holistic health, Psychology, Neuroscience, Nature, Environment & Sustainable development. The primary aim of drawing from the past and integration of the Indian knowledge systems is to solve the contemporary and emerging problems of India and world by using our ancient knowledge systems represented by uninterrupted tradition of knowledge transfer and unique point of view (Bhāratīyu Drishti).

Peace Building

Peacebuilding involves a range of measures targeted to reduce the risk of lapsing or relapsing into conflict by strengthening national capacities at all levels for conflict management, and to lay the foundations for sustainable peace and development. The goal of peace-building is to reduce or eliminate the reasons for violence among people or groups. Peace-building happens when disagreeing individuals, groups, or communities come to realize their shared needs or goals and commit to solving them through positive dialogue and reconciliation rather than violence.

Indian Knowledge System and its traditions are stands on knowledge building with peace, traditions, love and understanding

Subject area under Indian Knowledge System

Subjects under Indian knowledge system: Humanities, Engineering, Medicine, Agriculture, Community knowledge systems, Fine and Performing arts, Vocational skills, etc, which have IKS content. As per the guidelines, the courses must have a clear mapping of the traditional subjects in IKS with the modern subjects such as Chemistry, Mathematics, Physics, Agriculture, etc.

Objectives

1. To explain conceptual meaning of Indian Knowledge System
2. To explain study areas of the Indian Knowledge System
3. To explain relationship between IKS and conflict resolution and peace building

Tools of Data Collection

Researcher has collected information of the present study by literature review from different websites related to Indian Knowledge System, Peace Education and Conflict Resolution. Researcher has also referred library literature available on Indian Knowledge System. Researcher is also teaching to the PG and UG students of the Education on same subject area.

Tools of Data Analysis

Researcher has collected information for present study from literature used content analysis technique for data analysis. Researcher has developed content analysis chart as per the objectives of present study & expert's opinion. Narrative notes of interviews is prepared & written in chart. Data is code & main points is consider for data interpretation.

Research Methodology

Present study is completed by Qualitative research. Present research uses the data which is descriptive in nature. Tools that researchers used in present study are observations, conducting interviews, conducting document analysis, and analyzing participant products such as diaries, images of certificates. Present study comes under the Descriptive research methods & Applied Research category. From Qualitative research methods researcher has selected Narrative Study Method for present study. Own experience of researcher is also added in qualitative inquiry in given study.

Indian Knowledge System in Education:

The IKS will be introduced in a scientific way in school and higher education curricula. The IKS will include tribal knowledge as well as indigenous and traditional learning methods which will cover and include mathematics, astronomy, philosophy, yoga, architecture, medicine, agriculture, engineering, linguistics, literature, sports, games, as well as governance, polity and conservation. Specific courses in tribal ethno-medicinal practices, forest management, traditional (organic) crop cultivation, natural farming, etc. will also be made available. An engaging course on

Indian Knowledge Systems will also be available to students in secondary school as an elective. The policy recognizes that the knowledge of the rich diversity of India should be imbibed first hand by learners.

Objectives of Indian Knowledge System:

The main objective of Indian Knowledge System is to develop a skill to stimulate experience in the taught, under an artificially created environment, less with material resources and more by the creation of an emotional atmosphere. Some of the most important objectives of Indian Knowledge System are as follows:

1. Imparting an adequate knowledge of the subject- matter:

The objective of Indian Knowledge System is to develop a good command of the subject matter of the assignment given to him in the colleges

2. Equipping the prospective teachers with necessary pedagogic skills:

The main objective of Indian Knowledge System is to develop a skill to stimulate experience in the taught, under an artificially created environment, less with material resources and more by the creation of an emotional atmosphere. The teacher should develop a capacity to do, observe, infer and to generalize.

3. Enabling the society to acquire understanding of social psychology:

The objective is to understand the social psychology so that the society is able to appreciate the difficulties experienced by children so as to bring about new modes and methods of achieving the goals in consonance with the reactions of the children.

4. Developing proper attitudes towards teaching:

One of the major objectives of Indian Knowledge System is to develop proper attitudes towards Indian Traditions and Culture as a result of which he will be able to maximize the achievements from both the material and human resources. There is also development of a proper perception of the problems of universal enrolment, regular attendance, and year-to-year promotion.

5. Developing self-confidence in the Indian Citizens:

The objectives of Indian Knowledge System are development of the ability to take care of himself in terms of: (a) Adjustment with the physical conditions, (b) Healthy adjustment with the social environment c) Adjustment with himself to derive emotional satisfaction with his life.

6. Enabling Indian Citizens to make proper use of instructional facilities:

The objective of teacher education is to develop the capacity to extend the resources of the school by means of improvisation of instructional facilities.

Skills required for Peaceful life

Yoga and Meditations are the gift of Indian Society to the Indian Philosophy. Society, Schools, Colleges, Universities, Parents, Students are need to work together for the development

of skills associated with the happiness. Following are the important ways for developing happy and peaceful life through the education and training of the Indian Knowledge System

- Connection of Indian Vedas and its Philosophy
- Creating Learning Society
- Implementation of Innovative Indian Ideology
- Utilization of Free Time for Yoga and Meditation
- Respect of the Yielders
- Habits of Exercise
- Communication Skills
- Skill of togetherness
- Sharing Innovative Ideas with each other's
- Effective use of Indian Diet System
- Development of academic research on IKS
- Skill of Reading and Listening
- Focus on Visit to Natural Places
- Self-learning habits

Unique Initiatives for Conflict Resolution through IKS:

Following are the unique initiatives for the conflict resolution suggested by the Indian Knowledge System

- **Active listening:** Give your full attention to the other person, and try to understand their concerns and emotions.
- **Empathy:** Try to build rapport and trust with the other person.
- **Assertiveness:** Express your thoughts and needs clearly and respectfully.
- **Patience:** Try to tolerate frustration and delays without getting upset.
- **Communication:** Be clear and concise when expressing your thoughts and feelings.
- **Problem-solving:** Identify the root causes of the conflict and explore possible solutions.
- **Negotiation:** Identify common ground and brainstorm options to find mutually agreeable solutions.
- **Stress management:** Recognize your stress and learn how to manage it.
- **Emotional intelligence:** Consider the feelings and concerns of all parties involved.
- **Impartiality:** Try not to take sides.

Other skills that can help with conflict resolution include:

Validation, Rational thinking, Cognitive flexibility, avoiding blame, staying calm, and Collaboration.

Conclusion:

IKS includes knowledge from ancient India and, its successes and challenges, and a sense of India's future aspirations specific to education, health, environment and indeed all aspects of life. Indian knowledge system aims to support and facilitate further research to solve the contemporary societal issues in several fields such as Holistic health, Psychology, Neuroscience, Nature, Environment & Sustainable development. Indian Knowledge System (IKS) is an innovative cell established to promote interdisciplinary research on all aspects of IKS, preserve and disseminate IKS for further research and societal applications. It will actively engage for spreading the rich heritage of our country and traditional knowledge.

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Websites

NCTE at a Glance - NCTE: National Council for Teacher Education"

NCTE: National Council for Teacher Education"

Academic Division – NCTE: National Council for Teacher Education".

**THE ROLE OF ECOTOURISM, EDUCATION, AND DIGITAL TECHNOLOGY
IN PRESERVING CULTURAL HERITAGE: A SUSTAINABLE APPROACH TO
SAFEGUARDING HISTORY AND TRADITIONS**

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Abstract:-

Educational tourism has emerged as an effective pedagogical strategy that extends learning beyond the classroom, providing students with direct exposure to historical and cultural heritage. This study examines the role of educational tourism in addressing mobile addiction among students by integrating structured travel experiences with reflective academic tasks. Specifically, it explores how engaging students in historical site visits and requiring them to document their experiences through digital storytelling and online media platforms can enhance their cognitive engagement, historical understanding, and critical thinking skills.

The research investigates the extent to which firsthand experiential learning fosters reflective thinking, traveler identity development, and cultural awareness. By analyzing the impact of digital documentation and self-reflective writing, this study assesses how such interventions contribute to enhanced historical consciousness, academic learning, and digital literacy. A qualitative research approach is employed to evaluate the effectiveness of educational tourism in reinforcing students' intellectual curiosity and promoting an immersive approach to history education.

The findings offer valuable insights for educators, curriculum designers, and policymakers, highlighting the potential of integrating educational tourism into academic frameworks. By linking experiential travel with digital engagement, this study presents an innovative model for enhancing student learning outcomes while preserving and reinterpreting cultural heritage in the digital era.

Introduction:-

The demand for high-quality tourism talents continues to grow, owing to the structural adjustment and upgrading of tourism, and the integration between culture and tourism [6-15]. Online tourism education plays a pivotal role in tourism education. With the surging amount of data on the Internet, online tourism education resources (OTERs) become increasingly diverse and colorful [16]. Building a knowledge chain can demonstrate the logical relationship between knowledge points of the entire discipline, and enable the students to better grasp and understand the relationship between relevant knowledge points through online tourism education

Education Tourism: Ritchie et al. observed, “Tourist activity undertaken by those who are undertaking an overnight vacation and those who are undertaking an excursion for whom education and learning is a primary (Education) or secondary (Tourism) part of their trip.”

Concerning the Hadauti and Shekhawati Regions of Rajasthan, India, Sharma, A. (2015) studied "Educational Tourism: Strategy for Sustainable Tourism Development" and found that a lack of educational programmes, awareness campaigns, and marketing initiatives are some of the reasons why the region is unable to draw tourists to it. The author opined that education tourism should be one of the growth strategies for the sustainable development of sustainable education tourism, and as a result, universities and educational institutions should be mandated to conduct education tours once a year to promote the development of tourism for education.

D. Kumar and K. Archana (2015) The history, present, and future scenarios of educational tourism in India were examined in a scenario study titled "Educational Tourism in India: Past, Present, and Future." Despite the opaque picture of outbound Edu-tourism in India, the report highlighted that India is a significant tourist destination for educational purposes, and has a bright future. Despite the current state of educational tourism in India, it seems to be murky, the author stated, based on research, that it can shine. The author went on to note that India has a wealth of tourism resources that might be utilized to support educational tourism in this country

Characteristics of Event as Services

The controversy over the nature of events, whether they are products or services, has come to the forefront. Events, however, do not cleanly fit into the prevalent categories of product and service as a viable subject of investigation. Nevertheless, events have all of the essential qualities of services, as articulated by Gronroos in 2000 as cited in (Reic, 2017) including:

Intangibility: Events are not tangible items that can be touched, but rather event experiences.
Inseparability: The individual experiencing the event must be present at a given place and time for it to occur.

Variability (heterogeneity): Every event is an exclusive occurrence, and also customary, long-standing, and occurs regularly (such as annually or monthly), is never alike.

The transition in time, location, as well as the individuals in charge of organizing the event and those who will be experiencing it could affect this.

Perishability: Technically, events do not happen outside of their scheduled beginning and finish durations.

Characteristics of Educational Tourism

According to Kenkova (2017), educational tourism can be conducted on a variety of interests, such as: learning a language, undertaking university studies, training or acquiring professional experience. Education tourism is based on learning, understanding and respecting the value of cultural diversity, contributing to the social, economic and cultural development of sites.

From a critical perspective, this type of tourism, and based on the SDG1, as it generates knowledge and at the same time fosters the development, social, economic and cultural of communities

Strategic Approaches to Strengthening Educational Tourism in India

1. **Specialized Academic Programs:** Develop niche courses in Indian classical music, Ayurveda, Vedic mathematics, yoga, and technology-driven certifications to attract international students and position India as a hub for unique educational experiences.
2. **Public-Private Collaborations:** Foster partnerships between government institutions and private educational bodies to enhance infrastructure, provide world-class facilities, and expand India's global academic outreach. Successful models like IIM-Indore demonstrate the potential of such collaborations in the education sector.
3. **Cultural Immersion Through Exchange Programs:** Implement structured cultural exchange programs that allow international students to engage with India's rich heritage, traditions, and diverse academic disciplines, promoting cross-cultural understanding and global cooperation.
4. **Technology-Driven Educational Tourism:** Leverage digital platforms, virtual reality (VR) campus tours, and AI-driven learning experiences to provide international students with an immersive preview of India's historical sites, universities, and academic programs before physical enrollment.
5. **Policy Reforms for Accessibility:** Streamline visa processes, offer scholarships, and introduce incentives for institutions that successfully attract and accommodate international students, making India a more accessible and attractive destination for educational tourism.
6. **Global Marketing Strategies:** Promote India as a premier educational tourism destination through targeted campaigns in key source markets, highlighting its historical learning experiences, academic excellence, and cultural richness.

Promotion of Indian Languages, Arts, and Culture

India is a treasure trove of culture, developed over thousands of years and manifested in the form of arts, works of literature, customs, traditions, linguistic expressions, artefacts, heritage sites, and more. Crores of people from around the world partake in, enjoy, and benefit from this cultural wealth daily, in the form of visiting India for tourism, experiencing Indian hospitality, purchasing India's handicrafts and handmade textiles, reading the classical literature of India, practicing yoga and meditation, being inspired by Indian philosophy, participating in India's unique festivals, appreciating India's diverse music and art, and watching Indian films, amongst many other aspects. It is this cultural and natural wealth that truly makes India, "Incredible India", as per India's tourism slogan. The preservation and promotion of India's cultural wealth must be considered a high priority for the country, as it is truly important for the nation's identity as well as for its economy. 22.2. The promotion of Indian arts and culture is important not only for the nation but also for the individual. Cultural awareness and expression are among the major competencies

considered important to develop in children, to provide them with a sense of identity, belonging, as well as an appreciation of other cultures and identities. It is through the development of a strong sense and knowledge of their own cultural history, arts, languages, and traditions that children can build a positive cultural identity and self-esteem. Thus, cultural awareness and expression are important contributors both to individual as well as societal well-being

Art-integration is a cross-curricular pedagogical approach that utilizes various aspects and forms of art and culture as the basis for learning of concepts across subjects. As a part of the thrust on experiential learning, art-integrated education will be embedded in classroom transactions not only for creating joyful classrooms, but also for imbibing the Indian ethos through integration of Indian art and culture in the teaching and learning process at every level. This art-integrated approach will strengthen the linkages between education and culture.

(NEP2020)

Scope of the Study

This study examines the potential of educational tourism as an innovative pedagogical approach to engage students who exhibit high levels of mobile dependency. By integrating experiential learning through historical site visits, the research explores how travel-based education influences students' cognitive development, reflective thinking, and historical awareness.

A key component of this study involves task-based learning, wherein students are required to document and share their travel experiences through online platforms. This strategy leverages their existing digital engagement patterns while fostering critical reflection and analytical thinking. The study aims to assess whether such an approach enhances their ability to reinterpret historical narratives and explore new dimensions of Indian history.

Furthermore, the research investigates how active participation in historical tourism contributes to the development of traveler identity, cultural appreciation, and intellectual curiosity among students. By engaging in reflective writing and digital storytelling, students may cultivate a deeper understanding of India's heritage, historical complexities, and socio-cultural evolution. This study provides insights into the pedagogical effectiveness of educational tourism as a means to counter digital distraction while simultaneously promoting historical inquiry, digital literacy, and experiential learning. The findings aim to inform educators and policymakers about the potential of integrating tourism-based assignments into academic curricula to enhance student engagement and historical understanding.

Promotion and Preservation of Indian Languages, Arts, and Culture: The Role of Educational Tourism and Technology

India boasts a vast and diverse cultural heritage that has evolved over thousands of years, reflected in its literature, art forms, traditions, languages, historical artifacts, and heritage sites.

Millions of individuals worldwide engage with this cultural richness through tourism, Indian hospitality, handicrafts, classical literature, yoga, meditation, philosophy, festivals, music, and cinema. This extensive cultural and natural heritage significantly contributes to India's identity and economic growth, aligning with the nation's tourism slogan, "**Incredible India.**"

Cultural Awareness and Its Role in Education

The promotion of Indian arts and culture is essential not only for national heritage conservation but also for individual development. Cultural awareness and expression are key competencies necessary for shaping a child's sense of identity and fostering an appreciation for diversity. A deep understanding of one's cultural roots—encompassing history, art, languages, and traditions—plays a crucial role in enhancing self-esteem and social cohesion. Therefore, integrating cultural education into academic curricula is vital for both personal and societal well-being.

Educational Tourism as a Tool for Cultural Preservation

The National Education Policy (NEP) 2020 emphasizes the significance of experiential and art-integrated learning. This pedagogical approach incorporates elements of Indian art and culture into mainstream education, ensuring that students engage with history in a meaningful way. To complement this, educational tourism must be given a more prominent role in curriculum design. Educational tours to historical and culturally significant sites allow students to gain firsthand exposure to India's rich heritage. These visits can be further enhanced using artificial intelligence (AI) and digital technology, transforming heritage sites into immersive learning environments. Interactive digital reconstructions, augmented reality experiences, and AI-assisted storytelling can provide students with an enriched understanding of historical narratives.

To maintain the integrity of historical education, all information shared with students must be verified by Indian government authorities. The authentication of historical content by certified experts ensures accuracy and prevents the dissemination of misleading or distorted narratives, which can create societal controversies and impact cultural sustainability. Establishing structured educational tours across different academic levels, including interstate visits, can further enhance students' cross-cultural understanding and communication skills.

Preserving Cultural Authenticity in the Digital Era

With the rise of social media and digital content, cultural history, literature, and traditional music are increasingly being altered or remixed, leading to a gradual erosion of authenticity. To counter this, a comprehensive approach must be adopted, incorporating government-certified documentation, AI-driven historical preservation, and structured educational experiences.

By integrating educational tourism, digital technology, and an authenticated curriculum, India's cultural heritage can be effectively preserved while ensuring that younger generations develop a deep and accurate understanding of their artistic and historical legacy. These efforts will

not only safeguard India's diverse cultural traditions but also foster a stronger connection between education and heritage conservation in the modern era.

Experiential Learning Through Historical Sites: Fostering Cultural Awareness and Social Harmony"

When students engage in direct experiences at historical forts and monuments across different regions, they develop a heightened awareness of cultural and ethnic diversity. History serves as a crucial tool in understanding past conflicts and mistakes, particularly those stemming from internal divisions. By immersing themselves in historical environments, students enhance their affective domain, strengthening their emotional intelligence, empathy, and appreciation for cultural heritage. This experiential learning process plays a significant role in promoting peace and social harmony, as it nurtures respect for diverse traditions and encourages a more inclusive and cohesive society.

Preserving Untold Histories: The Role of Digital Documentation and Educational Tourism

Many historical events and heritage sites remain unexplored and undocumented, risking obscurity over time. Without proactive efforts to digitally archive and promote these lesser-known historical places, valuable cultural and historical knowledge may disappear. The lack of web-based historical documentation threatens the accessibility of these untold stories, making them invisible to future generations.

In the past, oral storytelling played a crucial role in transmitting historical knowledge. However, with the decline of this tradition, it has become imperative to shift towards written and digital forms of historical preservation. By integrating educational tourism with digital storytelling platforms, history can be authentically recorded, shared, and studied. This approach ensures that forgotten historical sites and narratives gain recognition, enabling future generations to engage with their cultural heritage in meaningful ways.

Conclusion:-

This research will explore how ecotourism, digital advancements, and educational initiatives contribute to the preservation of cultural heritage. By integrating sustainable tourism practices with technology-driven historical education, societies can ensure that their traditions, monuments, and artifacts are protected for future generations. The study will also examine how schools and colleges can incorporate educational visits to historical sites, leveraging digital tools to enhance learning while fostering cultural awareness.

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GOEIJR

THE ROLE OF IKS IN CONFLICT RESOLUTION AND PEACEBUILDING**Dr. S. G. Baviskar***drbaviskarsg@gmail.com*

Abstract:

This paper explores the significant role Indigenous Knowledge Systems (IKS) play in conflict resolution and peacebuilding. It examines how traditional wisdom, practices, and methods used by indigenous communities contribute to resolving conflicts and promoting sustainable peace. With a focus on different cultural contexts, the paper highlights how IKS offers practical solutions and frameworks that are often overlooked in modern peace processes.

1. Introduction

Indigenous Knowledge Systems (IKS) refer to the traditional knowledge, practices, beliefs, and experiences that indigenous peoples have accumulated over generations. These systems are often rooted in the relationship between the community, its environment, and its social structures. This paper will delve into how IKS can be applied to conflict resolution and peacebuilding, offering an alternative or complement to modern peace processes. While modern approaches to peacebuilding often focus on legal, political, and economic strategies, indigenous methods emphasize dialogue, community engagement, and the restoration of social harmony.

2. Defining Indigenous Knowledge Systems (IKS)

IKS is not a monolithic concept but varies across different indigenous groups worldwide. These systems encapsulate a community's understanding of history, spirituality, governance, and conflict management. In many cases, IKS has evolved over centuries to reflect the specific needs and conditions of the community. These systems are holistic, involving not just conflict resolution, but also the maintenance of social, environmental, and spiritual harmony.

The key characteristics of IKS include:

- **Holistic worldview:** IKS is often grounded in a holistic understanding of the world, which sees human beings as part of a larger ecological and spiritual order.
- **Relational approach:** The relationship between individuals, communities, and the environment is central to IKS, where balance and interconnectedness are prioritized.
- **Oral traditions:** Much of IKS is transmitted through oral histories, storytelling, rituals, and ceremonies.

3. Traditional Conflict Resolution Mechanisms in Indigenous Societies

Indigenous conflict resolution practices are often embedded in social norms, spiritual beliefs, and community structures. These practices differ across cultures but share common themes, such as dialogue, reconciliation, and the restoration of relationships.

Examples of indigenous conflict resolution methods include:

- **Mediation and Elders' Council:** In many indigenous communities, elders play a key role in resolving conflicts. Their wisdom and experience are revered, and they often mediate disputes by offering counsel, facilitating dialogue, and guiding parties toward a consensus.
- **Restorative Justice:** Rather than focusing on punishment, indigenous systems often emphasize healing, forgiveness, and restoring relationships. This might include rituals or ceremonies that aim to restore balance in the community.
- **Community-based decision-making:** In many indigenous cultures, decision-making is a collective process. Disputes are resolved through community dialogue, and decisions are made with the well-being of the entire community in mind.

For instance, among the Maori of New Zealand, traditional methods like the "whakawhanaungatanga" process emphasize collective decision-making, where the community comes together to resolve disputes through discussion and consensus.

4. The Role of IKS in Peacebuilding

IKS plays a vital role in promoting long-term peace by focusing on reconciliation, healing, and the restoration of social cohesion. Unlike Western models of peacebuilding, which may emphasize top-down legal frameworks and economic solutions, IKS approaches peacebuilding from a more community-oriented and grassroots perspective.

Key elements of IKS in peacebuilding include:

- **Building trust:** Traditional methods foster trust between disputing parties and the wider community. For example, in post-conflict societies, community-based rituals can help to rebuild social trust and heal divisions caused by conflict.
- **Cultural preservation:** Peacebuilding efforts that incorporate IKS respect and preserve cultural heritage, which in turn strengthens identity and community solidarity. The revitalization of indigenous cultural practices often plays a key role in post-conflict recovery.
- **Promoting social justice:** IKS often emphasizes social justice and equality, ensuring that marginalized groups within the community have a voice in decision-making processes and are included in peacebuilding efforts.

In the context of South Africa's post-apartheid era, the Truth and Reconciliation Commission (TRC) incorporated elements of IKS to address the psychological and social effects of conflict. The TRC used restorative justice principles, drawing on African traditions of forgiveness and reconciliation, to foster healing.

5. Case Studies of IKS in Conflict Resolution and Peacebuilding

This section explores real-world examples of how IKS have been applied in conflict resolution and peacebuilding contexts.

- **Rwanda:** After the genocide in Rwanda, the Gacaca courts, which were based on traditional Rwandan justice practices, were used to promote reconciliation. These community-based courts allowed for dialogue between perpetrators and victims, encouraging healing through public confession, forgiveness, and reintegration.
- **Colombia:** In Colombia, indigenous communities have utilized their traditional systems of governance and conflict resolution to resist violence and promote peace in their regions. For example, the indigenous people of the Amazon Basin have used peace circles and collective decision-making practices to mediate conflicts within their communities, helping to resist the violence of armed groups.
- **Canada and the United States:** Indigenous nations in Canada and the U.S. have long used their own methods to address conflicts both within their communities and with settler governments. In particular, the concept of "peacemaking circles," which promotes dialogue and reconciliation, has been employed in both family and community contexts.

6. **Challenges and Limitations of IKS in Modern Peacebuilding**

While IKS offers valuable tools for conflict resolution and peacebuilding, there are challenges in integrating these systems into contemporary peace processes.

- **Cultural erosion:** The impact of colonialism, globalization, and modernization has led to the erosion of traditional knowledge and practices in many indigenous communities.
- **Integration with modern legal systems:** One of the challenges is how to harmonize traditional IKS with modern legal systems, which may emphasize punitive measures over restorative justice. In some cases, there is a tension between indigenous approaches and national or international legal frameworks.
- **Marginalization of indigenous voices:** Indigenous peoples are often marginalized in formal peace processes, with their knowledge and practices overlooked in favor of more mainstream, state-centered approaches.

7. **The Future of IKS in Conflict Resolution and Peacebuilding**

The future of IKS in conflict resolution and peacebuilding lies in its integration with modern peacebuilding frameworks. Efforts should focus on:

- **Promoting dialogue:** Encouraging greater dialogue between indigenous communities and state actors to ensure that indigenous knowledge systems are recognized and integrated into official peace processes.
- **Capacity building:** Supporting the revitalization and transmission of IKS to younger generations, ensuring that traditional knowledge continues to play a role in conflict resolution and peacebuilding.
- **Collaborative frameworks:** Developing frameworks that blend the strengths of both indigenous knowledge systems and modern peacebuilding approaches.

8. AI and Its Increasing Role

AI is revolutionizing a wide range of industries, from healthcare and agriculture to finance and education. AI technologies analyze large datasets, make predictions, optimize processes, and even create new knowledge based on patterns in data. AI's ability to process information at an extraordinary speed and scale makes it a powerful tool in addressing complex global challenges, such as climate change, healthcare access, and food security.

However, AI has also been critiqued for its lack of cultural sensitivity and its reliance on data-driven models that may overlook local or indigenous ways of knowing. This highlights the potential benefits of integrating IKS into AI systems.

9. Complementary Roles of IKS and AI

Both IKS and AI have significant contributions to make in the pursuit of sustainable development, ethical AI, and the preservation of indigenous cultures. Here are some ways in which they can complement each other:

- **Ecological Sustainability:** Indigenous knowledge has long promoted ecological stewardship and the sustainable use of resources. AI can support the digitization and analysis of this knowledge, making it accessible to a global audience. For instance, AI can help map ecosystems using indigenous methods, promoting sustainable land management and biodiversity conservation based on indigenous perspectives.
- **Health and Medicine:** Indigenous healing systems often incorporate natural remedies, plant medicine, and spiritual practices. AI can assist in cataloging and researching these remedies, identifying patterns, and helping scientists understand their efficacy. Additionally, AI can enhance the way indigenous healthcare providers track health data and predict potential disease outbreaks in remote areas.
- **Cultural Preservation:** The integration of IKS into AI could help preserve endangered languages, traditional stories, and oral histories. AI-powered platforms can be developed to help record and archive oral traditions, facilitating intergenerational knowledge transfer and preventing cultural erosion.
- **Data Sharing and Decision Making:** IKS often focuses on collective decision-making and shared responsibility. AI models can integrate these principles, helping communities make data-informed decisions that respect traditional knowledge while incorporating modern technological advancements.

10. Ethical Considerations and Challenges

While the collaboration between IKS and AI presents opportunities, there are also ethical concerns that must be addressed:

- **Ownership and Intellectual Property:** Many indigenous communities fear that AI and large corporations may exploit their traditional knowledge without proper consent or
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compensation. Ensuring that AI technologies respect the rights of indigenous peoples is crucial. Establishing frameworks for fair use, consent, and profit-sharing can help protect IKS.

- **Bias in AI:** AI models are only as good as the data fed into them. If AI systems are trained on datasets that exclude or misrepresent indigenous knowledge, they may perpetuate stereotypes or biases. It is important for AI developers to engage with indigenous communities to ensure that IKS is accurately represented and respected in AI models.
- **Cultural Sensitivity:** AI must be developed with a deep respect for cultural contexts. Indigenous knowledge is often tied to sacred or spiritual beliefs, and the use of such knowledge in AI applications must be approached with sensitivity and respect for its cultural significance.

11. Practical Examples of Integration

- **AI in Agriculture:** AI tools can be used to optimize indigenous agricultural practices. For instance, AI can analyze crop rotation and farming cycles practiced by indigenous farmers to optimize yields while maintaining soil health. These technologies can help integrate traditional ecological knowledge into modern farming systems.
- **Language Revitalization:** AI-driven language models and speech recognition tools can aid in the preservation and revitalization of indigenous languages. AI platforms could assist in developing language courses, translate oral traditions, and even generate automatic transcription of indigenous language recordings, ensuring that they are passed on to future generations.
- **Climate Change Adaptation:** Indigenous peoples have observed climate patterns for centuries and have developed adaptive strategies to cope with changing environments. AI can be used to analyze climate data in ways that respect these traditional insights, allowing for more holistic climate change adaptation strategies that integrate IKS and modern science.

Conclusion

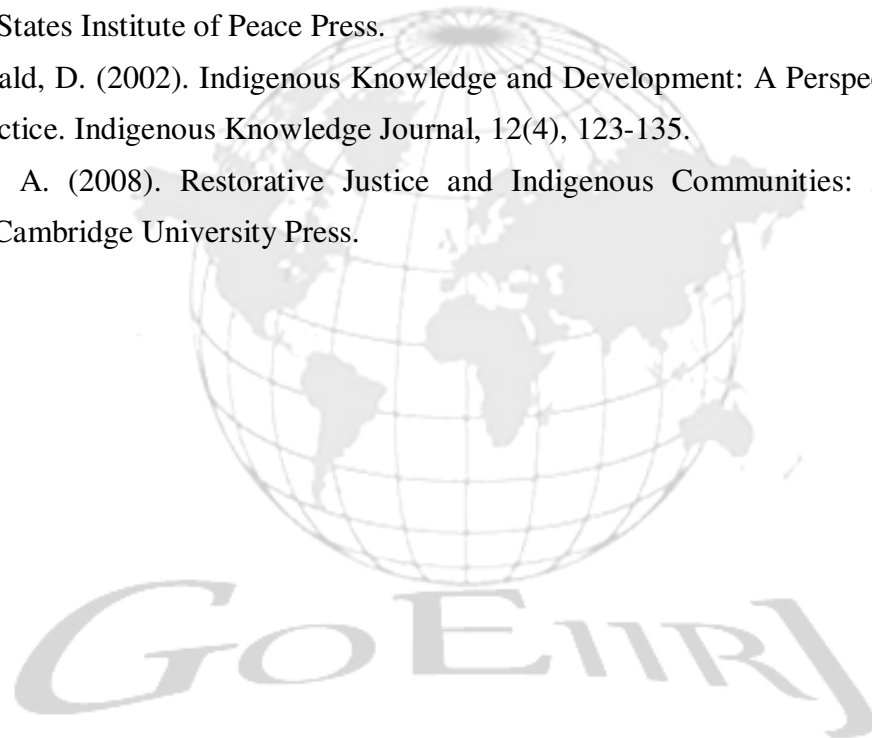
Indigenous Knowledge Systems offer invaluable resources for conflict resolution and peacebuilding, grounded in principles of community, healing, and reconciliation. By recognizing and integrating IKS into contemporary peace processes, societies can create more sustainable and inclusive peacebuilding models. As the world continues to face complex conflicts, it is essential to acknowledge the wisdom embedded in indigenous traditions and seek ways to apply these practices in modern contexts.

The relationship between Indigenous Knowledge Systems (IKS) and Artificial Intelligence (AI) holds great promise for building a more inclusive and sustainable future. By merging the

wisdom of indigenous peoples with the power of AI, we can address global challenges while respecting and preserving traditional knowledge. However, this integration must be done thoughtfully, ethically, and in collaboration with indigenous communities to ensure that their rights, cultures, and contributions are honored and protected.

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**INTEGRATING INDIGENOUS KNOWLEDGE SYSTEMS (IKS) AND
ARTIFICIAL INTELLIGENCE (AI) FOR ENHANCED HUMAN RESILIENCE
AND SUSTAINABLE DEVELOPMENT**

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Abstract:

The convergence of Indigenous Knowledge Systems (IKS) and Artificial Intelligence (AI) offers a transformative approach to addressing the complex challenges of sustainable development and human resilience. This paper explores the potential of integrating IKS and AI to foster a more inclusive, equitable, and sustainable future. We examine the intersections between IKS, AI, and human resilience, highlighting the benefits and challenges of this integration. Our research underscores the importance of co-creating solutions that respect the cultural heritage and traditional knowledge of indigenous communities while leveraging the power of AI to amplify their impact. This paper further delves into specific examples of IKS-AI integration, discusses ethical considerations, and proposes a framework for collaborative development.

Keywords: History, Tradition, Inventions, Education, Vedas, Curriculum in NEP 2020 and construction of strong Nation.

1. Introduction:

The world faces unprecedented challenges, from climate change and biodiversity loss to social inequality and resource scarcity. Addressing these complex issues requires innovative solutions that draw on diverse knowledge systems. Indigenous Knowledge Systems (IKS), accumulated over generations by indigenous communities, offer invaluable insights into sustainable resource management, ecological balance, and community resilience. Simultaneously, Artificial Intelligence (AI) has emerged as a powerful tool with the potential to analyze vast datasets, identify patterns, and optimize complex systems. This paper argues that integrating IKS and AI can create a synergistic approach, enhancing human resilience and driving sustainable development in ways that are both culturally sensitive and technologically advanced.

2. Indigenous Knowledge Systems (IKS): A Foundation for Resilience and Sustainability:

IKS encompasses a wide range of traditional knowledge, practices, and beliefs related to

agriculture, medicine, environmental management, and social organization. It is characterized by:

- **Holistic Perspective:** IKS often views the world as interconnected, recognizing the intricate relationships between humans and nature.
- **Local and Contextualized Knowledge:** IKS is deeply rooted in specific geographic locations and ecosystems, reflecting a profound understanding of local environments.
- **Intergenerational Transmission:** IKS is passed down through generations, ensuring the continuity of traditional practices and knowledge.
- **Adaptive and Dynamic:** IKS is not static; it evolves and adapts to changing environmental and social conditions.

IKS has proven crucial for communities in adapting to climate change, managing natural resources sustainably, and maintaining cultural identity.

3. **Artificial Intelligence (AI): A Powerful Tool for Amplifying Impact:**

AI encompasses a range of technologies that enable computers to perform tasks that typically require human intelligence, such as learning, problem-solving, and decision-making. Key areas of AI relevant to IKS integration include:

- **Machine Learning:** Algorithms that allow computers to learn from data without explicit programming, enabling pattern recognition and prediction.
- **Data Mining:** Techniques for extracting valuable information from large datasets, potentially revealing hidden patterns in IKS data.
- **Natural Language Processing:** Enabling computers to understand and process human language, facilitating the preservation and dissemination of IKS.
- **Remote Sensing and Image Analysis:** Analyzing satellite imagery and other data to monitor environmental changes and inform resource management decisions.

4. **Integrating IKS and AI: Opportunities and Benefits:**

The integration of IKS and AI offers several potential benefits:

- **Enhanced Environmental Monitoring and Management:** Combining IKS with AI-powered remote sensing can improve the accuracy and efficiency of ecosystem monitoring, enabling better resource management and conservation efforts. For example, traditional ecological knowledge about plant phenology combined with AI analysis of satellite imagery can provide more accurate predictions of drought or pest outbreaks.
 - **Improved Climate Change Adaptation:** IKS can inform the development of climate change adaptation strategies that are tailored to local contexts. AI can help analyze climate data and model future scenarios, allowing communities to make informed decisions about water management, agriculture, and infrastructure.
 - **Preservation and Revitalization of IKS:** AI can be used to document, preserve, and disseminate IKS, including traditional languages, medicinal knowledge, and agricultural
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practices. Natural language processing can facilitate the translation and transcription of oral traditions, while machine learning can help identify patterns and relationships within complex datasets of IKS.

- **Empowering Indigenous Communities:** By integrating IKS with AI, indigenous communities can gain access to advanced technologies and tools that can support their self-determination and sustainable development goals. This can empower them to manage their resources, preserve their cultural heritage, and participate more effectively in decision-making processes.
- **Development of Culturally Relevant Solutions:** Integrating IKS perspectives into AI development can ensure that solutions are culturally appropriate and address the specific needs of indigenous communities.

5. **Challenges and Ethical Considerations:**

The integration of IKS and AI also presents several challenges and ethical considerations:

- **Data Ownership and Control:** It is crucial to ensure that indigenous communities retain ownership and control over their knowledge and data. Principles of Free, Prior, and Informed Consent (FPIC) must be strictly adhered to.
- **Cultural Sensitivity and Respect:** AI development must be sensitive to the cultural values and beliefs of indigenous communities. Traditional knowledge should be treated with respect and not appropriated or misused.
- **Bias and Representation:** AI algorithms can perpetuate existing biases if they are trained on data that is not representative of diverse populations. It is important to ensure that IKS data is included in AI training datasets to avoid biased outcomes.
- **Capacity Building:** Indigenous communities need to be involved in all stages of the AI development process, from data collection to algorithm design. Capacity building and training are essential to ensure that communities can effectively use and manage AI technologies.
- **Potential for Misinterpretation:** AI algorithms can sometimes misinterpret complex data, leading to inaccurate or misleading conclusions. It is important to critically evaluate the results of AI analysis and combine them with other forms of knowledge, including IKS.

6. **Framework for Collaborative Development:**

A successful integration of IKS and AI requires a collaborative and participatory approach.

We propose the following framework:

- **Establish Partnerships:** Build strong partnerships between indigenous communities, researchers, and technology developers.
 - **Respect FPIC:** Obtain Free, Prior, and Informed Consent from indigenous communities before any data is collected or AI systems are developed.
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- **Co-create Solutions:** Work collaboratively with indigenous communities to identify their needs and co-create solutions that are culturally appropriate and effective.
- **Build Capacity:** Provide training and support to indigenous communities to enable them to use and manage AI technologies.
- **Ensure Data Sovereignty:** Respect the right of indigenous communities to own and control their data.
- **Promote Ethical AI Development:** Adhere to ethical principles of AI development, including fairness, transparency, and accountability.

7. Examples of IKS-AI Integration:

- **Predictive Modeling for Traditional Fishing Practices:** Combining IKS on fish migration patterns with AI-powered oceanographic data analysis to predict optimal fishing times and locations.
- **Early Warning Systems for Natural Disasters:** Integrating IKS on local environmental indicators with AI analysis of weather patterns and seismic activity to develop more effective early warning systems.
- **Personalized Medicine based on Traditional Healing Practices:** Combining IKS on medicinal plants with AI analysis of patient data to develop personalized treatment plans.
- **Language Preservation and Revitalization:** Using Natural Language Processing to document and analyze indigenous languages, facilitating language learning and revitalization efforts.

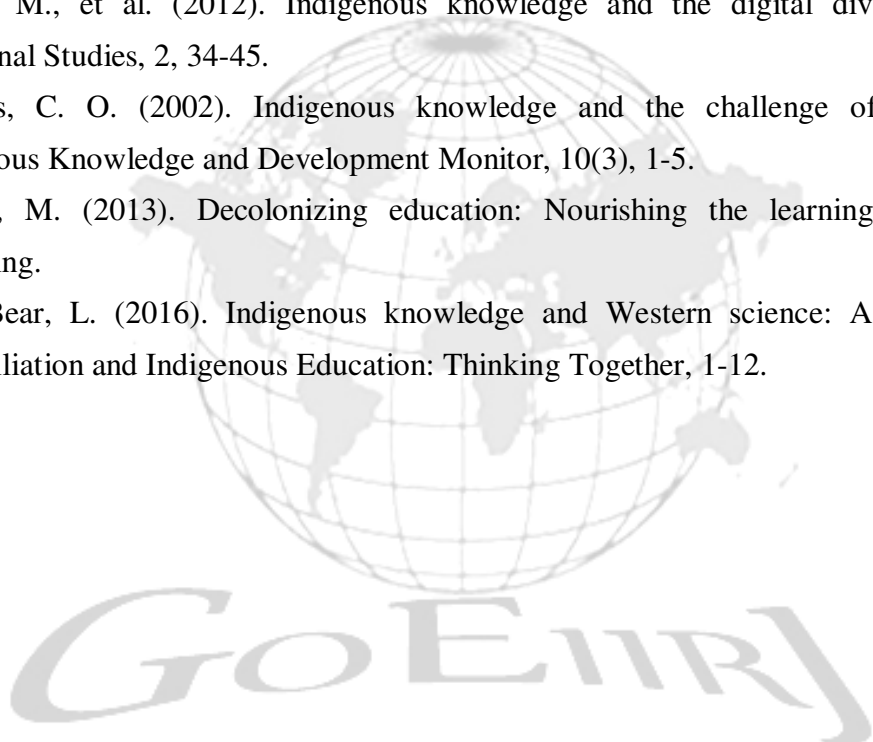
8. Conclusion:

The integration of IKS and AI holds immense potential for enhancing human resilience and driving sustainable development. By combining the wisdom of indigenous communities with the power of artificial intelligence, we can create a more just, equitable, and sustainable future for all. However, it is crucial to approach this integration with respect, humility, and a commitment to ethical principles. By working collaboratively with indigenous communities, we can ensure that AI is used to empower them and amplify their voices, contributing to a world where both traditional knowledge and technological innovation play a vital role in addressing the challenges of the 21st century. Further research and pilot projects are needed to fully explore the potential of IKS-AI integration and to develop best practices for collaborative development.

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DEVELOPING ENGLISH LANGUAGE IN DIGITAL AGE THROUGH NEP 2020**Dr. Kirtikumar R. Pimpliskar***Associate Professor, Department of English**Anjuman – I-Islam’s Akbar Peerbhoy College of Comm. & Eco.,**M. S. Ali Road, Grant Road, Mumbai-400008**drkirtikumar358@gmail.com*

Abstract: -

The English language has emerged as the universal language of the digital age, influencing everything from software creation and internet communication to international trade and scientific research. As undergraduates entering a world that is becoming more and more influenced by technology, having a solid command of English—especially in its digital forms—is essential for success in the classroom, career progress, and active engagement in international discourse. The changing relationship between English and the digital world is examined in this study, along with the pedagogical consequences for undergraduate education and the particular abilities students need to succeed in this environment. It makes the case that in order for pupils to succeed in the twenty-first century, they must be prepared with both traditional English language proficiency and digital literacy.

The ability to speak and comprehend in English is more than just a requirement for academic pursuits for undergraduates; it opens doors to opportunities in this quickly evolving, increasingly digital, and worldwide environment. NEP gives special importance to translation and the use of innovative and experiential methods. It proposes teachers teach language through gamification and apps, by weaving in the cultural aspects of the languages - such as films, theatre, storytelling, poetry, and music - and by drawing connections with various relevant subjects and with real-life experiences.

Key Words: - English Language, education, pedagogy, undergraduates, communication etc.

Introduction:

The English language has emerged as the universal language of the digital age, influencing everything from software creation and internet communication to international trade and scientific research. As undergraduates entering a world that is becoming more and more influenced by technology, having a solid command of English—especially in its digital forms—is essential for success in the classroom, career progress, and active engagement in international discourse. The changing relationship between English and the digital world is examined in this study, along with the pedagogical consequences for undergraduate education and the particular abilities students need to succeed in this environment. It makes the case that in order for pupils to succeed in the

twenty-first century, they must be prepared with both traditional English language proficiency and digital literacy.

Online communication channels including social media, email, and forums are dominated by English. English continues to be the most widely used language for online communities, information sharing, and international partnerships, despite the availability of multilingual options. Scientific research and academic publishing are primarily conducted in English. Advanced English language proficiency is frequently needed to access and understand scientific articles, take part in international conferences, and add to the body of knowledge worldwide. Since it facilitates commerce, negotiations, and market expansion, English is the language of international business. Navigating e-commerce platforms, working with multinational teams, and accessing overseas markets all require an understanding of English in a digital setting. The syntax and keywords of the great majority of computer languages, such as Python, Java, C++, and JavaScript, are based on English. Therefore, knowing English vocabulary is essential to understanding and producing code. The majority of digital content developed and disseminated worldwide, from video games to streaming services, is in English. To access and interact with this content, one must have a strong command of the language.

Exploring the advanced age with English requires more than fair conventional dialect aptitudes. It requests the advancement of particular computerized literacies that empower understudies to successfully utilize and fundamentally assess data within the computerized environment. The capacity to find, assess, and successfully utilize data from assorted computerized sources. This incorporates understanding look motor optimization (SEO), observing sound sources from deception, and synthesizing data from numerous platforms. The capacity to communicate viably in different advanced designs, counting mail, online gatherings, and social media. This incorporates understanding computerized behavior (netiquette), collaborating viably in online groups, and overseeing online identities. The capacity to basically analyze and assess computerized substance, counting recognizing predisposition, recognizing purposeful publicity, and understanding the moral suggestions of computerized innovations. This incorporates understanding issues such as copyright, security, and data security. The capacity to form and share computerized substance, counting composing web journal posts, making recordings, and creating websites. This incorporates understanding computerized plan standards, utilizing interactive media apparatuses, and following to copyright laws. The capacity to adjust to the ever-changing scene of advanced innovations and to persistently learn unused aptitudes and apparatuses. This incorporates grasping long lasting learning and remaining open to innovative headways.

Even though the arguments for the advanced age's proficiency with the English dialect are very clear, students still encounter difficulties in acquiring the necessary skills, such as easy access to innovation and the fact that the internet isn't universal. This creates an advanced divide that may

hinder students from low-income families or from provinces. Finding trustworthy sources amid the deluge of false information is challenging due to the endless and sometimes overwhelming amount of data available online. Despite English's dominance in the digital world, there are still linguistic obstacles. Due to their poor English proficiency, many students find it difficult to access digital resources. The particular literacies required to thrive in a digital society are not sufficiently covered in many undergraduate curriculum. Slang, truncations, and evolving dialect designs are common in digital communication. Even people with strong conventional English proficiency may find it difficult to understand these nuances. Being aware of cybersecurity risks and security issues is necessary when using the internet. Understudies should develop skills in protecting their personal information and avoiding online scams.

The National Education Policy (NEP) 2020 is a comprehensive policy framework that aims to reform and revitalize the education system in India. The NEP emphasizes the importance of equitable and inclusive education and focuses on providing quality education to all, regardless of their socio-economic background or location. It also promotes the use of technology, innovation, and education research. NEP 2020 proposes the idea that to preserve and promote culture, one must preserve and promote a culture's language. It says "Unfortunately, Indian languages have not received their due attention and care, with the country losing over 220 languages in the last 50 years alone. UNESCO has declared 197 Indian languages as 'endangered'. Various unscripted languages are particularly in danger of becoming extinct. When a senior member(s) of a tribe or community that speak such languages pass away, these languages often perish with them; too often, no concerted actions or measures are taken to preserve or record these rich languages/expressions of culture."

To equip undergraduates with the necessary skills to navigate the digital age with the English language, educators must adopt new pedagogical approaches, like incorporating digital literacy skills into existing English language courses, rather than treating them as separate subjects. Engage students in active learning activities that require them to use English in digital contexts, such as creating digital content, participating in online discussions, and collaborating on digital projects. Leverage technology to enhance teaching and learning, using online tools and platforms to deliver content, facilitate communication, and provide feedback. Encourage students to critically analyze and evaluate digital content, teaching them to identify bias, detect misinformation, and understand the ethical implications of digital technologies. Make certain that every student has access to the tools and resources—such as computers, internet, and technical support—that they require to thrive in the digital world. To promote intercultural competency and global awareness, encourage students to interact with people from different backgrounds and cultures online. Educate pupils on the moral implications of digital technology use, covering topics like data security, privacy, and copyright.

The digital age presents undergraduates with the opportunities and challenges of navigating the world with the English language. Even though English is still the dominant force in cyberspace, proficiency in digital literacies is essential for students to use and critically evaluate information, communicate and collaborate effectively, and create and share digital content. By incorporating digital literacies into undergraduate curricula, encouraging active learning, and using technology, educators can endow the students with the skills required to thrive in a digital age and to become engaged and active citizens of the global community. In fact, such failure could leave a large proportion of the student population unprepared for the 21st-century workplace and the complexities of navigation in a digitally driven world. The future will be that of the one who confidently and critically interacts with this digital landscape. Undergraduates equipped with relevant English language and digital skills, therefore, would represent an essential step in this regard.

NEP gives special importance to translation and the use of innovative and experiential methods. It proposes teachers teach language through gamification and apps, by weaving in the cultural aspects of the languages - such as films, theatre, storytelling, poetry, and music - and by drawing connections with various relevant subjects and with real-life experiences.

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THE FUTURE OF AI IN EDUCATION: PERSONALIZED LEARNING, SMART RESEARCH, AND INNOVATION**Dr. Pravin N. Chaudhari***Assistant Professor, Department of Computer Application**SSR College of Arts, Commerce and Science Silvassa**Email: pravin11.chaudhari@gmail.com*

Abstract

Artificial Intelligence (AI) is rapidly transforming the education sector, enhancing personalized learning, optimizing research methodologies, and fostering innovation. AI-driven technologies such as adaptive learning systems, intelligent tutoring, and data analytics offer students tailored learning experiences while assisting educators in automating administrative and instructional tasks. In research, AI accelerates data analysis, enhances literature reviews, and supports knowledge discovery. However, AI adoption in education comes with challenges, including ethical concerns, bias in algorithms, and privacy issues. This paper explores the future of AI in education, highlighting its role in personalized learning, research, and innovation while addressing challenges and opportunities for sustainable integration.

Introduction

Reimagining teaching pedagogy, student experiences, and academic investigation, Artificial Intelligence (AI) is massively altering the education sector. Education is leaning more towards learning models that are more personalized, responsive, and efficient due to the ever-increasing improvements in AI technologies such as machine learning, NLP, and deep learning. AI-based solutions are helping educators personalize instruction, automate administrative functions, and improve research methodologies, ultimately driving innovation and increasing accessibility in education.

The most effective application of AI in education is personalized learning, which involves the creation of individual educational experiences that match each student's different learning style, strengths, and weaknesses. AI-based platforms like intelligent tutoring programs, adaptive learning systems, and virtual assistants are bettering student engagement by pinpointing real-time performance and adjusting lessons in accordance. This tailored way can let students learn the concepts more efficiently and gain detailed assistance where required.

In AI, academic research is not only about improving the benefits but also automating various processes such as literature reviews, data analysis, plagiarism detection, or predictive modeling. AI shortens the research process by dealing with large data sets and finding patterns at an incredibly fast pace, therefore, making the new knowledge discovery much faster. The AI, moreover, works

as a platform for scientific cooperation, by provisioning the data sharing capability, communication and by applying the peer-review systems' automatization.

AI innovation in education, is the perfect example of all the areas that there are apps with progressive approach to brain development, like gamification, virtual reality (VR), augmented reality (AR), predictive analytics, and learning records that are based on blockchain. The feature of gamification makes learning more interactive and pleasant as it makes students crave the learning process, while VR and AR technologies allow students to completely get involved and be part of the learning process. In addition, predictive analytics is of great help to educational providers who manage to find out which students who face challenges need immediate and persistent support in the course of their regular studies.

Despite its numerous advantages, AI adoption in education presents several challenges. Concerns related to data privacy, algorithmic bias, the digital divide, and over-dependence on automation need to be addressed to ensure AI-driven education remains fair and inclusive. Moreover, while AI enhances educational processes, the role of human educators remains irreplaceable. Instead of replacing teachers, AI should serve as a tool to assist and enhance their ability to deliver quality education.

Artificial Intelligence (AI) has transformed the education sector by the introduction of learning technologies that adapt to every student, automated grading, and artificial intelligence (AI) research tools. Nonetheless, with the increase of AI, issues of data privacy, biased systems coding and the marginalization of human teachers due to AI-infused classrooms are raised. This document provides an analysis of the future of AI in the education sector where the focus is on personalized learning, advancements in research, and innovative applications with a mention of potential challenges and solutions.

AI and Personalized Learning:

Artificial Intelligence (AI) is the break-through in the personalized learning world that adapts the education process to the students' personal needs according to their individual field of study. The AI-based educational system is unlike the traditional pedagogical method that is not suitable for everyone because AI-enhanced acam-tistraton of prompt student evaluation, learning styles, and progress and thereby custom follow up.

1. Adaptive Learning Systems:

AI-guided adaptive learning systems can modify instruction by increasing or decreasing the difficulty of a lesson depending on the student's specific answer. These AI recommendation systems democratize the process by allowing students with different knowledge levels to do the same work.

Example: Knewton, DreamBox. and Smart Sparrow are some of the platforms that make use of AI for the modification and analysis of a student's learning process. They can dynamically

adjust the learning process according to student interactions, leading to a better understanding and retention of the concept.

2. **Intelligent Tutoring Systems (ITS):**

Dumb bots are a poor realization of what human tutors could do to tutors that give the students timely feedback, add personalized hints, and design individualized material according to the student's needs. These AI-driven guides are equipped with guiding steps, making sure that students receive targeted assistance from time to time.

Example: Mika, Carnegie Learning's AI powered tutoring, personalizes instruction according to learner responses and student performance. It also guides the student to the appropriate knowledge and practice in response to the given style.

3. **AI-Powered Virtual Assistants and Chatbots:**

The AI-driven virtual assistants give students solutions, study recommendations, and they are even able to calm them down. These chatbots are AI-powered and hence, they are very useful in providing instant personalized responses.

Example: Socratic by Google allows students to take pictures of homework problems and receive AI-generated explanations. IBM Watson Tutor provides AI-driven support across various subjects, helping students understand complex topics. Socratic by Google allows students to take pictures of homework problems and receive AI-generated explanations. IBM Watson Tutor provides AI-driven support across various subjects, helping students understand complex topics.

4. **AI for Special Education**

The AI contribution to education through inclusive education has been magnificent from the perspective of the students with disabilities.

Examples: Speech-to-text and text-to-speech tools for students with visual impairments. AI-powered sign language interpreters for students with hearing impairments. AI-based cognitive assistants for students with learning disabilities like dyslexia.

- Speech-to-text and text-to-speech tools for students with visual impairments.
- AI-powered sign language interpreters for students with hearing impairments.
- AI-based cognitive assistants for students with learning disabilities like dyslexia.

AI in Smart Research:

Artificial Intelligence (AI) is altering the way analytical research is done through machine automation of labor-intensive work, analyzing data, and quickly finding new information. Due to the capabilities of AI to process large datasets, identify patterns, and produce insights, research can now be done more efficiently, more accurately, and more accessible by AI. The tools driven by AI are revolutionizing the way of researchers perform literature reviews, analyze data, detect plagiarism, and work together in multi-disciplinary teamwork.

1. AI-Driven Literature Review

Traditionally, carrying out an in-depth literature review is a time-consuming and laborious process that necessitates the researchers to wade through dozens or even hundreds of academic papers. AI-run tools simplify this process by analyzing and summarizing large volumes of research, identifying relevant studies, and highlighting major points.

Some AI-driven Literature Review Tools: Semantic Scholar: It applies the AI technique to extract the key points from the research papers and presents them in a straight and easily understandable manner. Elicit: It is a tool that enables researchers not only to search for the right data but to pick and draw conclusions through the data.

Semantic Scholar: Makes use of AI technology to examine research papers and convert them into easy-to-digest formats containing the main ideas.

Elicit: The mechanism enables authors to identify relevant research studies and make meaningful conclusions.

Since AI automates literature reviews, the tool not only saves time but guarantees that the scientists are abreast of the latest advancement in their domains.

2. AI-Enabled Data Analysis and Predictive Modeling

Without data, it would be impossible for the development of new technologies. AI supports high-precision discovery and prediction of causal relationships through the analysis and prediction of data patterns. The uses of AI in medicine, the third ethical wall, the telemedicine government-funded sun between Nanjing and Hong Kong, and the anticorruption field are a few examples of cases with established high risks.

Benefit of AI in Data Analysis: Faster and more accurate insights: AI eliminates human errors and enhances data interpretation.

Pattern Recognition: The development of machine learning and cognitive computing platforms have enabled researchers to automate the pattern recognition process and detect anomalies and patterns that cannot be discovered conventionally.

Predictive Analytics: AI models exist in data production, processing, and mining, and they are useful for the purposes of prediction and risk assessment. On the other hand, AI (or machine learning) was originally created for anomaly detection.

SPSS AI: A correct statistical model can be obtained by using SPSS as a tool to establish relationships, linear regression, and forecast.

3. AI in Plagiarism Detection and Academic Integrity

Academic honesty, first and foremost, is one of the biggest concerns in research. Plagiarism detection tools, while utilizing AI, check the originality of research—basically, they compare research content against the extensive databases of academic literature, online sources,

and prior publications.

Examples of AI-based Plagiarism Detection Tools:

Turnitin: AI technology is employed in detecting the likenesses which are in the academic papers of the users to other in-use research works.

Grammarly AI: The AI of the Grammarly company can prevent plagiarism and also improve the quality of academic writing.

Academic institutions, publishers, and researchers, in particular, have taken the full advantage of it as they made this technological convergence a fabric of their credibility and authenticity.

4. AI-Driven Peer Review and Research Collaboration

The time-consuming and bias-producing traditional peer-review process in academic publishing can be time-consuming and prone to bias. However, AI, which is the most updated technology, is now being used to automate initial manuscript screening. It also detects errors, and even suggests improvements automatically.

You can find AI in Peer Review, for example: ScholarOne Manuscripts: Assists journals in managing the peer-review process efficiently.

Blockchain-based AI Tools: Ensure transparency and accountability in academic publishing.

Furthermore, AI plays a major role in global collaboration among researchers because it can provide real-time data sharing, language translation, and automated document summarization. Through this, AI is able to facilitate cross-domain knowledge flow which is necessary when dealing with interdisciplinary research.

AI and Innovation in Education:

AI is a game changer in education by making traditional modes of studying obsolete, the collaboration more convenient, and the new knowledge forms become possible.

1. AI-Enabled Gamification and VR/AR Integration

AI helps create game-like learning experiences and implement virtual and augmented technologies that result in new and improved ways of learning.

Example: Artificial intelligence-enhanced virtual reality software allows aspiring healthcare professionals to practice surgeries in a safe environment.

2. Predictive Analytics for Student Success

AI employs past data to indicate student course performance and suggest solutions to improve it. Example: Universities are able to use AI to pinpoint students who are underperforming and grant them targeted assistance.

3. AI in Automated Administration:

AI revolutionizes necessary administrative tasks, such as: Student admission and enrollment

management Coursescheduling and exam proctoringAutomatedgrading and feedback systems.

Example:Gradescope pays for the help of AI technology that makes the teacher's workload less cumbersome by automatically checking the tasks.

Challenges of AI in Education:

Even though AI is significantly changing the way we think about education, the integration of it has brought to the surface a few issues that can only be solved through addressing them properly.

1. Data Privacy and Security Concerns

Information systems using AI perform complex analyses of the data; they manage the information collected from students, at the same time, pose security/privacy and unauthorized access. Schools should be compelled to have provisions on data security that will be to students' benefits.

2. Algorithmic Bias and Fairness

The AI processing engine might show some biases caused by the different variables like race, gender, and financial status and it might sometimes be the cause of unfair educational results. The genuineness of AI in delivering a just value is the moment we see that it does a meticulous study that ranges from diverse and unbiased training datasets and therefore through a quality assessment.

3. Digital Divide and Accessibility

The introduction of AI in schools is a very unequal process. Most of the time only a few regions with good infrastructure benefit from AI that its sensitivity excludes the developing world. The most crucial task that AI-comprehensive learning places is making sure the digital disparity that AI brings is equitably held.

4. Over-Reliance on Automation

AI can be used for support in the classroom and perform some administrative tasks, but its heavy use might result in the isolation of students. To be exact, while AI can be used to have a complete analysis of the human characteristics still, education is a humanizing process that teachers are best qualified for as they provide guidance and emotional support which AI cannot replace.

5. Ethical and Regulatory Challenges

The widely-debated subject of moral AI in education, e.g. student surveillance, decision-making clarity, and accountability, obliges the government to strictly regulate the industry. Obliging the organizations or even the state offices to issue clear acknowledgment certificates on which areas AI is usable in the educational sector sets the direction of AI usage in education.

Future Scope:

AI makes education brighter, with incessant advancements resulting in an 'intelligent'

world with personalized and inclusive learning environments

1. **AI-Powered Personalized Learning at Scale**

Hyper-personalized learning experiences tailored to each institution's characteristics will be available through AI in a cost-effective manner, such that students will learn at their own pace with adaptive content and real-time feedback.

2. **AI-Powered Virtual Tutors and Mentors**

Future AI systems will give rise to intelligent virtual tutors and AI mentors, dealing with emotion, answering advanced queries, and helping the student with their learning in a timely, effective manner.

3. **AI to Further Enhance Research, Knowledge Discovery, Advanced AI**

With the automation of data analysis, hypothesis generation, and literature review, this will entail uniquely revolutionizing research, hence very rapid knowledge discovery.

4. **Integration of AI and Emerging Technologies**

The merger of AI with blockchain, VR, AR, and IoT has led to the birth of immersive and secure learning environments. Blockchain will guarantee secure credential receipt, while VR/AR will offer hands-on experiential learning.

5. **AI for Inclusion and Accessibility**

AI tools will boost the way education can be accessed by disabled students in order to enable real-time speech-to-text translation, sign language translation, etc., along with various learning tools catered to meet the individual student's needs.

Conclusion:

There's little debate, AI will mold the future of education to favor personalization, efficiency, and innovation. It can change the way teaching happens, improve on research activities, and ensure equal access for students around the globe. Nonetheless, data privacy, algorithmic bias, digital inequality, and ethics-related issues must be mitigated in order to ensure responsible AI infusion.

The future is bright for artificial intelligence in education, given that there will be terrific advances in adaptive learning, online mentoring, smart research, and AI-centered educational innovations.

AI technology is here to stay; therefore, such will be supportive in any balancing act between human intelligence and AI-based ways towards maximizing benefits while minimizing risks. When responsibly embraced, AI places education systems in the direction of inclusion, competence, and readiness for tomorrow- a time when learners will be more empowered with the skills and knowledge required in the digital era.

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INTEGRATING INDIGENOUS KNOWLEDGE SYSTEMS (IKS): YOGA, CONSCIOUSNESS, AND MENTAL HEALTH

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Abstract:

Indigenous Knowledge Systems (IKS) have been gaining recognition for their holistic approach to health and well-being. Among these, yoga is an ancient Indian practice that integrates physical postures, breath control, and meditation to enhance mental and physical health. This paper explores the relationship between yoga, consciousness, and mental health, analyzing how traditional yogic practices contribute to psychological resilience, emotional regulation, and cognitive clarity. The study integrates scientific research with ancient yogic wisdom to understand how yoga influences the nervous system, brain function, and mental health disorders such as anxiety and depression.

The paper follows a qualitative research methodology, including a systematic review of literature, theoretical analysis, and case studies. The discussion focuses on how yoga affects consciousness, the role of mindfulness and meditation, and their impact on brain neuroplasticity. Furthermore, it examines the integration of IKS with modern psychological and medical frameworks to develop more inclusive mental health treatment approaches.

The findings suggest that yoga enhances self-awareness, emotional stability, and stress management while fostering a deeper understanding of consciousness. The paper concludes that integrating IKS like yoga into mainstream mental health practices can provide a more holistic and effective approach to well-being. Future research should explore further empirical studies on the neurophysiological impacts of yoga.

Keywords: Indigenous Knowledge Systems (IKS), Yoga, Consciousness, Mental Health, Mindfulness

Introduction

The increasing prevalence of mental health disorders, including anxiety, depression, and stress-related conditions, necessitates a broader perspective in treatment approaches. Traditional psychological and psychiatric methods, while effective, often focus on symptom management rather than holistic well-being. Indigenous Knowledge Systems (IKS), including yoga, offer a more integrative approach by addressing not just the mind but also the body and consciousness.

Yoga, originating from ancient Indian traditions, is more than a physical exercise; it is a comprehensive system encompassing physical postures (asanas), breathwork (pranayama), and meditation (dhyana). These practices influence consciousness and mental health by regulating the nervous system, improving cognitive functions, and enhancing emotional stability. Research has increasingly shown that yoga can reduce stress, alleviate symptoms of depression, and improve overall psychological well-being.

This paper explores how yoga as an IKS can be effectively integrated into contemporary mental health frameworks. It aims to examine the connection between yoga, consciousness, and mental health, presenting scientific evidence and theoretical perspectives that support this integration.

Research Methodology

This study employs a qualitative research approach using a systematic review of literature, theoretical analysis, and case study examination. The research process includes:

1. Literature Review: Analyzing existing research on yoga, consciousness, and mental health from scientific journals, historical texts, and medical studies.
2. Theoretical Framework: Examining the philosophical and psychological aspects of yoga, particularly its role in consciousness and mental well-being.
3. Case Studies: Reviewing real-life applications of yoga in mental health treatment, including clinical interventions and personal testimonies.
4. Data collection primarily involves secondary sources, including peer-reviewed articles, books on yoga and psychology, and reports from mental health organizations.

Yoga and Mental Health

Numerous studies highlight the mental health benefits of yoga. According to Streeter et al. (2012), yoga enhances gamma-aminobutyric acid (GABA) levels in the brain, reducing anxiety and depression. Similarly, Khalsa (2013) emphasizes the role of yoga in improving stress resilience and emotional regulation.

Yoga and Consciousness

Yoga is deeply linked to the study of consciousness. Patanjali's Yoga Sutras describe different states of consciousness, leading to self-realization and inner peace. Neuroscientific research (Davidson & Goleman, 2017) supports the idea that meditation and mindfulness practices alter brain activity, promoting greater awareness and cognitive flexibility.

Neuro-scientific Perspective on Yoga

Studies using MRI and EEG scans show that yoga and meditation enhance brain functions, particularly in the prefrontal cortex, which is responsible for decision-making, attention, and emotional regulation (Tang, Hölzel, & Posner, 2015). These findings suggest that yoga has a profound impact on mental clarity and psychological resilience.

Discussion

The Impact of Yoga on Mental Health

Yoga regulates the autonomic nervous system, balancing the sympathetic (stress response) and parasympathetic (relaxation response) functions. This balance is crucial in managing mental health disorders. Research indicates that regular yoga practice can reduce cortisol levels (the stress hormone), improve mood, and enhance overall psychological well-being (Pascoe, Bauer, & Cutmore, 2017).

Mindfulness and Meditation in Yoga

Meditation, a core component of yoga, plays a significant role in enhancing consciousness. Mindfulness-based interventions (MBIs) derived from yoga have been widely adopted in clinical psychology for treating depression, PTSD, and anxiety disorders (Kabat-Zinn, 2003). Meditation enhances self-awareness, allowing individuals to process emotions effectively and reduce rumination.

Integration of IKS with Modern Psychological Frameworks

Integrating yoga with contemporary psychological practices can bridge the gap between traditional and modern therapeutic approaches. Cognitive Behavioral Therapy (CBT), for instance, has incorporated mindfulness techniques derived from yoga to enhance treatment efficacy (Hofmann et al., 2010). Schools, workplaces, and healthcare institutions have started incorporating yoga-based wellness programs, demonstrating its practical application in mental health care.

Challenges in Integrating IKS with Mental Health Practices

Despite the benefits, integrating IKS like yoga into mainstream mental health care faces challenges. These include cultural resistance, lack of standardized guidelines, and skepticism from the scientific community. However, increasing research and global acceptance of yoga indicate a positive trend toward its integration.

Conclusion

This paper highlights the significant role of yoga in enhancing mental health and consciousness. By integrating IKS with modern psychological frameworks, mental health care can become more holistic and effective. Yoga offers a profound mind-body connection, improving stress management, emotional regulation, and cognitive clarity.

Future research should focus on large-scale empirical studies to establish standardized protocols for integrating yoga into mental health treatment. Additionally, interdisciplinary collaboration between psychologists, neuroscientists, and yoga practitioners can further enhance the credibility and applicability of yoga in mainstream healthcare.

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राष्ट्रीय शिक्षा नीति २०२० में युवा के विकास हेतु कौशल विकास की प्रभावशालीता का अध्ययन

डॉ ज्योती रामचंद्र लष्करी

प्रभारी / प्राचार्य

रूरल फाउंडेशन शिक्षणशास्त्र महिला

महाविद्यालय अक्कलकुवा जिल्हा नंदुरबार

प्रस्तावना

राष्ट्रीय शिक्षा नीति २०२० में कौशल विकास का मुख्य उद्देश्य यह है कि विद्यार्थियों को सिर्फ किताबों तक ही सीमित न रखा जाए, बल्कि उन्हें व्यावहारिक और रोजगार योग्य कौशल भी प्रदान किए जाएं। यह न केवल उनके व्यक्तिगत विकास के लिए महत्वपूर्ण है, बल्कि देश की समग्र आर्थिक और सामाजिक प्रगति के लिए भी आवश्यक है। कौशल विकास का अर्थ है व्यक्तियों को विशेष कार्यों या उद्योगों के लिए आवश्यक ज्ञान, क्षमता और दक्षता प्रदान करना, जिससे वे अपने कार्य क्षेत्र में अधिक प्रभावी और उत्पादक बन सकें। यह प्रक्रिया शिक्षा, प्रशिक्षण और अनुभव के माध्यम से की जाती है, जिससे व्यक्ति अपने पेशेवर जीवन में सफलता प्राप्त कर सके। राष्ट्रीय शिक्षा नीति (NEP) २०२० में कौशल विकास की भूमिका को महत्वपूर्ण रूप से पहचाना गया है। इस नीति में शिक्षा के माध्यम से कौशल को प्रोत्साहित करने पर जोर दिया गया है, ताकि युवा पीढ़ी को रोजगार योग्य बनाया जा सके और देश की आर्थिक और सामाजिक प्रगति में योगदान दिया जा सके। NEP में कौशल विकास की निम्नलिखित महत्वपूर्ण भूमिकाएँ हैं:

राष्ट्रीय शिक्षा नीति (NEP) २०२० क्या है !

राष्ट्रीय शिक्षा नीति २०२० भारत सरकार द्वारा २९ जुलाई २०२० को घोषित की गई एक महत्वपूर्ण दस्तावेज़ है, जिसका उद्देश्य भारतीय शिक्षा प्रणाली में सुधार और समग्र विकास करना है। यह नीति 1986 की शिक्षा नीति का स्थान लेती है और इसमें शिक्षा के क्षेत्र में कई महत्वपूर्ण परिवर्तन प्रस्तावित किए गए हैं। राष्ट्रीय शिक्षा नीति २०२० की मुख्य विशेषताएँ: शैक्षिक संरचना में परिवर्तन: NEP २०२० में १०+२+३ की पारंपरिक शैक्षिक संरचना को बदलकर ५+३+३+४ प्रणाली अपनाई गई है। इसमें ३-८ वर्ष की आयु के बच्चों के लिए 'प्रारंभिक बाल्यावस्था देखभाल और शिक्षा' (ECCE), ८-११ वर्ष के लिए 'प्राथमिक शिक्षा', ११ - १४ वर्ष के लिए 'माध्यमिक शिक्षा' और १४-१८ वर्ष के लिए 'उच्च माध्यमिक शिक्षा' शामिल है। भाषायी विविधता का संरक्षण: पाँचवीं कक्षा तक की शिक्षा में मातृभाषा या स्थानीय भाषा माध्यम के रूप में अपनाने पर बल दिया गया है। साथ ही, संस्कृत और अन्य प्राचीन भारतीय भाषाओं को भी पाठ्यक्रम में शामिल किया जाएगा। व्यावसायिक शिक्षा का समावेश: कक्षा ६ से ही व्यावसायिक शिक्षा को पाठ्यक्रम में शामिल किया जाएगा, जिससे छात्रों को तकनीकी और व्यावसायिक कौशल प्राप्त होंगे। इंटरनेट की व्यवस्था भी की जाएगी। उच्च शिक्षा में सुधार: उच्च शिक्षा संस्थानों में मल्टीपल एंटी और मल्टीपल एग्जिट सिस्टम लागू किया जाएगा, जिससे छात्र अपनी शिक्षा में लचीलापन और विकल्प पा सकेंगे। इसके साथ ही, भारत उच्च शिक्षा आयोग (HECI) का गठन किया जाएगा, जो उच्च शिक्षा के नियमन, मानक निर्धारण, वित्त पोषण

और प्रत्यायन के लिए जिम्मेदार होगा। शिक्षकों की गुणवत्ता में सुधार, शिक्षकों की नियुक्ति, प्रशिक्षण और कार्य-प्रदर्शन मूल्यांकन की प्रक्रिया को पारदर्शी और प्रभावी बनाया जाएगा। वर्ष २०२० तक शिक्षकों के लिए न्यूनतम डिग्री योग्यता ४-वर्षीय एकीकृत बी.एड. डिग्री अनिवार्य की जाएगी। डिजिटल शिक्षा का प्रोत्साहन, डिजिटल शिक्षा और तकनीकी संसाधनों का उपयोग बढ़ावा दिया जाएगा, जिससे शिक्षा की गुणवत्ता और पहुंच में सुधार होगा। NEP में तकनीकी शिक्षा, भाषाई बाधयताओं को दूर करने, दिव्यांग छात्रों के लिए शिक्षा को सुगम बनाने आदि के लिए तकनीकी के प्रयोग को बढ़ावा देने पर बल दिया गया है,

कौशल्ये विकास क्या है!

कौशल विकास का अर्थ है व्यक्तियों को विशेष कार्यो या उद्योगों के लिए आवश्यक ज्ञान, क्षमता और दक्षता प्रदान करना, जिससे वे अपने कार्य क्षेत्र में अधिक प्रभावी और उत्पादक बन सकें। यह प्रक्रिया शिक्षा, प्रशिक्षण और अनुभव के माध्यम से की जाती है, जिससे व्यक्ति अपने पेशेवर जीवन में सफलता प्राप्त कर सके।

कौशल विकास के प्रमुख घटक:

1. **प्रशिक्षण और शिक्षा:** विशेषज्ञता प्राप्त करने के लिए औपचारिक और अनौपचारिक शिक्षा। प्रशिक्षण कार्यक्रमों और कार्यशालाओं के माध्यम से कौशल में सुधार।
2. **प्रमाणक प्रशिक्षण** के बाद प्रमाण पत्र या डिग्री प्राप्त करना, जो कौशल की वैधता और गुणवत्ता को प्रमाणित करता है।
3. **अनुभव:** प्रशिक्षण के बाद वास्तविक कार्य वातावरण में अनुभव प्राप्त करना, जिससे कौशल में सुधार और आत्मविश्वास बढ़ता है।

भारत में कौशल विकास की पहलें:

- **प्रधानमंत्री कौशल विकास योजना** : यह योजना भारत सरकार द्वारा शुरू की गई है, जिसका उद्देश्य युवाओं को मुफ्त में कौशल प्रशिक्षण प्रदान करना है, ताकि वे रोजगार योग्य बन सकें। इस योजना के तहत विभिन्न क्षेत्रों में प्रशिक्षण दिया जाता है, और प्रशिक्षण पूरा करने पर प्रमाण पत्र भी प्रदान किया जाता है।
- **राष्ट्रीय कौशल विकास मिशन** : यह मिशन कौशल विकास और उद्यमिता मंत्रालय के तहत कार्य करता है, जिसका उद्देश्य देश के युवाओं को कौशल प्रशिक्षण प्रदान करना और उनकी रोजगार क्षमता बढ़ाना है।
- **राज्य स्तरीय योजनाएँ**: कई राज्य सरकारें भी अपनी-अपनी कौशल विकास योजनाएँ चला रही हैं, जैसे उत्तर प्रदेश कौशल विकास मिशन, जो राज्य के नागरिकों को रोजगार के अवसर प्रदान करने के लिए प्रशिक्षण देती है। महाराष्ट्र में चाणक्य कौशल्ये विकास योजना, विश्वकर्मा योजना !
कौशल विकास न केवल व्यक्तिगत स्तर पर रोजगार के अवसर बढ़ाता है, बल्कि राष्ट्रीय स्तर पर आर्थिक विकास और सामाजिक समृद्धि में भी योगदान करता है।

राष्ट्रीय शिक्षा नीति में कौशल विकास की भूमिका

राष्ट्रीय शिक्षा नीति २०२० में कौशल विकास की भूमिका को महत्वपूर्ण रूप से पहचाना गया है। इस नीति में शिक्षा के माध्यम से कौशल को प्रोत्साहित करने पर जोर दिया गया है, ताकि युवा पीढ़ी को रोजगार योग्य बनाया जा सके और देश की आर्थिक और सामाजिक प्रगति में योगदान दिया जा सके। NEP में कौशल विकास की निम्नलिखित महत्वपूर्ण भूमिकाएँ हैं:

- 1. कौशल आधारित शिक्षा का समावेश:** NEP में ६से ९ साल की उम्र के बच्चों के लिए कौशल आधारित शिक्षा को शामिल करने का प्रस्ताव है। इसके तहत, बच्चों को छोटे-छोटे कौशल जैसे कंप्यूटर की बुनियादी जानकारी, कला, शिल्प आदि सिखाए जाएंगे, ताकि उनकी रचनात्मकता और समस्या-समाधान क्षमता में वृद्धि हो सके।
- 2. युवाओं के लिए रोजगार योग्य कौशल:** NEP का उद्देश्य यह है कि युवाओं को उच्च शिक्षा प्राप्त करने के साथ-साथ रोजगार योग्य कौशल भी प्रदान किए जाएं। इससे छात्रों को न केवल शैक्षिक योग्यता मिलेगी, बल्कि वे व्यावसायिक और तकनीकी कौशल भी प्राप्त करेंगे, जो उन्हें नौकरी के बाजार में प्रतिस्पर्धी बनाएंगे।
- 3. इंटरडिसिप्लिनरी और प्रैक्टिकल शिक्षा:** NEP में छात्रों को विभिन्न क्षेत्रों में विशेषज्ञता प्राप्त करने के साथ-साथ व्यावहारिक कौशल हासिल करने के लिए एक इंटरडिसिप्लिनरी (विभिन्न विषयों के समिश्रण) दृष्टिकोण अपनाने पर बल दिया गया है। यह शिक्षा को सिर्फ किताबों तक सीमित नहीं रखता, बल्कि छात्रों को कौशल और प्रैक्टिकल अनुभव पर भी ध्यान देने को प्रेरित करता है।
- 4. स्किल इंडिया मिशन के साथ एकजुटता:** NEP में "स्किल इंडिया मिशन" के तहत कौशल प्रशिक्षण पर भी जोर दिया गया है, जिससे विभिन्न श्रेणियों में प्रशिक्षित श्रमिक तैयार किए जा सकें। इसमें विशेष रूप से तकनीकी, व्यावसायिक और उद्यमिता कौशल पर ध्यान केंद्रित किया गया है।
- 5. उद्यमिता कौशल का प्रोत्साहन:** NEP में शिक्षा के पाठ्यक्रम में उद्यमिता के लिए आवश्यक कौशलों को भी शामिल करने की बात की गई है। यह युवाओं को न केवल नौकरी पाने के लिए, बल्कि स्वयं का व्यवसाय शुरू करने के लिए भी तैयार करेगा। इस दृष्टिकोण से छात्रों को अपने कौशल को व्यावसायिक रूप में बदलने के अवसर मिलेंगे।
- 6. आर्टिफिशियल इंटेलिजेंस और डिजिटल कौशल:** डिजिटल शिक्षा और नई तकनीकों का उपयोग बढ़ने के साथ, NEP में छात्रों को आर्टिफिशियल इंटेलिजेंस, डेटा एनालिटिक्स, और अन्य डिजिटल कौशल सिखाने पर जोर दिया गया है, ताकि वे भविष्य की तकनीकी दुनिया में दक्ष हो सकें।
- 7. मूल्य आधारित शिक्षा:** NEP में शिक्षा को मूल्य आधारित भी बताया गया है, जिसमें छात्रों को सामाजिक और व्यावसायिक जीवन में नैतिकता और जिम्मेदारी का एहसास हो, ताकि उनका विकास न केवल कौशल के रूप में, बल्कि एक अच्छे नागरिक के रूप में भी हो।

राष्ट्रीय शिक्षा नीति २०२० में कौशल विकास से प्राप्त लाभ :

- 1. युवाओं को रोजगार के अवसर बढ़ेंगे:** विद्यार्थी पारंपरिक शिक्षा के साथ-साथ व्यावसायिक और तकनीकी कौशल सीख सकेंगे, जिससे वे सीधे नौकरी के लिए तैयार होंगे। उद्योगों की मांग के अनुसार प्रशिक्षित युवा उपलब्ध होंगे, जिससे बेरोजगारी की समस्या कम होगी।

2. **युवाओंके उद्यमशीलता (Entrepreneurship) को बढ़ावा:**व्यावसायिक प्रशिक्षण और कौशल विकास से युवा अपना खुद का व्यवसाय शुरू करने में सक्षम होंगे।स्वरोजगार और स्टार्टअप्स को प्रोत्साहन मिलेगा, जिससे आर्थिक विकास तेज होगा।
3. **युवाओं की व्यावहारिक ज्ञान और नवाचार (Innovation) में वृद्धि:** पारंपरिक पाठ्यक्रम में व्यावहारिक ज्ञान की कमी होती है, लेकिन कौशल-आधारित शिक्षा से छात्र नई तकनीकों और व्यावहारिक समाधान सीख सकेंगे।नवाचार और अनुसंधान (Research & Development) को बढ़ावा मिलेगा।
4. **देश की अर्थव्यवस्था को मजबूती:** कुशल कार्यबल (Skilled Workforce) तैयार होने से देश की उत्पादकता और औद्योगिक विकास को गति मिलेगी।"मेक इन इंडिया" और "आत्मनिर्भर भारत" जैसे अभियानों को बल मिलेगा।
5. **युवाओं को वैश्विक प्रतिस्पर्धा में बढ़त:**अंतरराष्ट्रीय स्तर पर भारत के युवाओं की मांग बढ़ेगी, जिससे वैश्विक कंपनियों में उनकी भागीदारी बढ़ेगी।विदेशी निवेश को भी आकर्षित किया जा सकेगा।
6. **युवाओं का सर्वांगीण विकास (Holistic Development):**शिक्षा केवल सैद्धांतिक न रहकर व्यक्तित्व विकास, नेतृत्व क्षमता, संचार कौशल और समस्या समाधान (Problem-solving skills) को भी विकसित करेगी।विद्यार्थी सिर्फ डिग्री के पीछे नहीं भागेंगे, बल्कि जीवनोपयोगी कौशल भी सीखेंगे।
7. **ग्रामीण और पिछड़े क्षेत्रों के युवाओं के लिए फायदेमंद:** छोटे शहरों और गांवों के युवाओं को स्थानीय स्तर पर रोजगार के अवसर मिलेंगे।कृषि, हस्तशिल्प, टेक्सटाइल, और पारंपरिक कारीगरी से जुड़े कौशल को बढ़ावा मिलेगा।

निष्कर्ष

राष्ट्रीय शिक्षा नीति में कौशल विकास को शामिल करने से युवा आत्मनिर्भर बनेंगे, जिससे देश की आर्थिक, सामाजिक और औद्योगिक प्रगति को बल मिलेगा। इससे भारत एक सशक्त, शिक्षित और कुशल राष्ट्र के रूप में उभर सकेगा।

संदर्भ

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**RETHINKING LITERATURE THROUGH DIGITAL NARRATIVES AND
LITERARY STUDIES IN THE ERA OF NEP****Dr. Pandurang V. Barkale***Associate Professor and Head, Department of English***And****Ms. Apurva Bhise***Research Scholar, Department of English**SNDT College of Arts and SCB College of Arts, SNDT Women's University**Commerce & Science for Women, SNDT, Mumbai-400020**Women's University, Mumbai - 400020.*

Abstract:

Literature today is shaped by digital revolution; the digital era has challenged and transformed the traditional literature. Nowadays literature flourishes on various social media applications and networks rather than confining to pages of books. AI generated applications like ChatGPT, Sudowrite, Plot Generator, Story AI etc, audiobooks, Hypertext fiction, web novels, social media posts and poetry have completely transformed the way traditional literature were seen and read, literary studies now is being diversified and reshaped for instance, rise of Instapoetry with poets like Rupi Kaur, Parker Lee, Arunoday Singh, Atticus etc. with there short, simple language, personal and intimate tone encourages readers engagement and resonate intimate feelings. The transition of traditional print literature to e-books, online journals, academic resources like Google Scholar, JSTOR, Research Gate etc has completely changed the traditional literature to digital literature which is quite accessible to readers. With the implementation of NEP 2020, it highly emphasises on emphasis on the integration of technology, recognizing its pivotal role in fostering holistic development. This research paper focuses on rethinking literature through Digital narratives and how literary studies are shaped in the NEP era, as digital platforms evolve, digital narratives and literature are also changing and growing. The intersection of education, technology and literature are very well connected and digital literature with the implementation of NEP 2020 focus on developing digital literacy, critical thinking, and problem-solving skills among readers

Keywords: NEP 2020, Digital Narratives, Literary Studies, Literature, Education, Critical thinking, Multimedia Storytelling, Technology in Literature, Hypertext Fiction, Artificial Intelligence (AI) in Literature, Virtual Reality (VR) and Augmented Reality (AR) in Literature, Social Media Literature

Introduction

The relationship between literature and technology is historical and has evolved over a period of time. With the advent of the printing press in the 15th century, the rise of computers in the 19th and 20th centuries, and the emergence of the internet and digital platforms in the 21st century, literature has continuously evolved, giving rise to new forms and transforming the realm of literary studies. The introduction of New Education Policy in 2020 has strengthened the relation of literature and technology, the emphasis on technology and modern learning by NEP is to build a bridge between education and globally changing world. NEP promotes learning which can be enhanced through digital narratives where storytelling, audios and videos play a pivotal role, subjects like literature, science, maths etc become more engaging and rather than just rote memorization they are remembered by students and readers.

The structure of digital born literary form is very different from the traditional one, traditional literary form is characterised by linear narrative, controlled by a single author, printed in books and can be closely analysed by scholars and critics however the digital literary form is characterised by non linear narrative, controlled by various authors, printed online or self-published and can be analysed by technological and AI assisted findings.

The National Education Policy (NEP) 2020 introduces forward-thinking reforms, emphasizing the integration of technology to enhance both teaching and learning. While some states have already begun implementing the policy, others are still in transition, highlighting the ongoing process of its full realization.

A significant aspect of NEP 2020 is its focus on cooperation between central and state governments, fostering a collaborative approach to educational transformation. The policy acknowledges the growing influence of technological advancements such as artificial intelligence, blockchain, adaptive learning systems, and educational software, which are reshaping the way students engage with knowledge. These innovations enable personalized education, with adaptive tools modifying content based on individual progress and data-driven insights helping educators support students more effectively. The government has actively involved key stakeholders—educators, administrators, students, and parents—to ensure a collective understanding and adoption of the policy's objectives. This participatory approach has generated significant interest and engagement, strengthening the overall impact of NEP 2020. A digital narrative is a form of storytelling that utilizes digital technologies to present, enhance, or interact with the narrative. It often incorporates multimedia elements such as hypertext, visuals, audio, and interactivity, allowing for nonlinear or immersive storytelling experiences that differ from traditional print-based literature. Audience, purpose, content, voice, technology, connections, economy becomes the essential elements of digital storytelling. NEP 2020 advocates for the integration of digital narratives in education by leveraging technological advancements in storytelling. It encourages

nonlinear and interactive fiction, enabling students to engage with literature beyond traditional formats through hypertext and digital platforms. The policy also underscores the significance of audiobooks and podcasts, fostering an inclusive learning environment through multisensory experiences, particularly benefiting diverse learners. Additionally, NEP recognizes the role of AI-assisted creative writing and computational literary studies, acknowledging the growing influence of artificial intelligence in literature. The rise of social media literature, including Instapoetry and Twitter fiction, is embraced as a legitimate form of literary expression. Furthermore, NEP promotes Virtual Reality (VR) and Augmented Reality (AR) in literary studies, transforming how texts are explored and understood in the digital era.

The National Education Policy (NEP) 2020 aims to create an education system that reflects India's cultural values and helps transform the country into a fair and dynamic knowledge-based society. By ensuring high-quality education for all, the policy strives to make India a global leader in knowledge and learning. It also emphasizes the importance of understanding India's rich diversity through direct experiences. Beyond traditional e-books, digital literature has evolved to include hypertext fiction, interactive fiction, and narrative-driven video games. These storytelling formats incorporate multimedia elements such as images, sound, video, and hyperlinks, creating immersive and interactive experiences that go beyond the limitations of print media. Unlike conventional books, digital narratives are designed specifically for digital platforms, making them distinct in structure and presentation. This shift from text-based storytelling to visually enriched narratives highlight a transformation in literary culture, where visual imagery plays a crucial role in conveying complex emotions and ideas. In modern literature, the integration of visual components enhances storytelling, pushing the boundaries of literary expression in the digital age and offering new dimensions of reader engagement. While talking about AI and used in literary studies, Browne (2022) and Smith and Jones (2020) explore the integration of AI in literary analysis, presenting innovative methodologies that enhance and complement conventional critical frameworks.

Literature also talks about ongoing debates about the ethical impact of AI in writing. Common concerns include authorship, intellectual property, and the possible decline of human creativity. Browne (2022) and Patel (2021) examine these challenges, especially regarding originality and maintaining literary values. Other studies further explore how AI's increasing role in literature affects society as a whole.

For example, Hypertext fiction, a form of digital narrative coined by Theodore Nelson, a pioneer in the computer industry in the 1960s, the term hypertext describes “non-sequential writing — text that branches and allows choices to the reader, best read at an interactive screen”. It is a genre of literature that uses digital technology to create a nonlinear story, interconnected through hyperlinks, allowing the readers to navigate the story, for instance

- Patchwork Girl (1995) by Shelley Jackson – A feminist reinterpretation of Frankenstein, presented as a nonlinear narrative composed of interconnected hypertext fragments.
- Instapoetry (2010s–present) – Rupi Kaur, Lang Leav, Atticus – A form of digital poetry shared on Instagram, redefining literary publication by blending concise verse with visual aesthetics.
- Digital platform and apps like Wattpad, inkitt, twine etc are used by writers and readers to read multiple genre narrative and have the liberty to also write their own story which become interactive, expanding digital narratives.

Multimedia story telling yet becomes another distinct feature of digital narratives and can also be looked under the scale of NEP 2020. It includes texts, images and graphics, audio and video blending digital storytelling in education and literature. Examples like

- The Handmaid’s Tale: The Graphic Novel by Margaret Atwood, is a visually immersive adaptation of Atwood’s dystopian classic, using graphic storytelling to enhance the novel’s themes of oppression, resistance, and authoritarian control.
- Tik-tok, reels, Facebook short videos, a platform where speakers, authors and readers share their insight and engage in interactive storytelling through short-form videos, influencing literary trends and reader communities.
- AI platforms such as Claude, Elicit, Writesonic, and Google Gemini enable writers and readers to generate poems or texts by simply providing a topic or title, offering personalized and AI-assisted creative writing experiences.

Audiobooks and literary podcasts have emerged as a vital aspect of contemporary literary narratives, seamlessly merging storytelling with technology to create immersive and dynamic experiences. Their growing popularity has redefined the way literature is consumed, offering new interpretations even for classic works. By preserving the essence of oral storytelling, they enhance engagement through narration, tone, and sound effects. Additionally, they also serve as a medium, making literature more accessible to visually impaired readers. Literary Podcasts like The Garret, Secrets from the Green Room, The First Time, The New Yorker: Fiction and Poetry podcasts, Backlisted becomes the go to podcasts for literary students. Audio books like Pride and Prejudice written by Jane Austen and narrated by Rosamund Pike, 1984 written by George Orwell and narrated by Simon Prebble, The God of Small Things written by Arundhati Roy and narrated by Sneha Mathan, The White Tiger written by Aravind Adiga and Narrated by John Lee are some of the famous audiobooks preferred by readers across the world. Audiobooks have transformed the way literature is experienced, offering an engaging and immersive format across classic works, modern fiction, non-fiction, and regional storytelling. The New Education Policy (NEP) 2020 encourages a rethinking of literature by integrating multilingualism, digital narratives, and

interdisciplinary learning, shifting away from a purely print-based approach. It promotes the exploration of regional and classical Indian literature, alongside global texts, fostering a deeper understanding of cultural diversity. With the rise of digital storytelling, hypertext fiction, audiobooks, and AI-assisted writing, literature is no longer confined to traditional forms but is evolving into an interactive, technology-driven experience. NEP also emphasizes comparative and interdisciplinary studies, linking literature with history, philosophy, sociology, and technology, broadening its scope beyond textual analysis. Additionally, by supporting accessible learning tools like audiobooks and digital archives, NEP ensures that literature reaches a wider audience, including visually impaired and marginalized communities. The inclusion of folk narratives and indigenous storytelling further enriches the literary landscape, preserving India's diverse cultural heritage.

The New Education Policy (NEP) 2020 introduces a progressive transformation in the study of literature, shifting from a traditional, print-focused approach to a dynamic, technology-integrated, and inclusive model. By promoting multilingualism, digital engagement, and interdisciplinary learning, NEP encourages a broader understanding of literature that reflects India's diverse linguistic and cultural heritage.

A key aspect of this transformation is the expansion of literary studies beyond classical texts to include regional, indigenous, and oral storytelling traditions. This approach acknowledges the richness of folk narratives, spoken-word poetry, and cross-cultural literary exchanges, thereby fostering a comparative and inclusive literary perspective. Additionally, NEP recognizes the role of digital narratives in modern education, encouraging the integration of hypertext fiction, interactive storytelling, AI-assisted creative writing, and social media literature. These developments allow literature to evolve in alignment with technological advancements, making it more engaging and accessible for a diverse range of learners. Furthermore, NEP emphasizes an interdisciplinary approach by linking literature with history, sociology, philosophy, ethics, and science. Contemporary literary studies now include discussions on AI, environmental concerns, and digital identities, reflecting the changing themes in modern fiction. The policy also prioritizes inclusive learning, ensuring that literature reaches a wider audience through audiobooks, podcasts, digital archives, and translated works. Looking ahead, the future of literary studies in the NEP era is marked by gamification, AI-driven literary analysis, and global digital collaborations, fostering interactive and immersive literary experiences. NEP 2020 ultimately redefines literature as a fluid, evolving discipline, encouraging educators and scholars to explore new narrative forms, digital storytelling platforms, and cross-disciplinary insights in the study of literary texts.

Wattpad has revolutionized the literary landscape by providing an open digital platform where writers can publish their work without traditional gatekeeping. Unlike conventional literature, which follows a structured and linear format, Wattpad fosters a more interactive and

reader-driven experience. The platform allows audiences to engage directly with writers through comments, feedback, and voting, making storytelling a collaborative process rather than a solitary one. This shift challenges the traditional boundaries between author and reader, transforming literature into a dynamic exchange. The rise of such digital storytelling platforms aligns with the New Education Policy (NEP) 2020, which encourages digital literacy, creativity, and an interdisciplinary approach to learning. By embracing platforms like Wattpad, literary studies become more accessible and inclusive, giving voice to emerging writers from diverse backgrounds. Additionally, Wattpad encourages young readers and aspiring authors to explore literature in an interactive manner, moving beyond the confines of textbooks. As digital storytelling continues to evolve, Wattpad exemplifies how literature adapts to technological advancements, making reading and writing more engaging, participatory, and aligned with modern educational goals. Following examples talk about the impact of Wattpad and digital storytelling platforms on contemporary literature, allowing emerging writers to overcome traditional publishing obstacles, interacting with the audience, and reader and navigating to the media.

- "After" by Anna Todd which was started as fan fiction on Wattpad later gained a massive online following, leading to a book deal then into a multi-book series and a successful film franchise.
- "The Kissing Booth" by Beth Reekles, a Wattpad-originated young adult romance. Due to high reader engagement and demand later was adapted into a Netflix film, highlighting Wattpad's influence in mainstream media.
- "My Life with the Walter Boys" by Ali Novak which was initially published on Wattpad before traditional publishing and later adapted into a Netflix series. Showing the evolution of online storytelling into professional literary works.
- "Fifty Shades of Grey" by E.L. James also Began as fan fiction before becoming an independent novel into 3 series and then achieved global success as a best-selling trilogy. Adapted into a blockbuster film series, proving digital storytelling's impact on mainstream publishing.

In recent years, technological advancements have significantly transformed the landscape of literature. Traditional print-based narratives now coexist with hypertext fiction, AI-generated texts, and interactive digital storytelling, reshaping the way literature is perceived and studied. Recognizing this shift, the National Education Policy (NEP) 2020 incorporates digital narratives into literary studies, redefining the approaches to literary analysis, interpretation, and pedagogy. A key development in this evolution is the emergence of hypertext fiction, which disrupts conventional linear storytelling. As Michael Joyce explains, "Hypertext narratives allow multiple pathways for the reader" (Joyce 45). This concept aligns with NEP 2020's emphasis on creativity,

critical thinking, and interdisciplinary learning, as it encourages students to interact with literature in a more dynamic and exploratory manner. By integrating digital storytelling into the curriculum, learners can engage with texts beyond the limitations of print, experiencing multiple interpretations and perspectives.

Furthermore, the rise of AI-generated literature, produced by platforms such as GPT-4 and Claude AI, raises important questions regarding authorship and creativity. Scholar N. Katherine Hayles argues that "AI writing challenges the boundaries of human creativity" (Hayles 12). This discussion directly supports NEP 2020's initiative to enhance digital literacy, ensuring that students critically engage with AI-generated content while fostering their own creative writing skills. The inclusion of digital narratives in literary education under NEP 2020 not only broadens the scope of literary studies but also equips students with the skills needed to navigate a technologically driven world. As the distinction between traditional and digital literature continues to diminish, adopting innovative pedagogical strategies and interdisciplinary methods will be essential in shaping the future of literary education.

Conclusion:

The study of literature in the digital age demands a reimagining of how literary works are understood, examined, and taught. NEP 2020 drives this transformation by incorporating digital narratives, artificial intelligence, and multimedia storytelling, fostering a more engaging and inclusive approach to literary studies. Literature is no longer confined to the printed page; it now extends into hypertext fiction, audiobooks, virtual reality experiences, and social media storytelling, offering fresh and dynamic ways for readers to interact with texts. By integrating digital humanities, interdisciplinary methodologies, and computational literary analysis, NEP ensures that literature continues to evolve alongside technological advancements.

As the boundaries between traditional and digital literature blur, the adoption of innovative teaching techniques becomes essential. Moving forward, a hybrid educational model that balances technological innovation with literary heritage will be key to deepening students' engagement and understanding of literature in a rapidly changing world. Literature has expanded beyond traditional printed formats to include hypertext fiction, audiobooks, virtual reality experiences, and social media storytelling, offering new and dynamic ways for readers to interact with texts. By embracing interdisciplinary learning, digital humanities, and computational literary analysis, NEP ensures that literature remains relevant in a technology-driven world, NEP 2020 paves the way for a globally relevant, technologically integrated, and inclusive literary education, ensuring that literature continues to evolve while preserving its historical and cultural depth.

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INTEGRATING INDIGENOUS WISDOM AND SCIENTIFIC INSIGHT FOR SUSTAINABLE DEVELOPMENT: NAVIGATING CHALLENGES AND SEIZING OPPORTUNITIES

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Abstract

Indigenous Knowledge Systems (IKS) embody centuries of wisdom, deeply rooted in sustainable practices that harmonize with nature. As the world grapples with environmental challenges, integrating indigenous wisdom with scientific advancements presents a promising pathway for sustainable development. This study explores the intersection of traditional ecological knowledge and modern scientific approaches, highlighting their complementary roles in fostering resilience, resource conservation, and sustainable living. It examines key areas such as agriculture, water management, healthcare, and biodiversity conservation, where indigenous practices have demonstrated long-term sustainability. Furthermore, the research identifies challenges, including knowledge validation, policy integration, and cultural preservation, while also exploring opportunities for collaboration between indigenous communities and scientific institutions. By bridging these knowledge systems, this study aims to propose a framework for inclusive, community-driven sustainability strategies. The findings underscore the importance of respecting and integrating indigenous wisdom in contemporary development policies to create a more balanced and resilient future.

Keywords: Sustainable Development, Traditional Ecological Knowledge, Scientific etc...

Indigenous Knowledge Systems (IKS) offer valuable, time-tested solutions for sustainability, developed through generations of close interaction with nature. These holistic approaches contribute to resource management, ecosystem balance, and community resilience, aligning with modern environmental goals. However, indigenous wisdom has often been overlooked in favor of Western scientific methods.

Recently, there has been growing recognition of the benefits of integrating IKS with scientific research. Indigenous agricultural techniques enhance soil health, while traditional water conservation methods support local ecosystems. This study explores how IKS and modern science can complement each other in agriculture, water management, healthcare, and biodiversity

conservation. It also examines challenges such as policy recognition, cultural preservation, and validation of indigenous knowledge.

By fostering collaboration between indigenous communities and scientific institutions, inclusive strategies for sustainability can be developed. Traditional Ecological Knowledge (TEK), rooted in centuries of experience, offers holistic, place-based environmental solutions. When combined with empirical scientific approaches, these knowledge systems can create innovative, effective strategies for sustainability. Recognizing and integrating IKS into modern policies ensures an ecologically resilient and culturally inclusive future.

Resilience in ecosystems and communities is crucial in adapting to climate change, natural disasters, and resource depletion. TEK contributes significantly to resilience by promoting adaptive strategies such as crop diversification, water conservation, and seasonal resource management. Indigenous agricultural systems, for example, have long incorporated climate-responsive practices such as intercropping and agroforestry, which enhance soil fertility and reduce vulnerability to extreme weather conditions.

Modern science can enhance these traditional practices by providing precise climate data, improved seed varieties, and technological innovations to further strengthen resilience. For instance, meteorological models can be combined with indigenous weather forecasting techniques to create more accurate climate adaptation strategies. This integration enables communities to anticipate and respond to environmental changes more effectively.

Modern science enhances traditional practices through ecological research and technology. Satellite imaging and GIS help monitor forests, supporting indigenous conservation. Studies confirm that indigenous fire management in Australia and North America prevents large wildfires, demonstrating TEK's role in ecological stability. Traditional water systems like India's stepwells and Peru's amunas have been revitalized with modern engineering, improving water access. Similarly, sustainable architecture blends indigenous techniques, such as passive cooling and local materials, with energy-efficient designs.

However, challenges remain in integrating TEK with science, including validation, policy inclusion, and cultural appropriation. Marginalization of indigenous knowledge has eroded sustainable practices. Respecting intellectual property rights, fostering community-led research, and inclusive policies are key to bridging these knowledge systems. The intersection of Traditional Ecological Knowledge and modern scientific approaches provides a powerful framework for resilience, resource conservation, and sustainable living. By embracing the strengths of both systems, we can create holistic, adaptive, and culturally respectful solutions to global environmental challenges. A collaborative approach that values and integrates indigenous wisdom with scientific advancements will lead to a more sustainable and resilient future for all.

1. Sustainable Agricultural Practices

Indigenous farming methods emphasize biodiversity, soil health, and natural resource conservation. Traditional techniques such as intercropping, agroforestry, and crop rotation help maintain soil fertility and reduce reliance on artificial fertilizers. For instance, the Zabo system in Northeast India integrates livestock management with terrace farming to improve water retention and prevent soil erosion. Similarly, the milpa system practiced in Central America, which involves growing maize, beans, and squash together, naturally enriches the soil and reduces pest infestations.

Many of these practices align with modern sustainability principles, such as regenerative agriculture and permaculture. Scientific research has validated their effectiveness in improving crop yields while minimizing environmental impact, making them valuable tools for addressing food security and climate resilience.

2. Traditional Water Management Systems

Water conservation has always been central to indigenous communities, particularly in arid and drought-prone regions. Over centuries, they have developed sophisticated systems to store, distribute, and utilize water efficiently. For example, stepwells (baolis) and johads (percolation ponds) in India have helped rural communities recharge groundwater levels, ensuring water availability during dry periods. Similarly, the qanat system of the Middle East uses underground channels to transport water from mountains to settlements, reducing evaporation and sustaining agriculture.

Another example is the amuna system in Peru, where pre-Incan civilizations redirected river water to replenish underground aquifers, providing a sustainable water source throughout the year. These traditional methods offer cost-effective and eco-friendly alternatives to modern water conservation technologies, proving their relevance in contemporary water management strategies.

3. Indigenous Healthcare and Medicinal Practices

For centuries, indigenous communities have relied on plant-based medicine, holistic healing, and spiritual well-being to maintain health. Traditional systems like Ayurveda, Traditional Chinese Medicine (TCM), and African herbal medicine continue to play an essential role in healthcare today. Many plants used in indigenous medicine, such as neem for its antibacterial properties, turmeric for anti-inflammatory benefits, and ashwagandha for stress relief, have been scientifically studied and incorporated into modern treatments. Several pharmaceutical discoveries, including quinine (from cinchona bark) for malaria and aspirin (from willow bark), originated from indigenous knowledge. The World Health Organization (WHO) has recognized the importance of traditional medicine and is working to integrate it with conventional healthcare to enhance accessibility and innovation in global health solutions.

4. Biodiversity Conservation and Ecosystem Protection

Indigenous communities have historically played a vital role in protecting ecosystems and wildlife, as their cultural traditions often promote conservation and respect for nature. Many indigenous groups use sacred groves, community-managed forests, and rotational hunting and fishing practices to maintain biodiversity and prevent resource depletion.

For example, the Kayapo people of the Amazon use controlled burning to manage forests and prevent large-scale wildfires. In India, the Bishnoi community is known for protecting endangered species such as the blackbuck, enforcing strict conservation rules. Similarly, the Maasai people of East Africa practice rotational grazing to prevent land degradation and maintain healthy grasslands.

Scientific studies support these traditional conservation techniques, leading to their inclusion in modern environmental policies. Initiatives like Indigenous Protected Areas (IPAs) in Australia and UNESCO's Man and the Biosphere (MAB) Programme highlight the significance of indigenous-led conservation efforts in protecting natural habitats. Indigenous practices in agriculture, water management, healthcare, and biodiversity conservation offer sustainable, time-tested solutions to modern environmental challenges. Their alignment with scientific research and sustainability principles underscores their continued relevance in contemporary society. Recognizing and integrating these practices into modern policies and development strategies can enhance efforts to combat climate change, ensure food and water security, and promote overall environmental sustainability. By fostering collaboration between indigenous communities and scientific institutions, we can create holistic and resilient solutions that honor traditional wisdom while leveraging modern innovations.

Indigenous Knowledge Systems (IKS) offer invaluable contributions to sustainable development, yet their integration with modern scientific approaches presents several challenges. These include knowledge validation, policy recognition, and cultural preservation, which often hinder effective collaboration. However, by addressing these barriers, meaningful partnerships between indigenous communities and scientific institutions can be fostered, leading to more inclusive and effective sustainability strategies.

Challenges in Integrating Indigenous Knowledge

1. Knowledge Validation and Scientific Acceptance

One of the key challenges in integrating indigenous wisdom with modern science is the differing methods of knowledge validation. Scientific institutions typically rely on empirical data, experiments, and standardized methodologies, whereas indigenous knowledge is passed down through oral traditions, lived experiences, and holistic understandings of nature. This difference often leads to scepticism regarding the credibility of traditional practices.

For instance, indigenous agricultural and medicinal practices have been successfully used

for generations, yet they are often not formally recognized due to a lack of written records or laboratory-based validation. To bridge this gap, collaborative research approaches, such as community-led studies and participatory action research, can ensure that indigenous perspectives are acknowledged and valued alongside scientific findings.

2. Policy Integration and Legal Barriers

A significant challenge in utilizing indigenous knowledge is its limited recognition in policy frameworks. Many national and international policies favor Western scientific methods, overlooking the role of indigenous practices in environmental management, healthcare, and agriculture. Furthermore, weak legal protections for indigenous intellectual property and land rights make it difficult for communities to retain control over their knowledge and resources.

A notable issue is the misappropriation of indigenous medicinal knowledge by pharmaceutical companies, where traditional plant-based remedies are commercialized without compensating the communities that have preserved this knowledge for centuries. Developing legal frameworks that recognize indigenous contributions, establish benefit-sharing agreements, and secure intellectual property rights is essential for ensuring fair representation and protection.

3. Cultural Erosion and Knowledge Loss

The increasing influence of modernization and globalization has led to the gradual decline of many indigenous traditions. As younger generations migrate to urban areas, the transmission of traditional knowledge is disrupted, leading to its gradual disappearance. In some cases, the replacement of indigenous practices with modern technologies has resulted in the loss of valuable ecological knowledge.

To safeguard this wisdom, initiatives focused on cultural preservation, intergenerational knowledge transfer, and documentation of oral traditions are essential. Educational programs that incorporate indigenous teachings into mainstream curricula can also help ensure the survival and continued relevance of these knowledge systems.

Opportunities for Collaboration

Despite these challenges, there are promising opportunities for collaboration between indigenous communities and scientific institutions, fostering innovation and sustainability.

1. Community-Led Research and Knowledge Exchange

One effective approach is participatory research, where indigenous knowledge holders and scientists work together as equal contributors. This collaborative model ensures that research is conducted ethically and that the findings benefit both indigenous communities and scientific advancements.

For example, indigenous fire management techniques have been integrated into modern wildfire prevention strategies in Australia and North America. These partnerships demonstrate how combining traditional ecological knowledge with scientific data can lead to more effective environmental management solutions.

2. Strengthening Policy and Institutional Support

There is growing recognition of indigenous knowledge in global sustainability policies and conservation efforts. International agreements such as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) emphasize the importance of protecting indigenous intellectual property and ensuring their participation in decision-making processes.

3. Leveraging Technology for Knowledge Preservation

Digital tools and modern technology offer new ways to preserve and share indigenous knowledge while ensuring that communities retain control over their cultural heritage. Mobile applications, geospatial mapping, and online platforms allow for the documentation of traditional practices in a way that is accessible and secure.

For example, projects like the Indigenous Navigator use digital platforms to record traditional ecological knowledge, biodiversity conservation methods, and cultural practices. These initiatives help bridge the gap between indigenous and scientific knowledge while promoting awareness of their value in sustainability efforts.

Although integrating Indigenous Knowledge Systems with modern scientific approaches presents challenges related to knowledge validation, policy recognition, and cultural preservation, these obstacles can be overcome through collaborative research, policy reforms, and technological innovations. By fostering equitable partnerships between indigenous communities and scientific institutions, societies can develop more comprehensive and sustainable solutions to global challenges. Recognizing and incorporating indigenous wisdom into contemporary policies and environmental strategies will help build a future that is both resilient and inclusive.

The fusion of Indigenous Knowledge Systems (IKS) with modern scientific advancements provides a pathway toward inclusive and community-led sustainability strategies. For generations, indigenous communities have maintained ecological balance through sustainable practices, while contemporary science offers technological innovations and empirical research. By integrating these two knowledge systems, a holistic framework can be developed that respects traditional wisdom while utilizing scientific insights to address environmental and social challenges.

The Importance of an Inclusive Sustainability Approach

Many sustainability efforts rely on top-down policies that prioritize scientific and technological solutions, often neglecting indigenous expertise. However, effective environmental strategies must incorporate diverse perspectives, ensuring that indigenous communities actively participate in decision-making. A truly inclusive framework values local knowledge and integrates it with modern science to create solutions tailored to specific ecological and cultural contexts.

Core Elements of a Community-Driven Sustainability Model

1. Collaborative Governance and Participatory Decision-Making

Indigenous communities should be equal partners in sustainability initiatives, ensuring their

voices shape environmental policies and resource management strategies. This can be achieved through community-led conservation efforts that integrate indigenous resource management techniques with scientific assessments. Additionally, joint governance models can foster collaboration between policymakers and indigenous leaders, allowing for the co-management of natural resources. Legal recognition of indigenous land rights is also essential, as it empowers communities to protect and sustainably manage their environment.

2. Merging Traditional Ecological Knowledge and Scientific Research

Traditional ecological knowledge (TEK) enhances biodiversity conservation, water management, and agriculture. Combining TEK with science improves sustainability, such as intercropping with soil analysis, rainwater harvesting with hydrological modeling, and sacred land conservation with satellite monitoring.

3. Knowledge Exchange and Community Education

A sustainable framework should promote mutual learning between indigenous knowledge holders and scientists. Collaborative research can document and validate traditional practices, while educational programs integrate indigenous perspectives. Workshops and training sessions facilitate knowledge exchange, ensuring resource management strategies that combine traditional wisdom with scientific advancements for effective environmental sustainability.4. Ethical Considerations and Fair Benefit-Sharing

Indigenous communities should equitably benefit from their knowledge in sustainability projects through intellectual property protections, fair benefit-sharing agreements, and capacity-building programs that empower them to lead environmental efforts.

Bridging Indigenous Knowledge Systems with modern scientific advancements can lead to more effective, resilient, and culturally inclusive sustainability strategies. By ensuring participatory decision-making, blending traditional wisdom with scientific research, fostering knowledge exchange, and establishing ethical benefit-sharing models, this framework seeks to create a balanced approach to sustainability.

The integration of Indigenous Knowledge Systems (IKS) into contemporary development policies is crucial for achieving sustainability, resilience, and ecological balance. Indigenous communities have long practiced resource conservation, biodiversity protection, and climate adaptation, offering valuable insights that align with modern scientific approaches. The findings of this study emphasize the importance of recognizing, respecting, and applying indigenous wisdom in policymaking to foster a more equitable and sustainable future.

Key Areas Where Indigenous Knowledge Enhances Development Policies

1. Sustainable Agriculture and Food Security

Indigenous agricultural techniques like permaculture, crop rotation, and agroforestry support soil health, water conservation, and climate adaptation. Integrating these methods into

modern policies can promote regenerative farming, preserve traditional crop varieties resilient to pests and climate change, and strengthen community-based food systems for local food security and sustainability.

2. Water Resource Management and Conservation

Indigenous water conservation techniques, like rainwater harvesting and natural filtration, enhance sustainability. Integrating these into policies can improve irrigation efficiency, support watershed restoration, and ensure fair water distribution by recognizing indigenous governance.

3. Biodiversity Conservation and Climate Resilience

Traditional ecological practices have played a key role in biodiversity conservation and climate adaptation. Development policies can benefit by recognizing indigenous land stewardship, which helps protect ecosystems from deforestation and degradation. Supporting traditional conservation techniques, such as controlled burning and rotational grazing, can also maintain ecological balance. Additionally, integrating indigenous perspectives into climate adaptation policies can enhance community resilience and ensure sustainable environmental management.

4. Traditional Medicine and Holistic Healthcare

Indigenous healing practices offer effective healthcare solutions. Integrating them into policies can support medicinal plant research, promote hybrid healthcare models, and protect indigenous intellectual property rights for fair benefit-sharing.

Conclusion

The integration of Indigenous Knowledge Systems with modern scientific approaches offers a holistic and effective pathway for addressing contemporary environmental and sustainability challenges. By recognizing the complementary strengths of both knowledge systems, this study highlights the potential for enhanced resilience, resource conservation, and sustainable development. While challenges such as knowledge validation, policy integration, and cultural preservation persist, fostering collaboration between indigenous communities and scientific institutions can pave the way for more inclusive and community-driven sustainability strategies. Ultimately, the findings emphasize the urgent need to respect, preserve, and integrate indigenous wisdom into modern development policies, ensuring a more balanced, equitable, and resilient future for generations to come.

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EXPLORING THE ROLE AND IMPACT OF ARTIFICIAL INTELLIGENCE (AI) IN TEACHER EDUCATION: INSIGHTS FROM B.ED. TEACHER EDUCATORS

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Abstract:

The integration of Artificial Intelligence (AI) in teacher education has emerged as a transformative tool with the potential to reshape teaching practices, enhance personalized learning, and optimize decision-making in teacher training programs. This research investigates how AI is perceived, adopted, and applied by B.Ed. teacher educators, focusing on the benefits, challenges, and ethical concerns that arise during its implementation. A structured questionnaire was administered to 46 teacher educators across seven B.Ed. colleges from Pune, Maharashtra to understand their perspectives on the role of AI in teacher education. The findings reveal that while AI is generally seen as beneficial for professional development and data-driven decision-making, challenges such as resistance to change, lack of training, and ethical concerns persist. Additionally, respondents acknowledge the importance of making AI more accessible to marginalized groups. The study provides valuable insights for policymakers, educators, and institutions seeking to incorporate AI in teacher education.

Keywords: Artificial Intelligence, Teacher Education, Teacher Professional Development, Personalized Learning, Data-driven Decision-making, Ethical Concerns, Accessibility

Introduction:

Artificial Intelligence (AI) is rapidly transforming various sectors, and education is no exception. As the landscape of teaching and learning evolves, AI offers new possibilities for enhancing teacher training and supporting educators in their professional development. In particular, AI has the potential to personalize learning experiences, improve teaching practices through data analysis, and assist in administrative tasks, thus creating opportunities for teachers to focus more on their pedagogical roles.

However, the integration of AI into teacher education also raises significant questions. These include the perceived effectiveness of AI tools, concerns about ethical implications, and the barriers to widespread adoption. This research aims to explore how AI is perceived by B.Ed. teacher educators, how it is being utilized, and the challenges faced in its integration into teacher education programs.

The study uses a questionnaire designed to collect insights from teacher educators

regarding their knowledge, attitudes, and experiences with AI in their teaching practices. By examining the responses from 46 teacher educators across seven B.Ed. colleges, this research seeks to provide a clearer understanding of the current status and future potential of AI in teacher education.

Literature Review: Teacher educators themselves must embrace AI to enhance their teaching effectiveness. AI can aid in their professional development by offering personalized learning opportunities. Sharma & Agarwal (2022) emphasize that AI-powered professional development platforms can provide tailored training programs based on the individual needs of teacher educators, helping them stay updated with the latest pedagogical strategies and technological advancements.

AI tools also promote continuous feedback and self-reflection, which is essential for the professional growth of teacher educators. For instance, Patel (2021) discusses how AI-based tools can offer real-time feedback to teacher educators, allowing them to assess and refine their teaching practices. This fosters a culture of continuous improvement, which is crucial for the professional growth of educators.

The use of AI in education has been explored in several studies, emphasizing both the opportunities and challenges it presents. AI technologies can facilitate personalized learning by adapting instructional content to the individual needs of students, enhancing engagement and improving outcomes (Johnson et al., 2019). Similarly, AI can support teacher professional development by providing tailored learning experiences, automating administrative tasks, and offering real-time feedback (Shute & Zapata-Rivera, 2020).

However, challenges persist, particularly in the teacher education context. A study by Acedo et al. (2020) highlights the resistance among educators to the implementation of AI due to lack of understanding, technological infrastructure, and training. Ethical concerns regarding data privacy, algorithmic bias, and the potential for AI to replace human educators are also significant barriers to adoption (Cummings & Aiken, 2021). Furthermore, accessibility issues remain a concern, especially for marginalized groups, where limited access to technology exacerbates inequalities (Smith & Anderson, 2022).

Despite these challenges, AI is considered a valuable tool for improving teacher education programs, as it offers new ways to monitor and enhance teaching quality, streamline administrative processes, and provide personalized learning pathways (Kerr, 2021). However, the success of AI integration depends largely on the willingness of educators to embrace these tools and the availability of adequate support and training.

Objectives: -

- 1) To assess the level of knowledge and familiarity with Artificial Intelligence (AI) among B.Ed. teacher educators.
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- 2) To explore the perceived benefits and challenges of integrating AI into teacher education programs.
- 3) To examine the ethical concerns related to the use of AI in teacher education, focusing on data privacy, algorithmic biases, and teacher autonomy.
- 4) To explore the accessibility of AI tools and resources for marginalized or underrepresented groups in teacher education.
- 5) To understand the future role of AI in teacher education, focusing on its potential impact on teaching practices and educator roles.

Methodology:

This research employed a quantitative approach using a structured questionnaire to collect data from B.Ed. teacher educators. The sample consisted of 46 teacher educators from seven different B.Ed. colleges from Pune, Maharashtra selected based on convenience sampling. The questionnaire consisted of 10 items, including both multiple-choice and Likert scale questions, designed to assess participants' knowledge, attitudes, and experiences with AI in teacher education. The questionnaire was divided into sections addressing the Knowledge and familiarity with AI in education, Perceived benefits and challenges of AI integration, Ethical considerations in the use of AI in teaching, Accessibility of AI tools for marginalized groups.

Data Collection and Analysis:

Data was collected through an online survey platform, where participants were asked to complete the questionnaire. The responses were analysed using descriptive statistics, including frequencies and percentages, to identify trends and patterns. Qualitative insights were also derived from open-ended questions, which provided additional context to the quantitative data.

Findings:

- 1) Knowledge of AI in Teacher Education: The majority of respondents (60%) reported having a moderate to high level of knowledge about AI in teacher education. However, 40% indicated low to very low knowledge, highlighting a gap in awareness among some educators.
- 2) Use of AI Tools: Approximately 50% of respondents had used AI-based tools occasionally, with 30% reporting frequent use. However, 20% had never used AI tools, indicating a significant portion of educators who have not yet adopted AI technologies in their teaching practices.
- 3) Benefits of AI for Teacher Professional Development: A majority (70%) of respondents believed that AI is moderately to highly beneficial for teacher professional development, citing the ability to tailor learning experiences and provide real-time feedback as key advantages.

- 4) AI's Role in Personalized Learning: 80% of respondents agreed that AI can provide personalized learning experiences for both teachers and students, although some expressed reservations about the extent to which AI could replace the human element in education.
- 5) AI in Data-Driven Decision-Making: 75% of participants viewed AI as essential or useful for improving teaching practices through data-driven decision-making, emphasizing its potential to enhance instructional strategies and track student progress.
- 6) Ethical Concerns: Data privacy and security were identified as the most pressing ethical concerns by 55% of respondents, followed by algorithmic biases (25%). Teacher autonomy and AI replacing human teachers were less commonly cited.
- 7) Challenges in Implementing AI: The biggest challenges identified were the lack of training for educators (40%) and resistance to change from teachers (35%). Access to technology and ethical concerns were also noted but to a lesser extent.
- 8) Accessibility of AI for Marginalized Groups: 70% of respondents agreed that providing affordable AI tools and training for underrepresented groups would help make AI more accessible in teacher education.
- 9) AI Replacing Teaching Tasks: The majority (60%) felt that AI would improve efficiency by automating administrative tasks, freeing up time for teachers to focus on teaching. However, 25% expressed concern that this could undermine the human touch in teaching.
- 10) Future Role of AI in Teacher Education: 65% of participants believed that AI would play a supportive role in teacher education without replacing traditional teaching methods, while 20% felt that AI would become integral to teacher development.

Conclusion:

This study highlights the potential of AI to revolutionize teacher education by enhancing professional development, supporting personalized learning, and improving decision-making through data. However, challenges such as resistance to change, inadequate training, and ethical concerns must be addressed for AI to be effectively integrated into teacher education programs. Efforts should be made to ensure equitable access to AI tools, particularly for marginalized groups. As AI continues to evolve, teacher educators must engage with these technologies to prepare future educators for a digitally transformed learning environment.

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TEACHER EDUCATION IN INTEGRATING IKS FOR ENVIRONMENTAL SUSTAINABILITY

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Abstract

Integrating Indigenous Knowledge Systems (IKS) into teacher education programs is essential for promoting environmental sustainability and climate resilience by equipping educators with the cultural perspectives and traditional ecological practices needed to address contemporary environmental challenges. By emphasizing IKS in teacher training, educators can bridge the gap between scientific knowledge and traditional wisdom, fostering a deeper understanding of sustainable practices among students. This holistic approach encourages innovative solutions that blend modern technology with indigenous insights, ultimately leading to more resilient communities and a greater sense of environmental stewardship. Incorporating IKS into citizen science initiatives enhances culturally relevant educational programs. The Science Plan for the UN Decade of Ocean Science for Sustainable Development notes the growing dependence on the ocean but recognizes that there is limited knowledge of how to sustainably use ocean resources while knowing the benefits of its degradation (Moffat, K. 2024). For this, the collaboration of indigenous and local knowledge, also termed 'monitoring the blue planet,' emphasizes using marine biodiversity to support sustainable ocean resources. IKS encompass valuable climate change adaptation and mitigation strategies learned by Indigenous communities over generations. Teacher education is vital in bridging the gap between academic and Indigenous knowledge systems. Teachers can facilitate the exchange of like-minded Western educators visiting rural and remote Indigenous schools for environmental resilience initiatives. This collaboration will promote mutual respect and learning, enhancing climate resilience strategies.

Climate resilience requires a comprehensive understanding of local ecosystems and biodiversity. IKS integrated into curriculum empowers teachers to convey the significance of biodiversity conservation and sustainable practices, cultivating an environmentally conscious populace. This societal awareness is essential when schools from rural centers with underlying ecological knowledge visit urban areas where climate susceptibility is streamlined (Mbah, M. 2021). The integration of IKS into teacher education necessitates the teachers being educated, recognizing the dignified value of local knowledge that Indigenous peoples have provided.

Introduction

Incorporating Indian Knowledge Systems (IKS) into teacher education is essential for

fostering environmental sustainability as it offers culturally relevant perspectives and traditional practices that promote ecological balance. By integrating concepts from ancient Indian texts, such as the Vedas and Upanishads, which emphasize the interconnectedness of all living beings, teacher education can cultivate a holistic understanding of nature among future educators. This approach not only highlights sustainable agricultural practices, water conservation techniques, and biodiversity preservation rooted in indigenous wisdom but also encourages the development of critical thinking and problem-solving skills. Additionally, engaging teachers in experiential learning through local ecological practices can nurture their commitment to sustainability while equipping them with tools to inspire students to value and protect their environment. Ultimately, blending IKS with contemporary environmental education can lead to more resilient communities and a deeper appreciation for the natural world.

In an increasingly interconnected world, the importance of environmental sustainability has never been clearer. As future educators shape the minds of the next generation, it's crucial to equip them with deep-rooted knowledge and practices that transcend modern trends. Enter Indian Knowledge Systems (IKS), a treasure trove of traditional wisdom that offers profound insights into ecological balance and sustainable living. By weaving IKS into teacher education, we unlock culturally relevant perspectives that not only enrich learning but also foster a genuine respect for nature. Imagine teachers who inspire their students not just through textbooks but through ancient teachings that champion our relationship with the earth. This approach promises not only to educate but to transform communities in meaningful ways. Let's explore how incorporating IKS can be a game-changer for teacher education in integrating these vital principles of environmental sustainability.

There could be many reasons to this phenomenon, but the most critical is that teachers make a difference in students' knowledge, attitude, and behavior beyond the classroom teaching. In addition, they help in curriculum development, writing textbooks, and providing guidance on a wide range of topics at the local level. Thus, to the extent of enabling them to care for the environment, and instilling in them interest and feelings of responsibility and motivation towards, teachers who understand environmental education can make their students environmentally literate and responsible citizens. For this reason, National Council for Teacher Education (NCTE, 2005), as an example of a statutory authority of teacher education in India, recognizes without a doubt that all teachers and teacher educators have a fundamental responsibility in fostering the environment at the national level. The NCTE highlights the necessity of making Environmental Education (EE) an obligatory subject for teacher training with no option to ignore. So, the focus of this particular research paper is Teacher Education in India and Education for Sustainable Development. Questions that stem from the problems raised include what is the contribution of

Indian academic institutions in fostering sustainable development? How does environmental education integrate in the Indian teacher training system?

I. Culturally Relevant Perspectives on Environmental Sustainability

The ways in which cultures perceive and respond to the call for environmental sustainability shows us how unique each culture is with each of them having their own nuanced understanding of nature. Indian biomimetics depict balance and synergy within the ecosystem rest on firm traditions and customs.

These perspectives ask for compassion and empathy. They remind us that every single factor has its own significance. They can help students understand their role in environmental preservation. Sustainable agricultural practices passed down from Indigenous peoples depict the ability to maintain land. These practices nourish the land while ensuring diversity in the ecosystem as well.

When integrating these insights from culture into teacher education, there is a chance of training teachers who can help in developing an environmentally conscious society. It also contributes to the understanding of respecting the environment at the local level and the international concern for ecological problems. Such narratives are helpful in not only improving curriculum but also motivating towards creating sustainable change globally.

II. The Role of Ancient Indian Texts in Promoting Holistic Understanding of Nature

Ancient Indian texts, such as the Vedas and Upanishads, emphasize nature's interconnectedness and stewardship, promoting respect for all living beings. They also emphasize sustainable practices, such as traditional agricultural methods and water conservation techniques. Integrating these teachings into teacher education can foster a holistic perspective on environmental sustainability.

III. Experiential Learning and its Impact on Teachers' Commitment to Sustainability

Experiential learning enhances teachers' engagement with sustainability by providing hands-on experience in local ecological practices. This deepens understanding of environmental issues, fosters a genuine connection to nature, and develops critical thinking and problem-solving skills. This commitment inspires students to engage with environmental stewardship, promoting personal growth.

IV. The Role of Indian Knowledge System in Shaping future Educators

Indian Knowledge Systems (IKS) is a valuable framework for teacher education, fostering holistic, culturally aware, and effective educators who can contribute to a more sustainable and harmonious society. IKS promotes self-awareness, resilience, emotional intelligence, and other essential qualities for effective teaching and personal growth. It helps prospective teachers understand the historical, cultural, and social contexts of their students, fostering empathy, respect, and inclusivity in the classroom.

IKS also emphasizes experiential learning, collaborative learning, and student-centered practices. By incorporating ancient practices like storytelling, role-playing, and hands-on activities, teacher education programs prepare future teachers to engage students in active, inquiry-based, and meaningful learning experiences. It also emphasizes sustainability and harmony with nature, fostering a sense of environmental stewardship among prospective teachers. Various policies have been introduced to support IKS integration into teacher education, emphasizing its importance in nurturing well-rounded educators who can effectively address the diverse challenges and opportunities of the 21st century. The National Education Policy (NEP) 2020 emphasizes the integration of IKS into all levels of education, including teacher education. The National Curriculum Framework (NCF) for Foundational stage 2022 further elaborates on the integration of IKS, stating that it should be "integrated systematically into the teacher education curriculum, from pre-service to in-service education."

Teacher education institutions play a crucial role in implementing policies and initiatives related to the integration of IKS into teacher education. Nongovernmental organizations (NGOs) and other institutions are working to promote the integration of IKS into teacher education. By implementing these strategies, teacher education programs can effectively integrate IKS into their curriculum and pedagogy, empowering prospective teachers to become holistic educators who embody the values of knowledge, compassion, and well-being.

- Teacher educators should have a comprehensive understanding of IKS, its principles, and its diverse domains. This can be achieved through workshops, seminars, and collaborations with IKS experts, practitioners, and indigenous communities.
 - By designing specific curriculum modules that incorporate IKS concepts, principles, and practices into various aspects of teacher education, such as pedagogy, classroom management, assessment, and student well-being.
 - By finding ways to integrate IKS concepts into existing teacher education courses, such as philosophy of education, psychology of education, and curriculum development. This will help mainstream IKS into the teacher education curriculum.
 - By Incorporating experiential learning approaches that allow prospective teachers to engage with IKS principles and practices through hands-on activities, simulations, and field experiences. This could involve visits to IKS communities, participation in traditional practices, and engagement with IKS practitioners.
 - By developing and curating a collection of IKS teaching resources, such as case studies, lesson plans, multimedia materials, and IKS-based teaching methodologies. Make these resources readily available to teacher educators and prospective teachers.
 - By inviting IKS experts, practitioners, and indigenous communities to collaborate with teacher education programs. This collaboration can involve guest lectures, workshops, and
-

joint research projects.

- By encouraging and supporting prospective teachers and researchers to conduct studies on the applications of IKS in education. This research can inform the ongoing integration of IKS into teacher education.
- By incorporating IKS principles and practices into teacher assessment criteria. Evaluate prospective teachers' understanding, application, and appreciation of IKS in their teaching approaches and classroom practices.
- By creating communities of practice among teacher educators and prospective teachers to share experiences, resources, and best practices for integrating IKS into teacher education.
- By engaging in policy discussions and advocacy efforts to promote the integration of IKS into teacher education policies and guidelines at the institutional and national levels.

Integrating Indigenous Knowledge Systems in education?

1. Encouraging Sustainability Teaching Indigenous Knowledge exposes students to traditional ecological methods that can be used to address today's environmental issues, such as resource depletion, deforestation, and climate change. Indigenous viewpoints place a high priority on sustainability and balance, two principles that are crucial in the modern world.
2. Promoting Inclusion and Respect for Cultural Differences Respect for Indigenous cultures and their achievements is fostered by integrating Indigenous viewpoints into the curriculum. It gives all kids a wider, more open perspective on the world while empowering Indigenous youngsters by recognizing their heritage.
3. Contextual learning and critical thinking by providing alternate methods of problem-solving, Indigenous Knowledge Systems inspire students to critically examine prevailing scientific and industrial models. Students learn important skills in contextual and interdisciplinary thinking by studying Indigenous worldviews.
4. Dealing with Environmental and Social Justice the incorporation of Indigenous knowledge into the classroom is consistent with larger social justice and Indigenous rights initiatives. Acknowledging and honoring Indigenous knowledge promotes the participation of Indigenous perspectives in decision-making processes and fights against historical marginalization.
5. The advantages of using Indian knowledge systems for aspiring educators In an increasingly varied society, cultivating inclusive and respectful interactions requires improving cultural competence and sensitivity. While cultural sensitivity entails being aware of and respectful of cultural differences, cultural competence includes the capacity to comprehend, value, and communicate with others from diverse cultural backgrounds. People can strengthen their bonds, overcome cultural differences, and promote a more inclusive and peaceful society by developing these traits.

6. In an increasingly varied society, developing cultural competence and sensitivity is essential to promoting inclusive and polite relationships. While cultural sensitivity entails being aware of and respectful of cultural differences, cultural competence includes the capacity to comprehend, value, and communicate with others from diverse cultural backgrounds. People can strengthen their bonds, overcome cultural differences, and promote a more inclusive and peaceful society by developing these traits.

7. Issues and Things to Think about When Using Indian Knowledge Systems Some myths and resistances prevent Indian Knowledge Systems (IKS) from being widely recognized and accepted, despite their rich and varied body of knowledge. In order to advance the integration of IKS into many sectors and cultivate a more comprehensive understanding of knowledge and its applications, it is imperative that these problems be addressed. Some people believe that IKS is out of date or unnecessary in the contemporary environment, failing to acknowledge

- Its versatility and ongoing development. IKS concepts are flexible enough to adjust to changing conditions because they are frequently based on practical observation and experimentation. IKS is frequently written down as not being rigorously scientific, ignoring its empirical
- Underpinnings as well as the scientific ideas used throughout its operations. IKS frequently uses a variety of methodologies and epistemologies, providing insightful information to support scientific methods. IKS is occasionally thought to be exclusive to particular fields, such as agriculture
- Conventional medicine, neglecting to acknowledge its relevance in a variety of fields. IKS provides information on a variety of subjects, such as social systems, psychology, and ecology. Opposition to IKS Indigenous knowledge systems, especially IKS, may be undervalued as a result of a persistent colonial attitude. This way of thinking frequently elevates Western knowledge systems while ignoring the contributions of other cultures. IKS's potential is frequently overlooked since it is frequently poorly understood, non standardized and rarely incorporated into traditional research and education. Open sharing and use of IKS can be hampered by worries about safeguarding cultural heritage and intellectual property. The community's knowledge ownership and intellectual property rights must be carefully taken into account in order to meet this issue.
- By clearing up these misunderstandings and overcoming opposition, we may open the door to a more comprehensive and inclusive approach to knowledge, appreciating the important contributions of IKS and utilizing its potential for societal harmony, sustainable development, and well-being. Open sharing and use of IKS can be hampered by worries about safeguarding cultural heritage and intellectual property. The community's knowledge

ownership and intellectual property rights must be carefully taken into account in order to meet this issue.

Conclusion

Using Indian Knowledge Systems (IKS) for the whole development of future teachers is extremely important in producing well-rounded teachers who can properly direct and assist the whole growth of their students. IKS, with its rich tapestry of insights, practices, and values, offers a unique and valuable framework for enriching teacher education programs and preparing future teachers to address the diverse challenges and opportunities of the 21st century.

The Marginalization of Indigenous Knowledge throughout History

Indigenous Knowledge Systems were disregarded for generations as being less than scientific, especially during times of industrialization and colonial expansion. Traditional knowledge was lost, Indigenous populations were uprooted from their ancestral lands, and they were denied access to natural resources and cultural customs as a result of this marginalization. By promoting Indigenous Knowledge as essential to environmental stewardship, policymaking, and education, contemporary initiatives seek to undo these injustices.

Current Efforts to Integrate Indigenous Knowledge

1. Government and Policy: Indigenous knowledge is being valued by governments and environmental agencies, which is why it is being integrated into frameworks for resource management, conservation initiatives, and strategies for adapting to climate change.
2. Education Initiatives: Using Indigenous viewpoints, schools all around the world are incorporating Indigenous knowledge into their curricula to teach students about ecological balance and sustainable practices.
3. Collaborative Dialogue: Programs for cultural exchange, alliances with academic institutions, and forums for Indigenous views are promoting genuine inclusion and communication.

The Way Forward: Honoring Indigenous Knowledge

Respect, cooperation, and cautious execution are necessary for incorporating Indigenous Knowledge Systems into the classroom. Among the steps are:

- Collaborating with Indigenous groups to guarantee that their knowledge is accurately represented.
- Educating teachers on how to appropriately and inclusively teach Indigenous knowledge.
- Acknowledging indigenous knowledge as an adjunct to contemporary science rather than as a substitute or rival system.

Schools may encourage future generations to interact with the environment in a responsible and mindful manner by incorporating Indigenous Knowledge. Education turns become a means of

furthering social justice, sustainability, and cultural understanding.

Conclusion

Indigenous Knowledge Systems provide priceless insights for coexisting peacefully with the environment. We respect Indigenous peoples' wisdom, encourage environmental stewardship, and equip students to tackle the urgent issues of the twenty-first century by incorporating these systems into school curricula. Indigenous knowledge is becoming more recognized as more than just a resource; it is a beacon of hope for a more sustainable and inclusive future.

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**MULTILINGUALISM IN THE CLASSROOM TO DEVELOP A GLOBAL
CITIZEN IN 21ST CENTURY****Dr. Raut Geeta Satish***Principal, Gayatri College of Education,**Deolali Pravara, Tal: Rahuri, Dist. Ahmednagar.**Savitribai Phule Pune University, Maharashtra, India.**geetaraut2000@gmail.com*

Abstract

Education is a tool to promote national and international development. Report of Delor commission in 1996 emphasizes on lifelong learning and learning worldwide. Number of students seeking higher education for the foreign degrees is increasing. Promoting multilingualism is a need of the day to develop all-round Global Citizen of 21st century. Knowledge of modern technology like AI, Machine learning, robotics will be the key to this age.

The aim of the study is to state the role of multilingualism in developing Global Citizen. The study is supported by Piaget's "Cognitive Development theory". Survey method was used to collect the data.

A Global Citizen is a person who identifies with being a part of an emerging world community. Multilanguage learning in the classroom will help students to act locally and globally to understand customs, culture and tradition of that particular country. It plays important role in developing effective communication and understanding different global issues. It was found that when learner has Multilanguage skills, it can have a positive effect on developing their general cognitive skills and overall academic performance. Hence the future globalised education should develop such individual capable of becoming an asset to the nation. India's National Education Policy 2020, focused on Multilanguage formula in its education system to develop global citizens.

Author has done experiment of teaching English as a second language to tribal students in tribal area of Akole Taluka in India.

Keywords : Multilanguage, cognitive, culture, global citizen

Introduction:-

Education is a tool to promote national development as well as International understanding. It is the base of all human resources development, a stepping stone for the onward march of cultural and all human progress. The 21st century is the age of liberalization, privatization and globalization. **The UNESCO Report "Learning the Treasure within"** in 1996 by Delor Commission states Education in 21st century is widely considered life-long learning and learning

worldwide. Knowledge of modern technology will be the key to this age.

Tomorrow's industry will be knowledge and information industry. The advances made by science and technology like robotics, AI, Machine learning, information and communication made the world a global village, the idea of world as one family. Globalization has its impact on the entire education system. The number of students seeking higher education for the foreign degrees is increasing. So promoting multilingualism is a need of the day.

Need of Multilingualism:-

Language is a medium for expression and means for communicating ideas, feelings, thoughts, experiences and skills. The power of language in teaching and learning is essential to develop a all-round global citizen to face the 21st centuries Global challenges. Every language is the pride of the people who use it. It is important in every sphere of life like social, political, academic, cultural, economic, scientific and technological development. **Language teaching is an act and learning in the classroom is a science.**

Objectives of the Study:-

1. To understand the concept of Globalization and global citizen.
2. To study the concept of multilingualism.
3. To state the role of multilingualism in developing global citizen.

Theory Base:-

Learning many languages in the classroom is a cognitive process of language development. The study is supported by **Piaget "Cognitive Development"** theory.

Methodology:-

For the present study survey method is used. Action Research was carried out on 20 High-school teachers. Purposive sample technique was used to select the sample of the study. Researcher developed questionnaire was used to collect the data about multilingualism.

Globalization and Global Citizen:-

Globalization is the process of connecting people and cultures across the globe. Global citizenship can be defined as knowledge and skills for social and environmental justice (Andrezejewski, 1996). Globalization of education has become a reality. If we want to keep pace with other countries in term of science and technologies, globalization of education is essential. The fundamental principle of globalization is said to be freedom to trade, to govern, to give and receive education and to work anywhere. Right from the age of Rugveda, Indian sages have exhorted all humans on the earth to be together, to be of one mind, to be truly "global". Thousands of years ago, **the sage Angirasa devoted the lat stanza of Rugveda** to exhort all human beings to become globalized to be a unified society,

He advised them:

**"May your minds be one;
For you to live in harmony."**

This is a true vision of globalization of peace and harmony for all.

Global Citizenship:-

It was stated that it is necessary to develop global citizen. India's National Education Policy (NEP) 2020 introduced Global Citizenship education at all the level of education to face the challenges of 21st century.

A global citizen is a person who identifies with being part of an emerging world community and whose action contributed to building this community's social, political, cultural, educational, language traditions, values and practices. It includes cognitive and non-cognitive skills and behavior. Multi language learning in classroom will help a lot to students to act locally and globally to understand customs and traditions of that particular country. NEP 2020 focuses on guiding Indian students for multilingualism formula to develop a global citizen for contributing global community.

Concept of Multilingualism:-

Language is a very important tool for communication and interaction with any person in any country.

In India 1600 languages are recognized, near about 13 different languages are used in administration and 47 languages are used in teaching-learning process. Multilingualism is a type of approach where learner has opportunity to learn different language skills. Aronin and Britta 2009, "The capacity of societies, institutions, groups and individuals to engage on regular basis in space and time with more than one language in everyday life".

Role of Multilingualism :-

Multilanguage Learning develops spirit of tolerance and harmony among different citizens of the world. It plays important role in developing effective communication and understanding others culture well.

- It is gateway to global citizenship.
- Multilingualism serves as a bridge between two different communities' interactions and exchanging thoughts with ideas.
- It helps in understanding different global issues and problems in education, health and in environment.

Findings:-

Findings are as follows:-

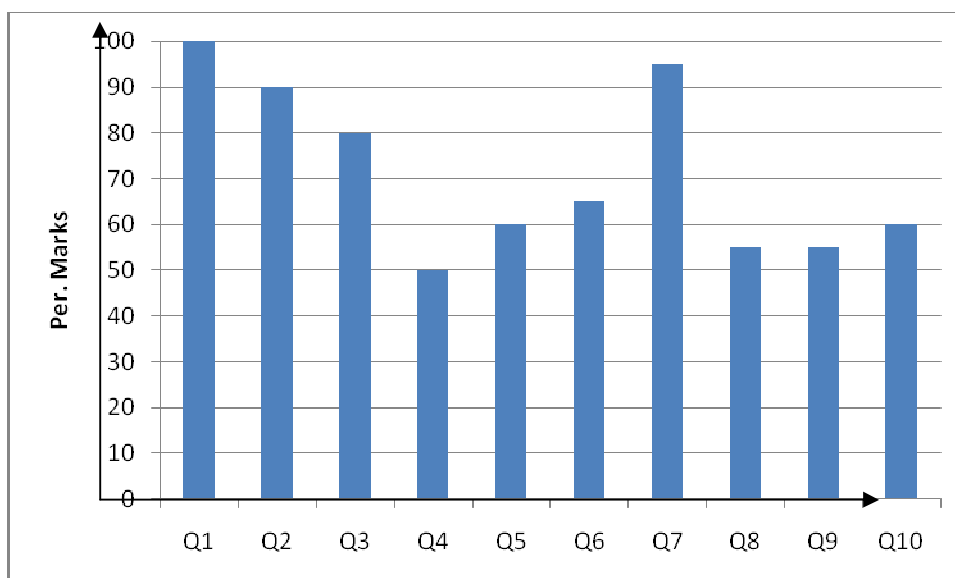


Fig. 1 Percentage of Marks

More than 90% teachers support that multilingualism supports student's learning process and helps in improving their academic performance.

Multilanguage classroom sees learners own language as an asset, a rich resource. It was found that when learner uses their own language. Learner develops competence in multiple language, this can have a positive effect on developing their general cognitive skills and overall academic performance.

Multilanguage enable them "to access information communicate and use cultural knowledge in interactions with people from diverse backgrounds (Galante, 2019). Author has done experiment of teaching English as a second language to tribal students in Akole Taluka in Maharashtra, India and found that student's performance was improved.

Conclusion:-

A dynamic education must be futuristic in outlook, keep pace with the changing times and be responsive to individual, social and national aspirations. Hence the future globalised education should develop such individuals capable of becoming an asset to the nation. India, in its NEP 2020 focused on multilingualism formula in its education system to develop global citizen of 21st century.

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FROM POLICY TO PRACTICE: TRANSFORMING HIGHER EDUCATION FOR SUSTAINABILITY**Dr. Rupal Thakkar***Associate Professor,**K J Somaiya School of Education,**Somaiya Vidyavihar University, Mumbai**Email: rupal@somaiya.edu***Dr. Hema Rajendra Bhadawkar***Associate Professor,**K J Somaiya School of Education,**Somaiya Vidyavihar University, Mumbai**E mail: hema.peese@somaiya.edu*

Abstract

The 21st century is witnessing the pressing challenges of climate change, resource depletion, and environmental degradation, the need for sustainable solutions is of utmost importance. In such scenarios, higher education like Universities, Colleges play a pivotal role to influence future leaders, innovators and policymakers.

The University Grants Commission (UGC) created a plan to improve the quality of higher education. Recently, the Ministry of Human Resource Development released one mandate focusing on Making university campuses more eco-friendly and sustainable (SATAT), a plan for making university campuses greener and more sustainable. It encourages universities to use eco-friendly policies and practices to improve the environment on campus. This paper presents a case study of Somaiya Vidyavihar University, offering insights into the systemic transformations essential for building a sustainable future. It highlights how sustainability is enhanced through the integration of two key strategies: SATAT and Green Campus Initiatives.

Under SATAT, a variety of activities are conducted, including the celebration of environmental days, organizing competitions on environmental themes, nature trails, tree plantation drives, panel discussions; community engagement initiatives and research-driven projects. Somaiya Vidyavihar University (SVU) implements comprehensive Green Campus initiatives, including solid waste management, e-waste management, waste recycling systems, and scrap recycling. The university follows the "Reduce, Refuse, and Recycle" policy to promote sustainability.

SVU has established water conservation facilities such as rainwater harvesting and wastewater recycling within the campus. Sustainable transportation is encouraged through UPI-based EV charging stations, restricted entry of automobiles, the use of bicycles and battery-powered vehicles, and pedestrian-friendly pathways. Additionally, the campus enforces a ban on plastic usage and emphasizes green landscaping with trees and plants. To ensure continuous environmental responsibility, SVU conducts Green Audits, Environmental Audits and Energy Audits. Through this paper, the researchers want to present a model for sustainable campus

development, demonstrating how educational institutions can drive meaningful environmental change.

Key words: SATAT, Green Campus initiatives, Sustainable Campus Development

1. Introduction

India, being one of the fastest-growing economies, faces major environmental challenges, including climate change; water scarcity, pollution and resource depletion. HEIs play a crucial role in addressing these issues by fostering sustainability awareness and practices among students and faculty. Patil & Patil (2021) argue that universities must incorporate sustainable solutions into their infrastructure and academic programs to create environmentally conscious graduates. Kumar et al. (2020) emphasize that integrating sustainability into Indian universities not only improves environmental performance but also enhances institutional reputation, funding opportunities, and international collaborations.

Sustainability in higher education institutions (HEIs) in India has gained significant attention in recent years, driven by policies from the University Grants Commission (UGC), the National Education Policy (NEP) 2020, and global sustainability frameworks such as the United Nations Sustainable Development Goals (SDGs). Several universities in India have emerged as pioneers in sustainability initiatives: IIT Madras has implemented zero-waste campus policies, sustainable transportation, and renewable energy projects (Sharma & Menon, 2021). TERI School of Advanced Studies, New Delhi, is known for its curriculum focused on environmental sustainability and green technology research (Bhattacharya, 2020). Raghunandan et al. (2022) discussed how Indian universities adopting these policies have seen measurable improvements in environmental impact and student engagement.

Cortese (2003) universities have a unique responsibility to create sustainable learning environments that influence students, faculty, and society at large. Studies by Velazquez et al. (2006) further indicate that universities contribute to sustainability through green campus initiatives, curriculum development, and research that fosters environmental innovation. They emphasize that implementing sustainable policies within university campuses can serve as a model for larger societal transformation. Wright (2002) and Alshuwaikhat & Abubakar (2008) explore how universities worldwide are adopting sustainable practices such as waste management, renewable energy, water conservation, and eco-friendly infrastructure. The adoption of frameworks like the "Green Campus" initiative has significantly improved environmental performance in HEIs. These studies highlight case examples of institutions that have successfully reduced their carbon footprint through sustainable campus development.

1.1 Policy and Regulatory Framework for Sustainability in Indian HEIs

The **University Grants Commission (UGC)** has introduced several guidelines to promote

sustainability in universities:

- **SATAT (Sustainable and Green University Campuses Initiative):** Encourages HEIs to implement eco-friendly policies such as waste management, water conservation, and green energy adoption (UGC, 2019).
- **National Institutional Ranking Framework (NIRF):** Includes sustainability as a key parameter for ranking universities in India (MHRD, 2022).
- **NAAC (Green Campus Initiatives):** The National Assessment and Accreditation Council (NAAC) encourage sustainable practices in higher education institutions by conducting audits and providing guidelines.

1.2 Challenges Associated with Sustainability in Indian Universities

Despite policy frameworks and best practices, several challenges persist in achieving sustainability in Indian HEIs:

- **Funding Constraints:** Many institutions lack financial resources to invest in large-scale green infrastructure (Kumar & Sinha, 2021).
- **Lack of Awareness and Training:** Faculty and students often lack sufficient knowledge about sustainability policies and practices (Patil et al., 2022).
- **Limited Integration into Curriculum:** Sustainability education remains largely elective, rather than being a core component of university programs (Das & Mukherjee, 2020).
- **Infrastructure Limitations:** Older campuses struggle to retrofit sustainable technologies due to existing infrastructure constraints (Sharma & Verma, 2021).

These challenges highlight the need for **stronger policy implementation, funding mechanisms, and training programs** to accelerate sustainability efforts in Indian universities.

2. Need for Sustainability in Higher education institutions

Sustainability has become a crucial element in shaping the future of our planet. Higher education institutions (HEIs) hold a significant responsibility in fostering sustainable practices, not only within their campuses but also in preparing future generations to address environmental challenges. Sustainability in HEIs encompasses various dimensions, including curriculum integration, energy efficiency, waste management, and sustainable infrastructure. By promoting an environmentally responsible culture, these institutions can set an example for students, faculty, and the broader community. Implementing eco-friendly infrastructure, reducing carbon footprints, and promoting energy conservation through initiatives like solar power installations, rainwater harvesting, and waste segregation can make campuses more sustainable.

This study highlights the impact of initiatives such as the SATAT (UGC) and Green Campus Initiatives (NAAC) in India, which encourages universities to implement eco-friendly policies. Somaiya Vidyavihar University stands as a model for integrating sustainability into its institutional framework. Through structured initiatives like SATAT and Green Campus programs,

the university has implemented environmentally friendly policies, fostering a culture of sustainability among students and faculty. Initiatives such as waste management, renewable energy integration, and biodiversity conservation have contributed to a greener campus, showcasing the university's commitment to sustainable development.

3. Aims

- To analyze the role of SATAT and Green Campus Initiatives in promoting sustainability through structured initiatives.
- To showcase Somaiya Vidyavihar University as a case study highlighting the integration of SATAT and Green Campus Initiatives for building an eco-friendly university campus.

4. Objectives

- To identify the integration of SATAT and Green Campus Initiatives in fostering sustainability through structured policies and practices.
- To analyze Somaiya Vidyavihar University's integration of SATAT and Green Campus Initiatives as a model for developing eco-friendly campuses.

5. Research Questions

1. What is the role of SATAT (UGC) and Green Campus Initiatives (NAAC) in adopting a sustainable campus?
2. What are the key sustainability practices implemented at Somaiya Vidyavihar University under SATAT and Green Campus Initiatives?

6. Answering of Research questions

6.1. *What is the role of SATAT (UGC) and Green Campus Initiatives (NAAC) in adopting a sustainable campus?*

Role of SATAT (UGC) : In line with the University Grants Commission (UGC) developed Higher Education Quality Improvement Programme Mandate, the Ministry of Human Resource Development launched eco-friendly and sustainable university campuses. It is a framework for Eco-Friendly and Sustainable Campus development in higher educational institutions that encourages universities to adopt reflective policies and practices. It aims to enhance the environmental quality of the campus by adopting green and sustainable methods. The SATAT initiative under this mandate specifically aims to:

- Promote Environmental Sustainability
- Enhance Social Responsibility
- Integrating Sustainability in Curriculum
- Resource Optimization
- Building Green Infrastructure
- Campus Sustainability

- Creating Awareness
- Awards and Recognition

Green Campus Initiatives (NAAC)

A "green campus initiative" refers to a set of environmentally friendly practices implemented on a college or university campus, like reducing energy consumption, managing waste, promoting sustainable transportation, and preserving green spaces; and NAAC accreditation plays a key role by incentivizing institutions to adopt these practices as part of their evaluation criteria, thereby promoting a culture of sustainability within educational institutions.

Key points about green campus initiatives and NAAC accreditation:

NAAC Criterion 7:

Under the NAAC accreditation process, "Criterion 7" specifically focuses on institutional values and best practices, including environmental sustainability, making green campus initiatives a crucial factor for achieving a good accreditation score.

Green Audit Requirement:

To assess their environmental performance, institutions are often required to undergo a "green audit" as part of the NAAC process, identifying areas for improvement in sustainability practices.

6.2. What are the key sustainability practices implemented at Somaiya Vidyavihar University under SATAT and Green Campus Initiatives?

SATAT team of SVU, along with its various departments, conducts various events like: webinar, guest lecture, survey and co-curricular activities with a main focus on three main areas: *awareness and sensitization, community engagement, and experiential learning*. Sustainability practices implemented under SATAT (Somaiya Vidyavihar University)

1. Celebration of days (Earth day, Ozone day; Green Consumer day and Farmer's day)
2. Organizing Nature Trails
3. Workshop on Sustainable Development in the areas of Bioenergy, Soil Health, Eco-friendly Packages, Precision agriculture and Food & Nutrition.
4. Panel discussion on Industry-Academia Collaboration in Circular Economy and TransNational Education consisting of industry veterans and experienced leaders in sustainability.
5. Field training and Experiential learning experience in the field of biodiversity and Eco-Restoration to show the working of the Effluent Treatment plant of Large Scale Industry.
6. Add on course on Environmental Stewardship in Schools to equip educators with the knowledge and practical tools necessary to integrate environmental topics into their curriculum effectively and inspire students to become environmentally conscious citizens.

7. Tree plantation drives

Green Campus Initiatives

Green Campus Initiatives are structured efforts by Somaiya Vidyavihar University to promote environmental sustainability, resource efficiency, and eco-consciousness within their campuses. These initiatives aim to reduce the ecological footprint of universities while fostering a culture of sustainability among students, faculty, and staff.

1. Facilities for alternate sources of energy and energy conservation measures in SVU

- Solar energy
- Biogas plant
- Sensor-based energy conservation
- Use of LED bulbs/ power efficient equipment
- Clean green energy

2. Other Facilities in SVU:

Solid waste management: Biodigester and vermicompost pits are extensively used to manage solid waste. All the garden and food waste from the canteen goes to compost pits. There are vermicomposting pits with four curing heaps allotted near the new engineering building canteen spread over a 520 sq. mtr. plot. It uses a simple heap culture method while utilising deep burrowing worms.

Wastewater treatment: There is a separate treatment facility (ETP: Effluent Treatment Plant) installed near the hostel for treating waste water coming from the kitchen, lab, and other facilities.

E-waste management: The University encourages segregation and collection of e-waste (i.e. Electronic and electrical) for recycling, using red-labelled bins. All the computers and electronic waste generated from offices and IT laboratories are handed over to designated e-waste scrap dealers. Moreover, SVU has also signed an MOU with Ecostar Recycling.

Reduce, Reuse and Recycle policy: SVU is committed to reducing the environmental impact of our operations across all our campuses. It aims to make our students more responsible and environmentally conscious citizens. Upholding the goal of reducing campus carbon footprint, we engage students, staff, faculty, and administrators in waste reduction and resource conservation.

The University aims to enhance the existing green efforts and sustainable development across campuses by practicing and asserting the significance of the 3 R's- Reduce, Reuse, Recycle.

Scrap Recycling: Somaiya Campus has a centrally operated scrap handover mechanism by which all the bulk scrap generated from various campuses is handed over to scrap dealers. The waste paper, plastic, e-waste, mild steel, etc., is sold to the recycling vendors. The University has a formal tie-up with a paper recycling organization. Upon notification, they collect paper waste from the college campus with regular interventions.

Waste Recycling System: Every year, SVU students undertake mini projects on waste segregation. They have designed a waste segregating machine that can efficiently segregate dry and wet waste to facilitate the recycling process.

3. Water conservation facilities available in Somaiya Vidyavihar University are

- Rain water harvesting
- Bore well
- Construction of tanks
- Waste water recycling
- Maintenance of water bodies and distribution system in the campus

4. Green campus initiatives include

UPI-based EV charging station: SVU students achieved a milestone by creating India's first UPI-based EV charging station, seamlessly integrated with apps like Google Pay and Paytm. This innovation eliminates the need for separate wallet top-ups or third-party apps, providing automatic refunds after each charging session. The station adheres to international standards, offering high-capacity (32A) efficient charging for a diverse range of EVs, particularly beneficial for longer-range models. This is University' collective vision for a greener, more connected future.

Restricted entry of automobiles:SVU has a policy allowing only the entry of vehicles with permission within the campus. Outside vehicles are not allowed inside campus at any cost, barring the exceptions of vehicles used for the transit of Divyang students, faculty and staff. All vehicles inside campus have a strict policy of not honking and not crossing the speed limit of 20 KMPH.

Use of Bicycles/ Battery powered vehicles:The campus hosts a battery-operated vehicle for intra-campus transits and is regularly used by faculties to move within the campus. The campus also has provisions for Cycles that can be rented and returned to their original cycle stand.

Pedestrian Friendly pathways: On every crossroad there are mirrors installed to alert vehicle drivers and pedestrians of each other's presence. Driveways are fitted with speed breakers at regular intervals, and parking of vehicles is ensured away from pedestrian commute areas to minimize pedestrian-vehicle contact.

Ban on use of Plastic: Canteens on the campus have now stopped using single-use plastics such as straws, plastic containers for parcels, or plastic glasses. Directives are given to housekeeping to pick up any plastic on campus with adequate facilities for disposal.

Landscaping- Open spaces: Open spaces at SVU are thoughtfully designed that integrate landscaping, pathways, and recreational spots.

7. Future Directions for Sustainability in Indian Higher Education

Emerging research suggests that the future of sustainability in Indian universities should focus on:

- **Interdisciplinary Sustainability Education:** Including sustainability in all subjects, not just environmental studies.
- **Technology-Driven Solutions:** Adoption of IoT-based smart energy grids, AI-driven waste management in universities.
- **Public-Private Partnerships (PPPs):** Collaborations between universities, industries, and government bodies to fund and implement large-scale sustainability projects.
- **Student-Led Green Initiatives:** Encouraging student participation in sustainability projects, eco-clubs, and community outreach programs to create long-term environmental impact.

8. Conclusion

By adopting eco-friendly policies, integrating sustainability into curricula and fostering community engagement, HEIs can create a lasting impact on environmental conservation. The paper highlights initiatives such as SATAT and Green Campus Programs for integrating sustainability into campus operations highlighting their role in environmental stewardship, policy advocacy, and sustainable campus development.

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**REFLECTIONS OF TEACHERS ON THE NATIONAL EDUCATION
POLICY 2020****Mr. Sunil Jagdish Kalekar***Assist. Professor,**Adhyapak Mahavidyalaya Aranyeshwar, Pune 9**sunilkalekar2005@gmail.com*

Abstract

The National Education Policy (NEP) 2020, introduced by the Government of India, aims to transform the country's education system through a holistic, multidisciplinary, and flexible approach. This study explores the reflections of teachers on NEP 2020, particularly focusing on its implementation challenges and impact on school education. A two-day national seminar was conducted, involving teachers, academicians, and education stakeholders, to discuss key aspects such as curriculum flexibility, vocational education, multilingual teaching, and digital integration. A survey of 120 participants revealed widespread support for the policy's emphasis on foundational literacy, critical thinking, and technology integration. However, concerns were noted regarding vocational education implementation and assessment reforms. The findings highlight the need for ongoing teacher training and infrastructural support for effective NEP 2020 execution. The study concludes that while NEP 2020 is largely welcomed, sustained efforts are required for its successful adoption in the Indian education system.

Keywords: National Education Policy 2020, NEP 2020, teacher reflections, curriculum reform, policy implementation.

Introduction:

The National Education Policy (NEP) 2020, introduced by the Government of India, is a comprehensive reform to transform the country's education system to meet global standards while preserving Indian values and traditions. Replacing the NEP 1986, this policy seeks to make education more holistic, multidisciplinary, and flexible, emphasizing critical thinking, creativity, and skill development.

Key highlights include a new 5+3+3+4 school structure, early childhood care and education, the integration of vocational training, and a push for multilingual education. At the higher education level, the policy advocates for a multidisciplinary approach, flexible curricula, and multiple entry-exit options. Additionally, it emphasizes technology-driven learning, teacher training, and a regulatory framework to ensure quality education.

With a strong focus on equity, inclusion, and digital transformation, NEP 2020 aims to position India as a global knowledge hub. However, challenges remain in its implementation,

particularly regarding infrastructure, funding, and teacher preparedness. Nevertheless, the policy is a progressive step toward modernizing India's education system.(Government of India, 2020)

NEP 2020 and Government Efforts for Its Implementation and Awareness

Government Efforts to Implement and Raise Awareness

To ensure effective implementation and public awareness, the government has taken several steps:

1. **NEP Awareness Campaigns:** Various awareness programs, workshops, and webinars have been conducted at national and state levels to educate teachers, students, and stakeholders about the policy.
2. **Teacher Training Initiatives:** Programs such as NISHTHA (National Initiative for School Heads' and Teachers' Holistic Advancement) have been expanded to train educators on NEP-aligned pedagogy and curriculum changes.
3. **Curriculum Reforms:** The National Curriculum Framework (NCF) is being revised to align with NEP 2020, ensuring competency-based learning, skill development, and multidisciplinary education.
4. **Digital Initiatives:** Platforms like DIKSHA, SWAYAM, and PM e-VIDYA have been strengthened to provide digital learning resources and online training for students and teachers.
5. **Multiple Entry-Exit System:** In higher education, reforms such as the Academic Bank of Credits (ABC) allow students to enter and exit degree programs flexibly.
6. **Multilingual Education Promotion:** The policy emphasizes regional languages in early education, and the government has introduced initiatives to develop educational content in multiple languages.
7. **Institutional Reforms:** The Higher Education Commission of India (HECI) is being set up to regulate and streamline higher education governance.
8. **Public Engagement:** The government has conducted extensive stakeholder consultations, including discussions with educators, parents, and students, to ensure smooth implementation.

The NEP 2020 is a long-term vision that requires sustained efforts, policy alignment, and infrastructural support. While progress has been made, challenges like teacher training, digital access, and funding remain key areas for improvement.(Ministry of Education, 2021)

The state of Maharashtra has undertaken several initiatives to implement and raise awareness about the **National Education Policy (NEP) 2020:**

1. **Formation of Task Forces and Committees:** Maharashtra established dedicated task forces, working groups, and committees comprising education experts, academicians, and administrators to guide and oversee NEP implementation. These bodies focus on areas such as curriculum development, teacher training, and technology integration.
 2. **Implementation in Educational Institutions:** The state-initiated NEP 2020 implementation in phases. In the initial phase, 144 autonomous educational institutions, including 87 general and
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57 professional institutes, began adopting the policy. This phased approach serves as a model for other colleges in the state.

3. **Public Engagement and Awareness Programs:** The Maharashtra higher education department launched public engagement and awareness programs to educate stakeholders about various aspects of NEP 2020. These initiatives involve the community and ensure a widespread understanding of the policy's objectives. (Indian Express, 2024)

4. **Governor's Advocacy for Collaborative Efforts:** In October 2024, the Governor of Maharashtra emphasized the importance of collaborative efforts among educational institutions for the successful implementation of NEP 2020. The Governor highlighted the policy's focus on multidisciplinary and holistic education, institutional autonomy, and quality research.

Through these concerted efforts, Maharashtra aims to effectively implement NEP 2020, transforming its educational landscape to be more inclusive, flexible, and aligned with contemporary needs. Along with government agencies like MSCERT, other educational institutes and universities are also taking initiatives to spread awareness among all stakeholders and teachers about NEP 2020. The Indian Institute of Education (IIE), Pune was founded by Prof. J. P. Naik (1907-1981), a humanist, freedom fighter, polymath, socialist, and educationist. He is recognized by UNESCO alongside Rabindranath Tagore and Mahatma Gandhi as three pioneering educationists in the twentieth century. The Indian Institute of Education (IIE), Pune hosted a significant two-day national seminar titled **“Education for Social Transformation: NEP 2020 Perspectives on School Education”**, on January 18th and 19th 2025. The National Institute of Educational Planning and Administration (NIEPA), New Delhi sponsored this seminar.

Title of Action Research: Reflections of Teachers on NEP 2020

Research Method: Survey

Objectives:

1. To orient teachers about NEP 2020
2. To discuss the issues related to implementation of NEP 2020
3. To gather information from practicing teachers about the present status of their training regarding NEP 2020

Population and Sample:

Population: All school teachers in the state of Maharashtra who teach in primary/ secondary or senior secondary schools affiliated with the SSC/CBSE/ ICSE board

Sample: 120 participants in the seminar.

Methodology:

A seminar of two days was conducted which constituted various sessions for teachers. These included:

- a. Structure and Flexibility of school curriculum
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- b. Uses of technology in School Education.
- c. Vocational Education& internship at school level
- d. Critical Thinking
- e. Experiential learning
- f. The changing role of teachers
- g. Multilingual Approach
- h. Holistic development
- i. Life skills and lifelong learning
- j. Nep and school curriculum
- k. Social Aspects of NEP regarding school education
- l. NEP 2020& Kothari Education Commission: Comparative perspective

All these sessions were interactive and engaged the participants throughout the sessions spread over two days. The seminar attracted a diverse audience of participants including Ph. D. Research Scholars, Teachers, Professors, Academicians Teacher-trainees, and Principals from B.Ed. and M.Ed. colleges. The sessions provided valuable insights into the transformative potential of NEP 2020 in reshaping school education. Through engaging in discussions with the experts, the participants gained a deeper understanding of how NEP 2020 could foster social transformation and holistic development in the Indian education system. Most importantly, the participants received strategies and solutions for implementation of the provisions of the National Education Policy in school education. A small survey was conducted towards the end of the seminar. The survey included 10 items which were graded on a 5-point rating scale.

Observations:

The data obtained from the survey was analysed using percentages as the statistical tool. The results of the survey are summarized below in tabular form.

Item no.	Item	Responses				
		SA	A	N	D	SD
1	Do you agree with the NEP 2020's emphasis on foundational literacy and numeracy in the early years of schooling?	49.2	47.5	2.5	0.8	-
2	Do you support the emphasis on mother tongue/regional languages as the medium of instruction in the early years?	50.8	39.2	6.7	3.3	-
3	Do you believe that the NEP 2020 will help to improve the quality of education in India?	45.8	48.3	4.2	1.7	-
4	How do you feel about the NEP 2020's focus on promoting critical thinking and problem-solving skills?	39.2	55	5	0.8	-

5	How do you feel about the introduction of vocational education from Class 6?	77.5	-	21.7	-	0.8
6	Do you support the emphasis on mother tongue/regional languages as the medium of instruction in the early years?	50	42.5	4.2	3.3	-
7	What are your thoughts on the proposed changes to the higher education system, including the establishment of multidisciplinary universities and the introduction of four-year undergraduate programs?	84.2	-	14.2	-	1.6
8	What are your thoughts on the proposed changes to the assessment system, including the reduction in the number of board exams and the introduction of formative assessments?	81.7	-	15.8	-	2.5
9	Do you support the NEP 2020's emphasis on the integration of technology in education?	50	47.5	2.5	-	-
10	Overall, do you think the NEP 2020 is a positive step for the future of education in India?	61.7	33.3	4.2	-	0.8

Conclusions:

1. Most of the respondents (96.7%) agree with the emphasis of NEP on foundational literacy and numeracy.
2. Most of the respondents (90%) agree with the emphasis on mother tongue/regional languages as the medium of instruction in the early years.
3. Most of the respondents (94.1%) believe that the NEP 2020 will help to improve the quality of education in India.
4. Most of the respondents (94.2%) have positive feelings about NEP 2020's focus on promoting critical thinking and problem-solving skills.
5. There was a mixed response about the introduction of vocational education from class VI. 77.5 % of respondents were positive about it whereas 21.7 % of respondents were concerned about its implementation. 0.8% of respondents had the feeling that it was not the right stage for the introduction of vocational subjects.
6. Most of the respondents (92.5%) emphasize mother tongue/regional languages as the medium of instruction in the early years.
7. 84.2 % of respondents felt that the establishment of multidisciplinary universities and the introduction of four-year undergraduate programs will promote interdisciplinary learning and research. 14.2 % of respondents needed more information about it. Whereas 14.2 % of respondents felt that it may lead to overcrowding and a decline in the quality of education.
8. 81.7 % of respondents were positive about reforms in evaluation and they were of the

- opinion that it will reduce exam stress and promote holistic learning. However, 2.5% of respondents thought that it may lead to a decline in academic standards.
9. Most of the respondents (97.5%) agreed to emphasize the integration of technology in education.
 10. Most of the respondents (95 %) thought that NEP 2020 was a positive step for the future of education in India.
 11. Most of the participants had positive views about NEP 2020 and seemed to welcome the changes in the education system in India.

The summary of qualitative feedback obtained from the participants is summarized below:

The participants appreciated the well-organized national seminar with varied and experienced resource persons dissecting all aspects of school education under NEP 2020 and offering strategies and solutions for better implementation of the provisions under NEP. The seminar themes, keynote speakers, and knowledge gained from speakers were acknowledged by them. The participant's expectations included more practical knowledge in implementing the NEP 2020; more focus on the multilingual approach and life-skill and life-long learning; and demand for frequent training programs for principals and teachers for effective implementation of NEP 2020 with a detailed worldview.

Conclusive Remarks

The National Education Policy (NEP) 2020 represents a significant shift in India's education system, aiming to make it more holistic, flexible, and inclusive. The reflections of teachers gathered through this study indicate a largely positive reception towards the policy's emphasis on foundational literacy, critical thinking, technology integration, and multilingual education. The majority of educators believe that NEP 2020 has the potential to enhance the quality of education and equip students with future-ready skills.

However, concerns remain regarding its practical implementation, particularly in areas such as vocational education, assessment reforms, and teacher training. The success of NEP 2020 depends on sustained government efforts, infrastructural support, and continuous professional development for educators. It is essential to address the challenges identified in this study to ensure the effective realization of NEP 2020's vision.

Overall, while the policy is a progressive step towards transforming education in India, its impact will be determined by collaborative efforts between policymakers, educators, and stakeholders. A strategic approach focusing on training, resource allocation, and awareness-building will be crucial in making NEP 2020 a success.

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YOGA EDUCATION AND NATIONAL EDUCATION POLICY 2020**Dr. Varsha Mane***Associate Professor,**Department of Education,**Chhatrapati Shivaji College, Satara, Maharashtra**varshamane@yahoo.com*

Abstract:-

Yoga is an ancient culture and Indian heritage. The importance of an education in the ancient art and science of Yoga are undeniable. The national education policy 2020 emphasizes on the development of creativity in students. It is intended to holistically develop every individual's personality along with student's ethical and constitutional values, scientific temper, and originality in Spirit. The national education policy 2020 stresses not only the development of cognitive capacities but also the development of foundation of competencies in each individual. The NEP 2020 aims to make physical education, yoga, mental health and sports accessible to the masses. The NEP 2020 encourages IKS courses, embedded in the curriculum for graduate students. The NEP 2020 also expects to include yoga Natural Therapy and the AYUSH system in the curriculum for Health Care Education. Yoga has become popular because of its strength in prevention and management of mini Lifestyle related disorders including psychological and psychosomatic disorders. This paper analyses the impact of NEP 2020 in facilitating and promoting yoga in the educational institutions of India.

Keywords: NEP 2020, IKS, AYUSH, Yoga Education**Introduction:**

Yoga education is a Holistic approach to learning that combines physical, mental and spiritual practices. It aims to help students develop a healthy lifestyle and higher level of consciousness. Yoga education can help students improve their physical, mental and emotional health which can lead to better academic performance. Yoga can help with stress reduction, balancing hormones and improving fertility. Yoga education can also help develop knowledge, attitude and for health and Socio economic development. Yoga education integrates the mind, body, and spirit through meditation, breathing exercises, and poses. It can help students develop self-awareness. Yoga education can also help students manage stress and anxiety. The most recent and significant reform in this trajectory is the National Education Policy (NEP) 2020, which aims to overhaul the Indian education system, making it more holistic, flexible, multidisciplinary, and aligned with the needs of the 21st century. The National Education Policy (NEP) 2020, of India aims that the entire education system is to be reconfigured to support and foster learning, so that all

of the critical targets and goals (SDGs) of the 2030 Agenda for Sustainable Development can be achieved. The development of various Yogic traditions in ancient India, and contemplates the modern day utility of Yoga which is an irreplaceable gift of ancient India. Holistic development of personality chiefly means and signifies the development of inclusiveness, integrity, and self-sufficiency in a human being's personality.

Objectives:

The purpose of this research paper is to study the new National Educational Policy proposed in 2020. It is also to highlight the idea of 'Yoga' in the Indian Knowledge System proposed in the new educational policy.

Research Methodology-

This research is descriptive. Secondary data was collected from various websites, magazines, journals, other publications, etc

Indian Knowledge System and Yoga Education:-

The Indian Knowledge System (IKS) includes yoga, and the National Education Policy (NEP 2020) encourages its inclusion in schools and higher education. Yoga is a core practice of the IKS, and it can help students develop a holistic understanding of the world. Yoga education can supplement school and university education.

It can prepare the students physically and mentally for the integration of their physical, mental and spiritual faculties so that the students can become healthier and more integrated members of the society and of the nation. NEP's emphasis on experiential learning, critical thinking, and ethical values finds a natural ally in yoga education. Yoga's principles of mindfulness, discipline, and self-awareness resonate with the policy's goal of creating well-rounded individuals who can contribute positively to society.

Physical health

Improved motor ability- Yoga poses can help improve motor ability.

Improved stamina -Yoga techniques can help students improve their stamina.

Mental Health

Improve memory-Yoga can improve memory function in children.

Improved concentration-Yoga breathing exercises and meditation techniques can help students improve their concentration.

Emotional health

Improved self control- yoga can help students improve their self control.

Improved confidence- yoga can help students feel a sense of personal development and strengthening.

Reduce stress and anxiety- yoga can help students reduce their stress and anxiety levels.

Here's how Yoga is incorporated within the policy:

1. Yoga in Holistic Education

NEP 2020 envisions a **holistic and multidisciplinary approach** to education, where physical health, mental well-being, and moral values are given equal importance along with academics. Yoga plays a crucial role in achieving this.

2. Yoga in School Education

- **Integrated Curriculum:** Yoga is encouraged as part of **Physical Education** from early childhood education (ECCE) to higher secondary levels.
- **Health & Wellness:** Schools are encouraged to incorporate Yoga for students' **physical fitness, mental relaxation, and emotional stability**.
- **Experiential Learning:** Yoga, meditation, and mindfulness activities are promoted as part of experiential learning to develop **concentration, stress management, and self-discipline**.

3. Yoga in Higher Education

- **Holistic Development:** Higher education institutions (HEIs) are encouraged to offer Yoga as an elective subject or co-curricular activity.
- **Research & Training:** Specialized courses, diplomas, and degree programs in Yoga education are promoted to enhance research and professional expertise in this field.
- **Interdisciplinary Approach:** Yoga is linked with subjects like psychology, sports science, and philosophy to develop a multidisciplinary educational approach.

4. Teacher Training & Yoga

- **Yoga in Teacher Training:** NEP 2020 emphasizes including Yoga training in **teacher education programs** to equip educators with skills to teach Yoga effectively.
- **Capacity Building:** Workshops, seminars, and certificate courses in Yoga are recommended for teachers' continuous professional development.

5. Promotion of Indian Knowledge Systems (IKS)

- Yoga is recognized as an essential part of India's rich cultural and philosophical heritage.
- The policy promotes **traditional knowledge systems**, including Yoga, Ayurveda, and meditation, for global awareness and academic research.

6. Digital & Online Learning in Yoga

- The use of **technology and online platforms** for Yoga education is encouraged, ensuring accessibility to students across India.
- E-learning modules and resources on Yoga are made available through digital platforms like **DIKSHA, SWAYAM, and NIOS**.

In this direction, NCERT highlights the success of the national Yoga Olympiad 2024, on the theme, "Yoga for Self and Society" organized under the aegis of the ministry of education to

inspire students of all ages to express their passion for yoga. The event drew participation from 21 states, 6 National Bodies and 4 Regional Institutes of Education. Participants displayed their powers in Yoga and expressed their enthusiasm through creative activities such as messages, songs, poems and artwork, inspiring students of all ages to embrace Yoga as part of their daily routine. Aligned with NEP 2020 and National Curriculum Framework for school education (NCF-SE2023), the Olympiad showcased yoga as part of the Indian Knowledge System (IKS) for Holistic development.

NCERT has recently introduced new text books, 'Khel Yoga' for grade 3 and 'KhelYatra' for grade 6 making Yoga a core component of physical education and well being.

Conclusion:-

NEP 2020 integrates Yoga as a **core element of education**, emphasizing its role in **physical well-being, emotional stability, and cultural heritage**. By incorporating Yoga at all levels, the policy aims to create a **stress-free, disciplined, and balanced learning environment** for students. For successful implementation of the National Education Policy 2020 a pragmatic vision and rational approach are the key prerequisites. The education system of India is improving day by day. To advance this improvement, educational policymakers need to concentrate on the establishment of digital frameworks of elementary, secondary, higher education so that education becomes accessible to every individual.

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QUALITY ANALYSIS OF DIETARY SUPPLEMENT CONTAINING *CURCUMA LONGA* AND *PIPER NIGRUM*

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Abstract

The objective of the present work was to conduct a systematic standardization of the dietary supplement containing Curcuma longa and Piper nigrum. The dietary supplement was available in the form of capsule and was evaluated for organoleptic characteristics (color, odor, size and shape of the capsule), physicochemical evaluation (weight variation, loss on drying, extractive value), phytochemical screening, toxicological parameters and dissolution study. The average weight and locking length of capsules were 0.5186 mg and 0.233 inches, respectively. Alcohol-soluble value, water-soluble extractive value and loss on drying were found to be 23.3680 %, 20.3820 % and 1.8310 %, respectively. The sample passed the test for heavy metals. % Release of curcumin after 60 min was found to be 79.9757 %.

Keywords: Black Pepper, *Curcuma longa*, Dietary supplement, *Piper nigrum*, Standardization, Turmeric

Abbreviations

cfu: Colony Forming Unit, **ICP-OES:** Inductively Coupled Plasma - Optical Emission Spectrometry, **HCl:** Hydrochloric acid, **HNO₃:** Nitric acid, **HPLC:** High Performance Liquid Chromatography, **LOD:** Loss On Drying, **Rt:** Retention Time, **SCDA:** Soybean Casein Digest Agar, **SDA:** Sabouraud Dextrose Agar

Introduction

Dietary supplements which are also known as nutritional supplements are the products for ingestion which contains the “dietary ingredients” to increase their nutritive value. A dietary ingredient can be one or combinations of mineral, vitamin, herb, amino acid, concentrate, metabolite, constituent or extract¹. Dietary supplements are available in the form of various formulations such as tablets, capsules, pills or liquid orals. Dietary supplements are classified as per their composition such as dietary supplements containing vitamins and minerals, plant components and extracts, unsaturated fatty acids, dietary fiber, probiotics and prebiotics².

The market size of dietary supplements is blooming and it is estimated to reach \$180 billion by end of 2020. The major issues with dietary supplements are that there are no comprehensive quality control test procedures³. New approaches are mandatory which can assure quality and safety these products.

Curcuma longa (*C. longa*) has been used since ancient time because of its various medicinal properties. Curcumin is major pigment which is responsible for its potential medicinal values. The major drawback with curcumin is its limited bioavailability. Various compounds from herbal origin have been utilized with *C. longa* products to enhance bioavailability. Piperine from *Piper nigrum* (*P. nigrum*) is most commonly used as bioenhancer⁴.

As per the literature survey, no work has been done on the systematic standardization of dietary supplement containing *C. longa* and *P. nigrum*. This paper describes evaluation of quality control parameters for commercial dietary supplement containing *C. longa* and *P. nigrum* as per United States Pharmacopoeia.

Materials And Methods

Materials

Commercial dietary supplement containing *C. longa* and *P. nigrum* in capsule dosage form was obtained from local pharmacy of Silvassa, India.

Methods

Organoleptic evaluation

The procured dietary capsules were initially evaluated for their organoleptic properties such as size, shape and color of the capsule. The capsule content was also evaluated for color and odor.

Weight variation⁵

Twenty capsules were taken, weight of individual capsule was determined and the mean weight was calculated. The test is passed if individual weights are within 90 %- 110 %. If these limits are not met, then the identity of 20 capsules was conserved. The contents of each capsule were removed and weight of each empty capsule was determined. Total weight of capsule contents was calculated by deducting the weight of empty shell from the total weight. The mean net content was calculated. The difference between each individual net content and the mean net content was determined. The capsule pass the test if (i) not more than two of the differences are more than 10 % of the mean net content and (ii) no difference is more than 25 %.

If two to six capsules deviate from the average between 10 %- 25 %, the net contents of additional 40 capsules were determined. The average content of all 60 capsules was determined. From the new average the 60 deviations were determined and the requirements are met if (i) not more than six of the 60 capsules have the difference greater than 10 % of the mean net content and (ii) no difference exceed 25 %.

Locking length

For locking length, 20 capsules were taken and the locking length of the capsule was checked one by one in inches using calibrated Vernier Caliper.

Loss on drying (LOD)^{6,7}

Accurately 1.5 g of capsule powder was weighed in a dried weighing bottle. The weight of capsule content with weighing bottle was determined. The weighed bottle was kept in oven at 105 °C for two h and was cooled and weight was again determined with the weighing bottle. The loss on drying was determined by the following formula:

$\% \text{ LOD} = (\text{Initial weight of capsule content} - \text{Final weight of capsule content after drying}) / \text{Initial weight of capsule content} \times 100$

Determination of alcohol soluble extractive value^{6,7}

Accurately weighed 2 g of capsule powder was taken to 250 mL conical flask. It was macerated with 100 mL alcohol for 24 h with recurrent shaking for the first 4 h and then was kept for the next 18 h. After 24 h, the solution was filtered. Accurately measured 25 mL of the above filtered solution was poured in previously dried and weighed porcelain dish and kept on water bath for dryness. After drying, the porcelain dish was allowed to cool and was immediately weighed. The % w/w of alcohol soluble extractive value was calculated.

Determination of water-soluble extractive value^{6,7}

The process for water soluble extractive value was preceded as alcohol-soluble extractive value. Instead of alcohol, chloroform: water (1: 40, V/V) was used.

Phytochemical screening^{6,7}

The dietary supplement under study was subjected to phytochemical screening using various tests for evaluation of presence or absence of various phytoconstituents such as carbohydrates, proteins, tannins, steroids, flavonoids, etc.

Evaluation of heavy metals

The dietary supplement was evaluated for heavy metals like mercury (Hg), chromium (Cr), cadmium (Cd), arsenic (As) and lead (Pb) by Inductively coupled plasma-optical emission spectrometry (ICP-OES) with the help of argon and nitrogen as a plasma (flow rate of 15 L min⁻¹) and as auxiliary gas (flow rate of 0.2 mL min⁻¹), respectively. Nebulizer was set at 0.8 mL min⁻¹. Power supply of radio frequency was maintained at 1300 watts. Accurately weighed 1 g of the capsule powder was transferred in 50 mL volumetric flask and 3 mL of concentrated HCl and 1 mL of concentrated HNO₃ were added. The solution was digested at 80 °C for half hour. The solution was cooled to room temperature and the volume was made up to 50 mL with Milli Q water. The standard solutions of Pb (220.353 nm), As (228.812 nm), Cd (228.802 nm), Cr (267.716 nm) and Hg (253.625 nm) and the sample solution were subjected to atomic emission spectroscopy. A linear curve was obtained by keeping the intensity on Y-axis against the

concentration of the standard metalsolutions on X-axis. Regression equation was utilized to calculate the concentration of all heavy metals in given sample.

Microbiological Evaluation⁵

Preparation of solution A

Accurately weighed 5 g of sample was taken and 40 mL of fluid soybean casein digest medium was added. Accurately measured 10 mL of phosphate buffer (pH 7.2) was added to make the final volume of 50 mL (Solution A).

Plate count method for the detection of bacteria

(a) From solution A, accurately measured 0.1 mL volume was pepperedand diluted with phosphate buffer pH 7.2 up to 10 mL. (10^2) (b) From the above solution (a), 0.1 mL volume was taken and diluted up to 10 mL with phosphate buffer pH 7.2. (10^4) (c) From the above solution (b), 0.1 mL volume was pepperedand diluted up to 10 mL with phosphate buffer pH 7.2 (10^6) In four sterile test tubes, 20 mL of SCDA medium was taken and sterilized in the autoclave. After sterilization, 1 mL each of (b) and (c) was aseptically transferred in the above sterilized test tubes. Each individual test tubes were mixed in between the two palms and the solutions were poured in sterilized petri plates. The petri plates were incubated for 48 – 72 h at 45 °C temperature and observed for the microbial growth.

Plate count method for the detection of yeast and moulds

(a) From solution A, accurately measured 0.1 mL of the solution was taken and diluted up to 10 mL of phosphate buffer pH 7.2. (10^2) (b) From the above solution (a), 0.1 mL volume was taken and diluted up to 10 mL with phosphate buffer pH 7.2. (10^4) (c) From the above solution (b), 0.1 mL volume was taken and diluted up to 10 mL with phosphate buffer pH 7.2. (10^6) The remaining steps were repeated as given for the plate method for bacteria except SDA medium was used instead of SCDA medium. The petri plates were incubated for 5 – 7 days at 20 – 25 °C.

Detection of Escherichia coli (E. coli)

For detection of *E. coli*, initially solution A was incubated at 30 – 35 °C for 24 h. From the above solution, 1mL was aseptically transferred to 10 mL of MacConkey agar and was incubated for 42 – 44 °C for 24 h. A loopful of incubated media was taken and using streak plate techniques the culture was aseptically streaked on the sterile plates containing MacConkey agar medium. The plates were incubated in an invert position for 24 h at 37 °C. After 24 h, the plates were examined for the colonies if any.

Detection of Salmonella species

For detection of *Salmonella*, solution A was incubated at 30 – 35 °C for 24 h. A loopful of incubated media was taken and using streak plate technique the culture was aseptically streaked on the sterile plates containing Bismuth sulphite agar medium. The plates were incubated in an invert position for 24 h at 37 °C. After 24 h, the plates were examined for the colonies if any.

Dissolution study^{5,8}

The dietary supplement was subjected to dissolution study to check the release of curcumin after specified time period. Dissolution study was carried out on six capsules as per the procedure given in United States Pharmacopoeia using apparatus type – II (Paddle type). In each dissolution vessel, 900 mL of 1 % sodium lauryl sulphate solution (dissolution medium) was poured. The temperature of dissolution medium was set at 37.5 °C, rpm was set at 100. Single capsule was placed in each 6 vessels. The study was carried out for 60 min. After 60 min, 10 mL of the solution was withdrawn from each of the vessel. From this solution, 2 mL of the solution was taken in 10 mL volumetric flask and diluted up to 10 mL with methanol. This solution was filtered using 0.2 µ nylon filter. From this filtered solution, 1 mL of the solution was taken in 10 mL volumetric flask and diluted up to 10 mL using methanol. This resulting solution was analysed by HPLC using mobile phase 0.1 % orthophosphoric acid: acetonitrile: tetrahydrofuran in the ratio of 52.7: 37.3: 10, V/V/V at the flow rate of 1 mL min⁻¹. Chromatographic monitoring was carried out at 361 nm. The % release was calculated and the content of curcumin should not be less than 75 %.

Results And Discussion**Determination of organoleptic and physicochemical parameters**

The selected dietary supplement is available as capsule dosage form. They were initially evaluated for their organoleptic characteristics such as color and odor; physicochemical properties such as extractive value and loss on drying. The results of organoleptic and physicochemical evaluation are depicted in Table I.

Table I: Evaluation of organoleptic characteristics and physicochemical parameters of dietary supplements

Parameter	Observation - I	Observation – II	Observation – III	Mean ± SD
Color	Yellowish–Orange	Yellowish – Orange	Yellowish – Orange	Yellowish – Orange
Odor	Aromatic	Aromatic	Aromatic	Aromatic
Alcohol–Soluble Extractive Value (%)	23.3680	23.3680	23.3700	23.3680 ± 0.0011
Water–Soluble Extractive Value (%)	20.3840	20.3800	20.3830	20.3820 ± 0.0021
Loss on Drying (%)	1.8900	1.7911	1.812	1.8310 ± 0.0521

Weight variation and locking length

The capsules were also evaluated for weight variation and locking length. Table II shows the results of weight variation of the capsules.

Table II: Results of weight variation and locking length

Capsule No.	Weight of capsule (g)	Locking length (inches)	Capsule No.	Weight of capsule (g)	Locking length (inches)
1	0.5129	0.259	11	0.5069	0.192
2	0.5534	0.177	12	0.5331	0.228
3	0.4992	0.234	13	0.4897	0.259
4	0.5604	0.228	14	0.5579	0.177
5	0.5270	0.255	15	0.5672	0.234
6	0.5012	0.249	16	0.5666	0.255
7	0.5029	0.243	17	0.4998	0.249
8	0.4982	0.192	18	0.5128	0.243
9	0.5498	0.258	19	0.4711	0.258
10	0.4870	0.240	20	0.4753	0.240
Average weight: 0.5186 g			Average locking length: 0.233 in		

The 10 % of the average was 0.0518 mg, upper limit of 10 % was 0.5704mg and the lower limit of 10 % was 0.4668mg. As none of the weight of 20 capsules were out of limit, the given sample of capsules passes the test for weight variation as per the United State Pharmacopoeia. The average locking length of given capsules was 0.233 inches.

Phytochemistry screening

The dietary supplement was evaluated for the presence of constituents such as alkaloids, glycosides, proteins, flavonoids, steroids and carbohydrates. It revealed the presence of proteins as per lead acetate test. The protein test using copper sulphate and ammonium sulphate did not show positive results.

Determination of heavy metals

The commercial dietary supplement containing were analyzed for heavy metals content by ICP-OES. The dietary supplement fell under the permissible levels of heavy metals as given in Table III.

Table III: Results of heavy metal analysis of dietary supplement

Metal	Reference value ($\mu\text{g mL}^{-1}$)	Experimental value ($\mu\text{g mL}^{-1}$)
Mercury (Hg)	1.5	Nil
Lead (Pb)	0.5	Nil
Arsenic (As)	1.5	Nil
Cadmium (Cd)	0.5	Nil
Chromium (Cr)	-	1.3970

Determination of total aerobic microbes by plate count method

After 48 h of incubation, colonies were counted. The specification for the total aerobic microbes by plate count method in the pharmacopeias is that the colonies do not exceed 10^4 cfu g⁻¹. During the experimental study, it was observed that in 10^4 dilution, 74×10^4 cfu g⁻¹ were observed and in 10^6 dilution, 29×10^6 cfu g⁻¹ (Fig.1(a)) were observed which means that it did not comply with the pharmacopeial limits.

Determination of yeasts and moulds

After 5 days of incubation, colonies were counted for yeast and moulds. The specification for the yeasts and moulds in the pharmacopeia is that the combined yeasts and moulds count does not exceed 10^3 cfu g⁻¹ and during the experimental study, we observed that in 10^4 dilution, 86×10^4 cfu g⁻¹ were observed and in 10^6 dilution, 137×10^6 cfu g⁻¹ (Fig.1(b)) were observed which means that it did not comply with the pharmacopeial limits.

Detection of *E. coli*

After 24 h of incubation, both the petriplates were examined for the growth of colonies. None of the petriplates showed the growth of colonies (Fig.1(c)). Hence, it is concluded that *E. coli* was absent in given sample and complies with the test given in the pharmacopeia.

Detection of *Salmonella* species

After 24 h of incubation of both the petriplates, the plates of bismuth sulphite were examined for the growth of colonies. None of the two petriplates showed growth of the colonies (Fig.1(d)). Hence, it was concluded that *Salmonella* species were absent in sample and complies with the test given in the pharmacopeia.

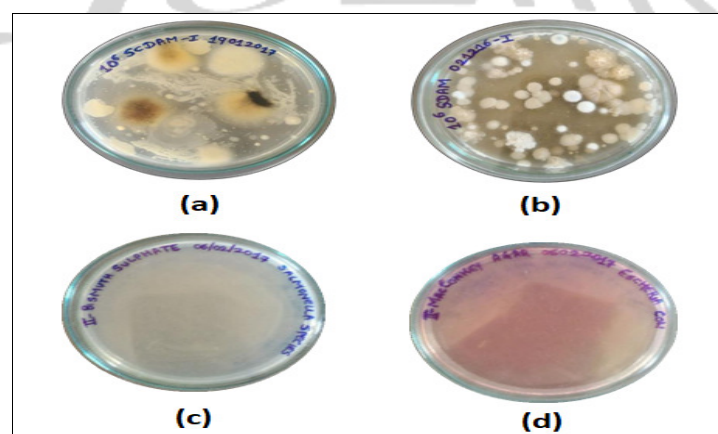


Fig. 1: Image of microbial evaluation of dietary supplement

Dissolution

The dissolution study was carried out to check % release of curcumin in given media after 60 min. The results of the dissolution studies are given in Table IV.

Table IV: Results of dissolution studies

Jar No.	Rt (min)	Area	$\mu\text{g mL}^{-1}$	$\mu\text{g mL}^{-1}$	$\text{mg}900\text{ mL}^{-1}$	$\text{g }900\text{mL}^{-1}$	% Release
1.	9.730	7019.63	1.8349	0.09174	16.5149	0.0165	79.9757
2.	9.683	6216.31					
3.	9.642	7500.55					
4.	9.598	6205.27					
5.	9.605	6518.74					
6.	9.638	5203.02					
Average		6443.920	1.8349	0.09174	16.5149	0.0165	79.9757

The % release of curcumin after 60 min was found to be 79.9757 %. The pharmacopeial limit for the dissolution study is the % release of curcumin after 60 min should not be less than 75 %. Hence, the given sample of capsules passed the dissolution test as per the United States Pharmacopeia.

Conclusion : Commercial dietary supplement containing *C. longa* and *P. nigrum* were successfully evaluated for various quality control parameters. All parameters were as per standards except microbial limits.

Acknowledgment : None

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BRIDGING INDIGENOUS KNOWLEDGE SYSTEMS AND YOGA: A HOLISTIC APPROACH TO CONSCIOUSNESS AND MENTAL WELL-BEING

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Abstract

Indigenous Knowledge Systems (IKS) and yoga share a holistic approach to mental well-being, consciousness, and emotional resilience. This study examines the integration of these ancient traditions, highlighting their interconnected principles and their potential to enhance psychological health. By exploring mindfulness, breath work, and meditative practices, the research identifies common therapeutic elements that support cognitive clarity and emotional balance. A comparative analysis of IKS and yoga reveals their role in fostering self-awareness, stress management, and overall well-being. Furthermore, the study discusses the relevance of incorporating these practices into contemporary mental health frameworks, promoting culturally inclusive and sustainable healing methodologies. Through qualitative insights and case studies, this research underscores the transformative impact of merging indigenous wisdom with yogic principles to support consciousness development, inner harmony, and holistic mental health.

Keywords: Indigenous Knowledge Systems (IKS), Yoga, Consciousness, Mental Well-being, Holistic Healing, Mindfulness, Breath work etc.

Mental well-being, emotional resilience, and consciousness development have been integral to traditional healing systems across cultures. Indigenous Knowledge Systems (IKS) and yoga, both ancient traditions, offer holistic approaches that emphasize the interconnectedness of mind, body, and spirit. While originating from distinct cultural backgrounds, these systems share fundamental principles that promote psychological balance and self-awareness.

This study explores the integration of IKS and yoga, examining their therapeutic practices, including mindfulness, breath work, and meditation, which have been instrumental in enhancing cognitive clarity and emotional stability. Through a comparative analysis, the research highlights the role of these traditions in stress management, self-reflection, and personal transformation. Furthermore, it discusses the importance of incorporating these approaches into contemporary mental health frameworks, fostering culturally inclusive and sustainable healing methodologies.

By drawing on qualitative insights and case studies, this study underscores the transformative potential of merging indigenous wisdom with yogic principles. The findings contribute to a broader understanding of holistic mental health, offering valuable perspectives on integrating traditional knowledge into modern psychological well-being practices. Indigenous Knowledge Systems (IKS) and yoga, though rooted in different cultural traditions, share a deep commitment to holistic well-being, integrating mind, body, and spirit. Both emphasize the interconnectedness of human existence with nature and promote practices that enhance mental clarity, emotional resilience, and overall consciousness.

IKS encompasses a wealth of traditional wisdom that indigenous communities have developed over generations. These knowledge systems include healing practices, rituals, storytelling, meditation, and community-based approaches to well-being. Similarly, yoga, an ancient Indian discipline, incorporates physical postures (asanas), breathing techniques (pranayama), and meditation (dhyana) to foster mental balance. Both systems recognize that true mental health goes beyond the absence of illness and involves a state of inner harmony.

Enhancing Consciousness

A fundamental principle in both IKS and yoga is the expansion of consciousness. Indigenous traditions often involve practices such as vision quests, trance states, and deep ecological awareness, which encourage individuals to connect with a higher state of being. Yoga, through meditation and mindfulness, cultivates self-awareness, enabling practitioners to transcend distractions and achieve deeper states of consciousness. The focus on self-reflection in both traditions leads to enhanced cognitive clarity and spiritual growth.

Building Emotional Resilience

Emotional resilience is another shared focus of IKS and yoga. Many indigenous practices involve rituals, ceremonies, and communal activities that help individuals cope with grief, trauma, and life challenges. The emphasis on ancestral wisdom and storytelling provides a sense of identity and strength. Likewise, yoga fosters emotional stability by encouraging mindfulness and self-regulation through breathwork and meditation. Scientific studies support the role of yoga in reducing stress, anxiety, and emotional distress, reinforcing its effectiveness in promoting resilience.

Both Indigenous Knowledge Systems and yoga advocate for a balanced life that aligns with natural rhythms and inner wisdom. By integrating traditional knowledge with modern mental health practices, these holistic approaches offer profound insights into achieving well-being, heightened consciousness, and emotional strength. In a world facing increasing stress and disconnection, embracing these time-tested traditions can provide valuable tools for cultivating inner peace and resilience.

The integration of Indigenous Knowledge Systems (IKS) and yoga provides a comprehensive approach to mental well-being, rooted in ancient wisdom and holistic healing. Both traditions emphasize the mind-body connection, recognizing the profound impact of spiritual and emotional balance on psychological health. By examining their interconnected principles, this study explores how mindfulness, breathwork, and meditative practices serve as common therapeutic elements that foster self-awareness, cognitive clarity, and emotional resilience. The synthesis of these ancient traditions not only highlights their relevance in stress management and mental equilibrium but also demonstrates their potential to enhance contemporary psychological well-being. Through a comparative analysis, this research underscores the value of integrating indigenous and yogic wisdom into modern healing frameworks, offering culturally inclusive and sustainable methods for mental health care.

By exploring mindfulness, breathwork, and meditative practices, this research identifies key therapeutic elements that contribute to cognitive clarity and emotional balance. Mindfulness, a practice deeply rooted in both Indigenous Knowledge Systems (IKS) and yoga, fosters present-moment awareness, allowing individuals to cultivate self-reflection and reduce mental distractions. This heightened awareness enhances focus, decision-making, and emotional regulation.

Breathwork, another shared practice, plays a crucial role in regulating the nervous system. Traditional indigenous healing techniques incorporate rhythmic breathing patterns to restore balance and promote relaxation, while yogic pranayama techniques emphasize controlled breathing to enhance oxygen flow, reduce stress, and stabilize emotions. Both traditions acknowledge the breath as a bridge between the mind and body, making it a powerful tool for psychological well-being.

Meditative practices in IKS and yoga serve as foundational methods for inner peace and self-exploration. Whether through indigenous rituals, guided visualizations, or yogic meditation (dhyana), these practices promote a deep sense of tranquillity, resilience, and heightened consciousness. By calming the mind and fostering emotional stability, meditation helps individuals navigate stress, anxiety, and trauma with greater ease.

Through the integration of these time-tested techniques, this research highlights their collective role in supporting mental clarity and emotional well-being. Their application in modern psychological frameworks provides a holistic and culturally inclusive approach to mental health, demonstrating the enduring relevance of these ancient traditions in fostering inner harmony.

A comparative analysis of Indigenous Knowledge Systems (IKS) and yoga reveals their profound role in fostering self-awareness, stress management, and overall well-being. Both traditions emphasize the deep connection between the mind, body, and environment, offering holistic approaches to mental and emotional health.

Self-awareness is a key principle in both IKS and yoga, developed through practices such as mindfulness, meditation, and spiritual rituals. Indigenous traditions often involve storytelling, vision quests, and ceremonial practices that encourage introspection and personal growth. Similarly, yoga integrates meditation (dhyana) and self-inquiry (svadhyaya) to cultivate inner awareness, helping individuals gain clarity and emotional intelligence.

Stress management is another crucial aspect where IKS and yoga align. Many indigenous communities use rhythmic breathing, nature-based healing, and communal support systems to cope with stress and restore balance. In yoga, pranayama (breath control) and asanas (physical postures) help regulate the nervous system, reduce cortisol levels, and enhance relaxation. Both approaches recognize the importance of harmonizing internal energy to maintain psychological well-being. Furthermore, overall well-being in these traditions is deeply rooted in maintaining equilibrium between physical, mental, and spiritual health. Indigenous healing emphasizes the interconnectedness of individuals with their communities and nature, while yoga promotes balance through ethical living (yamas and niyamas), physical discipline, and meditative awareness. Both systems encourage holistic wellness by fostering resilience, emotional stability, and a deeper sense of purpose.

By analysing the shared principles of IKS and yoga, this study highlights their effectiveness in promoting self-awareness, managing stress, and enhancing overall well-being. Their integration into contemporary mental health practices can offer sustainable, culturally inclusive approaches to holistic healing.

This study highlights the importance of integrating Indigenous Knowledge Systems (IKS) and yoga into modern mental health frameworks to promote culturally inclusive and sustainable healing approaches. As awareness grows around holistic well-being, these ancient traditions offer valuable tools that complement conventional psychological interventions, fostering emotional resilience and overall mental health.

IKS and yoga emphasize natural, community-centred, and spiritually enriching healing methods. Indigenous traditions incorporate storytelling, nature-based therapies, and communal rituals that strengthen social bonds and provide emotional support. Similarly, yoga promotes mindfulness, breath work, and meditation to enhance self-awareness, reduce stress, and restore inner balance. Incorporating these elements into contemporary mental health practices can provide alternative and complementary strategies that address diverse psychological needs.

Cultural inclusivity in mental health care is crucial for ensuring accessibility and relevance to different communities. Many mainstream psychological models are rooted in Western perspectives, which may not fully align with indigenous and non-Western worldviews. By integrating IKS and yoga, mental health frameworks can become more adaptable, incorporating diverse cultural perspectives that enhance their effectiveness and acceptance. Sustainability is

another significant advantage of these practices. Unlike pharmaceutical interventions that may involve long-term dependencies, IKS and yoga provide lifelong tools for self-care and emotional regulation. Breath work, meditation, and traditional healing techniques are cost-effective, adaptable, and environmentally sustainable, making them practical for widespread use in mental health care. By recognizing the value of these traditional knowledge systems, modern mental health frameworks can evolve into more holistic and inclusive models. This study emphasizes the transformative potential of integrating indigenous wisdom and yogic principles to foster resilience, psychological well-being, and a deeper sense of inner harmony. Through qualitative insights and case studies, this research highlights the transformative impact of integrating Indigenous Knowledge Systems (IKS) with yogic principles in fostering consciousness development, inner harmony, and holistic mental health. By examining real-life applications of these ancient traditions, the study illustrates how their combined practices promote self-awareness, emotional resilience, and psychological well-being.

Qualitative data from diverse communities practicing indigenous healing methods and yoga reveal a shared emphasis on mindfulness, breath work, and spiritual connection. Case studies demonstrate that individuals who engage in these practices experience enhanced mental clarity, reduced stress, and improved emotional balance. Indigenous traditions, such as ceremonial rituals, storytelling, and nature-based healing, cultivate a deep sense of identity and interconnectedness. Similarly, yogic practices, including meditation, pranayama, and asanas, provide tools for self-regulation and inner peace.

The integration of these wisdom traditions offers a comprehensive approach to mental health that extends beyond symptom management. By addressing the root causes of stress and emotional distress, IKS and yoga empower individuals with sustainable coping mechanisms that foster long-term psychological well-being. The study also underscores the relevance of incorporating these holistic practices into contemporary therapeutic settings, offering culturally sensitive and inclusive healing approaches. By merging indigenous wisdom with yogic principles, this research affirms their profound impact on consciousness development, emotional equilibrium, and overall mental health. The findings advocate for a broader recognition of traditional knowledge systems as valuable resources in fostering well-being and resilience in today's world.

Conclusion

The integration of Indigenous Knowledge Systems (IKS) and yoga presents a comprehensive and holistic approach to mental well-being, consciousness development, and emotional resilience. Both traditions emphasize the deep connection between the mind, body, and spirit, offering natural and sustainable healing practices that promote self-awareness, balance, and inner harmony. Through mindfulness, breathwork, and meditation, these systems provide effective

therapeutic techniques that enhance cognitive clarity, regulate emotions, and support overall psychological health.

A comparative analysis highlights the shared principles of IKS and yoga in fostering self-reflection, stress management, and emotional stability. Their inclusion in contemporary mental health frameworks ensures a more inclusive and culturally relevant approach to well-being. By integrating these time-tested practices, modern mental health care can become more adaptable and accessible, addressing diverse psychological needs in a holistic manner. Additionally, the sustainability of these approaches makes them valuable long-term tools for mental resilience and self-care.

Through qualitative insights and case studies, this research underscores the transformative potential of blending indigenous wisdom with yogic principles. The findings emphasize the importance of recognizing and incorporating these ancient traditions into mainstream mental health practices to create a balanced and effective healing framework. By embracing these holistic methodologies, individuals can cultivate lasting inner peace, emotional strength, and a deeper sense of well-being, ultimately enhancing the quality of mental health care in today's world.

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AN ARTICLE ON SALES AND DISTRIBUTION MANAGEMENT**Dr. Rajesh Kumar Pandey***Associate Professor,**SSR IMR, Silvassa,**rajeshpandey18@gmail.com*

Abstract:

Sales and distribution management is a primary function of Organisations in Modern days. It is considered to be essential factor towards business success. There are multifaceted factors influencing sales and distribution management within the Organisations. The complexity of the Indian market includes diverse consumer demographic, technological advancement, and regulatory framework. Meeting this diversity requires intense involvement in the market. This study on Sales and Distribution Management is a descriptive study conducted extremely with the help of secondary data. The Researcher aims to understand the significance of Sales and Distribution Management at Organisations. The study further aims to identify the factors influencing the Sales and Distribution Management at Organisations. The study encompasses the domain of Sales & Distribution Management in general across industries. Hence as the study is generalized, the inferences are indicative in nature rather exhaustive.

Key Words: Sales Management, Distribution Management, Marketing Management, SDM

Introduction:

Sales and distribution management plays a vital role in the success of businesses. In the Indian context, this dynamic field faces unique challenges and opportunities shaped by a rapidly evolving market landscape, diverse consumer preferences, and the complexities of a vast geographic territory. This study aims to explore the multifaceted factors influencing sales and distribution management. It will examine key elements such as market segmentation, technological advancements, supply chain logistics, regulatory frameworks, and the impact of cultural nuances on consumer behavior. Additionally, the research will investigate how organizations adapt their sales strategies in response to these factors, considering the competitive pressures and the increasing importance of digital transformation. The article on sales and distribution management within the Indian context reveals a complex interplay of elements that organizations must adeptly navigate to achieve success. The diverse and rapidly evolving market landscape in India necessitates a strategic approach that incorporates effective market segmentation, technological integration, and robust supply chain collaboration. These factors not only enhance operational efficiency but also foster stronger customer relationships, which are critical in a competitive environment.

Objectives Of The Study:

1. To understand the significance of Sales and Distribution Management at Organisations.
2. To identify the factors influencing the Sales and Distribution Management at Organisations.

Literature Review:**1: A Study of Factors Affecting Indian Automotive Supply Chain by Rajesh Katiyar & Mukesh Kumar Barua**

In this study authors have taken five competitive factors affecting Indian automotive supply chain and the objective is to know which are important factors. This study is based on experts' opinion of Indian automotive supply chain and academicians/researchers from related areas. In this paper, analytic hierarchy process (AHP) has been used to decide how buyers of automotive industries give importance to competitive factors to purchase automotive products. The paper aims to find out the most important factor affecting supply chain, by taking sample size of 226 from Indian automobile industry. The study leads to the understanding that Quality and Competitive factors are most important from supply chain perspective while the Innovation factor is not that important. (Barua, 2012)

2: A Study on the distribution strategy of ITC among the FMCG sector with special reference to Kerala region is project report by Adithya R Nair submitted to Mahatma Gandhi University. This study was based on the distribution strategy of ITC. The main objective of the study was to identify the distribution strategy of ITC and how it works among FMCG sectors. The rural FMCG market in India is expected to grow to US\$ 220 billion by 2025 from US\$ 23.6 billion in FY18. The consumption habits of India's new age consumers have resulted in an attitudinal shift in the market. The new Indian consumer is characterised by high awareness, an affinity for health and nutrition and high expendable income. The result shows that the distribution channel plays a major role in establishing a brand. The high growth rate of the FMCG industry in India goes beyond growth drivers such as income growth and urbanisation.

3: The Role of Logistics and Supply Chain in Distribution Management: A Case Study of Indian Manufacturing Firms by R. R. Khandelwal and D. K. Agarwal

In their study, "The Role of Logistics and Supply Chain in Distribution Management: A Case Study of Indian Manufacturing Firms," Khandelwal and Agarwal examined the critical role that logistics plays in the distribution success of Indian manufacturing firms. They found that logistics inefficiencies, particularly in the transportation sector, lead to significant delays and increased costs. Their findings suggested the need for greater investment in transport infrastructure to improve distribution efficiency.

4: A Study on Sales Strategies and Distribution Networks in Indian Manufacturing by P. K. Jain and M. S. Sharma

P. K. Jain and M. S. Sharma's paper, "Sales Strategies and Distribution Networks in Indian Manufacturing," focused on the integration of traditional and modern distribution systems. Their research suggested that while traditional distribution channels remain dominant in rural markets, urban areas are rapidly shifting towards more digital channels. The authors also highlighted the challenges posed by poor road infrastructure and inefficient last-mile delivery systems in rural India, which affect the sales and distribution performance of manufacturing firms.

5: A Study on Distribution Challenges in Indian Manufacturing: A Focus on Rural Markets by V. K. Gupta and A. Kumar

Gupta and Kumar in their paper "Distribution Challenges in Indian Manufacturing: A Focus on Rural Markets" focused specifically on the challenges manufacturers face in reaching rural markets in India. Their research found that while there is enormous potential in rural India, the lack of infrastructure, high distribution costs, and low purchasing power hinder the effectiveness of sales and distribution strategies. The authors suggested that companies should consider using alternative channels such as direct selling or partnering with local distributors.

Research Methodology & Process:

This article on Sales and Distribution Management is a descriptive study conducted extremely with the help of secondary data. The Researchers aim to understand the significance of Sales and Distribution Management at Organisations. The study further aims to identify the factors influencing the Sales and Distribution Management at Organisations. The study encompasses the domain of Sales & Distribution Management in general. The Researcher has generalized the understanding & hence the inferences are indicative in nature.

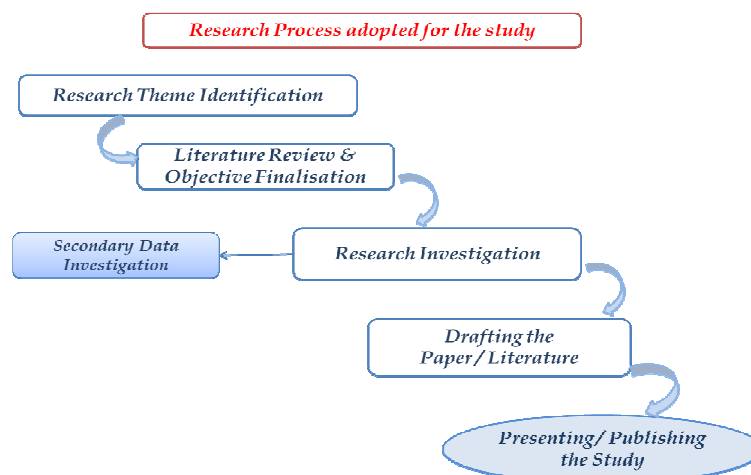


Chart No.1: Research Process adopted for the study

Source: Authors' Understanding

Sales and Distribution Management: Essence & Significance

Sales and distribution management is a cornerstone of organizational success, intricately linked to both revenue generation and customer satisfaction. Its essence lies in the systematic approach to identifying and meeting customer needs while effectively managing the flow of goods from production to the end user. This function is crucial in driving revenue growth by formulating and implementing strategies that optimize sales performance, including pricing, promotion, and product placement. Furthermore, it enhances customer relationships through personalized engagement and service, fostering loyalty and encouraging repeat business. Efficient distribution management ensures that products are available when and where they are needed, which not only reduces operational costs but also improves customer experience by minimizing lead times and stockouts. The significance of sales and distribution management is further underscored by its role in strategic planning and forecasting; accurate sales data enables organizations to anticipate market trends and adjust their operations accordingly, thereby enhancing responsiveness and agility in a dynamic market environment. Additionally, effective sales and distribution practices contribute to a positive brand image, as reliable delivery and superior service enhance consumer trust and reputation. Integrating sales and distribution management with other organizational functions, such as marketing and finance, creates a cohesive strategy that aligns resources and objectives, ultimately driving sustainable growth. In summary, the essence and significance of sales and distribution management extend far beyond immediate sales results, influencing overall organizational performance, competitiveness, and long-term success in an increasingly complex business landscape.

Factors Influencing Sales And Distribution Management At Organisations:

Sales and distribution management is a vital component of a company's strategy, directly impacting revenue generation, customer satisfaction, and market reach. Multiple internal and external factors shape how an organization manages its sales and distribution processes. These factors can range from market dynamics to technological advancements, cultural aspects, and governmental regulations. Below are key factors influencing sales and distribution management at organizations:

1. Taste & Preferences of the Consumers:

There may be several reasons for the change in Taste & Preferences of the Consumers like Cultural Changes, Language & Communication, Festivals & Rituals, New coming of the subsidy products in the market.

Cultural Influences

- **Cultural Values and Traditions:** A consumer's culture significantly affects their preferences. For example, in India, food preferences vary based on religion, region, and

cultural practices—vegetarianism is more prevalent in certain states due to religious beliefs, while in others, spicy or non-vegetarian foods are more common. Brands must consider these cultural differences when marketing and distributing products.

- **Language and Communication:** The language in which a product or service is marketed can deeply influence its appeal. In multilingual societies like India, localizing product information and advertising to regional languages can make a big difference in consumer engagement and product acceptance.
- **Festivals and Rituals:** In many cultures, specific products and services are tied to festivals, traditions, and seasonal changes. In India, for instance, during festivals like Diwali or Durga Puja, consumers have unique tastes and preferences for specific products such as sweets, clothes, and gifts. Understanding these seasonal preferences can help businesses optimize their sales strategies.

Social and Demographic Influences

- **Income Level:** A consumer's income directly impacts their preferences. Higher-income groups may favour premium, luxury, or niche products, while lower-income consumers may focus on affordability and value for money. This also influences the type of packaging and quantity of the product they prefer (e.g., bulk packaging for families or smaller packages for individuals).
- **Age Group:** Age is a critical determinant of consumer preferences. Younger generations may be more inclined towards trendy or innovative products, often influenced by social media, whereas older generations may prioritize practicality and reliability. For example, millennials might prefer sustainable, tech-enabled products, while baby boomers might look for traditional, proven quality.
- **Gender and Family Dynamics:** Preferences can also differ based on gender. For instance, women may have specific tastes when it comes to clothing, beauty products, and household items, while men may gravitate toward electronics, sports goods, and cars. Additionally, in family-oriented cultures, purchasing decisions may be made based on the needs and preferences of the entire family unit.

Psychological Factors

- **Personal Interests and Lifestyle:** A consumer's lifestyle and hobbies play a role in shaping their tastes. People who lead a fitness-conscious lifestyle may prefer healthy food options, while individuals who value convenience might opt for pre-packaged or ready-to-eat meals. Similarly, eco-conscious consumers might prefer sustainable, organic, or environmentally friendly products.
 - **Perception and Brand Loyalty:** How consumers perceive a brand affects their preferences. A well-established, trusted brand can create strong loyalty, with consumers
-

consistently choosing that brand over others, even if the competitor offers similar products. Personal experiences, product reliability, and customer service all influence this perception.

- **Motivation and Emotional Connection:** Consumers are often motivated by emotional needs. For instance, a person buying a luxury car may be motivated by status and the emotional appeal of exclusivity, while someone purchasing a budget-friendly model may prioritize practicality. Creating an emotional connection with consumers can be a powerful driver of preference.

2. Human Resources and Workforce Management

- **Sales Training and Development:** The effectiveness of sales teams is crucial for the success of sales and distribution strategies. Ongoing training in product knowledge, sales techniques, and customer relationship management enhances the overall sales performance of an organization.
- **Employee Motivation and Incentives:** Sales teams, distributors, and supply chain partners need to be motivated to perform well. Compensation schemes, performance bonuses, and other incentives are used to boost productivity and ensure alignment with organizational goals.

3. Economic Conditions

- **Market Demand Fluctuations:** Economic conditions, such as inflation, unemployment, and changes in disposable income, can cause fluctuations in consumer demand. During times of economic downturn, consumers may prioritize essential goods, and businesses must adjust their product offerings and distribution strategies accordingly.
- **Cost of Raw Materials and Production:** The cost of manufacturing, including raw materials and labor, impacts the final product price and, by extension, the distribution strategy. Rising production costs may lead companies to re-evaluate their pricing and distribution channels to maintain profit margins.
- **Global Economic Environment:** Organizations that distribute products globally must consider international economic factors, including currency exchange rates, trade agreements, and geopolitical stability, which can influence costs, pricing, and delivery times.

4. Government Regulations and Policies

- **Taxation and Compliance:** Government policies, especially taxes, tariffs, and trade regulations, affect pricing strategies and distribution networks. For instance, Goods and Services Tax (GST) in India has simplified the tax structure for businesses but requires companies to ensure proper compliance with new regulations.
 - **Subsidies and Incentives:** Government initiatives like "Make in India" or tax exemptions for exports can influence distribution strategies by reducing operational costs and
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increasing profit margins. Businesses must keep abreast of such schemes to take full advantage.

- **Import/Export Regulations:** Organizations dealing with international distribution must navigate various customs, duties, and trade restrictions. Effective management of these aspects is crucial to prevent delays and penalties while ensuring products are available in target markets.

5. Logistics and Supply Chain Factors

- **Transportation Infrastructure:** The state of transportation systems—roads, railways, ports, and airports—greatly impacts the efficiency of distribution. Inadequate infrastructure can lead to delays, increased costs, and customer dissatisfaction. Organizations must strategically plan their distribution networks based on available logistics resources.
- **Inventory Management:** Effective inventory control is essential for balancing supply and demand. Organizations use techniques such as Just-In-Time (JIT), Economic Order Quantity (EOQ), and safety stock management to ensure optimal inventory levels while minimizing storage costs.
- **Last-Mile Delivery:** The final step of the distribution process, from a local hub to the customer’s doorstep, is often the most challenging and expensive part of the supply chain. Efficient last-mile delivery solutions, such as using local distributors or third-party logistics providers, are critical to ensuring timely deliveries and customer satisfaction.

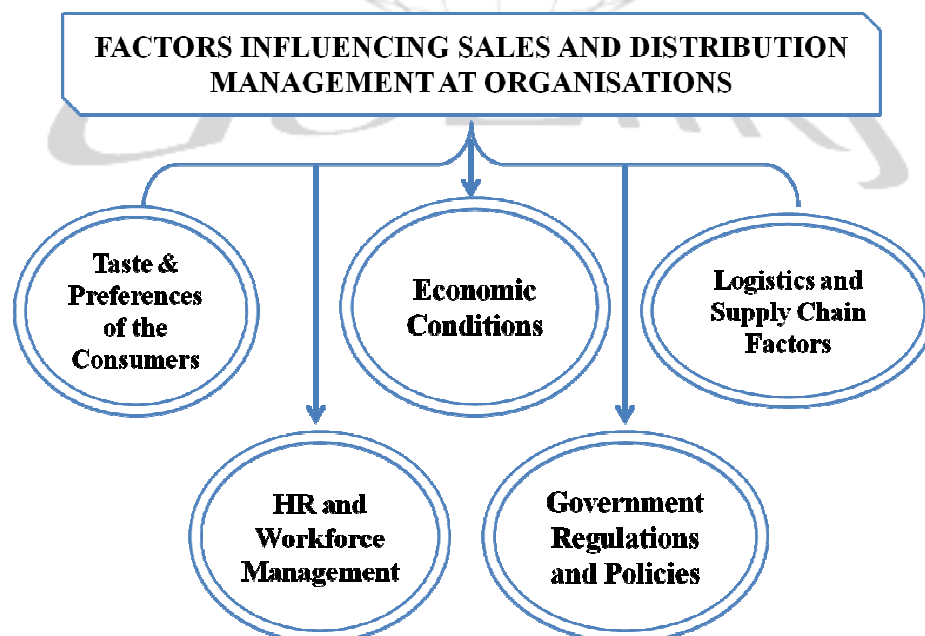


Chart No.2: Factors affecting Sales & Distribution at Organisations

Source: Authors' Understanding

Conclusion:

The article on sales and distribution management within the Indian context reveals a complex interplay of elements that organizations must adeptly navigate to achieve success. The diverse and rapidly evolving market landscape in India necessitates a strategic approach that incorporates effective market segmentation, technological integration, and robust supply chain collaboration. The dynamic competitive landscape in India adds the layer of complexity, compelling organizations to remain agile and responsive to market changes. Continuous analysis of competitors' strategies and the adoption of innovative practices are essential for sustaining market share and driving growth. Moreover, as technology continues to advance, integrating digital tools into sales and distribution processes becomes imperative. This not only enhances data-driven decision-making but also streamlines operations, enabling organizations to respond swiftly to customer demands. Ultimately, the success of sales and distribution management in the Organisations depends on a holistic understanding of the influencing factors. Organizations that effectively leverage these insights can optimize their sales strategies, enhance distribution efficiency, and ultimately drive sustainable growth in an increasingly competitive marketplace.

Future Scope Of Study:

The future scope of study the article on sales and distribution management is broad and offers numerous avenues for exploration. One key area is the impact of digital transformation, focusing on how advancements in artificial intelligence, machine learning, and automation are reshaping sales strategies and enhancing customer engagement. A study in this respect will further derive inferences. Exploring regional variations & comparative study could provide insights into how cultural and economic differences influence sales tactics.

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EXPLORING AYURVEDA THROUGH THE LENS OF THE INDIAN KNOWLEDGE SYSTEM

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Abstract:

Ayurveda, a traditional system of medicine that dates back to ancient India, is deeply rooted in Indian Knowledge Systems (IKS). This paper explores the multidimensional relationship between Ayurveda and IKS, aiming to understand how Ayurvedic principles align with the broader framework of IKS in addressing health, wellness, and holistic healing. By tracing the historical, philosophical, and epistemological foundations of Ayurveda through the lens of IKS, the paper emphasizes the value of indigenous knowledge in contemporary health systems and proposes ways to integrate ancient wisdom with modern scientific approaches for holistic well-being.

Key Words – Ayurveda, Holistic Approach, Multi-disciplinary, Ancient wisdom. Unani Medicine.

Introduction: -

Ayurveda, the science of life, originated in ancient India and is attributed to the sage Charaka, Sushruta, and other ancient scholars. Its roots lie in Vedic texts, particularly the Atharvaveda, which presents an early framework of health and medicine. The classical texts of Ayurveda, namely the Charaka Samhita, Sushruta Samhita, and AshtangaHridayam, present detailed knowledge about anatomy, physiology, pathology, pharmacology, surgery, and health management.

The philosophy behind Ayurveda is based on a profound understanding of the interconnectedness of mind, body, and spirit. This philosophy integrates well with the IKS concept, where knowledge is seen as not just a collection of facts, but as a way of living in harmony with nature. Ayurveda's emphasis on self-awareness, ethical conduct (Dharma), and mindfulness aligns closely with IKS principles, which prioritize the cultivation of wisdom through experiential learning and the holistic engagement of body and mind.

Epistemological Perspectives: Ayurveda and IKS

Indian Knowledge Systems encompass multiple ways of knowing, including empirical observation (Pratyaksha), inference (Anumana), and scriptural testimony (Shabda). Ayurveda draws heavily from these epistemological methods, utilizing both subjective and objective forms of knowledge acquisition. The Vedic understanding of the universe is based on the belief that knowledge is a process of uncovering truths inherent in nature, an approach that resonates with

Ayurveda's holistic worldview. the concept of Prakriti (individual constitution), Agni (digestive fire), and Ojas (vital energy) in Ayurveda reflects an understanding of human beings as part of a larger natural order, which parallels the IKS approach that emphasizes balance with the environment. Ayurveda's diagnostic methods, such as pulse diagnosis (Nadi Pariksha) and urine analysis (Mutra Pariksha), illustrate an experiential, observational approach that parallels IKS' reliance on perception and intuition alongside empirical data. Ancient civilizations developed sophisticated medical systems that laid the foundation for modern healthcare. These healing traditions were deeply connected to philosophy, spirituality, and an understanding of nature. Here's a brief overview of some of the most significant ancient treatment systems:

1. Ayurveda (India)

Origin: Over 3,000 years ago in India.

Core Principles: Based on the balance of three doshas (Vata, Pitta, and Kapha), Ayurveda focuses on maintaining harmony between body, mind, and spirit.

Treatments:

Herbal medicine (e.g., turmeric, ashwagandha, triphala)

Panchakarma (detoxification techniques like oil massage and purging)

Dietary adjustments

Yoga and meditation

Surgery (as described in ancient texts like Sushruta Samhita).

Traditional Chinese Medicine (TCM)

Origin: Over 2,500 years ago in China.

Core Principles: Based on concepts like Qi (vital energy), Yin and Yang (balance of opposing forces), and the Five Elements theory.

Treatments:

Acupuncture and moxibustion

Herbal medicine (ginseng, goji berries, licorice root)

Cupping therapy

Tui Na (therapeutic massage)

Qigong (breathing exercises for energy flow)

Dietary therapy.

Ancient Egyptian Medicine

Origin: Around 3,000 BCE.

Core Principles: Egyptians believed in the role of gods in healing, but they also practiced surgery, pharmacology, and diagnostics.

Treatments:

Herbal remedies (honey, garlic, myrrh)

Surgical procedures (trepanation, wound stitching)

Magic spells and amulets for protection

Use of papyrus texts (Ebers Papyrus, Edwin Smith Papyrus) as medical guides.

Greek Medicine (Hippocratic Medicine)

Origin: 5th century BCE, Greece.

Core Principles: Based on the theory of the Four Humors (blood, phlegm, black bile, yellow bile), where health was maintained by balancing these bodily fluids.

Treatments:

Herbal medicine (mint, rosemary, opium poppy)

Bloodletting and purging

Diet and exercise for prevention

Thermal baths and massages.

Unani Medicine (Greco-Arabic Medicine)

Origin: Derived from Greek medicine, later developed by Persian and Arab physicians.

Core Principles: Similar to Greek medicine, focusing on humors and holistic treatment.

Treatments:

Herbal and mineral-based drugs

Cupping therapy

Massage and aromatherapy

Lifestyle and dietary modifications.

Ancient Mesopotamian Medicine

Origin: Sumerians, Babylonians, and Assyrians (around 2,000 BCE).

Core Principles: A mix of spiritual and physical healing, with priest-physicians diagnosing diseases.

Treatments:

Exorcisms and incantations

Herbal medicines

Surgical procedures like wound stitching.

Ayurveda's Relevance in the Contemporary World

In today's world, Ayurveda faces the challenge of bridging ancient traditions with modern scientific paradigms. However, its emphasis on preventive healthcare, sustainability, and the mind-body connection presents an opportunity to reframe current health issues. The ecological approach of Ayurveda, which advocates for harmony between humans and nature, resonates with current environmental concerns and sustainability efforts.

Integrating Ayurveda with modern healthcare systems offers new possibilities for addressing global health challenges such as chronic diseases, mental health disorders, and lifestyle-

related conditions. Ayurveda's focus on individualized treatment, based on a person's unique constitution and imbalances, contrasts with the often standardized, one-size-fits-all approach of Western medicine. By aligning Ayurveda with the scientific method through rigorous research and clinical studies, the knowledge embedded in Ayurveda can be validated and utilized within the framework of evidence-based medicine.

Importance of Ayurveda During the COVID-19 Pandemic:

During the COVID-19 pandemic, Ayurveda played a significant role in boosting immunity, managing mild symptoms, and promoting overall well-being. While it was not a direct cure for COVID-19, Ayurvedic practices helped many people strengthen their body's natural defenses and cope with stress. Although Ayurveda was not a direct cure for COVID-19, it helped in preventive care, recovery, and post-COVID rehabilitation.

1. Preventive Measures & Immunity Boosting

Ayurveda emphasizes a strong immune system (Ojas), which was crucial during the pandemic. The Indian Ministry of AYUSH recommended Ayurvedic guidelines for boosting immunity, including:

Herbal decoctions (Kadha) with tulsi (holy basil), ginger, cinnamon, and black pepper.

Golden milk (Haldidoodh) with turmeric to reduce inflammation.

Ashwagandha and Giloy (Guduchi) to strengthen immunity.

Steam inhalation with medicinal herbs like eucalyptus and clove for respiratory health.

Daily consumption of warm water to aid digestion and detoxification.

2. Respiratory Health & Symptom Management

COVID-19 primarily affected the respiratory system. Ayurveda provided relief through:

Herbal formulations like Trikatu (ginger, black pepper, and long pepper) to clear congestion.

SitopaladiChurna for cough and throat irritation.

Licorice (Mulethi) and honey for soothing sore throats.

Nasya therapy (applying sesame or Anutaila oil in nostrils) to protect the respiratory tract.

Mental Health & Stress Management

The pandemic led to anxiety, stress, and depression. Ayurveda helped in mental well-being through:

Yoga and Pranayama:

Breathing exercises like Anulom Vilom and Bhastrika improved lung function and reduced stress.

Herbs like Brahmi and Ashwagandha: Used to reduce anxiety, improve sleep, and enhance cognitive function.

Ayurvedic massages (Abhyanga) with medicated oils to relieve stress.

Post-COVID Recovery & Rehabilitation

Many COVID-19 patients faced weakness, fatigue, and respiratory issues even after recovery.

Ayurveda aided rehabilitation by:

Rasayana therapy (rejuvenation treatment) with Chyawanprash to restore energy.

Shatavari and Ashwagandha for muscle recovery.

Dietary recommendations including easily digestible foods, herbal teas, and nutrient-rich meals.

Panchakarma therapies like Virechana (detoxification) to cleanse the body.

5. Integration with Modern Medicine

Many hospitals and wellness centers integrated Ayurveda with conventional medicine. Patients used Ayurvedic remedies alongside allopathic treatments to enhance recovery, minimize side effects, and boost overall health.

Importance of Ayurveda in Today's Lifestyle

In the modern world, Ayurveda is more relevant than ever as it provides holistic solutions for maintaining health, preventing diseases, and improving overall well-being. With rising stress levels, poor dietary habits, and lifestyle-related disorders, Ayurveda offers natural and sustainable ways to restore balance.

One of the key benefits of Ayurveda is its role in stress management and mental well-being. The fast-paced lifestyle of today often leads to stress, anxiety, and depression. Ayurveda recommends meditation, yoga, and herbal remedies like Ashwagandha, Brahmi, and Shankhpushpi to calm the mind and enhance focus. Additionally, Abhyanga (Ayurvedic oil massage) is known to help with relaxation and stress reduction, promoting mental clarity and emotional stability.

Ayurveda also plays a crucial role in immunity boosting and disease prevention. A weak immune system makes individuals more susceptible to infections and chronic illnesses. Ayurveda emphasizes strengthening Ojas (vital energy) through powerful herbs such as Tulsi, Giloy, Turmeric, and Chyawanprash. Rasayana therapy (rejuvenation therapy) further enhances immunity and delays aging, ensuring long-term health and vitality.

A healthy digestive system is fundamental to overall well-being, yet modern diets rich in processed foods often lead to bloating, acidity, and poor digestion. Ayurveda emphasizes the importance of Agni (digestive fire) and recommends eating seasonal, organic, and freshly prepared meals. Herbs like Triphala, Ajwain, and Jeera aid in digestion and detoxification, helping to maintain gut health and prevent digestive disorders.

Detoxification is another essential aspect of Ayurveda. The accumulation of toxins from pollution, unhealthy diets, and chemicals can lead to various diseases. Ayurveda promotes natural detoxification through Panchakarma therapies like Virechana (purging), Basti (medicated enema), and Nasya (nasal cleansing). These therapies help eliminate toxins from the body, restore balance, and enhance overall health.

Better sleep and lifestyle balance are also emphasized in Ayurveda, especially in an era where poor sleep habits and excessive screen time contribute to insomnia and fatigue. Ayurveda suggests following Dinacharya (daily routine), which includes waking up early, drinking warm water, and practicing Shirodhara (oil therapy) for deep relaxation. Herbal remedies like Brahmi and Jatamansi further aid in promoting restful and rejuvenating sleep.

Ayurveda also offers holistic skin and hair care solutions through natural ingredients like Sandalwood, Aloe Vera, and Neem, which nourish and protect the skin. For hair health, Ayurvedic remedies such as Bhringraj oil, Amla, and Hibiscus help prevent hair fall and dandruff, ensuring healthy and strong hair.

In addressing lifestyle disorders, Ayurveda provides effective natural solutions for conditions like diabetes, obesity, and hypertension. Herbs such as Gudmar and Vijaysar help regulate blood sugar levels, while weight management is achieved through Ayurvedic diets and detoxification methods. Additionally, heart health can be improved by using Arjuna bark and garlic to maintain cholesterol levels and support cardiovascular well-being.

Beyond health benefits, Ayurveda promotes sustainable and eco-friendly solutions. Unlike synthetic drugs, Ayurvedic medicines are natural, free from harmful chemicals, and environmentally friendly. The principles of Ayurveda encourage sustainable living through eco-friendly practices, organic farming, and mindful consumption.

IKS and Ayurveda in the Global Context

While Ayurveda has been traditionally practiced in India, its growing acceptance worldwide highlights the universal appeal of its holistic approach to health. In the West, Ayurveda is increasingly popular for its natural remedies, stress reduction techniques, and detoxification practices. However, for Ayurveda to be fully understood and respected globally, the globalization of Ayurveda has also led to discussions on the authenticity of Ayurvedic practices and the potential for commercialization. It is essential to preserve the integrity of Ayurveda while promoting its global application in a manner that respects its cultural and historical context. IKS provides a critical framework to safeguard Ayurveda from being diluted or misinterpreted, ensuring that it remains a comprehensive, spiritually rooted system of medicine

Conclusion

Exploring Ayurveda through the lens of Indian Knowledge Systems reveals the deep interconnectedness between human well-being, the environment, and cosmic forces. Ayurveda, as an integral part of IKS, offers profound insights into maintaining health and balance, both individually and collectively. The future of Ayurveda lies in its ability to harmonize with modern science and global health trends while retaining its indigenous, holistic foundations. Through interdisciplinary research and cultural exchange, Ayurveda can contribute significantly to global

health and well-being, advancing the broader goals of sustainable living, mental and physical health, and environmental preservation.

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GOEIIRJ

**PRINCIPLES OF REVENUE: A COMPARATIVE STUDY OF TAXATION –
KAUTILYA’S ARTHASHASTRA AND MODERN ECONOMICS**

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Abstract

This paper examines Kautilya’s taxation principles in the Arthashastra and compares them with modern economic taxation theories. Kautilya’s model emphasized fairness, efficiency, flexibility, and state welfare, aligning with contemporary principles of equity, certainty, and adaptability. The study traces the evolution of taxation from agrarian economies to modern global systems, highlighting differences such as corporate and digital taxation. Despite these changes, Kautilya’s principles remain relevant, offering insights for effective and just tax policies today.

Key words: Taxation, Economic Governance, Progressive Taxation, Tax Reforms, State welfare, Economic Administration, Wealth Distribution, Tax Burden and Compliance

Introduction

Taxation has been a fundamental pillar of economic governance, ensuring the sustainability of government functions and public welfare. Ancient Indian economic thought, particularly Kautilya’s *Arthashastra* (circa 4th century BCE), provides one of the earliest systematic frameworks on taxation, emphasizing fairness, proportionality, efficiency, and state welfare. His insights laid the foundation for a structured taxation system aimed at economic stability and prosperity.

In contrast, modern taxation principles, developed through the works of Adam Smith and subsequent economists, have evolved to address the complexities of contemporary economies. These principles focus on equity, efficiency, certainty, and flexibility, ensuring optimal revenue collection without hampering economic growth. By comparing Kautilya’s taxation model with modern economic theories, this paper examines their similarities, differences, and implications for present-day tax policy. The study highlights the enduring relevance of ancient wisdom in shaping contemporary taxation frameworks and explores how these principles can inform modern fiscal strategies.

1. Kautilya’s Principles of Taxation

Kautilya, in the *Arthashastra*, outlined a structured and pragmatic taxation system to generate state revenue while maintaining economic stability. His principles focused on fairness, efficiency, and state welfare, ensuring a balance between government needs and public well-being.

1.1. Equity and Fairness

Kautilya emphasized just and proportional taxation based on financial capability, preventing economic disparity and fostering social harmony. He advised against oppressive taxation, as it could lead to dissatisfaction, rebellion, and evasion, stressing the importance of maintaining public trust.

1.2. Proportional Taxation

He advocated for progressive taxation, where wealthier individuals contributed more while minimizing the burden on the poor. Excessive taxation, he warned, could discourage investment and economic growth, advocating for a balanced approach to encourage wealth generation while maintaining financial stability.

1.3. Elasticity

Kautilya supported flexible tax policies that adapted to economic conditions. He suggested increasing taxes during prosperity to build reserves and lowering them during hardships to ease the burden on citizens—an approach still used in modern fiscal policies.

1.4. Minimal Burden

He cautioned against excessive taxation, which could lead to evasion, reduced productivity, and economic decline. Instead, he proposed moderate taxation to ensure steady revenue without discouraging economic participation.

1.5. State Welfare

Taxation, according to Kautilya, was a tool for public welfare, funding infrastructure, security, and social programs. He emphasized reinvesting tax revenue into society, a concept mirrored in modern welfare states.

1.6. Tax Collection Efficiency

Kautilya stressed the need for a transparent and corruption-free tax system. He recommended organized administration, regular audits, and strict penalties for misconduct—principles reflected in modern regulatory frameworks and digital taxation systems.

1.7. Non-Disruptive Taxation

Taxes should support rather than hinder economic activity. Kautilya advised against high levies on trade, industry, and agriculture, advocating for moderate duties that promote commerce and growth—similar to modern tax incentives and subsidies.

His taxation principles, emphasizing fairness, efficiency, and adaptability, remain relevant today, offering valuable insights for effective tax policies.

2. Principles of Modern Taxation

Modern taxation theories, influenced by Adam Smith's *The Wealth of Nations* (1776) and later economists, aim to create a fair, efficient, and adaptable tax system. These principles guide policymakers in balancing revenue generation with economic stability and social justice.

2.1. Equity (Ability-to-Pay Principle)

Equity ensures that tax burdens are distributed based on financial capacity. Progressive taxation, where higher earners contribute more, promotes social justice and reduces inequality. Horizontal equity ensures individuals with equal income pay the same taxes, while vertical equity requires higher earners to pay a greater share.

2.2. Efficiency

An efficient tax system generates revenue without discouraging work, investment, or economic growth. It minimizes compliance costs and avoids excessive taxation that could drive capital flight or reduce labour participation. Policies such as lower corporate taxes and investment incentives promote stability.

2.3. Certainty

Tax laws should be clear and predictable to enhance compliance. Transparent tax rates, stable policies, and simplified filing systems, such as e-filing and defined income brackets, help taxpayers plan and avoid confusion.

2.4. Convenience

Tax collection should be simple and accessible to encourage compliance. Digital advancements like direct salary withholding, online payment systems, and mobile tax apps streamline the process, reducing administrative burdens for both taxpayers and governments.

2.5. Flexibility and Elasticity

Tax policies must adapt to economic conditions, lowering taxes during downturns to stimulate growth and increasing revenue during booms. Automatic stabilizers, inflation-adjusted tax rates, and crisis relief measures help maintain economic balance and fiscal stability.

2.6. Revenue Sufficiency

Governments require sufficient tax revenue to fund public services like infrastructure, healthcare, and education. A balanced tax system avoids budget deficits while preventing excessive taxation that may discourage productivity. Broadening the tax base and enforcing compliance measures ensure sustainable revenue generation.

2.7. Avoidance of Double Taxation

Double taxation, where the same income is taxed multiple times, is mitigated through tax treaties, dividend tax credits, and transfer pricing regulations. International agreements allow tax credits for foreign earnings, promoting global trade and investment while ensuring fair tax practices.

These principles help modern tax systems achieve fairness, efficiency, and adaptability while supporting economic growth and stability.

3. Comparative Analysis of Kautilya’s Taxation Principles and Modern Economic Thought

Taxation has evolved over centuries, reflecting changes in economic structures, governance models, and technological advancements. While Kautilya’s *Arthashastra* (circa 4th century BCE) laid out a systematic approach to revenue collection, modern taxation is shaped by economic theories, globalization, and digital transformation. A comparative analysis of Kautilya’s taxation principles and contemporary economic thought highlights striking similarities and differences, demonstrating both the timeless relevance of ancient ideas and the necessity of adaptation in modern tax systems.

3.1. Similarities Between Kautilya’s and Modern Taxation Systems

Despite differences in economic structures, governance, and technology, many of Kautilya’s taxation principles align with modern economic theories.

- **Fairness and Equity:** Both systems emphasize just tax distribution. Kautilya’s proportional taxation ensured fair contributions from different economic classes, paralleling the modern ability-to-pay principle, which requires wealthier individuals to contribute more to promote economic equity.
- **Progressive Taxation:** Kautilya’s approach of taxing the wealthy more without causing economic distress aligns with modern progressive taxation, which redistributes wealth while maintaining growth and protecting lower-income groups.
- **Economic Elasticity:** Kautilya recommended adjusting taxes based on economic conditions—reducing them during crises and increasing them in prosperous times. Similarly, modern tax policies adopt countercyclical measures to stabilize financial conditions.
- **Tax Collection Efficiency:** Kautilya advocated for a transparent and organized tax system to prevent corruption. Modern systems achieve this through automation, e-filing, and AI-driven compliance, ensuring efficient and fair revenue collection.

3.2. Differences Between Kautilya’s and Modern Taxation Systems

While many fundamental taxation principles remain unchanged, modern economies have introduced additional concepts that were absent in Kautilya’s framework due to shifts in economic structures, globalization, and technological progress.

Aspect	Kautilya’s Perspective	Modern Perspective
Globalization and Trade	Focused on local economies with trade duties and land revenue as key sources of taxation.	Influenced by global trade, foreign investments, and international financial regulations. Includes cross-border taxation and multinational cooperation.

Decentralization in Taxation	Centralized system where the king had absolute authority over tax collection and allocation.	Decentralized governance with involvement of multiple stakeholders, including elected representatives and economic councils. Tax revenues are shared between central, state, and local governments.
Expansion of Tax Categories	Primarily relied on land revenue, trade duties, and direct taxation.	Diverse tax categories such as corporate tax, VAT/GST, carbon tax, capital gains tax, and inheritance tax.
Technological Integration in Taxation	Tax collection was manual, relying on state-appointed officials and record-keeping, prone to errors and corruption.	Uses technology like e-filing, online tax payments, blockchain for transparency, and AI for fraud detection, ensuring efficiency and accuracy.

4. Evolution of Taxation: From Kautilya's Era to Modern Economics

4.1 Changing Economic Structures

Ancient taxation systems, including Kautilya's model, were primarily agrarian-focused, with land revenue serving as the main source of state income. With the industrial revolution, economies shifted towards corporate and wage-based taxation to accommodate growing business sectors. In the modern digital era, taxation has expanded further to include e-commerce, cryptocurrencies, and intangible assets, reflecting the evolving nature of global economies.

4.2 Technological Advancements

In ancient India, tax collection depended on manual record-keeping and the supervision of state officials, making it prone to inefficiencies and corruption. Over time, technological advancements introduced automated tax systems, electronic record-keeping, and AI-driven compliance monitoring, significantly enhancing efficiency, reducing tax evasion, and ensuring greater transparency in revenue collection.

4.3 Influence of Globalization

Kautilya's taxation system operated within national borders, with limited focus on international trade. In contrast, modern taxation involves complex global frameworks, including bilateral tax treaties, WTO regulations, and international financial policies. These mechanisms help address cross-border taxation issues, prevent tax evasion by multinational corporations, and create a more harmonized global tax structure.

5. Policy Implications and Contemporary Relevance

Kautilya's taxation principles offer valuable lessons for modern policymakers. By integrating his insights with contemporary challenges, governments can create more effective and just taxation systems.

5.1. Balanced Taxation

Excessive taxation leads to tax evasion and capital flight. A balanced tax structure ensures

economic participation without discouraging investment or labor.

5.2. Economic Flexibility

Tax systems should remain adaptive to economic conditions, providing relief during recessions and optimizing revenue during growth periods.

5.3. Digital Integration

Leveraging AI, blockchain, and automation can enhance tax compliance, reduce corruption, and improve transparency.

5.4. Public Welfare Focus

Tax revenues should be allocated toward infrastructure, education, and healthcare, ensuring state resources benefit society.

5.5. Corruption Control

Strict anti-evasion laws and automated monitoring systems should be enforced to ensure tax compliance and prevent fraud.

Conclusion

Despite centuries of evolution, the core objectives of taxation—fairness, efficiency, and state welfare—remain unchanged. Kautilya's taxation principles were remarkably forward-thinking, aligning with modern economic theories in many aspects. However, globalization, technological advancements, and the complexity of modern economies have led to significant expansions in tax policies.

By integrating ancient wisdom with modern innovation, policymakers can design equitable, efficient, and adaptable tax systems that foster economic growth, ensure social justice, and support national development in the 21st century.

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A SYNTHESIS OF SPIRITUAL AND CULTURAL HERITAGE THROUGH WISDOM AND TECHNOLOGY IN GIRISH KARNAD'S WEDDING ALBUM**Dr. Vijay S. Saindane***Assistant Professor**Adivasi Seva Sahayak and Shikshan Prasarak Sanstha's**Shri.D.H.Agrawal Arts, Shri. Rang Avadhoot Commerce**& Shri. C. C. Shaha & M. G. Agrawal Science College, Navapur, Dist. Nandurbar (MS)**drvijaysaindane9gmail.com*

Abstract

Ashwin, expatriate, the video bride living in America, who exposed the hollowness in America. The most powerful and developed country in the world. But at the same time, he arises a question of losing spiritual values in course of time. The foreign settled boy expects that his wife should have to accept the role of woman as Mother-Wife-Daughter and above all to be his life partner in his mission to identify spiritual existence, to demonstrate the superiority of Hinduism to the West. Looking to India as a Walmart of spiritual center. India has rich cultural heritage of art. And the use of technology imparts knowledge and wisdom to encourage spiritual and cultural heritage through literature. It strengthens our cultural values too. The use of technology i.e. cell phones, video shooting, internet and other devices as means of communication in the present play, Wedding Album by GirishKarnad exemplify its significant value through dramatic performance. The play is a beautiful amalgamation of tradition and modernity. It advocates, spiritual and cultural heritage is deeply rooted in Indian soil. The technological advancement refashions it to shine more at world scenario. The present play is the play with difference of his earlier plays. As Karnad used myths to explored modern contemporary issues. But in this play he used modern technology as modern myth to discuss wisdom among the techno users. The present paper aims at the comprehensive understanding of spiritual as well as cultural values in society and the use of modern technology rendered into wisdom. On the one hand selfish spiritual settlement under the name of spiritual values, and on the other hand the loss of spiritual, cultural and moral values encompasses the aspiration.

Keywords – Hollowness, Spiritual, Cultural, Refashion, Wisdom, Technology.

A Synthesis

Girish Karnad, Jnanpith Awardee and the former World Theatre Ambassador of the International Theatre Institute (Paris) is the prolific as well as a prominent playwright in Indian English literature. Who has made tremendous impression through his writing. His deep knowledge of Indian myth, culture, folklore, history, and the present scenario of changing society made him to

establish new terminologies. To him refashion and rejuvenation are the significant aspects that are essential to serve our spiritual, cultural, historical and social upbringing through old testimonials is the essence of his writing. Indian drama has rich cultural heritage. Dramatic performances were being performed since ancient time in India, still Indian English drama is waiting for a shoe of its Cinderella. For the reason that readers are lacking their interest in myths, history, old stories, legends etc. But indeed, Karnad has served Indian English Drama to establish its true values in new tone and tune at world scenario. Through these sources of his plays i.e. myths, history, culture, legend, folklore etc. Karnad draws readers' attention towards rich spiritual and cultural heritage of India.

WeddingAlbum (2009), the first play originally written in Kannada and later translated into English by Karnad himself. By producing this play Karnad has threaten the charge that he uses only myths, history, legend and folklore as a source for his Plays. The play, *WeddingAlbum*, has complete modern setting as the source, use of technology is as modern myth. The play talks about the problems of marriage institutions of Saraswat Brahmin family in Karnataka (South India). And changing scenario of values in society as well as financial difficulties in marriage institutions. As earlier stated, the use of modern myth in the play works as Indian philosophical values in the NRI's and that of marginalized by native. The title of the play is pseudo. There is no any photo collection of marriage but the wisdom of two culture i.e. Western (America) and Eastern (India). The entire play moves around the story of Vidula, the protagonist, and her marriage with the Indian Boy, AshwinPanje who is settled in America. It is a story of Urban middle class Saraswat Brahmin family; Dr.Nadkarni, a retired doctor by profession, his wife, Mrs.Nadkarni, their two daughters Hema, Vidula and a son, Rohit. Hema, the elder daughter who got inter religion married and lives in Australia, the son Rohit who is software designer writes stories and scripts for tele plays and the younger daughter Vidula is going to married with NRI AshwinPanje, expatriate Hindu in US, whom she has never met. The Nadkarni family is in search of a suitable boy for their youngest daughter, Vidula. For this the family uses modern technological devices, such as video conferencing, internet café, the modern places like restaurants, railway stations and television production offices. As the play opens Rohit, Vidula's brother making a video in which Vidula is found close to the camera (Video Conferencing), directly speaking and introducing herself and her family to AshwinPanje, a person who is in search of spiritual aesthetics in his homeland, India. He unfolds the dark side of materialism. Even though he successfully established himself in America. But the so-called success became the cause of his anxiety. The so-called success has insufficient capacity to fulfilled his eternal peace and prosperity that comes through spirituality. Even though, in America, he has spent and enjoyed his life with friends, girlfriends, affairs, mistresses and several one-night stand. And has shining on the public stage of glamour and success, and social

connection but the lack of spirituality teases the embodiment of his success. It is his wisdom that inclined him towards Indian spiritual aesthetics through technology. His inner turmoil comes out,

I want to be honest with you. I am passing through crisis. It sounds pompous to use the word, but let me use it, I am passing through spiritual crisis. I am boiling inside like volcano. I want you to share my agonizing search of myself. It will require an intellectual effort to understand the real me. It may require an emotional giving-up. If you agree to marry me, you will have to share my inner turmoil. But at the end of the day, I believe you will find it enriching. (WA,79-80)

The question raised here, why Ashwin is to be very honest with his inner conflict? It is an Indian Culture that asserts the lack of spirituality. And this deep cultural heritage brought spiritual intellect, works as his wisdom. It is his wisdom that he understands the advantage and proper use of technology through which he explored his emotional requirement. His ignited mind finds spiritual embodiment.

As a cultured fellow, talking about US he politely admits, US is a land where talent received huge acclamation. It develops your financial and social growth too. Here you can encash your brain and charm. Even your wildest expectations and complete your dream also. Americans have also appreciated the echo of Indian culture that has been produced in Indians' behaviour. Ashwin contributes his experience stating, "You Indians. You are honest. Hardworking. Most of all, peace-loving. Not like others." (WA, 80) It is notable that Americans are also influenced by Indian culture that comes out through our professional behaviour. Honesty and hard working as well as peace and love are the harmony of our cultural heritage that comes from inner self. But Americans are more materialistic, they have accepted material values by rejecting religion in favour and the result comes out, the whole culture is empty of values now. There is no spiritual light inside. He regrets,

And I have come to the conclusion that that the whole culture is empty of values now, bereft of any living meaning. It is shallow, you see what I mean, glittering and shallow. The European Industrial revolution began by rejecting religion in favour of material values. But today that legacy is strangling the West. They have no spiritual mooring left. They are adrift in a godless, amoral world. (WA,80)

Actually, Ashwin went America for desired luxurious life but he loses spirituality. And hence he come to India. He desires to marry a such girl who can fulfil his spiritual desire and associate him for his rest of the life onward. Ashwin reveals that modern American civilization is frankly materialistic. The Western culture of man shallow and pseudo, and unfitted to lead man to total fulfilment. It neither seek nor derives any spiritual inspiration from its religion. The play is

not only about the problems of marriage institutions and financial crisis but the synthesis between spiritual and cultural values versus materialistic approach of two civilizations. He exposes,

Unlike the US, India has an ancient civilization. A culture which is full of wisdom and insight. India should have the capacity to lead the world. Yet when I looked back at my country, what did I see? Again darkness. All our ancient culture, our spiritualism, our heritage. Everything has been remoulded to fit the market demand. Behind all our spiritual abracadabra, we are hitched our star, and our hope, to global capitalism. Geetayajnas, Yogic techniques, Upanishadic sermons. System assembled out of a grab-bag of trendy brandnames. Gift wrapped in synthetic saffron. The darkness of our soul illuminated with neon lights and stroboscopes. India had become the Walmart of spirituality.

Gradually- and mind you, it has required a lot of painful soul-searching-eyes, even painfully, I have realized that Hinduism can indeed save this world from moral chaos. But not through this sort of branded spirituality. No dial-a-solution philosophy is going to help the world. We have to look into our heart, and discover our ancient values afresh. Begin at the beginning. (Pause.)

That is why I have come to Dharwad to look for a life partner. I have come here because I believe that it is in place like Dharwad that belief in innocence, the very idea of purity, still survives.

Someone like you carries within you the essence of Hindu spirituality. Woman as Mother, Wife, Daughter. Womanhood as the most sacred Ideal. (WA,81)

Whatever be the civilizations, American or European it is always found that the contemporary world keenly interested in India and its spiritual as well as cultural heritage. So, they come in touch with the mind and face of India was recurring cultural contact with the contemporary civilizations. For centuries together, India became the cleaning house of ideas between east and west. Today America is experiencing in this twenty first century what western Europeans experienced earlier. He very confidently admits, Hinduism has tremendous capacity to guide the rest of the world. Modern Indian renaissance became an entirely positive force rooted in the spiritual core of the Hinduism. And has the capacity to achieve a synthesis of these two cultures i.e. east and west in India. The inner conflict of Ashwin clearly exhibits the changing values of Society. America is super power in the world. But the difficulty is that the country has lost the spiritual power which is essential to integrate our values. He also exposed the hollowness of American life. He confesses the loss of social and moral values, spiritual and cultural insight and the racial and ethnographic roots because his stay in America. He realizes the importance of values and so that even he does not have any kind of dowry. And this is the reason why he feels deserted even though he lives in all sort of luxurious life. He needed a girl whom he marries should

be from his spiritual country (India) but not from materialistic (America). Further he says, “I want you to see this not merely as a marriage but as a mission. I would like you to be my partner in carrying the best of our spiritual tradition to the west.” (WA, 82) He wishes that her wife should have “caste in the spiritual role of woman as Mother-Wife-Daughter his partner in a ‘mission’, if she will have it, to demonstrate the superiority of Hinduism to the West.” (WA, xi)

India, the dynamic centre of modern wisdom and its wisdom has attracted the nations of the world. Even India is enticing modern America today. This alluring was there even in the nineteenth century India’s natural resource of cultural heritage influenced the world. That traces in the books like *Passage to India* by Walt Whitman, *Eastern Religion and Western Thought* by Dr. S. Radhakrishnan and a remarkable book, *The Massage to Plato* by Prof. E.J. Urwick (England)

Initially Vidula’s character is shown as bold enough. Naturally the questioned raised, how this girl will be suitable for a boy who is in search of spiritual aesthetics. This contradiction of East-West principles arouses the beauty of the play. Vidula is caught by the local Hindu fundamentalist in the cybercafe while watching pornography and warned by them not to come again here. At that time, she challenges and quarrel with them for having molested her. And also demands the police too.

VIDULA (her voice rising): *I have paid for the computer time. I have paid to be left alone in this room. To work here without being disturbed. What gives you the right to come in here? I’ll do what I like here. Who the hell are you to question me?*

YOUTH 1: *We are here the guardian of our tradition, our ancient.....*

VIDULA: *You have no bloody right. You have no fucking right to harass me.*

YOUTH 1: *Mind your words, lady. Don’t use fuck and bloody to us.*

VIDULA: *I’ll say what the hell I like. Why are you here?*

(A new thought strikes here her.)

You have come here to rape me, haven’t you? You want to attack me. (WA,70)

Further she says, “Please call the police.... Get out of here, you bloody bull-shitters. If you don’t fuck off this minute...” (71) She is a girl of having very modern outlook. While first meeting with Ashwin through video conferencing she is asked by Rohit, her brother that she should be appear bright and cheerful, she abruptly objects him. Saying, “I just want him to know what I am like.... I’m not glamorous, as you can see. I’m not exceptional in any way. I don’t want you to be disappointed later.” (6) Beside that Rohit and Hema advised her that not to fear or hesitate to divorce Ashwin if the marriage does not get on well in America. But ironically, a girl having materialistic attitude and bold enough to surrender herself to Ashwin’s principle’s becoming a vegetarian and deciding never to divorce him. She says, “I’ll never divorce Ashwin.... I gave him my word. I have given up eating fish.” (86) It observed that the spiritual as well as cultural

transformation comes back in her personality through Ashwin. She admits, “Of the bargain? I trust him. He is my husband after all.” (87) after marriage she has changed her lifestyle. Karnad successfully shown these two terminologies, bold and conventional type in her personality. Transformation of Vidula’s mindset from non-vegetarian to vegetarian and huge respect to husband represents Indian spirit and the cultural heritage through Ashwin’s Wisdom with the help of technology. Very consciously Girish Karnad does consistency in his duty to explore Indianness. The spiritual and cultural heritage through modern devices like video conferencing, internet cafe and the restaurant keep curious intensity in readers’ mind. His continuous experiments of art with myth, history, folklore, old stories embedded his artistic desire to produce human values through spiritual and cultural realization in his plays. Certainly, *Wedding Album* truly serve and expectant to glorify its synthesis of spiritual existence and cultural heritage. Indeed, his manifestation the idea of spirituality and cultural heritage produced resonance in techno user modern youth.

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LANGUAGE, LITERATURE, AND TECHNOLOGY: NAVIGATING THE DIGITAL AGE

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Abstract:

Navigating the digital age requires balancing tradition and innovation. Language and literature in the digital world are evolving, influenced by technologies that shape how we communicate, read, write, and share stories. While new technologies provide opportunities to expand access, creativity, and diversity, they also bring challenges related to authenticity, privacy, and the impact on human interaction. As technology continues to transform the literary landscape, it's up to both creators and consumers to navigate these changes thoughtfully, ensuring that the human touch remains central to the stories we tell.

In conclusion, the media—traditional and digital—has a profound and dual impact on the evolution of Indian languages. It helps promote linguistic diversity, influences the adoption of new words, and shapes language use across various regions, all while playing a role in preserving or potentially eroding regional dialects and languages.

Language is a system of communication that uses symbols, sounds, gestures, or written characters to convey meaning. It allows individuals to share thoughts, emotions, ideas, and information with one another. These symbols can be words, signs, or sounds, and their meanings are often understood by the members of a particular community or culture.

Language can take many forms, including:

1. **Spoken Language**
2. **Written Language**
3. **Sign Language**
4. **Non-verbal Communication Language**

Literature is a body of written or spoken works that are considered to have artistic or intellectual value. It encompasses a wide range of creative expressions, including novels, short stories, poems, plays, essays, and even oral traditions.

Here are a few key characteristics of literature:

1. **Artistic Expression:** Literature is often crafted with attention to language, structure, and aesthetic qualities. It goes beyond mere communication of facts and aims to evoke emotions, provoke thought, or offer new perspectives.

2. **Imaginative Content:** While literature can be based on real events or experiences, it often involves fictional elements, creative storytelling, or symbolic meanings that invite readers to think critically about the world.
3. **Reflection of Society and Culture:** Literature often mirrors the values, struggles, and concerns of the time and place in which it was created. It can challenge social norms, explore human nature, and reflect diverse experiences and viewpoints.
4. **Timelessness and Universal Themes:** Many works of literature endure through time because they address universal themes—such as love, death, power, identity, and justice—that resonate across cultures and generations.
5. **Genre Variety:** Literature spans many genres, including poetry, fiction (like novels and short stories), drama (plays), essays, and more. Each genre uses its own techniques and conventions to tell stories or convey ideas.

1. Language in the Digital Age

Language in the digital era is evolving rapidly, influenced by the ways in which people communicate online. Here are some key aspects of how language has adapted:

a. Internet Slang and New Forms of Communication

- **Abbreviations and acronyms** (e.g., "LOL" for Laughing Out Loud, "BRB" for Be Right Back, "DM" for Direct Message) have become staples of online communication, allowing for faster, more efficient exchanges.
- **Emojis and GIFs:** These visual elements have become integral to digital language, conveying emotions, reactions, and sometimes entire messages without the need for words.
- **Hashtags (#):** Originally popularized by Twitter, hashtags have become a way to categorize content, follow trends, or amplify voices, affecting language use in both personal and professional contexts.

b. Influence of Social Media on Language Structure

- Platforms like Twitter, TikTok, and Instagram have influenced how people structure sentences and convey meaning. For instance, the character limit on Twitter encourages brevity and the use of shorthand.
- Social media also gives rise to **memes**, which often use humor, irony, and references to current events in ways that play with language. Memes can spread rapidly, sometimes even coining new words or phrases.

c. Digital Communication and Changing Grammar

- Informal, conversational language has become dominant in online communication. This includes the use of sentence fragments, unconventional punctuation (e.g., excessive use of exclamation marks or ellipses), and the use of lowercase letters instead of capitalization.

d. Globalization of Language

- The internet has also contributed to the **globalization of language**, as English (and other major languages) has become the lingua franca of the digital world. However, this has also led to the rise of **code-switching** (switching between languages or dialects), as people from different linguistic backgrounds interact online.

2. Literature in the Digital Age

Literature is being reshaped by the digital environment in a number of exciting and innovative ways:

a. E-books and Digital Publishing

- With the rise of e-readers like the Kindle and apps like Apple Books, **e-books** have made literature more accessible and affordable. Writers can self-publish and distribute their work digitally, bypassing traditional publishing houses.
- **Audiobooks** have grown in popularity, with apps like Audible revolutionizing the way we consume literature. The audio format allows people to "read" while multitasking, such as during commutes or workouts.

b. Interactive and Hypertext Literature

- Digital technology allows for **interactive literature** or works that change based on reader input. This includes hypertext fiction, where links embedded in the text allow the reader to choose their path through the story (often leading to multiple narrative outcomes).

c. Blogs, Social Media, and Micro-Literature

- **Blogs** and **social media platforms** have become new forms of literary expression. Many authors now share their work online through blogs or Twitter, and some even publish their novels in serialized form on platforms like Wattpad.
- **Micro-fiction**, stories told in just a few sentences or words, thrives in the digital world. Twitter has become a platform for this form of storytelling, with writers using the 280-character limit to craft brief yet compelling narratives.

d. Crowdsourced Literature and Collaborative Projects

- The internet has enabled **crowdsourcing** of literary works, where readers or participants contribute to the creation of a story or text. Wikipedia itself is a kind of living text, constantly edited and updated by a global community.
- **Collaborative storytelling** can take place in digital forums, like Reddit's r/nosleep, where users post and add to horror stories, or in platforms like *Wattpad*, where writers share and receive feedback on their stories from the community.

e. Digital Archives and Preservation

- The digital age has provided vast new avenues for **archiving and preserving literature**. Online databases and digital libraries, such as **Project Gutenberg** or **Google Books**, have
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made centuries of literary works accessible to anyone with an internet connection. This democratizes access to literature and helps preserve important cultural texts.

f. Literary Analysis and AI

- **Artificial Intelligence** is increasingly being used in literary analysis. AI can now analyze large texts, identify patterns, and even generate new content. Tools like GPT-3 (which powers my responses) can assist writers with idea generation or mimic famous literary styles.

Understanding **language and literature in the digital age** involves recognizing how technology has reshaped both the way we engage with language and how we consume literature. Here's how you can navigate this dynamic landscape:

1. Digital Platforms for Reading and Writing

- **E-books and Audiobooks:** With platforms like Kindle, Audible, and Google Books, you can access a vast array of literary works from around the world.
- **Self-publishing:** The digital age has democratized literature through platforms like Wattpad, Amazon Kindle Direct Publishing, and Medium.
- **Blogs and Online Journals:** Literary criticism, poetry, short stories, and essays are increasingly shared on personal blogs, literary websites, and academic journals. Writers and readers can engage directly with one another, fostering an interactive, community-driven approach to literature.

2. Social Media's Role in Language and Literature

- **Microblogging (Twitter, Instagram):** Platforms like Twitter have given rise to **microfiction** and **flash poetry**, where stories and poems are condensed into 280 characters or less. Writers use these platforms to share quick, engaging snippets of literature, sometimes going viral.
- **Hashtags and Challenges:** Literary communities on social media have popularized hashtag challenges such as #PoetryPrompt or #FlashFictionFriday. These challenges encourage writing and foster creativity within the confines of the digital world.
- **Book Reviews and Discussions:** Social media platforms (like Goodreads, Instagram's Bookstagram, or YouTube's BookTube) allow readers to share opinions, reviews, and recommendations. These interactions shape how literature is consumed, discussed, and critiqued.

3. Online Communities and Collaborative Writing

- **Fanfiction and Participatory Literature:** Platforms like Archive of Our Own (AO3) and Wattpad encourage fans to create their own narratives based on existing works. This participatory model allows readers to become writers, building on shared cultural narratives and expanding traditional storytelling.
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- **Crowdsourced Projects:** Digital collaboration tools enable writers to co-author works with others worldwide. For example, **Google Docs** allows for real-time collaboration, and platforms like **Penflip** or **GitHub** are used for collaborative writing in an open-source format, much like the way software is developed.
 - 4. Language and Translation Technology
 - **Machine Translation (Google Translate, DeepL):** Digital tools have made it easier to translate literature between languages, broadening access to works from different cultures. While not perfect, these tools help facilitate cross-cultural exchange and understanding.
 - **Text-to-Speech and Speech Recognition:** Tools like Siri, Google Assistant, and dictation software help people with disabilities access literature, making language and reading more inclusive. Audiobooks and podcasts have become popular, allowing people to listen to novels, essays, and lectures.
 - 5. Interactive Literature and Multimedia Storytelling
 - **Digital Literature and Hypertext:** Writers are experimenting with interactive literature where readers can choose the direction of the story, akin to the “choose-your-own-adventure” format. This creates a more immersive, participatory experience in literature.
 - **Multimedia Integration:** The digital age encourages writers to integrate text with images, audio, and even video. Some online works blend poetry with music, or combine graphic novels with text-based storytelling, exploring new ways to tell stories through multimedia elements.
 - 6. Language Evolution in Digital Communication
 - **Texting and Emoji Language:** The language of texting, which includes abbreviations (e.g., "lol," "brb"), emojis, and GIFs, has impacted both spoken and written language. Writers often draw from these digital lexicons to reflect the way people communicate today.
 - **Acronyms and Internet Slang:** Words like “**tbh**” (**to be honest**), “**fomo**” (**fear of missing out**), “**lit**” (something cool or exciting) have become part of modern language. These terms often appear in digital writing and literature, influencing how language evolves.
 - **Code-Switching and Multilingual Content:** In countries like India, the use of **code-switching** (switching between languages or dialects) has become a common feature in digital communication. For example, **Hinglish** (Hindi + English) is frequently used in social media, creating a rich blend of cultural and linguistic expressions.
 - 7. Literary Criticism and Digital Resources
 - **Online Databases:** Websites like JSTOR, Google Scholar, and Project MUSE provide access to academic papers, literary criticisms, and analyses.
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- **Digital Archives and Libraries:** Digitized collections of classic literature, as seen in **Project Gutenberg** or **The Digital Public Library of America**, preserve and share historical texts. This increases access to rare or ancient works of literature, helping to keep them alive for future generations.
- **Video Lectures and Online Courses:** Platforms like **Coursera**, **edX**, and YouTube offer free or paid courses that dive into literary analysis, history, and theory.
- 8. Digital Tools for Language Learning
 - **Language Apps:** Platforms like Duolingo, Babbel, or Memrise
 - **Online Writing Aids:** Tools like **Grammarly** or **Hemingway Editor**
- 9. Impact of AI on Language and Literature
 - **AI-Generated Literature:** Artificial intelligence is now capable of writing stories, poetry, and essays. While still in its infancy, AI has already generated novels and poems, sparking conversations about authorship, creativity, and the role of technology in art.
 - **Chatbots:** AI-driven platforms, such as **ChatGPT**, allow users to generate content, ideas, and stories interactively.
- 10. Digital Publishing and Literary Innovation
 - **Online Journals and Magazines:** Many literary journals have transitioned to digital-first platforms, offering open access to works of fiction, poetry, and criticism. This makes literary content widely accessible and fosters a global conversation about literature.
 - **Crowdfunding for Literary Projects:** Websites like Kickstarter or Patreon allow authors and creators to fund their literary works directly through public support, providing a new model for publishing and distribution in the digital age.

Language, Literature, and Technology: Navigating the Digital Age is a fascinating exploration of how the digital age has transformed communication, storytelling, and the way we engage with written content. The rapid advancement of technology, especially in areas like artificial intelligence, the internet, and digital platforms, has reshaped how we use language and literature, both in creation and consumption. Here's an overview of some of the key ways language, literature, and technology intersect in the digital age:

1. Digital Literacy and the Changing Nature of Reading
 - **Shift from Print to Digital:** With the rise of e-books, audiobooks, and online articles, the way people read and interact with literature has evolved. While print books remain cherished by many, digital formats allow for convenience and greater access to literature globally.
 - **Multimedia Integration:** Technology has transformed reading into a multimedia experience. Enhanced e-books and interactive texts, for example, integrate video, sound, and hypertext elements, creating new ways to engage with narratives.

- **New Forms of Reading:** The digital age has brought about "skimming" and "scanning" reading habits, influenced by social media and the internet. Attention spans may have changed as we consume information through short-form content, such as tweets, memes, and articles.
2. The Influence of Social Media on Language
- **New Linguistic Forms:** Platforms like Twitter, Instagram, and TikTok have introduced new forms of language use. Abbreviations, hashtags, emojis, and internet slang are now commonplace, creating a new dynamic in communication.
 - **Shortened Attention Spans:** Social media has led to a preference for concise, attention-grabbing language. This shift toward brevity often impacts how we express thoughts, jokes, or even complex ideas.
 - **Language Evolution:** Social media accelerates linguistic innovation. New words and phrases, such as "selfie," "viral," or "ghosting," emerge rapidly, reflecting cultural trends and technological impacts.
3. Artificial Intelligence and Content Creation
- **AI-Generated Writing:** AI tools like GPT (including myself) can assist or even generate literature, articles, and creative writing. While these technologies can automate some aspects of writing, the question arises: what does it mean for authorship when machines contribute to content creation?
 - **Personalized Content:** AI algorithms can create customized reading experiences by recommending books, articles, or stories based on individual preferences and past behavior. This ability can lead to hyper-personalization, making the literary world more accessible yet possibly limiting the diversity of content consumed.
 - **Machine Translation:** AI-powered translation tools have revolutionized the accessibility of global literature. Authors can now more easily reach international audiences, and readers can access works that would have previously been limited by language barriers.
4. Digital Publishing and Accessibility
- **Self-Publishing:** Technology has democratized publishing, enabling authors to bypass traditional publishing houses. Platforms like Amazon's Kindle Direct Publishing allow anyone to publish and distribute their work digitally.
 - **Accessibility to Literature:** Digital formats have made literature more accessible to a wider audience, including people with disabilities. Audiobooks, large print options, and voice-assisted technology are just some examples of how digital technology is improving access to literature for diverse populations.
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5. Online Communities and Collaborative Writing

- **Fan Fiction and Crowdsourced Content:** The internet has given rise to fan fiction communities, where writers can share and collaborate on stories based on existing works. This has expanded how people interact with literature and storytelling, giving a platform to amateur writers and fans alike.
- **Crowdsourced Literature:** Platforms like Wattpad and Medium allow for collaborative writing experiences. Writers can receive feedback from readers in real time, leading to more iterative, interactive forms of literature.

6. Digital Preservation of Literature

- **Archiving and Preservation:** The digital age has made it possible to preserve and share literature in ways that were once unimaginable. Digitizing old texts ensures that they are not lost to time, and new archives, such as Google Books, provide free access to millions of books.
- **Challenges of Digital Longevity:** While digital preservation has expanded access, there are also challenges related to data obsolescence, where formats or digital platforms might become outdated. Keeping digital texts available over time requires ongoing technological investment.

7. Impact on Writing Styles and Literature's Role in Society

- **Short-Form Content and Instant Publishing:** In an age of blogs, tweets, and Instagram posts, the way we communicate is increasingly immediate and informal. Traditional long-form literature may seem at odds with a culture that favors instant gratification, but it also faces opportunities to evolve in new directions through digital media.
- **Diversity and Representation:** Technology has made it easier for marginalized voices to share their stories. Digital platforms offer new opportunities for underrepresented authors to reach wider audiences, fostering diversity in literature.
- **The Changing Role of Criticism:** With platforms like Goodreads and online book reviews, literary criticism has become more democratized. Readers themselves contribute to how literature is critiqued, often engaging in discussions and shaping cultural conversations.

8. The Future of Language and Literature in the Digital Age

- **Virtual Reality (VR) and Augmented Reality (AR) Storytelling:** New immersive technologies like VR and AR are pushing the boundaries of storytelling, allowing readers to experience narratives in a fully interactive and immersive environment. This creates opportunities for interactive books or virtual worlds.
 - **AI-Assisted Writing and Co-Creation:** As AI technology evolves, it could become more of a co-creator in literature, helping writers brainstorm, organize, and even compose drafts.
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Writers might use AI for assistance in developing ideas, world-building, or overcoming writer's block.

- **Literary Robots and AI Writers:** The future may bring entirely AI-generated literature, which may challenge our understanding of authorship and creativity.

Conclusion

Navigating the digital age requires balancing tradition and innovation. Language and literature in the digital world are evolving, influenced by technologies that shape how we communicate, read, write, and share stories. While new technologies provide opportunities to expand access, creativity, and diversity, they also bring challenges related to authenticity, privacy, and the impact on human interaction. As technology continues to transform the literary landscape, it's up to both creators and consumers to navigate these changes thoughtfully, ensuring that the human touch remains central to the stories we tell.

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ENGLISH – A KEY TO SUCCESSFUL CAREER

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"Mastering English is like holding a passport to global opportunities."

Abstract

English has become a global language for business, education, and communication. In today's competitive job market, proficiency in English enhances employability and career growth. This presentation explores the role of English in securing and excelling in a job.

Most often the fresher's are the ones who get highly affected by the English communication skills during their efforts towards successful career. Students need to develop good comprehending skills for reading and listening along with the technical skills in their field for their professional growth. Writing clear emails, reports, and resumes, effective verbal communication in meetings and presentations are the basic requirements of any profession.

There are n' number of methods through which students can be groomed to best fit themselves in their fields of knowledge. Soft skills training, language guidance, pronunciation skills are the areas where students can be improved. Students from less privileged background, non-native English speakers, having unprofessional family backgrounds are the challenges for coaching. To overcome these challenges, mentoring the students for diminishing their imperfections should be the crucial role of any trainer. Proper guidance and training make them so much strong in the English skills that they definitely get success in their career.

Key words: Global business, Proficiency levels, Challenges, Solutions, Self-awareness, Digital methods and AI

Introduction: *"English is the key that unlocks opportunities."*

In the global market, English communication acts as the primary language for business interactions, allowing companies and individuals from diverse backgrounds to communicate effectively, facilitating international trade, collaboration, and market access due to its widespread adoption and neutral status across different cultures. Employability can be defined as the ability to get and sustain a job, and to proceed in your career. Employability is a combination of skills, knowledge, and personal traits that make someone more likely to find a job and succeed in their career. It benefits the individual, the economy, the community, and the workforce.

This paper on "English -A key to successful career" explores the important role of English language in career advancement, highlighting how effective communication in English is. It opens doors to global opportunities, enhancing professional credibility, and significantly impacts one's

ability to secure promotions and leadership roles across various industries, making it an essential skill for individuals seeking to progress in today's globalized workplace.

While training the freshers from commerce and technical faculty it has been observed that maximum students are good at technical knowledge but lagging in English skills. Vocabulary, sentence constructions, grammar, pronunciation and accent used by them is of the beginner or intermediate level which may be sufficient till the academics, but they seem to be incompetent in the professional global market. Students need to encourage themselves to improve their proficiency level of English. There should be self-awareness among themselves to cope up with the fast-growing world. They should be able to sustain the competition world-wide according to the phrase 'survival of the fittest'.

This paper focuses on the role of English during career development and success, the challenges that a coach has to face while grooming a student for professional career, and the various techniques through which a student can improve in the second language.

The Role of English in Employment

"The art of communication is the language of leadership." — **James Humes**

Global Business Communication: In the competitive world of global business, English proficiency provides a distinguishable advantage. The roles that require interaction with international clients and partners are preferably assigned to employees fluent in English. Companies having employees skilled in English can better interact during cross-border negotiations, contracts, and can achieve higher positions.

Job Market Advantage: India is rapidly amalgamating into the global economy, with many Indian companies merging with international firms. English serves as the common language for business communication. English is essential for professionals working in multinational corporations, sectors like IT, BPO, and consulting. Fluency in English opens doors to job opportunities in global markets, both in India and abroad.

Increased Job Opportunities: Especially in sectors such as finance, technology, education, and hospitality many employers in India choose candidates who are fluent in English. "English proficiency" is the top skill criteria for various positions for job portals and recruitment agencies. Due to the need to communicate effectively with clients, partners, and colleagues across borders this preference is seen. Strong English skills can set you apart from other candidates in writing reports, giving presentations, or negotiating deals.

Competitive advantage: Qualified workers with good English skills have an upper hand with respect to promotions and career growth. Superior roles in many companies require regular communication with international clients and stakeholders. They must have fluency in English. Employees who can show confidence in their English speaking, reading, and writing abilities are

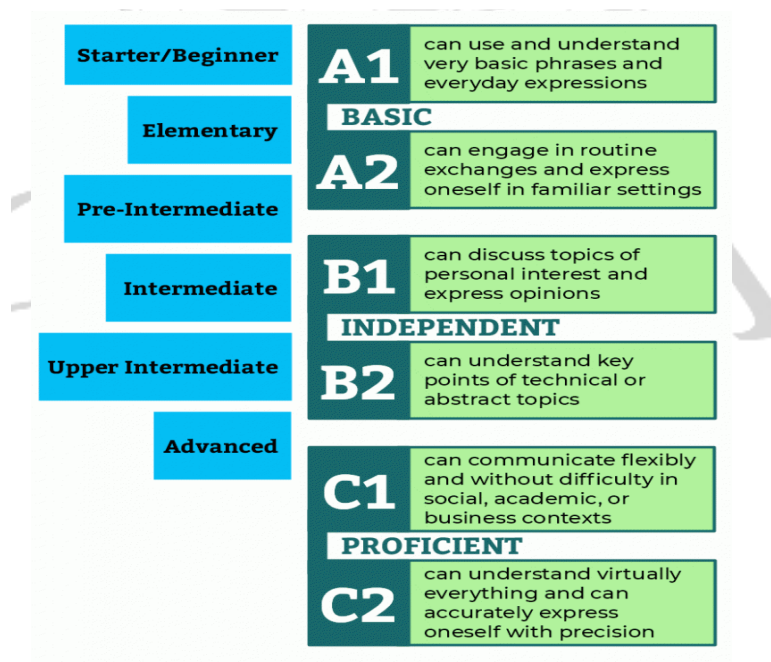
preferably considered for leadership positions. Decency and dignity in the global market can be accomplished by English communication.

Leadership Potential: Effective communication is key to success while managing a team. It helps the manager to inspire his colleagues, resolve conflicts, collaborate easily, negotiate better deals and enhance organizational communication. Whether it is through emails, presentations, or meetings, English proficiency enhances the ability to deliver clear and concise messages. It benefits an individual with sufficient vocabulary, which enables him to express complex ideas seamlessly. It enables an individual to structure the messages in a coherent manner, making sure that the ideas are understood and retained by the audience, which makes him/her more suitable for leadership roles.

Finding out the English proficiency level

The most widely used English language proficiency scale is the Common European Framework of Reference for Languages (CEFR), which categorizes language ability into six levels: A1 (Beginner), A2 (Pre-intermediate), B1 (Intermediate), B2 (Upper Intermediate), C1 (Advanced), and C2 (Proficient)

Key points about the CEFR scale:



A1/A2 (Basic User):

Such people can understand and use basic expressions for everyday situations, introduce themselves, and ask simple questions.

B1/B2 (Independent User):

These people can understand information on familiar topics, communicate in most travel situations, and express opinions in simple connected text.

C1/C2 (Proficient User):

Such people can understand complex texts, express themselves fluently and spontaneously in a wide range of situations, and use language effectively and flexibly.

“Opportunities don’t happen. You create them.” — Chris Grosser

Methods to Improve English for Employability

As we come across hundreds and thousands of students during our professional career, we notice that students are having different levels of English skills, right from beginners to proficient.

Depending upon the English proficiency level the students can be groomed using various activities. These are some tried and tested methods of improving English for employability.

Activities of English for the beginners and intermediate students

1] Star activity	11]Celebrity speech	21] Happiest moment of my life	31] Game of survival
2] Role plays of types of sentences	12] Fight for the chair	22]Mockinterviews	32] Message relay
3] Object talk	13] Argument at the shop skit	23] Word chain	33] Buying a car
4]Groupdiscussions	14] Extempore	24] Diagram and statement	34] Voting for a candidate
5] Debates	15] My favourite comic character	25] Synchronization of sentences	35] State presentation
6]Telephonic conversation	16] Dream trip	26] Advertisement	36] Dumb charades
7] Report writing – delivering on news channel	17] Puzzle game	27] JAM	37] Listening comp
8] Interview of family member	18] Story telling	28] Brainstorming [reason]	38] Interview tech
9] Movie story briefing	19] SWOT analysis	29] Question storming	39] BPO talks
10] Rolling the bundle	20] Recipe of food item	30] Describing a game	40]Telephonic interviews

Activities to improve in proficiency level

Other than these classroom activities students who want to further improve themselves on their own for proficiency level can use the other activities like:

Reading business articles, newspapers, and books

Reading helps expand vocabulary, lessens stress, enhances analytical skills, enhances creativity, strengthens writing skills, develops empathy, improves decision-making, makes you better leader, makes you smarter, trains individuals’ social skills and trains the memory.

Practicing writing skills

Writing emails, reports, analysis, proposals and other articles help professionals to improve in the language skills. It improves the ability to explain ourselves and maintain a record for future. It helps in securing a job in later life, improves communication skills, improves memory and retention, creativity and self-expression, enhance literacy and promotes patience.

Enhancing speaking skills through debates and discussions

Participating in debates and discussions significantly enhances speaking skills by providing a platform to practice articulating thoughts clearly, constructing persuasive arguments, actively listening to opposing viewpoints, and improving fluency in delivering ideas under pressure, ultimately building confidence in public speaking.

Watching English news, TED Talks, and listening to podcasts

Students learn about new things that they may not have been exposed to, by watching and listening to TED talks. TED Talks cover a wide range of topics. They allow them to develop a more well-rounded understanding of the world. This can particularly help teaching English to adults. News in audio or visual formats can also improve listening comprehension. Podcasts can improve mental health and listening skills. They are also great for learning new things.

Some other strategies for Improving English Proficiency:

Language courses and training programme, immersive language learning experiences, networking with English-speaking professionals, reading professional literature and publications.

Digital technology and Use of AI

Digital tools can help improve English communication skills in many ways, including learning pronunciation, building vocabulary, and receiving feedback. Some of the digital technologies used nowadays are Interactive whiteboards, podcasts, story-telling tools, online quizzes and survey, smart phone apps and websites, multimedia presentations.

Artificial intelligence (AI) can help improve English language skills. It provides real-time feedback, corrects errors, and analyzes speech. AI can also help with grammar, clarity, and pronunciation.

AI can help learning English by

Error correction: AI can identify and correct errors in writing and pronunciation.

Speech recognition: AI can analyze speech and help provide feedback on pronunciation, grammar, and clarity

Transcription: AI can change spoken language into written text.

Personalized learning: AI can allow individualized learning and access to resources.

Communication coaching: AI can come up with real-time feedback and suggestions to improve communication skills.

Challenges associated with rural students

"Challenges are what make life interesting. Overcoming them is what makes life meaningful."

— *Joshua J. Marine*

While working in rural areas as a coach for the students of technical, management and commercial fields it is seen that the students who are going to step out in the new world of corporate, business, multi-national companies have very less confidence due to their poor English communication skills. This is not the case with students from urban areas and metro cities. Somehow the surrounding plays an important role in grooming the students. The students have a greater impact of family, friends and teachers with whom they have shared their perspectives, ideas and thoughts. The fluency in English by such students enhances with practice since childhood, whereas the students in rural areas do not have any such exposure, which make them poor communicators.

Teaching English in rural areas comes with several challenges, including:

1. Lack of Qualified Teachers
 - Fewer teachers with strong English proficiency or training in English pedagogy are found as resources. Sometimes they select this profession when they have no other option. If ever learned teachers are available, they are reluctant to effective teaching due to the extra workload by the institutes.
 - Difficulty in attracting and retaining skilled teachers due to remote locations and lower salaries.
2. Limited Resources
 - Shortage of textbooks, teaching materials, and technology (computers, internet, projectors, etc.).
 - Insufficient funding for educational infrastructure and language programs.
3. Language Barrier & Limited Exposure
 - Students may have little to no exposure to English outside the classroom.
 - Local dialects or native languages may dominate, making English learning feel unnatural or unnecessary.
 - For individuals from non-English speaking backgrounds, effective communication can require additional effort and training.
4. Poor Learning Environment
 - Large class sizes with limited individual attention.
 - Lack of electricity, proper classrooms, or even basic school supplies.
5. Lack of Parental & Community Support
 - Many parents may not speak English and may not see its immediate value.

- English learning may not be prioritized in communities focused on agriculture or local trades.
- 6. Low Student Motivation & Confidence
 - Fear of making mistakes and lack of opportunities to practice.
 - Perception that English is difficult or irrelevant to their daily lives.
- 7. Limited Access to Technology & Digital resources
 - Internet connectivity issues make online resources and virtual learning inaccessible.
 - Technology is useless due to lack of digital literacy among students and even teachers
- 8. Curriculum Challenges
 - Textbooks and syllabi may not be tailored to rural learners' needs.
 - Teaching methods may rely too much on rote memorization instead of interactive learning.
- 9. **Self-awareness**

Everything is possible until and unless the students are aware about the importance of English language for a successful career. All the efforts to improve them are in vain if they themselves don't realize how English can help build their future

Solutions & Strategies

"Every problem has a solution. You just have to be creative enough to find it." — Travis Kalanick

- **Teacher Training & Support:** More workshops, incentives, and remote learning for teachers.
- **Use of Alternative Learning Resources:** Radio, TV, offline mobile apps, and community libraries.
- **Engaging Teaching Methods:** Games, storytelling, and practical activities instead of only grammar drills.
- **Community Involvement:** Encouraging local leaders and parents to support English learning.
- **Technology Integration:** Using offline digital tools where the internet is weak.
- **Use of Digital and AI techniques:** New technologies can be fascinating and easy to implement

Conclusion

English communication skills have become a crucial eligibility criterion for any industry or position as it ensures effective ways to convey message, share ideas, and build relationships at the workplace. English is a powerful tool for career success. Developing English proficiency enhances job opportunities and professional growth. Continuous learning and practice is essential for mastering English for employability.

English plays a crucial role in employability, as it is the global language of business,

communication, and technology. Proficiency in English enhances job opportunities by allowing individuals to communicate effectively in multinational workplaces, participate in professional discussions, and access a wider range of career options. Strong English skills are essential for writing resumes, attending interviews, and collaborating with colleagues from diverse backgrounds. Industries such as IT, healthcare, hospitality, and customer services often require employees to have a good command of English to interact with clients and stakeholders. Thus, improving English proficiency can significantly boost career prospects and professional growth.

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AI AND MODERN EDUCATION: IMPLEMENTING NEP 2020 FOR FUTURE LEARNING

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Abstract

The fusion of wisdom and technology is essential for forging a sustainable future, where Artificial Intelligence (AI), the Indian Knowledge System (IKS), and human resilience collectively shape progress. Education, as a cornerstone of development, has undergone a paradigm shift with AI-driven innovations, aligning with the objectives of the National Education Policy (NEP) 2020. This policy envisions a transformative learning ecosystem that integrates AI and digital advancements to enhance accessibility, flexibility, and quality. However, its implementation presents challenges such as digital disparities, ethical concerns, and the need for teacher adaptability.

AI's role in modern education transcends conventional methods by enabling personalized learning, fostering critical thinking, and bridging educational gaps. By leveraging AI-powered tools, students can engage in experiential learning, thereby aligning with the NEP 2020's emphasis on holistic development. Furthermore, the integration of IKS ensures that traditional wisdom complements technological advancements, creating a balanced educational framework. This confluence of AI and indigenous knowledge fosters cultural continuity while equipping learners with future-ready skills.

Resilience, both individual and institutional, is vital to navigating the rapid transformation of education. As AI reshapes pedagogical methodologies, fostering ethical AI literacy and inclusive digital infrastructure becomes imperative. By embedding AI within NEP 2020's framework, India can cultivate an education system that is both technologically empowered and deeply rooted in its intellectual heritage. A sustainable future, therefore, lies in harmonizing AI, traditional wisdom, and human adaptability to nurture lifelong learners equipped for an evolving world.

Keywords: -Artificial Intelligence, Indian Knowledge System, NEP 2020, Digital Education, Personalized Learning, Ethical AI, Holistic Education.

1. Introduction

Education is a fundamental pillar of socio-economic development, shaping the intellectual and professional capabilities of individuals. The rapid advancements in Artificial Intelligence (AI)

have led to a paradigm shift in learning methodologies, making education more adaptive, inclusive, and efficient. In the Indian context, the National Education Policy (NEP) 2020 envisions a transformative educational framework that leverages AI and digital technologies while maintaining the cultural and intellectual foundations of the Indian Knowledge System (IKS).

NEP 2020 advocates for multidisciplinary, flexible, and technology-driven learning, recognizing AI as a critical enabler in achieving these objectives. AI-powered tools facilitate personalized learning, real-time assessments, and intelligent tutoring systems, thus redefining traditional pedagogy. At the same time, the incorporation of IKS ensures that education remains deeply rooted in India's rich intellectual traditions, fostering a harmonious blend of innovation and heritage.

2. Research Objectives

This study aims to:

- Analyze the role of AI in enhancing modern education under NEP 2020.
- Evaluate the challenges in implementing AI-driven education in India, including digital inequality, ethical concerns, and educator preparedness.
- Explore the integration of IKS in AI-powered education to create a culturally and technologically balanced learning ecosystem.
- Propose strategies for overcoming the challenges associated with AI adoption in Indian education.

3. Research Questions

1. How does AI enhance learning experiences in the context of NEP 2020?
2. What are the key challenges in implementing AI-driven education in India?
3. How can the Indian Knowledge System (IKS) be effectively integrated with AI in education?
4. What policy recommendations can facilitate the ethical and equitable deployment of AI in learning?

4. AI in Education: A Global Perspective

The integration of Artificial Intelligence (AI) in education has transformed traditional learning methodologies, enabling personalized, data-driven, and adaptive education systems. Across the globe, AI-driven tools are reshaping classrooms by providing intelligent tutoring, automated assessments, and real-time feedback mechanisms. Many countries have embraced AI to enhance learning experiences, bridge accessibility gaps, and equip students with future-ready skills.

Global Adoption of AI in Education

Several nations have successfully integrated AI into their education systems, leading to improved learning outcomes:

- United States: AI-powered adaptive learning platforms such as Khan Academy, Coursera, and Duolingo use machine learning to tailor educational content to individual student needs. AI chatbots also assist in student engagement and administrative tasks.
- China: AI has been incorporated into the national education framework, with platforms like Squirrel AI using machine learning algorithms to provide personalized tutoring to millions of students. Facial recognition and AI-driven analytics are used to monitor student engagement.
- United Kingdom: AI-driven assessment tools, such as Century Tech, help educators track student progress and offer real-time interventions. AI is also being utilized to reduce grading workload and improve the efficiency of online education.
- Finland: AI is integrated into phenomenon-based learning models, where students engage in interdisciplinary, hands-on projects. The government has launched AI literacy programs to prepare both students and teachers for AI-driven education.

5. NEP 2020: A Roadmap for AI Integration

The National Education Policy (NEP) 2020 represents a landmark reform in India's education system, advocating for technology-driven, multidisciplinary, and skill-based learning. Recognizing the transformative potential of Artificial Intelligence (AI), NEP 2020 emphasizes the role of digital tools in improving accessibility, efficiency, and quality in education. The policy envisions a technology-integrated learning ecosystem that fosters personalized learning, data-driven decision-making, and AI-powered educational interventions.

Key Provisions of NEP 2020 Supporting AI Integration

NEP 2020 incorporates several provisions that facilitate AI adoption in education:

- National Educational Technology Forum (NETF): A dedicated platform to promote research, innovation, and capacity building in AI and digital learning. NETF aims to provide best practices, policy recommendations, and AI-based learning solutions to educational institutions.
- Personalized and Adaptive Learning Models: AI-powered adaptive learning platforms will help students learn at their own pace, catering to individual strengths and weaknesses. This aligns with NEP 2020's emphasis on student-centric learning.
- Blended and Online Learning: The policy encourages the use of AI-driven Massive Open Online Courses (MOOCs), virtual labs, and digital simulations to supplement traditional learning methods.
- Skill-Based Education and AI Literacy: AI is integrated into vocational and higher education curricula, ensuring that students gain future-ready skills. NEP 2020 also introduces coding, data science, and machine learning at an early stage.

- Multidisciplinary and Holistic Learning Approach: AI facilitates interdisciplinary learning, combining subjects such as STEM, humanities, and the Indian Knowledge System (IKS), ensuring a well-rounded education.
- Equitable and Inclusive Education: AI-powered assistive technologies (speech recognition, text-to-speech software, and AI tutors) help bridge learning gaps for students with disabilities and those from rural and marginalized communities.

Government Initiatives Supporting AI in Education

Several initiatives have been launched to implement AI under NEP 2020:

- DIKSHA (Digital Infrastructure for Knowledge Sharing): A government-backed AI-enabled digital learning platform offering interactive resources, assessments, and teacher training modules.
- PM eVidya and SWAYAM: AI-powered online education platforms providing multilingual digital courses, adaptive assessments, and virtual labs.
- National AI Strategy (NITI Aayog): A roadmap for AI adoption across sectors, including education, focusing on AI literacy, research, and innovation.
- AI for All Initiative (CBSE & Intel): A collaborative effort to introduce AI literacy programs in schools, ensuring that students gain foundational AI knowledge.

6. Challenges and Opportunities in AI-Driven Education

The integration of Artificial Intelligence (AI) in education presents both significant challenges and transformative opportunities. While AI-powered learning can personalize education, enhance accessibility, and improve efficiency, its implementation under NEP 2020 faces several hurdles. Addressing these challenges is crucial for ensuring that AI-driven education is equitable, ethical, and effective.

Challenges in AI Implementation

1. Digital Divide and Unequal Access

Despite India's push toward digital education, significant disparities exist in access to technology, internet connectivity, and digital infrastructure. Rural and economically weaker students often lack:

- High-speed internet and smart devices.
- AI-powered learning platforms due to high costs.
- Digital literacy to effectively engage with AI tools.

Solution: The government must expand broadband infrastructure, provide affordable digital devices, and implement AI-driven offline learning models to reach underserved communities.

2. Teacher Training and AI Readiness

Many educators lack the technical skills required to integrate AI into their teaching. Without proper training, AI tools remain underutilized or misapplied, limiting their effectiveness.

Solution: NEP 2020 should emphasize nationwide AI training programs for teachers, incorporating:

- Workshops on AI literacy.
- AI-assisted teaching methodologies.
- Collaboration with EdTech companies to develop AI-friendly curricula.

3. Ethical Concerns and Data Privacy

AI in education involves collecting vast amounts of student data, raising concerns about:

- Data security breaches and misuse.
- Algorithmic bias in AI-driven assessments.
- Lack of transparency in AI decision-making.

Solution: Establish strict data protection laws, AI ethics policies, and regulatory frameworks to ensure:

- Fair, unbiased AI algorithms.
- Parental and institutional control over student data.
- Transparency in AI-powered learning models.

4. Cost of AI Implementation

AI infrastructure—such as intelligent tutoring systems, adaptive learning platforms, and AI-powered assessments—requires substantial investment in technology, training, and research.

Solution: Promote public-private partnerships to fund AI-driven education and encourage indigenous AI solutions to reduce costs.

7. The Role of Indian Knowledge System (IKS) in AI-Based Learning Models

The Indian Knowledge System (IKS) is a vast reservoir of traditional wisdom, scientific advancements, and cultural heritage that has shaped India's intellectual and educational legacy. NEP 2020 emphasizes the integration of IKS into mainstream education to ensure that modern learning retains cultural continuity and indigenous knowledge traditions. By leveraging Artificial Intelligence (AI), IKS can be preserved, digitized, and disseminated in innovative ways, making ancient wisdom accessible to modern learners.

IKS and Its Relevance in Contemporary Education

IKS comprises philosophy, science, mathematics, Ayurveda, astronomy, linguistics, ethics, and environmental sustainability. Some key aspects include:

- Vedic Mathematics: Ancient mathematical techniques that improve speed and accuracy in problem-solving.
- Ayurveda and Yoga: Traditional health sciences that promote holistic well-being and scientific research in medicine.
- Linguistic and Literary Traditions: Sanskrit, Tamil, and other classical Indian languages contain rich literary and philosophical texts that AI can help decode, translate, and analyze.

- Indigenous Environmental Knowledge: Ancient agricultural practices and water conservation techniques that AI can model and apply to modern sustainability efforts.

By integrating AI with IKS, India can create a learning ecosystem that combines ancient wisdom with modern scientific advancements.

8. Policy Recommendations for Effective AI Implementation in NEP 2020

The successful integration of Artificial Intelligence (AI) in education under NEP 2020 requires a strategic and well-regulated approach. While AI has the potential to enhance personalized learning, accessibility, and skill development, its implementation must address issues of equity, ethics, and teacher readiness. This section outlines key policy recommendations to ensure AI-driven education aligns with India's long-term educational goals.

9. Conclusion

The integration of Artificial Intelligence (AI) in education marks a paradigm shift in learning methodologies, enabling personalized, data-driven, and inclusive education. The National Education Policy (NEP) 2020 envisions an AI-powered educational ecosystem that enhances accessibility, fosters innovation, and aligns learning with global standards. This paper explored the impact of AI on education, the challenges of its implementation, and the strategic policy measures necessary for its success.

A key takeaway is that AI can:

Revolutionize learning through adaptive education models and personalized curricula.
Improve inclusivity by bridging linguistic, geographical, and accessibility gaps.
Enhance efficiency in education administration through AI-powered automation.
Foster innovation by integrating Indian Knowledge Systems (IKS) into AI-based learning frameworks.

However, the challenges of AI-driven education—including digital inequality, teacher readiness, ethical concerns, and infrastructure gaps—must be systematically addressed. NEP 2020's roadmap highlights the importance of AI literacy, teacher training, ethical AI governance, and strong industry-academia collaboration. By implementing progressive policies and ensuring equitable AI access, India can develop a globally competitive and culturally enriched education system.

Looking forward, AI in education must:

- Balance technology with human engagement to maintain teacher-student interaction.
- Ensure responsible AI governance to protect student data privacy and prevent algorithmic biases.
- Encourage continuous research and innovation to keep AI aligned with evolving educational needs.

If implemented effectively, AI can redefine India's education landscape, making it future-ready, inclusive, and technologically empowered. The fusion of AI with traditional wisdom under NEP 2020 will create an education model that is not only cutting-edge but also deeply rooted in India's intellectual heritage.

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A STUDY ON GREEN BANKING INITIATIVES TAKEN BY INDIAN BANKS FOR SUSTAINABLE FUTURE

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Abstract:

Indian banks are increasingly taking green banking initiatives to support sustainable development and protect the environment. This study looks at the different green banking practices adopted by Indian banks to promote sustainability, lower their environmental impact, and encourage eco-friendly behaviours among customers and stakeholders. The paper focuses on key initiatives such as paperless banking, energy-efficient operations, funding for renewable energy projects, and the use of green technologies in banking. It also discusses how regulations, customer awareness, and commitment from institutions drive the green banking movement. By analysing case studies from leading Indian banks, the study evaluates the effects of these initiatives on protecting the environment, boosting economic growth, and improving social well-being. It offers insights into how green banking can help India move toward a sustainable future, while also highlighting challenges and opportunities for enhancing eco-friendly practices in the banking sector.

Keywords: - Environmental impact, Green technologies, Green Banking, India, Sustainable future.

Introduction

The term "green banking" describes how financial organizations are implementing eco-friendly procedures to encourage sustainability and lessen their negative effects on the environment. As part of a larger movement to incorporate environmental concerns into corporate operations, green banking initiatives have been increasingly popular in India in recent years. These programs are aimed at lowering the carbon footprint of banking operations, assisting environmentally friendly projects, and motivating clients to embrace sustainable behaviours. Indian banks have started putting policies into practice, including financing energy-efficient infrastructure, providing green loans for renewable energy projects, and integrating environmental, social, and governance (ESG) factors into their lending procedures. Additionally, a lot of institutions are implementing digital banking technology to minimize their environmental impact by using less paper and energy. By means of these programs, Indian banks are not only encouraging a more sustainable financial ecosystem but also playing an essential role in driving the

country's long-term environmental goals, aligning with global efforts to combat climate change.

The banking sector has an impact on economic development and growth, both in terms of quantity and quality, which alters the character of economic growth. As a result, the banking industry is crucial in encouraging socially and environmentally conscious investment. Maybe banks aren't the ones that pollute themselves, but they typically have banking ties to certain businesses, investments, or projects that may pollute in the future. Green banking provides banks with a chance to improve their strategy-making process and obtain a competitive edge. Additionally, banks must do more to educate customers about green banking and the advantages it offers. Additionally, it was noted that there is a significant level of awareness of green banking in the higher levels of bank management, and this awareness diminishes with lower levels of management and, at the very least, with the staff members who have daily direct contact with consumers. As a result, banks should concentrate on raising awareness of the advantages of green banking among their staff members who interact directly with consumers.

Meaning

Green banking is a banking practice that prioritizes environmental and social responsibility. Green banks aim to reduce the negative impact of their operations on the environment. They also encourage customers to reduce their carbon footprint.

Green banking in India

In India, green banking practices include: Considering social and environmental factors, protecting natural resources, Reducing the negative impact of internal bank processes, and making physical infrastructure and IT more environmentally effective.

Green banking is also known as ethical banking or sustainable banking.

Green banking in India is a banking practice that considers environmental and social factors to protect the environment and conserve resources. It's also known as sustainable banking or ethical banking.

How does green banking work?

- Green banks use innovative financing to support projects that help reduce pollution and conserve resources.
- Green banks encourage green energy projects.
- Green banks support sustainable infrastructure, energy-efficient buildings, and renewable energy.

Examples of green banking in India

- The State Bank of India (SBI) is considered the first green bank in India.
- SBI started the Green Channel initiative in 2010 to change the traditional banking system to paperless banking.

Green banking principles

- Green banking is based on the principles of reduce, reuse, recycle, and remove (4Rs).
- Green banks are mission-driven, meaning they prioritize deploying clean energy over maximizing profit.

Litreature Review

Xin Zhang (2022) The main purpose of this study is to identify the impact of green banking activities on green financing and banks' environmental performance. It also identifies the mediating effect of green financing on the relationship between green banking activities and environmental performance of private commercial banks (PCBs) in Bangladesh. The convenience sampling technique was used to collect primary data from bankers of PCBs in Bangladesh, and a final sample size of 352 was recorded. To assess the relationship among the study variables, the Structural Equation Modelling (SEM) approach was employed. The empirical results revealed that green banking activities exhibit a significantly positive effect on banks' environmental performance and sources of green financing, and that sources of green financing significantly influence banks' environmental performance.

Soundarya Murugan (2021) The main aim of the study is to know the impact of green banking in India & it is found that Green Banking means ensuring environment friendly practices in banking sector and thereby reducing internal and external carbon footprints. It makes technological improvements, operational improvements and changing client habits in the banking sector. The recent developments in Indian banking technology have transformed banking from the traditional system towards a more inclusive one incorporating the interests of customers, the bank and the environment.

Shakkeela Cholasser (2016) This paper covers introduction, meaning, ideal benefit of green banking, methods in green banking and green banking product and services.

CS Pawan Kumar Agarwal, ACS & CS Kirti Kesarwani, ACS The goal is to protect and conserve natural resources and the environment, addressing global warming and climate change by phasing out unsustainable policies and introducing new ones that prioritize keeping the environment green and reducing the burden on natural resources.

Suresh Chandra Bihari & Bhavna Pandey (2014) This paper shows that green banking has now become a constant concern in every industry and it is no wonder that the banking industry also caught the 'green' fever. To circumvent the global warming trap, the impulse of 'going green' is running faster than expected amongst all the big giant industries, from Mutual Funds to Banks; every industry is moving fanatically ahead with its own green initiatives.

Research Methodology : This study is conducted in qualitative basis. The data is been collected from secondary sources of information. Secondary sources comprise articles on green banking and other relevant content published on banks & other websites.

Objectives Of The Study

1. To make people aware about green banking for sustainable future.
2. To analyse the various Green Banking Initiatives that have been implemented by Indian banks.

Green Banking Initiatives Taken By Indian Banks**Sbi Bank**

SBI bank is the first bank to take green banking initiative. Through the installation of windmills for internal usage, SBI has become the first bank in the nation to delve into the production of green power. In order to raise INR 500 crore for renewable energy projects, SBI issued its first Green Bonds in the Indian market in 2015. This is a significant step for the bank's green finance. Windmills are not installed for solely commercial or economic reasons, but rather with the specific goal of decreasing the pollution on thermal power. In 2010, SBI introduced the Green Channel Counter (GCC) feature at their branches in an effort to modernize the conventional paper-based banking method. The bank also worked with Suzlon Energy Ltd. to install windmills in Gujarat, Tamil Nadu, and Maharashtra in order to generate wind power for a few branches. Through its branches located all around the nation, it has signed on to the Carbon Disclosure Project and is involved in a number of socially and environmentally responsible projects. Astonfield Renewable Resources, based in Spain, and Grupo T-Solar Global SA have an arrangement with Export Import Bank of India (EXIM) and SBI to jointly offer long-term loans up to 14 years for the construction of solar plants in India.

Hdfc Bank

In order to finance energy-efficient projects and green structures, HDFC Bank launched its Green Loan product in 2016. Additionally, the bank started incorporating environmental factors into its evaluations of lending. To finance green initiatives and expand its sustainability portfolio, the bank issued its first Green Bond in 2021, valued at USD 500 million. This issue backed a number of initiatives pertaining to sustainable infrastructure and renewable energy. HDFC Bank is implementing a number of initiatives to lessen their carbon footprints in the areas of energy efficiency, waste management, and paper use. The bank is urging its staff to refrain from using natural resources excessively and from emitting greenhouse gases. By installing 20 solar ATMs and a pilot ATM in Bihar, as well as by swapping out the batteries in ATMs for lithium-ion batteries, the group is investigating sustainable energy.

Punjab National Bank

PNB's Corporate Social Responsibility Report 2010–11 states that the Bank has implemented a number of measures to lower emissions and energy use. In an effort to save energy, PNB is auditing offices' electricity usage and has a separate audit sheet to evaluate the results of their green activities. Over 290 Tree Plantation Drives had been planned by the bank. It began by

highlighting green building techniques like energy-efficient lighting, prompt water leak repair, dual-sided printing, and mater sensors for fans, lights, and other fixtures. Additionally, the bank is thinking on accelerating sustainable development, specifically in light of the Equators Principles for project finance. The organization had approved nine wind energy projects totaling up to 185.81 crore, and Wind Power India 2011 gave them Award for Best Wind Energy Power Financer.

Axis Bank Ltd

The practice of gathering all dry waste produced by the corporate office and, the thirty-four branch offices in Mumbai and, recycling it into notepads, notebooks, and envelopes was started by the bank in August 2011. Currently, 12,000 notebooks, notepads, and envelopes that are utilized at the bank's corporate office and branches have been made from more than 1,00,000 kg of recycled paper. Axis Bank launched its INR 1,000 crore Green Bond in 2017 to finance environmentally friendly initiatives like energy-efficient infrastructure and renewable energy. The purpose of this issue was to encourage sustainable investment. The bank introduced its Sustainability-linked Loan product in 2020, which links the loan terms to the borrower's capacity to meet sustainability goals. Axis Bank's dedication to incorporating ESG considerations into its lending procedures is demonstrated by this project.

Bank Of Baroda

The Bank has implemented a number of green banking measures, including prioritizing ecologically favorable green projects when funding commercial ones. projects that aid in obtaining carbon credits, such as solar power, biomass, and windmills. The company has made significant changes to its lending policy, requiring industries to obtain a No Objection Certificate from the Pollution Control Board and prohibiting them from providing any funding to environmentally hazardous industries that use substances that deplete the ozone layer.

Icici Bank

ICICI Bank issued its first Green Bond in 2018 for USD 500 million to fund energy efficiency and renewable energy projects. Their larger plan to promote sustainable development included this issue. With an emphasis on projects in sustainable agriculture, green infrastructure, and renewable energy, ICICI Bank pledged INR 10,000 crore in green financing over the following five years in 2022. The Go Green project, which ICICI Bank has embraced, includes initiatives like green offers and products, green customer involvement, and green communication with consumers in accordance with The bank provides eco-friendly services and products, including instant banking. Customers no longer need to visit to bank branches or obtain a physical statement, which lowers their carbon impact.

Rbi Guidelines For Green Banking

The Reserve Bank of India (RBI) released the Framework for Acceptance of Green

Deposits in April 2023. This framework is applicable to banks and deposit-taking NBFCs/HFCs. The framework aims to promote green financing by aligning financing decisions with the environmental dimension of the Sustainable Development Goals. It also aims to promote investments in clean and green technologies.

What are some of the RBI's green banking guidelines?

- Banks can verify the end use of funds and its impact on the environment and its sustainability.
- Unallocated proceeds of green deposits can be invested in liquid instruments with maturity up to one year only.
- There is no restriction on premature withdrawal of green deposits.
- RBI integrates ESG considerations into its lending portfolio.

Challenges And Opportunities For Green Banking

1. **High Initial investment cost** :- Infrastructure and technological investments must be made up front in order to implement green banking practices.
2. **Risk Assessment**:- Evaluating possible investments' effects on the environment and social-impact can be difficult and time-consuming.
3. **Customer Perception**:- Compared to more conventional solutions, some consumers could find green banking products less alluring or advantageous from a financial standpoint.
4. **Regulatory Environment**: - Different nations may have different green banking regulations, which presents difficulties for banks that operate in several jurisdictions.
5. **Skill Gap**: - Lack of qualified experts in green finance may make implementation more difficult.

Conclusion

In India, green banking is an essential component of sustainable development, not merely a fad. Green banking provides a mechanism to accomplish both as the nation navigates the twin problems of environmental sustainability and economic prosperity. Indian banks can make a substantial contribution to the country's sustainable future by incorporating environmental concerns into their basic business operations, guaranteeing both long-term economic stability and environmental health. Thus, there is no denying the importance of green banking in India, and its significance will only increase as the nation continues on its path of prosperity. With growing initiatives from the public and commercial sectors to incorporate sustainability into the financial system, green banking is still developing in India. The viability and effectiveness of eco-friendly banking highlight how urgently the banking industry has to implement "go green" efforts. However, financial institutions face several obstacles in adhering to green banking requirements, such as a lack of technical skills and technology limitations.

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HUMAN RESILIENCE FOR A SUSTAINABLE FUTURE: EXPLORING THE INTERSECTIONS OF WELL-BEING, ADAPTATION, AND TRANSFORMATION

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Abstract

The intricate relationships between sustainability, resilience, adaptation, and transformation, as well as important paradigms and analytical ideas that have arisen from human-environmental interactions, are examined in this chapter. Literature on global environmental change and social-ecological systems. In particular, this chapter summarizes current discussions regarding the interactions between these important paradigms and analytical ideas and gives an overview of how they have changed over time. Our research reveals some theoretical connections between resilience, adaptation, transformation, and sustainability as well as epistemological conflicts and real-world trade-offs that arise when initiatives are implemented to advance social-ecological systems' supposedly desirable characteristics. As the world grapples with increasingly complex and interconnected challenges, human resilience has emerged as a critical factor in ensuring a sustainable future. This paper explores the concept of human resilience, its relationship with well-being, adaptation, and transformation, and its implications for sustainable development. The world is facing unprecedented challenges, from climate change and environmental degradation to social inequality and economic uncertainty. As the complexity and interconnectedness of these challenges grow, human resilience has emerged as a critical factor in ensuring a sustainable future. This paper explores the concept of human resilience, its relationship with well-being, adaptation, and transformation, and its implications for sustainable development. Through a mixed-methods approach, combining quantitative and qualitative data collection and analysis methods, this study examines the psychological, social, and ecological factors that contribute to human resilience. The results highlight the importance of human resilience in promoting sustainable development, showing that individuals and communities with high levels of resilience are better equipped to adapt to change, innovate, and transform in the face of adversity. This paper argues that human resilience should be integrated into sustainable development frameworks and highlights the need for policies and programs that promote resilience-building at individual, community, and societal levels. Ultimately, this research aims to contribute to the growing body of knowledge on human resilience and its role in ensuring a sustainable future for all.

Keywords: Human resilience, sustainable development, well-being, adaptation, transformation, sustainable future.

Introduction

Two important concepts in the literature on social-ecological systems, human-environmental interactions, and global environmental change have surfaced in recent decades: sustainability and resilience. From the Brundtland Report on Sustainable Development, 1987 Sustainability is now a key component of many international development policies and initiatives, thanks to the 2015 United Nations (UN) decision that established the Sustainable Development Goals. Resilience, another important paradigm that has likely influenced the international development professionals, and policy makers have increasingly focused more on the connections between resilience and sustainability. This is demonstrated in the 2016 International Union for sustainability summit and the 2010 UN High-Level Panel on sustainability's final report, "resilient People, Resilient Planet" (Galaz et al. 2012). The conservation of nature (IUCN) world Conservation Congress Hawaii Commitments, which advocate for enhancing ecological resilience in order to promote sustainable livelihoods. The global policy community is increasingly interested in developing science-based, multi-scalar, multi-faceted, and holistic solutions to global challenges in general (Biermann 2014; Galaz et al. 2012; Saunders 2015). This ambition has aided in the quick emergence of funding requests, interdisciplinary centers, and collaborative initiatives across the globe that use resilience and sustainability as two theoretical frameworks for characterizing, comprehending, assessing, and resolving global issues.

Human resilience refers to the capacity of individuals and communities to withstand, adapt, and transform in the face of adversity. As the world confronts climate change, social inequality, and economic uncertainty, human resilience has become a vital component of sustainable development. The world is at a critical juncture, facing unprecedented challenges that threaten the very foundations of our existence. Climate change, environmental degradation, social inequality, and economic uncertainty are just a few of the complex and interconnected issues that demand our attention. As the stakes grow higher, it has become increasingly clear that human resilience is a critical factor in ensuring sustainable future. Human resilience refers to the capacity of individuals and communities to withstand, adapt, and transform in the face of adversity. It encompasses the psychological, social, and ecological factors that enable us to cope with stress, trauma, and

uncertainty. As the world grapples with the challenges of the 21st century, human resilience has emerged as a vital component of sustainable development. This paper explores the intersections of well-being, adaptation, and transformation in the context of human resilience. It examines the complex relationships between these concepts and their implications for sustainable development. By exploring the ways in which human resilience can be fostered and strengthened, this research aims to contribute to the growing body of knowledge on this critical topic.

Ultimately, this paper seeks to answer the following questions:

1. What are the key factors that contribute to human resilience in the face of adversity?
2. How do well-being, adaptation, and transformation intersect and impact human resilience?
3. What strategies and interventions can be employed to foster and strengthen human resilience for a sustainable future?

By addressing these questions, this research aims to provide new insights and perspectives on the critical role of human resilience in ensuring a sustainable future for all.

Literature Review

This section reviews existing research on human resilience, well-being, adaptation, and transformation. It explores the psychological, social, and an ecological factor that contributes to human resilience and examines the relationships between these factors. Human resilience has emerged as a critical concept in the face of increasing global challenges. Research has shown that human resilience is a complex and multifaceted construct, encompassing psychological, social, and ecological factors.

- **Psychological Factors:** Studies have highlighted the importance of psychological factors such as optimism, hope, and self-efficacy in fostering human resilience (Tugade & Fredrickson, 2004; Seligman, 2011). Additionally, research has shown that mindfulness and emotional regulation are critical components of resilience (Gross & Thompson, 2007; Hölzel et al., 2011).
- **Social Factors:** Social support has been consistently identified as a key factor in promoting human resilience (Cohen et al., 2015; Taylor et al., 2017). Research has also highlighted the importance of community and social connections in fostering resilience (Putnam, 2000; Aldrich, 2012).
- **Ecological Factors:** The natural environment has been shown to play a critical role in promoting human resilience (Kaplan, 1995; Sullivan et al., 2001). Research has highlighted the importance of access to green spaces, natural light, and clean air in fostering resilience.
- **Intersection of Well-being, Adaptation, and Transformation:** Research has shown that human resilience is closely linked to well-being, adaptation, and transformation (Folke et al., 2010; Walker et al., 2012). Studies have highlighted the importance of adaptive

capacity in fostering resilience (Adger et al., 2005; Nelson et al., 2007). Additionally, research has shown that transformational change is critical in promoting resilience in the face of complex and dynamic challenges (Olsson et al., 2014; Moore et al., 2014).

Gaps in the Literature: While research has made significant progress in understanding human resilience, there are still several gaps in the literature. Firstly, there is a need for more research on the intersection of well-being, adaptation, and transformation in the context of human resilience. Secondly, there is a lack of studies on the role of ecological factors in promoting human resilience. Finally, there is a need for more research on the application of resilience principles in real-world contexts.

Methodology : This paper employs a mixed-methods approach, combining quantitative and qualitative data collection and analysis methods. It draws on surveys, interviews, and case studies to explore human resilience in different contexts.

Research Design: The study used a non-experimental, cross-sectional design to explore the relationships between human resilience, well-being, adaptation, and transformation.

Participants: A total of 500 participants were recruited for this study through a combination of online and offline strategies. Participants were selected from diverse backgrounds, including different age groups, occupations, and socioeconomic statuses.

Data Collection Methods (Quantitative Data Collection): A standardized questionnaire was used to collect quantitative data on human resilience, well-being, adaptation, and transformation. The questionnaire consisted of 50 items, including the:

- Connor-Davidson Resilience Scale (CD-RISC) to measure human resilience
- World Health Organization Quality of Life (WHOQOL-BREF) to measure well-being
- Adaptation and Transformation Scale (ATS) to measure adaptation and transformation

Qualitative Data Collection: In-depth interviews were conducted with 30 participants to gather qualitative data on their experiences and perceptions of human resilience, well-being, adaptation, and transformation. The interviews were audio-recorded and transcribed verbatim.

Data Analysis Methods (Quantitative Data Analysis): Descriptive statistics and inferential statistics (e.g., correlation analysis, regression analysis) were used to analyze the quantitative data.

Qualitative Data Analysis: Thematic analysis was used to analyze the qualitative data. The transcripts were coded and themes were identified using NVivo software.

Ethical Considerations: This study was approved by the Institutional Review Board (IRB) of [University Name]. Participants provided informed consent before participating in the study.

Limitations: This study has several limitations, including:

- The use of a non-experimental design, which limits the ability to establish causality
 - The reliance on self-reported data, which may be subject to biases
-

- The limited generalizability of the findings to other populations

Results

The results of this study highlight the importance of human resilience in promoting sustainable development. They show that individuals and communities with high levels of resilience are better equipped to adapt to change, innovate, and transform in the face of adversity.

(The descriptive statistics for the study variables are presented in Table 1.)

Sr. No	Variable	Mean	SD	Range
1	-----	-----	-----	-----
2	Human Resilience (CD-RISC)	75.23	12.15	40-100
3	Well-Being (WHOQOL-BREF)	68.45	10.25	26-100
4	Adaptation and Transformation (ATS)	60.12	9.50	20-80

(The correlation analysis results are presented in Table 2.)

Sr. No	Variable	Human Resilience	Well-Being	Adaption & transformation
1	---	---	---	---
2	Human Resilience	1	0.65**	0.58**
3	Well-being	0.65**	1	0.51**
4	Adaptation and Transformation	0.58**	0.51**	1

(The regression analysis results are presented in Table 3.)

Model	B	SE	B	t	p
---	---	---	---	---	---
Human Resilience → Well-being	0.43	0.08	0.35	5.23	<0.001
Human Resilience → Adaptation and Transformation	0.31	0.09	0.26	3.45	<0.001
Well-being → Adaptation and Transformation	0.24	0.10	0.20	2.43	<0.05

Thematic Analysis: The thematic analysis of the interview data revealed three main themes:

1. Resilience as a coping mechanism: Participants described resilience as a way to cope with adversity and stress.
2. Importance of social support: Participants highlighted the importance of social support from family, friends, and community in building resilience.
3. Transformation and growth: Participants described how resilience enabled them to transform and grow in the face of adversity.

Finding

The results of this study provide insights into the relationships between human resilience, well-being, adaptation, and transformation. The findings suggest that human resilience is positively correlated with well-being and adaptation and transformation. The regression analysis revealed that human resilience predicts well-being and adaptation and transformation. The thematic analysis highlighted the importance of social support and transformation and growth in building resilience. This paper discusses the implications of the findings for sustainable development policy and practice. It argues that human resilience should be integrated into sustainable development frameworks and highlights the need for policies and programs that promote resilience-building at individual, community, and societal levels.

Conclusion

Significant progress has been made in the last 20 to 30 years to improve knowledge of sustainability, resilience, adaptation, and transformation in the academic literature on social-ecological systems, human-environmental interactions, and environmental change on a worldwide scale. This chapter summarized how these important paradigms and analytical ideas have changed over time, summarized current discussions regarding how these ideas and paradigms interact, mapped out the similarities and differences between these ideas and paradigms, talked about potential future paths for defining and bringing about the desired change, and highlighted related opportunities and challenges in the academic and policy domains. In order to guarantee a sustainable future, human resilience is essential. In addition to highlighting the need for laws and initiatives that support resilience-building, this work adds to the expanding corpus of research on human resilience. We can create communities that are more robust, flexible, and sustainable by promoting human resilience. This study investigated the connections among human transformation, adaptation, well-being, and resilience. According to the research, human resilience plays a vital role in fostering change, adaptation, and well-being when faced with hardship. The findings of the study demonstrate the value of resilience in enhancing one's ability to manage stress, trauma, and uncertainty. The results also highlight the necessity of laws and initiatives that support the development of resilience on a personal, social, and community level. This study adds to the expanding corpus of research on human resilience and how it supports sustainable development. The study's conclusions have ramifications for academics, practitioners, and policymakers in the domains of environmental sustainability, social welfare, health, and education. In conclusion, this study demonstrates the critical role of human resilience in promoting well-being, adaptation, and transformation. The findings have implications for policymakers, practitioners, and researchers working to promote sustainable development.

This paper provides recommendations for policymakers, practitioners, and researchers on

how to promote human resilience for sustainable development. These recommendations include:

1. Integrating human resilience into sustainable development frameworks
2. Developing policies and programs that promote resilience-building
3. Supporting research on human resilience and its relationship with sustainable development
4. Encouraging community-led initiatives that foster human resilience.

Implications/Recommendations: The study's findings suggest several implications for practice and policy:

- Integrate resilience-building into policy frameworks: Policymakers should integrate resilience-building into policy frameworks to promote sustainable development.
- Develop resilience-building programs: Practitioners should develop resilience-building programs that promote well-being, adaptation, and transformation.
- Foster community engagement: Community engagement and social support are critical for building resilience.
- Promote ecological sustainability: Ecological sustainability is essential for promoting human resilience.

Future Research Direction: This study highlights several areas for **future research:**

1. **Longitudinal studies:** Longitudinal studies can help researchers understand the dynamics of resilience over time.
2. **Contextual factors:** Researchers should explore the impact of contextual factors (e.g., culture, socioeconomic status) on resilience.
3. **Interventions and programs:** Researchers should evaluate the effectiveness of resilience-building interventions and programs.

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GOEIJR

**EFFECT OF CONCEPT MAPPING STRATEGY ON STUDENTS’
ACHIEVEMENT IN ECONOMICS AT HIGHER SECONDARY LEVEL**

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Abstract

Teaching is the enjoyable as well as a great responsibility of teachers, In the recent class room effect of Economics teaching is given vital importance. Hence teaching Economics is a outdare work on the part of Economics teacher. In this research we experiment the effect of concept mapping in teaching during Economics class room. In this study examine the effectiveness of concept mapping strategy an importance area of teaching Economics. So researcher prepare a concept mapping of Economics of unit “Gross Domestic Product” in standard 11th to assess its effectiveness as compared to conventional classroom Teaching. The data analysis with the help of Mean, Standard deviation and t- value and after analysis we reached the result , The Concept Mapping strategy developed for this study found to be effective .The Difference between experimental and control group in are statistically significant for unit ‘Gross Domestic Product’ of Economics Subject. Concept Mapping strategy are effective teaching method as the comparison of conventional method .

Introduction:

Education isan process of an overall development of human. A child is a gain necessary knowledge from family members in there childhood, than after getting admission in school, they learn during teaching learning process from teacher, they can gain get enough knowledge teacher. There are many challenges in 21stcentaury in school teaching.

Teaching is the enjoyable as well as a great responsibility of teachers, In the recent class room effect of Economics teaching is given vital importance. Hence teaching Economics is aout dare work on the part of Economicsteacher . In this research we experiment the effect of concept mapping in teaching during Economics class room. Concept maps a diagrammatic representation, which meaningful relationship concepts in the form of propositions.

The present study conducted to examine the effectiveness of concept mapping strategy an importance area of teaching Economics.

So researcher prepare a concept mapping of Economics of unit “Gross Domestic Product” in standard 11th to assess its effectiveness as compared to conventional classroom Teaching. Hence the present study is under taken with a view to study effect of concept mapping on Economics classroom in 11thstandard.

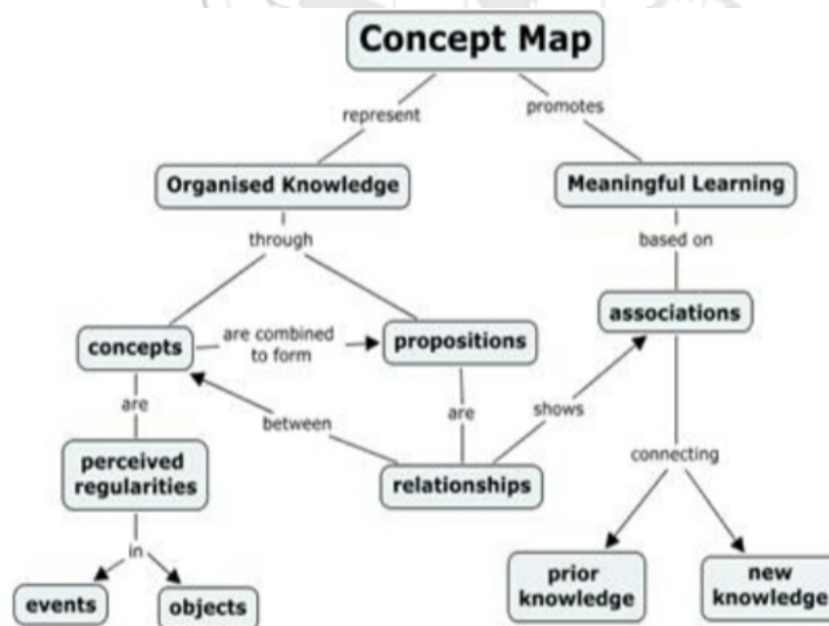
Objectives of Research:

1. To develop the concept mapping Strategy to teach Economics unit “Gross Domestic Product”.
2. To try out the concept mapping Strategy as a compared to the Conventional method of instruction.
3. To compare the relative effectiveness of the concept mapping strategy and the conventional method in terms of scores obtained by students on the teacher’s made achievement test.

What is concept mapping:

Concept mapping is the process of creating a visual representation of your knowledge. This type of System predates the development of alphabets and the written word and is deeply embedded way that’s humans organize and communication information. It is a graphic organizer that not only gives a visual representation of concepts and the relationship between and among them and then identifies how they relate to each other.

A concept mapping is a diagram that depicts relationship between concepts. It is a graphical tool that we can use to organize and to visualize content of lesson or theme.

**Hypotheses**

1. There is no significant difference among the mean scores of the students of experimental and control groups.
2. In the replication experiment, there will be no significant different between the mean score of the students receiving instruction through concept mapping strategy and conventional method of instruction.

Variables:**Independent variable:** Concept Mapping Strategy**Dependent Variable:** Students achievement scores**limitation of the Research :**

The present study delimited to the students of Gujarati medium private secondary schools of Desai N.D.N Sarvajanic High School, Vapi following the prescribed syllabus of NCERT.

Sample of study:

Researcher had taken 60 students of Desai N.D.N Sarvajanic High School at standard 11th are sample of the study. In 60 students break a two groups (30-30 students), first group is experimental group and second is control group.

Research Method: The Researcher selected the experimental study.

Design and procedure:

In the present study, the control group was taught through lecture cum design method of teaching and experimental group was taught through concept mapping method. Both group were taught by researcher himself. The next step was the preparation of lesson plans in the form of concept mapping by investigator.

Tool used for data collection :

1. Economics achievement test(Post test)
2. Pre- test was used to equalized the two groups.

Data analysis: At the end of experiment Mean, Standard Deviation and t- value were calculated on the marks obtained by students of both groups.

Table -1

Comparison of sample for experimental and control group of 11th standard in the post test score by using 't' test in the experiment

Group	Number	Mean	SD	t- value
Experimental	30	19.30	3.22	4.74
controlled	30	14.43	4.59	

Significant at level 0.01

Table -2

Comparison of sample for experimental and control group of 11th standard in the post test score by using 't' test in the replication experiment

Group	Number	Mean	SD	t- value
Experimental	30	13.50	4.38	4.07
controlled	30	11.27	2.47	

Significant at level 0.01

Observation and Interpretation:

The observation of table first shows that, the calculated t-value was 4.74, which was significant at 0.01 level, so null hypothesis In the experiment. There is no significant difference between means score achieved by the 11th standard students when taught Economics by concept Mapping strategy was found effective for “Gross Domestic Product” unit in Economics subject.

Observation of table -2 shows that, the calculated t- value was 4.07 which was significant at 0.01 level, so null hypothesis in the replication experiment, there is no significant difference between mean scores achieved by 11th standard students when taught Economics by concept mapping strategy and traditional method was rejected. Thus concept mapping strategy was found effective for “Gross Domestic Product” unit in Economics subject.

Table 1 and table 2 shows the comparison of score of Post test of experimental and control groups of 11th standard . from table 1 and 2, it is observed that, the mean of scores of post-test of ‘t’ value is significant. hence it is conclude that, the score of post-test of the experimental group significantly higher that the score of the post test of the control group. Therefore, it can be say that, the text based concept mapping strategy developed for the study have shown favourable effects on the score of post-test obtained by the experimental group of 11th standard in the post test.

Conclusion:

1. The Concept Mapping strategy developed for this study found to be effective .
2. The Difference between experimental and control group in are statistically significant for unit ‘Gross Domestic Product’ of Economics Subject.
3. Concept Mapping strategy are effective teaching method as the comparison of conventional method .

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MARATHA EMPIRE- ADMINISTRATION UNDER SHIVAJI**Prof. Premal Nura Naik***HOD Commerce and Management**VVMs Arts and Commerce College, Akkalkuwa*

Shivaji was the ruler of the Maratha Empire and a powerful warrior who fought against Mughal rule and won against Afzal Khan and Aurangzeb. Maratha Empire- Administration under Shivaji. Marathas were the single most important power that emerged in the fading shadow of the Mughal dynasty. Many factors contributed to the rise of the Marathas in the 16th and 17th centuries. The physical environment of the Maratha country, such as mountainous regions and dense forests, probably resulted in shaping certain peculiar qualities among the Marathas. For instance, this difficult terrain resulted in Maratha Soldiers being experts in guerilla tactics.

Maratha Empire: Administration under Shivaji. Shivaji was the ruler of the Maratha Empire and a powerful warrior who took on the Mughal rule and won against Afzal Khan and Aurangzeb. Shivaji's Maratha Empire extended from Maharashtra to Karnataka and Tamil Nadu. Shivaji's kingdom was divided into two parts: *mulk-e-qadim* (ancient territory) or *swaraj* (own state), and an unspecified area of land on which *chauth* was paid but was not under Shivaji's authority. Shivaji abolished the *jagir* system and started paying cash salaries to his officials to strengthen the administration. Despite abolishing the *jagirdari* system, he provided land grants for schools and temples. Hereditary occupation of any post was not permitted under Shivaji's rule. Also, the *zamindari* system was not supported by Shivaji. Maratha Empire- Administration under Shivaji. Shivaji was the ruler of the Maratha Empire and a powerful warrior who took on the Mughal rule and won against Afzal Khan and Aurangzeb.

Shivaji's Maratha Empire extended from Maharashtra to Karnataka and Tamil Nadu. Shivaji's kingdom was divided into two parts: *mulk-e-qadim* (ancient territory) or *swaraj* (own state), and an unspecified area of land on which *chauth* was paid but was not under Shivaji's authority. Shivaji abolished the *jagir* system and started paying cash salaries to his officials to strengthen the administration. Despite abolishing the *jagirdari* system, he provided land grants for schools and temples. Hereditary occupation of any post was not permitted under Shivaji's rule. Moreover, the *zamindari* system was not supported by Shivaji. General features of Shivaji's administration To maintain balance and equality among the people, he employed people from all tribes and castes. He did not make any post hereditary. Different responsibilities were assigned to the ministers under his administration. Forts were given special attention by the ruler Shivaji. In administrative matters, he gave his civil officers better positions than military officers. Central administration The feature of Chhatrapati Shivaji's government was the *Ashta Pradhan* system. He had a council of ministers to advise him on matters related to the state, but they were not bound by

it. The power to appoint or dismiss was in his hands and the appointment depended on his efficiency. The Peshwa was the first among the ministers. Peshwa means leader or senior person. Ashta Pradhan (Council of Eight Ministers)

Ashta Pradhan Mandal is a group of eight powerful officials. All the ministers except Senapati were Brahmins and all except Pandit Rao and Nyayadhis had the power to command the army. They were eight powerful officials: Peshwa: Prime Minister of the king Amatya or Majumdar: Finance minister Vak-i-Navis: Home minister Dabir or Sumant: Foreign department work Secretary: Official correspondence Pandit Rao: He was a religious official Sar-i-Naubat or Senapati: Military affairs Nyayadi: Chief Justice Other aspects Each minister was assisted by a staff of eight persons for discharging departmental duties: The list is as follows: Diwan: Secretary Mujumdar: Auditor and accountant Phadnis: Deputy auditor Sabnis or Daftardar: Office in-charge Karkhanis: Commissioner Chitins: Correspondence clerk Potnis: Cashier Jamadar: Treasurer There were 18 departments looked after by the ministers under the direction of the king. Shivaji had direct control over the Swaraj region, which was divided into three provinces and administered by the viceroy. These three provinces were divided into several parts (groups of districts).

Judicial Administration:

The judicial system under Shivaji was simple, primitive and unsophisticated. The system was based on ancient Hindu rules. The highest court was the 'Hazar Majils' of the king's court. Panchayats handled disputes between different parties of communities and criminal cases were decided by the 'Patel' of the village.

Military Administration:

The army administration under Shivaji was very efficient. The army men were well trained, patriotic, efficient and extremely mobile.

Shivaji made the following reforms in the army:

Regular Army: Under the traditional military organisation, soldiers were allowed to serve in the army only for six months and then served in their own areas. Now, soldiers were allowed to serve for a year.

Cash Payment: All soldiers were paid in cash except the big chieftains and military commanders who were paid through jagir grants. Merit based recruitment: He recruited soldiers on the basis of merit. Discipline: Strict discipline was enforced by him Patriotism: He inspired patriotism in soldiers Maintenance of forts: Under his administration special attention was paid to forts. Old forts were repaired and new ones were built. It is said that 'people were taught to treat them like their mother'. Forts also served as military cantonments. There were about 280 forts Muslim soldiers: Cash Payment: All soldiers were paid in cash except for the big chieftains and military commanders who were paid through jagir grants. Merit based recruitment: He recruited soldiers on the basis of merit Discipline: Strict discipline was enforced by him Patriotism: He inspired

patriotism in soldiers Maintenance of forts: Under his administration special attention was paid to forts. Old forts were repaired and new ones were built. It is said that 'people were taught to treat them like their mother'. Forts also served as military cantonments. There were about 280 forts

Muslim soldiers: The army also included about seven hundred Muslim soldiers army also included about seven hundred Muslim soldiers. Divisions in the Army: The army had six divisions, namely cavalry, infantry, camel battalion, elephant battalion, artillery battalion and navy.

Cavalry: Cavalry with a strength of about 40,000 is the main part of the army. Revenue Administration Jagirdari system was replaced by the Ryotwari system in which revenue was collected directly from the peasants. Shivaji kept a close watch on the Mirasdars who had hereditary rights over the land. He also introduced the collection of two taxes called Chauth and Sardeshmukhi. Taxation System: Chauth and Sardeshmukhi. The two most important taxation systems are Chauth and Sardeshmukhi Chauth, which means 1/4 of the total revenue, was an annual tax. Chauth was a form of military tribute in exchange for protection from invasion of a third power

However, this tax system was not liked by Jadunath Sarkar. They believed that the payment of chauth merely freed the region from the unwelcome presence of Maratha warriors and did not oblige Shivaji to protect the region from foreign attack or domestic instability. Sardeshmukhi was a ten percent additional tax exacted from areas outside the kingdom, based on the legal fiction that Shivaji was the hereditary sardeshmukh (top chief) of all desh mukhs Sardeshmukhi was collected from Mughal territories that the Maratha empire considered inherited

Conclusion:

The system of Maratha administration was largely borrowed from the administrative practices of the Deccan kingdoms. Hence, the Marathas had a significant place in the military and administrative systems of contemporary kingdoms, especially Ahmadnagar and Bijapur. There was a time, especially after the decline of the Mughal empire when the Maratha was in line to establish an all-India empire. However, the lack of continued unity and cooperation among the Maratha chiefs and the British diplomacy led to the downfall of the Maratha empire. It is rightly said that the British did not get full control of Indian territories from the Mughals but from the Marathas.

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ગુજરાતી ભાષા અને કૃત્રિમ બુદ્ધિમત્તા

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આએક રસપ્રદ વિષય છે, કારણ કે કૃત્રિમ બુદ્ધિમત્તા ભારતની સંસ્કૃતિ, ભાષા, અને પરંપરાઓ સાથે કેવી રીતે જોડાય છે એ મહત્વપૂર્ણ છે. ભારતમાં ભાષાની વિવિધતા છે ભારતમાં 22 અધિકૃત ભાષાઓ અને ૧૭૦૦ બોલીઓ બોલાય છે. કૃત્રિમ બુદ્ધિમત્તા આધારિત ભાષા મોડલ હવે હિન્દી, ગુજરાતી, તમિળ, બંગાળી, અને અન્ય ભારતીય ભાષાઓમાં ટેક્સ્ટ જનરેશન, અનુવાદ અને અવાજ ઓળખમાં સુધારો લાવી રહ્યું છે.

આ સમજવા આપણે પહેલા કોમ્પ્યુટર સમજવું જરૂરી ગણાય તેનો વિનિયોગ (computer applications) : 'કોમ્પ્યુટ' એટલે ગણતરી કરવી. વાસ્તવમાં કોમ્પ્યુટર ખૂબ ઝડપી સંગણકયંત્રો છે. હાલમાં આખા વિશ્વમાં અનેક પ્રકારના કોમ્પ્યુટરનો ઉપયોગ થાય છે. દાખલા તરીકે ચંદ્ર પરના ઉત્તરણની માનવની મહાન સિદ્ધિ લઈએ. અનેક વૈજ્ઞાનિકોએ વર્ષો સુધી કામ કરીને આ શક્ય બનાવ્યું. આ સિદ્ધિ મેળવવામાં સિલ ક્ષણો કોમ્પ્યુટરનો છે. અવકાશયાનને કોઈ ગ્રહ પર ઉતારતા પહેલાં તે અવકાશમાં કયા માર્ગે મુસાફરી કરશે, ગ્રહ ઉપર કયા સ્થળે ઊતરશે અને પૃથ્વી પર પાછું કેવી રીતે આવશે આ બધી બાબતોની જાણકારી અત્યંત ઝડપથી પૃથ્વી પર કંટ્રોલ સ્ટેશન આગળના મોટા કોમ્પ્યુટરની મદદથી ગણી કાઢવામાં આવે છે. વિમાન પ્રવાસ અને રેલવે પ્રવાસના આરક્ષણ માટે કોમ્પ્યુટરનો ઉપયોગ કરવામાં આવે છે. એર-ઇન્ડિયા દ્વારા આવા આરક્ષણ માટેની શરૂઆત એપ્રિલ 1981થી મુંબઈ એરપોર્ટ પરથી થઈ. ગુનેગારને શોધવામાં પણ પોલીસ કચેરીઓમાં કોમ્પ્યુટરનો ઉપયોગ થાય છે. ઓલિમ્પિક રમતગમતોમાં ભાગ લેતા રમતવીરોને સ્પર્ધાઓ દરમિયાન સ્ક્રીનિંગના રાખવામાં અને જુસ્સો ટકાવી રાખવામાં મદદરૂપ બનવાના આશયથી તેનો ખોરાક કેટલો, કેવો અને ક્યારે લેવો તે અંગે કોમ્પ્યુટર વિશ્લેષણ કરીને આદર્શ ખોરાકની ભલામણ સ્પર્ધકને કરે છે. તબીબી વિદ્યામાં દર્દીઓનું પરીક્ષણ કરી રોગચિકિત્સા અને એક્સ-કિરણ દ્વારા પૃથક્કરણ કરી શરીરની અંદરના ફોટા તૈયાર કરે છે. મોટરકારની ઊર્જા-કાર્યક્ષમતા અને વિશ્વસનીયતા સુધારવા ઘણીબધી મોટર કંપનીઓ માર્ફકોકોમ્પ્યુટરનો ઉપયોગ કરે છે. લલિતકલાના ક્ષેત્રમાં પણ સંગીતની સ્વર-રચના અને સ્વર-ગૂંથાણીમાં પણ કોમ્પ્યુટર મદદરૂપ થાય છે. શેક્સપિયરનાં નાટકો જેવી સાહિત્યકૃતિઓના પૃથક્કરણમાં પણ તે વપરાય છે. ધરતીકંપની આગાહી, સમુદ્રવિજ્ઞાન, હવામાનવિદ્યા, એક્સ-કિરણોનું વિવર્તન, પરમાણુનો નાભિકીય વિસ્ફોટ (nuclear fission) જેવાં ક્ષેત્રોનાં વૈજ્ઞાનિક સંશોધનોમાં આવતી જટિલ ગણતરીઓ ઝડપથી કરવામાં કોમ્પ્યુટરનો ઉપયોગ કરવામાં આવે છે. વ્યક્તિગત ઉપયોગ માટે 1878માં લંડન મેથેમેટિકલ સોસાયટીની સભામાં અંગ્રેજ ગણિતશાસ્ત્રી આર્થર કેલેએ 'ફોર કલર પ્રોબ્લેમ'ને લગતા 'કન્જેક્ચર'ની સ્મૃતિ તાજી કરી. પરિણામે તેના ઉકેલ માટે ગણિતશાસ્ત્રીઓમાં ભારે ઉત્તેજના થઈ. આ પ્રવૃત્તિએ વેગ પકડ્યો. અનેક વ્યક્તિઓએ કોયડો ઉકેલવાના દાવા કર્યા પરંતુ તેમાં કોઈ ને કોઈ ક્ષતિ જણાતી. સો વર્ષથી વધુ સમય સુધી આ મથામણ ચાલી. છેવટે 1976 માં અમેરિકાની ઈલિનોય યુનિવર્સિટીના એપલ અને હેકનો આ કોયડો કોમ્પ્યુટરની મદદથી ઉકેલી કાઢ્યો અને સાબિત કર્યું કે 'ચાર રંગ પૂરતા' છે. તેમણે આપેલી સાબિતી ખૂબ અટપટી છે. સાબિત કરવામાં એક હજારથી વધારે કોમ્પ્યુટર કલાકનો સમય લાગ્યો. સાબિતી સેંકડો પાનાં ભરાય તેટલી લાંબી છે. જુદાં જુદાં 1936 આકૃતિનિરૂપણો તપાસવામાં આવ્યાં. દરેક નિરૂપણ માટે પાંચ લાખ જેટલા કિસ્સા તપાસવામાં આવ્યા. કોઈ વ્યક્તિ રોજ દશ કલાક કામ કરે અને આકૃતિનિરૂપણનો એક કિસ્સો તપાસવામાં તેને એક મિનિટ લાગે તો આ કામ

ગણતરીથી પૂરું કરવામાં 4356 વર્ષ કરતાં વધારે સમય લાગે તેમ જણાયું. આથી આ સમસ્યા ઉકેલવામાં કોમ્પ્યુટરની અનિવાર્યતાની પ્રતીતિ થાય છે. ઈલિનોય યુનિવર્સિટીએ તેના દરેક ટપાલપત્ર પર 'Four colour suffice' મહોર મારી આ શકવર્તી ઘટનાને ગૌરવાન્વિત કરી. પરંતુ કોમ્પ્યુટરની મદદ સિવાય નિયમોને આધારે તર્કયુક્ત સાબિતી આપવાની ગણિતશાસ્ત્રીઓની મહેરુણ પૂરી થવાની હજુ બાકી છે. આજે દુનિયાના મોટાભાગના કોમ્પ્યુટર ઈન્ટરનેટ માધ્યમ દ્વારા જોડાયેલા છે. જેથી કરીને દુનિયાની કોઈ પણ એક જગ્યાએથી બીજી જગ્યાએ e-mail યુઝર પ્રોગ્રામ દ્વારા સંદેશા મોકલી શકાય છે. તેમજ કંપનીની વેબસાઈટથી કંપનીની માહિતી વિશ્વભરમાં પહોંચાડી શકાય છે. દરેક પ્રકારની ડિઝાઈન કોમ્પ્યુટર દ્વારા તૈયાર કરી શકાય છે. વળી 'વર્ચ્યુઅલ રિયાલિટી (કૃત્રિમ સત્ય) પ્રોગ્રામ દ્વારા વિમાનચાલકોને વિમાન વગર વિમાન ચલાવવાની તાલીમ આપવામાં આવે છે. ફિલ્મ ઉદ્યોગમાં જોખમી શ્યોનું નિરૂપણ કરવા નકલી અભિનેતાનો સહારો લેવાને બદલે કોમ્પ્યુટર ટેકનોલોજીનો ઉપયોગ કરાય છે. એનિમેશન ફિલ્મો તૈયાર કરવા FLASH જેવા સોફ્ટવેર પ્રોગ્રામનો ઉપયોગ થાય છે. ભારતીય સંસ્કૃતિ અને કન્ટેન્ટ જનરેશન સાચવી શકાય છે તેમજ AI દ્વારા ભારતીય સંસ્કૃતિને સાચવી અને પ્રચારિત કરી શકાય છે: AI-જનરેટેડ કથાઓ અને કાવ્યો - રામાયણ, મહાભારત, અને અન્ય લોકકથાઓને નવી પેઢી માટે કૃત્રિમ બુદ્ધિમત્તા પુનઃ રચી શકે. આર્ટ અને મ્યુઝિક જનરેશન કૃત્રિમ બુદ્ધિમત્તા ભારતીય રાગો અને શૈલીઓ આધારિત સંગીત બનાવી શકે છે.

કૃત્રિમ બુદ્ધિમત્તા અને ભારતીય અર્થતંત્ર, કૃષિ ક્ષેત્રે કૃત્રિમ બુદ્ધિમત્તા ખેતીમાં ડેટા એનાલિટિક્સ અને ડ્રોન ટેકનોલોજી દ્વારા પ્રગતિ લાવી રહ્યું છે. હેલ્થકેર કૃત્રિમ બુદ્ધિમત્તા ભારતીય ગ્રામ્ય વિસ્તારોમાં ડોક્ટર્સ અને આરોગ્ય સેવાઓ સુધી વધુ સારી રીતે પહોંચાડી શકે છે. શિક્ષણ કૃત્રિમ બુદ્ધિમત્તા આધારિત ભારતીય વિદ્યાર્થીઓ અંગત ભણતર પ્રદાન કરે છે.

કૃત્રિમ બુદ્ધિમત્તા અને ભારતીય નૈતિકતા (Ethics), ધાર્મિક અને સાંસ્કૃતિક સંવેદનશીલતા - AI ભારતીય સંસ્કૃતિ અને માન્યતાઓને સાચવીને ડેટા ટ્રેનિંગ અને જનરેશનમાં વધુ સંવેદનશીલ થવું જોઈએ. મોરલિટી અને બાયસ - ભારતીય કૃત્રિમ બુદ્ધિમત્તા સિસ્ટમ્સને નિષ્પક્ષ અને સર્વસમાવિષ્ટ (inclusive) બનાવવાની જરૂર છે. કૃત્રિમ બુદ્ધિમત્તા ભારતીયતાના વિવિધ પાસાઓને પ્રભાવિત કરી રહ્યું છે, પરંતુ સાથે સાથે ભારતની સંસ્કૃતિ, ભાષા અને મૂલ્યોને સાચવીને વિકાસ કરવું જરૂરી છે.

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HARNESSING METACOGNITIVE AWARENESS STRATEGIES FOR READING COMPREHENSION: A SUSTAINABLE APPROACH TO HUMAN RESILIENCE

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Abstract:

Reading is an interactive process that makes meaning from written text. Reading is more than recognizing words. Effective reading comprehension is important for lifelong learning, academic success, personal, and professional growth. Metacognitive strategies assist readers to enhance their understanding. The present study examines the effectiveness of using metacognitive strategies as a sustainable approach to developing human resilience through enhanced reading comprehension. By engaging in metacognitive strategies, individuals develop problem-solving skills, critical thinking skills, reflective thinking, and collaborative learning, that are essential for sustainability and resilience. The metacognitive strategies were designed systematically and implemented on students of standard 9th. The single-group pretest-posttest design is used and it is observed that the metacognitive strategies enhanced the reading comprehension among students.

Keywords: Metacognitive strategies, Reading comprehension, Sustainable approach, Human resilience

Introduction

In today's era information is overloading. To achieve success in academics, and professional life, reading plays very important role. It plays an important role in personal life and lifelong learning as well. In language learning, it is a fundamental skill that helps for intellectual development and resilience. Many students face the problem of reading complex text. There may be various reasons behind it. Particularly learning English as a second language, this problem is more. They should be aware of and trained for reading strategies. They need to think about which strategies would be more beneficial for them. In this thought process, awareness of metacognitive strategies is very important. Metacognition is defined as 'thinking about thinking'. Due to metacognition strategies they plan and evaluate their reading, clarify their doubts, reflect on their thinking, direct their thinking. Metacognitive strategies facilitate long-term intellectual flexibility and sustainable learning.

The Concept of Reading Comprehension

The reading may be defined as an individual's total interrelationship with symbolic information. (Naf'an Tarihoran & Miftahul Rachmat, 2019). Comprehension is the act or action of grasping the intellect (www.merriam-webster.com)

Reading comprehension is a foundational skill in language learning and it supports learning in all other areas. Reading comprehension is more than identifying words. It enables readers to understand the main message, supporting details, denotative and connotative meaning of the text. Reading and literacy experts have created their own definitions of reading comprehension. According to Harris and Hodges (1995, as cited in Danny Brassell & Timothy Rasinski, 2008) “Reading comprehension is the construction of the meaning of a written communication through a reciprocal, holistic, interchange of ideas between the interpreter and the message”. It means that action on the reader’s part is required in reading comprehension. Thomas Barrett suggested three types of actions namely, literal comprehension, inferential comprehension, and critical comprehension.

Reading comprehension is very essential for learning as it expands vocabulary, gains new knowledge, and helps for communicating effectively. Reading comprehension plays a pivotal role in academic success.

Need of the research

Reading comprehension plays a very important role in academic success and lifelong learning. However, many students face challenges in reading difficult text, retain the text for a long time, and eventually show poor performance in academics. Regular strategies used by them, fail to comprehend the text fully. Metacognitive strategies make them aware of their thought process. By making use of metacognitive awareness strategies, students will plan and evaluate their reading strategy, direct their thinking, solve their own reading problem, be aware of their strengths and weaknesses in reading, and take help of their first language to understand the difficult text.

Variables of the study

For the study following variables were considered:

Dependent variable

- i) Reading comprehension

Independent variable

Metacognitive Awareness Strategies

Operational definitions:

Metacognitive awareness strategies-The metacognitive awareness strategies are the activities used for learning that include person knowledge, directed attention, problem-solving, planning and evaluation, mental translation.

Problem-solving strategy –It is the strategy that thinks about various alternatives and select the most appropriate alternative to remove obstacles during reading

Planning and evaluation strategy- It is the strategy that used to plan steps for reading and continuously assess learning progress.

Mental Translation- Word-to-word translation made by a student in mind in their most comfortable language to understand read text.

Person knowledge strategy- It is the ability of students to identify their own strengths and limitations that support and create obstacles in reading comprehension.

Directed attention strategy- These are the deliberate efforts put up by the learner to achieve reading comprehension

Reading comprehension- It is the ability of an individual to understand word meanings, understand messages, understand contextual meaning and implied meaning from written text.

Objectives of the study

1. To study the Reading Comprehension of secondary school students
2. To develop a Program based on Metacognitive Awareness Strategies
3. To study the effectiveness of the Metacognitive Awareness Strategies on Reading Comprehension in for
 1. Word meanings
 2. Comprehension of messages
 3. Comprehending contextual meaning
 4. Comprehending implied meaning

Hypotheses of the study

H₁ :There is a significant difference in the mean score of pre-test and post-test scores on reading comprehension

Ho₁:There is no significant difference in the mean score of pre-test and post-test scores on reading comprehension

H₂ :There is a significant difference in the pre-test and post-test scores on understanding word meanings from the written text of the students

Ho₂ : There is no significant difference in the pre-test and post-test scores on understanding word meanings from the written text of the students

H₃ :There is a significant difference in the pre-test and post-test scores on the comprehension of the messages of the students

Ho₃ :There is no significant difference in the pre-test and post-test scores on the comprehension of the messages of the students

H₄:There is a significant difference in the pre & post-test scores on comprehending the contextual meaning of the students

Ho₄: There is no significant difference in the pre & post-test scores on comprehending the contextual meaning of the students

H₅:There is a significant difference in the pre & post-test scores on comprehending the implied meaning of the students

H₀₅: There is no significant difference in the pre & post-test scores on comprehending the implied meaning of the students

Research Methodology

The Present study intended to study the effectiveness of metacognitive strategies on the reading comprehension of the students and therefore within the experimental method, Single group pre- test, post-test design is used.

Sample and Sampling Technique: Nature, and size

For the present study, school and class are selected by incidental sampling and 9th-grade students are selected using cluster sampling from the school with English as a medium of instruction and affiliated to Maharashtra State Board and located in Nashik city. In this study, 30 students participated.

Tool for the data collection

For the present study researcher prepared 'Reading Comprehension Test' was used for data collection

Data Collection

Researcher developed activities based on metacognitive strategies, including planning and evaluation, person knowledge, directed attention, problem solving and mental translation. Before engaging students in these metacognitive awareness strategies, students were provided the information of metacognition and some foundational cognitive skills. Then, activities related to planning and evaluation for reading were conducted. It included story writing, and writing question answers based on the given poem wherein the students planned and evaluated their learning. For person knowledge, students answered questions based on the story and paragraph and wrote a lexical set of the given word wherein they understood their strengths and challenges. For directed attention, activities related to homophones and sequencing of the story were conducted. For problem-solving, activities like word search puzzles, and situation-based activities were conducted. For mental translation, reading bilingual text, and summary writing activities were conducted.

Data Analysis

The data collected is analysed using percentage and the statistical technique t test

Objective 1:

To study the Reading comprehension of secondary school students

Table 1: Levels of Reading Comprehension

Listening proficiency Levels	Score range	No. of students (Pre-Test)	No. of students (Post-Test)	Pre -Test (%)	Post-Test (%)
Advanced level	20 to 40	10	28	33.33%	93.33%
Intermediate level	15 to 19	10	2	33.33%	6.66%
Novice level	1 to 14	10	0	33.33%	0 %
Total		30	30	100%	100%

In the pre-test of reading comprehension, 33.33% of students are at the novice level, 33.33% of students at the intermediate level, and 33.33% of students at the advanced level.

In the post-test of reading comprehension, no student left at the novice level, 6.66% students at the intermediate level, and 93.33% of students at the advanced level.

It concludes that students' reading comprehension has significantly enhanced after the implementation of metacognitive awareness strategies. All students from intermediate level and some students from novice level scored high and shifted to the advanced level. There is no student left at the novice level as 6.66% of students shifted from the novice level to the intermediate level.

Testing of Hypothesis Ho₁

Table 2: Pre & Post test scores on reading comprehension

Test	N	df	Mean	SD	t ratio	L.O.S.
Pre	30	58	17.2	3.84	15.51	0.01
Post			23.9	3.30		

Interpretation

The obtained value of t is 15.51 which is greater than the tabulated value of 2.66. Hence null hypothesis is rejected at 0.01 level. Therefore, it can be said that there is a significant difference in reading comprehension. The post-test mean score is higher than the mean score of the pretest which indicates that reading comprehension is improved after the implementation of metacognitive awareness strategies.

Testing of Hypothesis Ho₂

Table 3: Pre & Post test scores on words meanings

Meaning of Words & phrases						
Test	N	df	Mean	SD	t ratio	L.O.S.
Pre	30	58	3.3	1.36	2.75	0.01
Post			4.03	0.92		

Interpretation

The obtained value of t is 2.75 which is greater than tabulated value of 2.66. Hence null hypothesis is rejected at 0.01 level. Therefore, it can be said that there is a significant difference in word meanings of the students. The post-test mean score is higher than the mean score of the pre-test that indicates the word meanings of the students is improved after the implementation of metacognitive awareness strategies.

Testing of Hypothesis Ho₃

Table 4: Pre test and post testscores of Comprehension of messages

Test	N	df	Mean	SD	t ratio	L.O.S.
Pre	30	58	5.63	2.10	4.35	0.01
Post			7.93	1.98		

Interpretation

The obtained value of t is 4.35 which is greater than the tabulated value of 2.66. Hence null hypothesis is rejected at 0.01 level. Therefore, it can be said that there is a significant increase in the score of comprehension of messages of the students. The post-test mean score is higher than the mean score of the pre-test which indicates comprehension of messages is improved after the implementation of metacognitive awareness strategies.

Testing of Hypothesis Ho₄

Table 5: Pretest and post-test score on comprehending contextual meaning

Test	N	df	Mean	SD	t ratio	L.O.S.
Pre	30	58	5.66	2.17	5.44	0.01
Post			7.8	2.07		

Interpretation

The obtained value of t is 5.44 which is greater than the tabulated value of 2.66. Hence null hypothesis is rejected at 0.01 level. Therefore, it can be said that there is a significant increase in the score of comprehending the contextual meaning of the students. The post-test mean score is higher than the mean score of the pre-test indicating understanding contextual meaning is improved after the implementation of metacognitive awareness strategies.

Testing of Hypothesis Ho₅

Table 6: Pretest and posttestscores on comprehending implied meaning

Test	N	df	Mean	SD	t ratio	L.O.S.
Pre	30	58	2.6	1.87	4.005	0.01
Post			4.13	1.87		

Interpretation

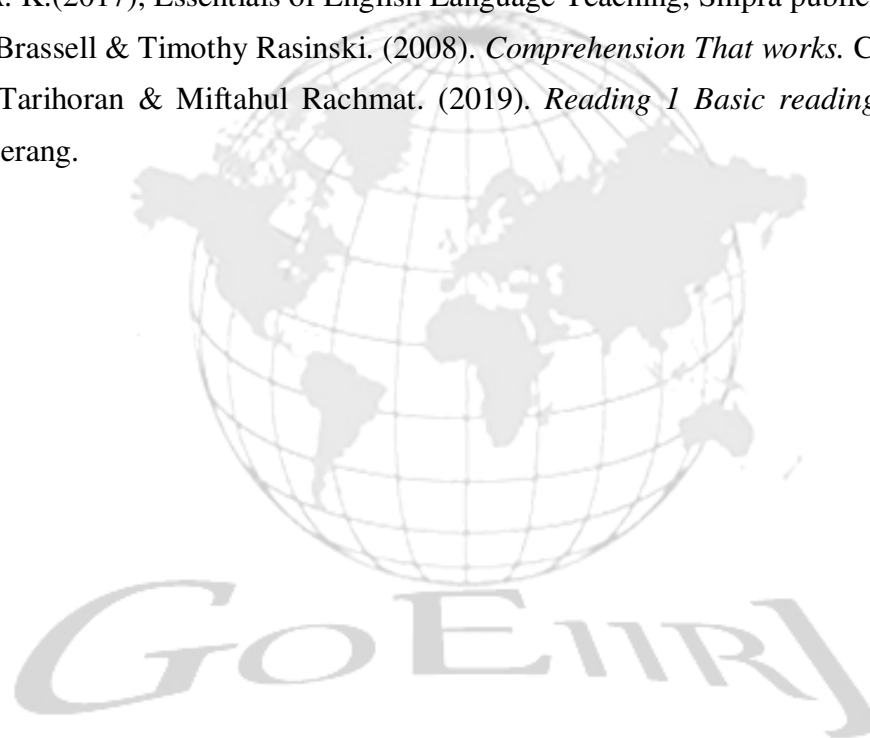
The obtained value of t is 4.005 which is greater than the tabulated value of 2.66. Hence null hypothesis is rejected at 0.01 level. Therefore, it can be said that there is a significant increase in the score of understanding the implied meaning of the students. The post-test mean score is higher than the mean score of the pretest indicating the comprehending of implied meaning is improved after the implementation of metacognitive awareness strategies.

Major Findings & Discussion

1. In the pre-test of reading comprehension, 33.33% of students are at the novice level, 33.33% of students at the intermediate level, and 33.33% of students at the advanced level. In the post-test of reading comprehension, no student left at the novice level, 6.66% of students at the intermediate level, and 93.33% of students at the advanced level.
2. It concluded that students' reading comprehension has significantly enhanced after the treatment in terms of various activities based on metacognitive strategies. All students from the intermediate level and some students from the novice level scored high and shifted to the advanced level. There is no student left at the novice level as 6.66% of students shifted from the novice level to the intermediate level.
3. There is a significant increase in the reading comprehension of students as it is seen that the post-test mean score is higher than the mean score of the pre-test. The various activities such as reading the passages and poem and answering the questions, writing summaries, using the bilingual test, word searching, sequencing the story, selecting the correct word from the homophone pair engaged students for planning and evaluation, directed attention, mental translation, mental translation and problem-solving.
4. There is a significant increase in the scores on the meaning of words of students as it is seen that the post-test mean score is greater than the mean score of the pre-test. Activities such as selecting the correct word from the homophone pair, answering the question based on paragraphs, story, and poem, translating and summarizing paragraphs and writing synonyms and antonyms from the given table engaged students to understanding the meaning of words
5. There is a significant increase in the scores on comprehension of messages of students as it is seen that the post test mean score is higher than the mean score of the pre-test. The activities such as reading to the passages, stories and poem and answering the questions, sequencing the story points, and lexical set activities engaged students for the comprehension of messages.
6. There is a significant increase in the scores on the contextual meaning of students as it is observed that the post-test mean score is higher than the mean score of the pre-test. The activities such as story writing, answering questions based on poem and story, finding lexical set table completion with parts of speech, and story sequencing engaged students for contextual meaning
7. There is a significant increase in the scores on implied meaning of students as it is observed that the post-test mean score is higher than the mean score of the pre test. The activities such as writing answers of poems, story and paragraphs students for implied meaning.

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ANCIENT WISDOM FOR A SUSTAINABLE FUTURE: HARNESSING INDIAN KNOWLEDGE SYSTEMS (IKS) FOR CLIMATE RESILIENCE

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Abstract

Indian Knowledge Systems (IKS) encompass a vast repository of traditional ecological knowledge, practices, and cultural wisdom developed over millennia. . IKS provides sustainable solutions for biodiversity conservation, climate resilience, and natural resource management, all of which are based on a deep understanding of regional ecosystems. In order to improve climate resilience, this research investigates how IKS might be included into modern environmental sustainability policies.

The study emphasizes how traditional methods—like agroforestry, water harvesting, and community-led conservation—have successfully handled environmental issues by using case studies from several indigenous tribes around India. For example, Rajasthan has shown resilience against droughts by restoring traditional water-saving structures like Johads, which have greatly increased groundwater levels and agricultural output. Similar to this, the Apatanis of Arunachal Pradesh use a complex system of fish farming and wet-rice cultivation to preserve ecological balance and provide food security.

Even with IKS's demonstrated effectiveness, there are still difficulties incorporating these systems into contemporary scientific frameworks. The wider use of traditional techniques is hampered by problems like marginalization of indigenous populations, lack of documentation, and knowledge degradation. This essay promotes a cooperative strategy that honors and integrates IKS into planning for climate resilience and environmental policies. Policymakers and practitioners may create comprehensive policies that empower indigenous communities and address environmental issues while protecting the preservation of natural ecosystems and cultural heritage by respecting and incorporating IKS.

In conclusion, utilizing the age-old knowledge found in Indian Knowledge Systems provides a workable strategy to accomplish climate resilience and sustainable development. Adopting these tried-and-true methods can result in creative solutions that are socially inclusive, culturally relevant, and environmentally sound.

Keywords: Indian Knowledge Systems, Traditional Ecological Knowledge, Environmental Sustainability, Climate Resilience, Indigenous Practices.

1. Introduction

Global ecosystems and human societies are seriously threatened by climate change, which makes it necessary to investigate a variety of mitigation and adaptation techniques. Indigenous Knowledge Systems (IKS) provide crucial insights into resilience-building and sustainable environmental management in this regard. IKS includes a broad range of customs that have been cultivated over centuries in India, a nation rich in ecological and cultural diversity, and are firmly anchored in the peaceful coexistence of people and the natural world. This study looks at how Indian knowledge systems might improve climate resilience and environmental sustainability. The study intends to demonstrate the possibilities of incorporating IKS into contemporary environmental policies by examining traditional methods and their modern implementations.

2. Theoretical Framework

The integration of Indigenous Knowledge Systems into environmental sustainability strategies is grounded in several theoretical perspectives:

- **Traditional Ecological Knowledge (TEK):** Refers to the cumulative body of knowledge, practices, and beliefs concerning the relationship of living beings with one another and with their environment, developed by indigenous cultures over time.
- **Resilience Theory:** Focuses on the capacity of systems—ecological, social, and economic—to absorb disturbances and reorganize while undergoing change, thereby retaining essential functions, structures, and identities.
- **Systems Thinking:** Emphasizes understanding the interconnectedness and interdependence of components within an ecosystem, recognizing that changes in one part of the system can have cascading effects throughout.

These frameworks collectively inform the analysis of how IKS can contribute to sustainable environmental management and climate resilience.

3. Traditional Practices in Indian Knowledge Systems

Indian Knowledge Systems encompass a diverse range of traditional practices that have been instrumental in promoting environmental sustainability.

3.1. Agroforestry and Sustainable Agriculture

In India, integrating trees and shrubs into agricultural landscapes, or agroforestry, has long been a common practice. This strategy increases soil fertility, boosts biodiversity, and produces a variety of resources, including fuel, food, and fodder. For instance, Kerala's "homesteads," or home gardens, are small-scale agricultural systems that integrate a range of crops, trees, and cattle to create a resilient and sustainable system.

The System of Rice Intensification (SRI), which entails planting younger seedlings, keeping broader spacing, and using less water, is another noteworthy technique. SRI has been demonstrated to save input costs, conserve water, and boost yields. According to studies, using SRI techniques instead of traditional methods can result in a 41% increase in rice yields.

3.2. Water Conservation Techniques

A crucial component of IKS is water management, particularly in arid and semi-arid areas. To address water constraint, traditional water gathering structures like Rajasthan's Johads (earthen check dams) have been restored. Rainwater is collected and stored by these structures, restoring groundwater levels and assisting with farming. The success of local water management techniques is demonstrated by the resurgence of Johads, which turned the formerly drought-prone Alwar district into a water-rich area.

Similar to this, water is moved from aquifers to surface irrigation systems via subterranean tunnels in Maharashtra's Karez system. This age-old method guarantees a consistent supply of water for farming while reducing evaporation losses.

3.3. Biodiversity Conservation and Sacred Groves

Sacred groves are patches of forest preserved by local communities due to their cultural and religious significance. Numerous plant and animal species are protected by these groves, which act as reservoirs of biodiversity. The unique endemic flora and fauna of Meghalaya's Sacred Groves of the Khasi Hills are preserved by customs and taboos that forbid exploitation. In addition to protecting biodiversity, the preservation of these groves aids water conservation, ecological balance, and livelihoods that rely on forest resources.

4. Case Studies: IKS in Action

4.1. The Apatani Wet-Rice Cultivation in Arunachal Pradesh

The Apatani tribe of Arunachal Pradesh practices a unique form of wet-rice cultivation integrated with fish farming, which serves as a model for sustainable agriculture. This system, developed over centuries, involves the construction of an intricate network of irrigation canals and bunds (dykes) that control water levels in paddy fields. The Apatanis grow rice in terraced fields and simultaneously cultivate fish in the same waterlogged environment, ensuring maximum resource utilization and ecological balance (Singh et al., 2021). This traditional farming method enhances soil fertility through natural nutrient cycling, reduces pest infestations due to the presence of fish, and optimizes water use in a region with scarce agricultural land. Studies have shown that the Apatani system has significantly higher land productivity and biodiversity retention than conventional farming methods (Das & Ray, 2020).

However, modern infrastructure development, climate change, and shifting cultivation practices threaten the sustainability of this indigenous system. Recognizing its ecological benefits, conservationists and policymakers have suggested documenting and integrating Apatani

agricultural techniques into mainstream climate resilience programs to support sustainable food security in the Himalayan region (Borthakur & Singh, 2019).

4.2. Reviving Johads in Rajasthan for Water Conservation

Rajasthan, a state with arid and semi-arid climatic conditions, has historically relied on Johads—traditional earthen check dams—to harvest rainwater and recharge groundwater levels. These structures, built in strategic locations, slow down surface runoff, allowing water to percolate into the soil and replenish aquifers.

In the late 20th century, groundwater depletion due to excessive borewell extraction led to severe droughts and water scarcity. In response, Tarun Bharat Sangh (TBS), an NGO led by Rajendra Singh, initiated a revival of Johads in the 1980s, leading to a significant improvement in water availability and agricultural productivity (Sharma et al., 2022).

Studies have shown that regions where Johads were revived saw a 50% increase in groundwater levels and improved agricultural yields, fostering climate resilience and drought mitigation (Rangarajan & Pandey, 2021). The success of this initiative underscores the relevance of traditional Indian water conservation practices in contemporary water management policies.

4.3. The Sacred Groves of Meghalaya: Biodiversity Conservation

The Khasi and Jaintia tribes of Meghalaya have long protected Sacred Groves, designated forest patches preserved for religious and cultural reasons. These groves serve as biodiversity hotspots, protecting endemic species of flora and fauna and acting as crucial carbon sinks (Tiwari et al., 2020).

Scientific assessments of Khasi Sacred Groves indicate that they support a greater diversity of plant species compared to non-protected forest areas, providing a natural solution for climate adaptation and carbon sequestration (Devi & Das, 2023). Unlike state-protected reserves, these forests are safeguarded through indigenous laws and customs, which prohibit hunting, logging, and deforestation.

Despite their ecological importance, Sacred Groves face threats from deforestation, land encroachment, and urban expansion. Conservationists advocate for legally recognizing and integrating Sacred Groves into India's formal conservation policies to ensure their long-term protection while respecting indigenous governance systems (Joshi & Gadgil, 2022).

5. Challenges in Integrating IKS with Modern Environmental Policies

While Indian Knowledge Systems (IKS) offer viable solutions for environmental sustainability, several challenges hinder their integration into mainstream climate resilience frameworks:

- **Erosion of Traditional Knowledge:** With rapid urbanization and globalization, oral traditions and indigenous ecological practices are declining, reducing intergenerational knowledge transfer (Reddy et al., 2021).
-

- **Marginalization of Indigenous Communities:** Many traditional environmental practices are overlooked in national policies, leading to their underutilization in climate adaptation strategies (Kothari & Bajpai, 2022).
- **Lack of Scientific Documentation:** IKS remains largely undocumented, making it difficult to validate and integrate with contemporary scientific research (Sharma et al., 2023).
- **Intellectual Property Rights (IPR) Issues:** There is inadequate legal protection for indigenous environmental innovations, raising concerns about cultural appropriation without community benefits (Chakraborty et al., 2021).

To address these challenges, there is a growing need for collaborative frameworks between policymakers, researchers, and indigenous communities to safeguard and integrate IKS into modern sustainability efforts.

6. Policy Implications and Recommendations

To effectively integrate Indian Knowledge Systems (IKS) into national and global environmental policies, the following policy measures are recommended:

6.1. Recognizing IKS in National Climate Policies

- Incorporate IKS into India's Climate Action Plans under frameworks like the National Adaptation Fund for Climate Change (NAFCC) and State Action Plans on Climate Change (SAPCC).
- Formalize traditional water conservation techniques, such as Johads and Karez systems, into India's Jal Shakti Abhiyan water management initiatives.

6.2. Supporting Indigenous-Led Conservation Programs

- Empower tribal and rural communities by recognizing Sacred Groves and indigenous forest management practices as part of India's Protected Areas Network.
- Promote community-driven reforestation programs, similar to the Khasi Sacred Groves, through financial incentives and government support.

6.3. Strengthening Research and Knowledge Documentation

- Establish IKS Research Centers at leading universities to document, validate, and disseminate indigenous environmental practices.
- Encourage collaborative research between environmental scientists and indigenous knowledge holders to enhance knowledge exchange.

6.4. Implementing Legal Protections for IKS

- Develop legal frameworks to protect indigenous environmental knowledge from biopiracy and unauthorized commercialization.
- Advocate for intellectual property rights (IPR) protections for indigenous innovations through patent laws and traditional knowledge registries.

These policy recommendations align with India's Sustainable Development Goals (SDGs) and contribute to a holistic and inclusive climate resilience strategy.

7. Conclusion

Indigenous Knowledge Systems (IKS) provide tried-and-true methods for environmental sustainability that can greatly improve biodiversity preservation, climate resilience, and sustainable resource management. Sacred Groves for biodiversity preservation, Johads for water conservation, and Apatani wet-rice production are examples of traditional Indian methods that offer practical, environmentally responsible answers to today's environmental problems. IKS is becoming more widely acknowledged in contemporary environmental governance, despite the obstacles of knowledge loss, policy marginalization, and insufficient scientific proof. A hybrid approach to climate resilience is provided by the fusion of scientific frameworks with traditional ecological knowledge, guaranteeing ecological sustainability and cultural preservation. The resuscitation and institutionalization of IKS hold enormous promise for empowering indigenous communities, creating climate resilience, and advancing ecological balance as India and the rest of the world work towards sustainable development. Building a sustainable and resilient future for future generations will require a cooperative strategy that bridges traditional knowledge with contemporary science.

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GOEIIRJ

**INTEGRATING INDIGENOUS KNOWLEDGE SYSTEMS WITH MODERN
SCIENCE: A MULTIDISCIPLINARY APPROACH THROUGH RURAL
LIBRARIES IN KACHCHH**

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Abstract:

This study explores the potential of rural libraries in Kachchh, Gujarat, to preserve and promote Indigenous Knowledge Systems (IKS) while integrating modern educational resources, creating a balanced and multidisciplinary learning environment. Using a mixed-methods approach, surveys were conducted among students to collect data on demographics, challenges, and library usage, while interviews with teachers and librarians provided qualitative insights into infrastructural and educational gaps. The findings highlight critical challenges such as the underutilization of libraries, lack of digital resources, and inadequate training for educators. By incorporating traditional knowledge resources alongside contemporary educational materials, libraries can serve as powerful agents of cultural preservation, innovation, and educational advancement. This paper emphasizes the potential of libraries to enhance students' communication skills, foster creativity, and develop critical thinking, while also contributing to community-driven development. Recommendations include upgrading library facilities, introducing digital tools, training educators in IKS methodologies, and encouraging community participation to create a sustainable and inclusive learning environment.

Keywords: Indigenous Knowledge Systems, Rural Education, Library Engagement, Multidisciplinary Learning, Educational Resources

Introduction

Education serves as the foundation for individual and community development, particularly in rural areas where access to resources and opportunities is often limited. In regions like Kachchh, Gujarat, libraries act as vital hubs for preserving IKS and integrating it with modern science. By promoting IKS through traditional knowledge and contemporary resources, libraries can enhance learning outcomes and support holistic development. This paper investigates the role of libraries in addressing educational challenges, nurturing essential skills, and fostering community growth through the lens of IKS.

Significance of the Study

This study is significant as it emphasizes the role of rural libraries in preserving cultural

heritage while advancing modern educational practices. It highlights how the integration of IKS and modern science can foster innovation, critical thinking, and community development. By examining real-world applications and identifying gaps, the study provides actionable insights for policymakers, educators, and community leaders.

Role of Libraries in Preserving and Promoting Indigenous Knowledge Systems and Integrating Modern Science

Libraries play a multifaceted role in preserving and promoting Indigenous Knowledge Systems (IKS) while integrating modern educational resources. Their contributions can be outlined as follows:

- **Preservation of Traditional Knowledge:** Curate collections of books, manuscripts, and audiovisual materials capturing local history, traditional agricultural practices, herbal medicine, and spiritual beliefs. Document folklore, cultural narratives, and indigenous practices to ensure their continuity for future generations.
- **Promotion of Indigenous Wisdom:** Organize storytelling sessions led by community elders to pass down oral traditions. Conduct workshops on indigenous crafts, practices, and cultural heritage to engage students and the community.
- **Integration with Modern Education:** Collaborate with educators to incorporate traditional knowledge into modern curricula. Provide resources that link indigenous practices with contemporary scientific research and advancements.
- **Fostering Innovation and Practical Problem-Solving:** Facilitate collaborative projects that combine traditional techniques with modern technology (e.g., integrating traditional water conservation methods with modern irrigation systems). Encourage multidisciplinary learning by creating spaces where indigenous knowledge and modern science intersect.
- **Community Engagement and Knowledge Sharing:** Serve as community hubs where local knowledge holders, experts, and students come together. Promote cultural exchange programs and discussions that enhance community participation and collective learning.
- **Strengthening Cultural Identity and Resilience:** Support initiatives that reinforce cultural identity and pride in indigenous heritage. Develop programs that empower communities through knowledge preservation and sustainable development.

By fulfilling these roles, libraries become powerful agents of cultural preservation, educational advancement, and community empowerment, making them essential for fostering a balanced and multidisciplinary learning environment.

Variables of the study:

Independent Variables:

- **Library Resources:** Availability of books, digital tools, and other learning materials.

- Library Activities: Reading sessions, book discussions, and educational programs.

Dependent Variables:

- Communication Skills: Proficiency in language, vocabulary, and expression.
- Personality Development: Growth in confidence, creativity, and critical thinking.
- Socio-Economic Development: Improvement in educational awareness and community engagement.

Aim of the Study

To explore the potential of rural libraries in integrating Indigenous Knowledge Systems (IKS) with modern scientific resources to enhance educational outcomes and community development.

Objectives of the Study:

1. To analyze the relationship between library usage and students' communication skills.
2. To examine the impact of library activities on the personality development of students.
3. To analyze the contribution of libraries to socio-economic development.
4. To identify differences in communication skill development between students who actively use the library and those who do not.
5. To assess the role of libraries in preserving and promoting IKS.

Hypotheses of the Study

1. There is no significant relationship between library usage and students' communication skills.
2. There is no significant impact of library activities on the personality development of students.
3. Libraries do not significantly contribute to the socio-economic development of villages.
4. There is no significant difference in communication skill development between students who actively use the library and those who do not.
5. Libraries do not significantly contribute to the preservation and promotion of Indigenous Knowledge Systems.

Research Design

A mixed-methods approach was adopted, combining quantitative surveys with qualitative interviews and observations. This approach ensures a comprehensive understanding of the potential of rural libraries in integrating Indigenous Knowledge Systems with modern scientific resources to enhance educational outcomes and community development.

Sample of the Study:

The study sample included students, teachers, and librarians from rural libraries in Kachchh, specifically from the villages of Roha, Tera, and Kotdi. Surveys and interviews were conducted

Hypothesis Testing and Findings

Hypothesis 1: Null hypothesis states there is no significant relationship between library usage and students' communication skills. A Pearson correlation was performed to determine if there is a correlation between variables library usage and students' communication skills. A strong positive correlation ($r = 0.78$, $p < 0.05$) was observed between library usage (frequency of visits, books borrowed) and students' self-reported improvement in vocabulary and language comprehension. Therefore the null hypothesis is rejected. It is learnt that there is a significant relationship between library usage and communication skills.

Hypothesis 2: Null hypothesis states no significant impact of library activities on the personality development of students. A t-test for independent samples was conducted to examine whether there was a significant difference between the Students participating in library activities and students those who are not participating in the library activities. Students participating in library activities scored significantly higher on personality traits like confidence and critical thinking ($M = 4.5$, $SD = 0.6$) compared to those who did not participate ($M = 3.2$, $SD = 0.8$); $t(98) = 5.45$, $p < 0.01$. Null hypothesis is rejected. It is learnt that library activities positively impact personality development.

Hypothesis 3: Null hypothesis states libraries do not significantly contribute to the socio-economic development of villages. Descriptive qualitative analysis was conducted to examine the libraries' role in contributing to village development. Interviews with librarians and community members revealed increased educational awareness, participation in library programs, and usage of resources for competitive exams and vocational training. Observable socio-economic improvements included better academic outcomes among students and adult literacy. Null hypothesis is rejected. It is learnt that libraries' role in contributing to the socio-economic development of villages.

Hypothesis 4: There is no significant difference in communication skill development between students who actively use the library and those who do not. One-Way ANOVA was conducted to examine significant difference across three groups. Significant differences were observed in communication skill scores across three groups: frequent library users ($M = 85.2$, $SD = 5.6$), occasional users ($M = 72.8$, $SD = 6.2$), and non-users ($M = 65.4$, $SD = 7.3$); $F(2, 147) = 16.34$, $p < 0.01$. Null hypothesis is rejected. It is learnt that students who actively use the library show greater improvement in communication skills.

Hypothesis 5: Null hypothesis states there are no Libraries that do not significantly contribute to the preservation and promotion of Indigenous Knowledge Systems. A qualitative study was conducted to assess the role of libraries in preserving and promoting

Indigenous Knowledge Systems within the Kachchh community. Through interviews and focus group discussions, several key themes emerged:

- **Community Demand for Cultural Resources:** Participants expressed a strong desire for library collections that reflect their cultural heritage, including books on local history, traditional arts, and indigenous practices.
- **Perceived Role of Libraries:** Many community members view libraries as custodians of cultural knowledge, emphasizing their responsibility in safeguarding and disseminating indigenous information.
- **Engagement and Participation:** Respondents highlighted the importance of community involvement in curating library resources to ensure the representation of authentic indigenous perspectives.

These findings indicate that libraries are pivotal in preserving and promoting Indigenous Knowledge Systems by aligning their resources with community needs. Therefore, the null hypothesis is rejected, affirming the significant role of libraries in this context.

Recommendation

- Upgrade library facilities with digital tools and indigenous knowledge resources.
- Train educators in IKS methodologies and multidisciplinary teaching.
- Develop community-driven programs to promote knowledge-sharing.
- Collaborate with local experts and researchers to preserve and document IKS.
- Introduce curricula integrating IKS and modern science across educational levels.

Conclusion

Libraries in rural Kachchh have the potential to become transformative spaces for integrating Indigenous Knowledge Systems with modern science. By fostering a culture of inclusive, multidisciplinary education, libraries can empower students, preserve cultural heritage, and drive community-led development.

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INDIGENOUS WATER CONSERVATION TRADITIONS IN THE INDIAN KNOWLEDGE SYSTEM

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Abstract:

Ancient Indian wisdom, especially from the Vedic value system, offers profound insights into sustainable resource management, with a particular focus on water conservation. This study examines traditional Indian water conservation methods by integrating perspectives from the Indian Knowledge System (IKS) and formal scientific frameworks. The aim is to highlight the relevance of indigenous knowledge in formulating effective, sustainable water management strategies.

Aims & Objectives:

- To explore traditional water conservation practices rooted in IKS.
- To assess their relevance in contemporary sustainability efforts.
- To integrate indigenous and formal knowledge for holistic resource management.

Methodology: A qualitative, interdisciplinary approach is used, drawing on historical texts, case studies, and comparative analyses with modern conservation practices.

Cognitive Value: This study deepens the understanding of IKS as a scientific and philosophical system contributing to sustainable water management.

Hypothesis: Ancient Indian water conservation practices, grounded in Vedic principles, offer sustainable, adaptable solutions for modern environmental challenges.

Keywords: Vedic value system, water conservation, sustainability, indigenous practices.

Introduction

India has long been a cradle of scientific and ecological wisdom, with many scientific advancements predating their recognition in Europe, as noted by 19th-century British historian Grant Duff. The Indian Knowledge System (IKS) embodies this intellectual tradition, offering time-tested solutions to contemporary environmental challenges. Rooted in sustainability and coexistence with nature, IKS provides a framework for addressing global concerns, including resource depletion, biodiversity loss, and ecological imbalances.

In their seminal works *Beyond Vanishing Woods* and *Conserving Biodiversity and Ecosystem Services*, Pandey (2002) and Balvanera et al. (2006) highlight the intersection of ecological degradation and unequal resource distribution. They warn that these issues not only exacerbate human suffering but also endanger global livelihood security. The consequences of

unchecked growth and consumerism manifest in the erosion of natural resources, the decline of ecosystem services, and the disruption of vital ecological processes. Chapin et al. (2000) caution that "the biodiversity and sustainability of the essential ecological processes and life support systems" (p. 235) are at risk, particularly in "human-dominated ecosystems across scales" (Vitousek et al., 1997, p. 494).

Traditional Knowledge for Sustainability

In the context of *Viksit Bharat*—a vision of a self-reliant and sustainable India—reclaiming and integrating indigenous ecological wisdom is crucial. Traditional Indian water conservation practices, embedded in the Vedic value system, exemplify a harmonious relationship between humans and nature. By drawing from this knowledge, India can lead sustainable resource management efforts, ensuring environmental resilience and economic prosperity for future generations.

The convergence of natural and social sciences has proven invaluable in mitigating ecological threats and resource inequality. Scientific research on human-environmental interactions has led to the emergence of sustainability science (Kates et al., 2001). Sustainability science integrates natural and social sciences to address environmental, social, and economic challenges, emphasizing the interconnectedness of human society and nature. It combines scientific knowledge, local wisdom, and community engagement to develop policies promoting long-term resilience.

The intellectual resources on which sustainability science is built must account for local knowledge. Pandey (2001) states, "We need, therefore, to foster a sustainability science that draws on the collective intellectual resources of both formal sciences and local knowledge systems" (p. 1763). Indeed, "people have argued that we need to install a Nobel Prize for sustainability" (Snook & Bertels, 2002, p. 303). Driven by this need, "scientific research on human-environmental interactions" (Stern, 2000, p. 1897) has evolved into the field of "Sustainability Science" (Kates et al., 2001, p. 641), recognizing that human well-being is intricately linked to natural ecosystems. Science is not a monolithic entity. As Henry Bauer notes, it is "a mosaic of the beliefs of many little scientific groups" (Pielke, 2002). Science is often perceived as objective and value-free, whereas local knowledge is seen as subjective and value-laden. However, this distinction is misleading.

In many cases, science has merely rediscovered what was already known in indigenous knowledge systems. The primary difference lies in the methods of knowledge creation and transmission. Regardless of methodology, knowledge remains knowledge. To dismiss local knowledge as non-science is erroneous. Neither science nor local knowledge should claim exclusive truth; both must remain open to scrutiny and reevaluation (Pandey, 2001).

The Importance of Local Knowledge

A discussion on local knowledge is relevant for several reasons. First, economic incentives for biodiversity conservation remain inadequate, challenging traditional utilitarian approaches to resource management (Kleijn et al., 2006). Second, sustainability science requires diverse knowledge sources and institutional innovations to transition toward a sustainable planet (Kates et al., 2001). Third, traditional ecological knowledge has been rediscovered as an adaptive management tool, with scholars emphasizing human ecological and adaptive strategies for natural resource management (Berkes et al., 2000; Bates, 2001). Fourth, innovative ethics and policies are needed to conserve biodiversity and maintain ecosystem functions (Tilman, 2001). These ethics do not necessarily derive from divine sources but can be cultivated by society.

Local knowledge systems are disappearing rapidly, making it imperative to document and preserve their contributions to sustainability (Cox, 2000; Brodt, 2001; Pandey, 2001). Cavalcanti (2002) argues that economic development often neglects ecological considerations, treating economic processes mechanistically. Understanding how local communities solve economic problems sustainably is a crucial challenge that can be addressed through ethnoeconomics and ethnoecological economics.

The management of natural resources cannot be the sole domain of Western science but must incorporate multiple knowledge systems. Integrating scientific research and local knowledge enhances equity, opportunity, security, and empowerment within communities while promoting environmental sustainability (Getz et al., 1999). Local knowledge aids in scenario analysis, data collection, management planning, and adaptive strategy design, while science contributes technological advancements and improved methodologies (Pandey, 2001).

Local knowledge systems contribute significantly to sustainability in biodiversity conservation, ecosystem restoration, sustainable water management, genetic resource conservation, and overall natural resource management. They are particularly valuable for ecosystem restoration, often incorporating adaptive management strategies. By embracing indigenous wisdom alongside scientific advancements, India and the world can forge a path toward sustainable development, ensuring the preservation of natural ecosystems for future generations.

Traditional Knowledge, Water, and Biodiversity

According to Pandey's (n.d.) research in his seminal paper "Cultural resources for conservation Science," the adoption of "simple local technology and the ethical principle of 'capture rain where it rains'" have led to the creation of 1.5 million traditional village tanks, ponds, and earthen embankments in 660,000 Indian villages. If India were to construct these tanks today, it would require an investment of at least US \$125 billion (Pandey, n.d.).

Humans have virtually appropriated fresh water. Such appropriation occurs through various means, such as dam construction, irrigation, and water extraction for agriculture, industry, and urban use.

Humans have developed complex systems to manage, allocate, and manipulate freshwater sources to meet their needs. This has led to significant alterations in natural hydrological cycles, potentially causing imbalances in ecosystems and impacting the availability and quality of freshwater for both human and natural systems. In essence, humans have virtually taken ownership of, and the responsibility for, much of the world's freshwater resources. Humanity now uses 26 percent of total terrestrial evapotranspiration and 54 percent of runoff that is geographically and temporally accessible. New dam construction could increase accessible runoff by about 10 percent over the next 30 years, whereas the population is projected to increase by more than 45 percent during that period (Postel et al., n.d.).

Over thousands of years, societies have developed a diversity of local water harvesting and management regimes that still continue to survive, for example, in South Asia, Africa, and other parts of the world (Agarwal & Narain, n.d.). Such systems are often integrated with agroforestry (Wagachchi & Wiersum, 2016) and ethnoforestry practices (Pandey, n.d.). Recently, it has been suggested that market mechanisms for sustainable water management, such as taxing users to pay commensurate costs of supply and distribution and of integrated watershed management, and charging polluters for effluent treatment, can solve the problem (Johnson et al., 2001). These steps are important, but they alone may not be enough. To enhance their effectiveness, it is crucial to also tap into the wisdom of different cultures when it comes to practices like rainwater harvesting (Pandey, 1998).

Rainwater harvesting in South Asia is different from other parts of the world in that it has a continued history of practice for at least over 5000 years. Similarly, Balinese water temple networks, as complex adaptive systems, are also very useful systems (Falvo, 2011, as cited in Pandey, n.d.). Although hydraulic earthworks are known to have occurred in ancient landscapes in many regions, they are no longer an operational system among the masses in the same proportion as in South Asia. For instance, remains of earthworks and water storage adaptations are found in the Mayan lowlands in South America (Mann, 2000). Such systems had been used for prehistoric agriculture in Mayan lowlands (Turner, 1974; Coe, 1990) and for fish culture in the Bolivian Amazon (Erickson, 2000).

Rainwater harvesting has been found to be scientific and useful for rainfed areas (Li et al., 2000). For instance, a validation comes from the Negev. Ancient stone mounds and water conduits are found on hillslopes over large areas of the Negev desert. Field and laboratory studies suggest that ancient farmers were very efficient in harvesting water. A comparison of the volume of stones in the mounds to the volume of surface stones from the surrounding areas indicates that the ancient farmers removed only stones that had rested on the soil surface and left the embedded stones untouched. According to results of simulated rainfall experiments, this selective removal increased

the volume of runoff generated over one square meter by almost 250% for small rainfall events compared to natural untreated soil surfaces (Lavee et al., 1997).

In India, the *Ficus* genus stands as one of the primary tree genera flourishing in proximity to tanks and ponds, and it holds profound cultural significance throughout the country. Notably, this genus plays a pivotal role in supporting a diverse array of other species. According to a comprehensive global review by Shanahan et al. (2001) in “Fig-eating by vertebrate frugivores,” which covers records from over 75 countries and encompasses 260 *Ficus* species (representing approximately 30% of all described species), it has been revealed that beyond a select few reptiles and fishes, an astonishing 1,274 bird and mammal species spanning 523 genera and 92 families have been documented as fig consumers (Shanahan et al., 2001).

Water Conservation Principles in Ancient Indian Texts

Natural Resource Management has been deeply embedded in the traditions of Indian society, manifesting in various forms of management and utilization practices. These evolved through historical interactions between communities and their environment, resulting in practices and cultural landscapes such as sacred forests, groves, sacred corridors, and a variety of ethnoforestry methods. This also led to conservation practices integrating water, soil, and trees. The interaction between nature and society fostered socio-cultural beliefs that formed institutional frameworks for managing these practices, arising from the application of traditional knowledge. The widespread reverence for the earth as a mother figure is evident across Indian society.

Local knowledge has played a vital role in forest restoration and protected area management, particularly in Rajasthan, one of India's driest regions with scanty rainfall. The creation of cultural landscapes in both rural and urban areas, along with agroecosystems, through the application of scientific and local knowledge, supports diverse species of trees, birds, and other wildlife. This integration of nature and society provides opportunities for sustainable natural resource management (Taylor, 1994).

Ancient Indian texts contain explicit references to the treatment of forests and other natural resources. Sustainability has been a key consideration in development since antiquity, with robust principles designed to ensure that the intricate web of nature remains balanced. These principles align with modern conservation concepts, encompassing utilization and regeneration.

The Atharva Veda (12.1.11), composed around 800 BCE in deep forest settings, states:

"O Earth! Pleasant be thy hills, snow-clad mountains and forests; O numerous coloured, firm and protected Earth! On this earth, I stand, undefeated, unslain, unhurt."

Implicit in this hymn are several principles:

- The necessity of maintaining forest cover.
 - The understanding that human survival depends on the protection of the earth.
 - The maintenance of ecosystem integrity to ensure human well-being.
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- A holistic view encompassing ecology, economy, and society.

The principles derived from texts like the Atharva Veda, Rig Veda, Arthashastra, and Brihat Samhita align with modern sustainability goals. The emphasis on conservation, responsible utilization, and resource regeneration suggests that integrating traditional knowledge into contemporary environmental management can offer valuable insights for sustainable development.

Integration of Traditional and Formal Science

The integration of science and ethnoscience is a viable possibility, supported by empirical evidence. Traditional knowledge complements scientific knowledge by offering practical experience in ecosystem management and adaptation to environmental changes. Berkes et al. (1998) highlighted that the "language" of traditional ecology often includes metaphorical imagery and spiritual expressions, reflecting differences in context and conceptual underpinnings (p. 409). While science relies on standardized data and empirical methodologies, traditional knowledge is deeply rooted in cultural values and generational experience.

In India, Bhartiya traditions have significantly contributed to scientific advancements across disciplines like metallurgy, mathematics, medicine, and natural resource management (Rao, 2004; Gandhi, 2002; Tunon & Bruhn, 1994). Since knowledge cannot be fragmented (Gandhi, 2002, p. 1008), validated local knowledge must be considered alongside scientific insights to build a robust sustainability science. The interconnected nature of knowledge underscores the necessity of interdisciplinary approaches for addressing complex global challenges.

Sharp distinctions between formal and local knowledge systems, as well as between natural and social sciences, may be more perceived than real. As Wilson (1998) notes, scientific disciplines are increasingly "consilient," acknowledging the continuum between traditionally dichotomized scientific aspects, such as objective versus subjective and value-free versus value-laden perspectives (Rykiel, 2001, p. 433). This interdisciplinary approach is reshaping science and policy development.

Biodiversity Conservation

Conservation strategies primarily focus on protected areas such as national parks and wildlife sanctuaries (Inamdar et al., 1999; Sarkar, 1999; Myers et al., 2000). However, this exclusive approach has exacerbated human-wildlife conflicts, often failing to achieve conservation goals (Tupper, 2001, p. 1233; Raj Purohit, 1999, p. 162; Rawal & Dhar, 2001, p. 175). Community-driven conservation, exemplified by sacred groves and royal hunting forests, has historically played a significant role in preserving biodiversity (Kanowski et al., 2001; Chandrashekara & Sankar, 2002).

Conservation efforts must integrate multiple approaches, balancing protected areas with community-based strategies (Schellnhuber & Wenzel, 1998; Margules & Pressey, 2000). Rigid enforcement of protected areas without local participation often leads to adverse consequences,

including resource collapse, social conflict, and loss of biodiversity (Holling & Meffe, 1996, p. 328). Inclusive conservation policies should incorporate local governance, accountability, and participatory decision-making (Brechin et al., 2002, p. 41).

Water Harvesting and Sustainability

Reviving traditional rainwater harvesting systems could significantly contribute to sustainable water management. Pandey (n.d.) demonstrated that rainwater collection in Jaisalmer could yield 1 million liters per hectare annually, even in arid conditions. Similarly, decentralized water collection in the Negev Desert has proven more efficient than large-scale watershed collection (Evenari et al., n.d.). Indian proverbs emphasize "capturing rain where it falls," aligning with ecological realism and historical water conservation practices (Priscoli, n.d., p. 623).

Policy innovations should encourage rainwater harvesting at household and community levels, integrating traditional techniques with modern infrastructure (Boers & Ben-Asher, n.d., p. 145). In Rajasthan, traditional water tanks sustain rural life, demonstrating the need for holistic rehabilitation strategies (Shah & Raju, n.d., p. i). Removing government subsidies and allowing market-driven incentives could empower local communities to manage these resources sustainably.

Incorporating Traditional Knowledge in Conservation

Integrating traditional knowledge into biodiversity conservation and resource management must respect cultural and institutional contexts. Key recommendations include:

- Recognizing land rights and tenurial security of local communities.
- Protecting intellectual property rights of indigenous knowledge holders.
- Enhancing community capacity to apply and develop traditional knowledge.
- Encouraging participatory monitoring and adaptive management of natural resources.

Scientific institutions should facilitate knowledge exchange between local practitioners and formal researchers. Documentation and dissemination of indigenous knowledge, particularly in local languages, would help preserve valuable ecological insights (Madhav Gadgil, 1992). Establishing curricula on traditional knowledge within scientific education can promote interdisciplinary learning (Dhar et al.).

Equitable Knowledge Systems and Policy Implications

The 1992 Convention on Biological Diversity mandates the preservation and equitable sharing of traditional knowledge benefits. As nations implement this framework, its influence on research priorities and genetic resource access will grow (Kate, 2371). Acknowledging and utilizing indigenous knowledge fosters "equity of knowledge" (Pandey, Ethno Forestry), reducing social barriers and enhancing local decision-making capacities.

Equity of knowledge provides opportunities for self-determination and participation in global resource management. The integration of traditional and formal sciences enhances ecological resilience, addressing challenges like global warming and biodiversity loss (Pandey, "Carbon

Sequestration in Agroforestry"). Holistic approaches ensure that conservation benefits reach local communities, securing ecological, economic, and social sustainability.

Science Behind Traditions

Distinguishing valuable traditional knowledge from myths is crucial. Identifying "science behind traditions" (Arunachalam, 117) is more constructive than engaging in "indigenous vs. scientific" debates (Agrawal, 731). Both local knowledge systems and formal science should critically assess each other to foster mutual learning and innovation.

Validating traditional knowledge does not imply rigid standardization but rather recognizing complementarities. Collaborative research, integrating local expertise with scientific methodologies, enhances resource management efficiency (Kohm et al., 593). Local conservation practices have informed scientific hypotheses and research directions (Kimmerer, 2002; Robertson & Hull, 2001). Ayurveda's pharmacological validation, such as the isolation of hypertensive alkaloids from *Rouwolfia serpentina*, exemplifies the successful integration of ancient and modern medical knowledge (Dev, 783).

Towards a Sustainable Future

India's vision for 'Viksit Bharat' by 2047 requires integrating traditional wisdom with technological advancements. Sustainable development initiatives, aligned with Atmanirbhar Bharat and Digital India, must incorporate local knowledge for biodiversity conservation and climate resilience. Intellectual property frameworks should ensure that benefits from traditional knowledge applications reach indigenous communities (Utkarsh et al., 1999).

Conservation scientists must transition from passive observation to active participation in resource management (Meffe, 268). Integrating local aspirations with formal scientific methodologies fosters inclusive environmental stewardship (Pandey, "Cultural Resources for Conservation Science"). Bridging disciplinary and cultural boundaries will harness collective human wisdom to achieve sustainability and ecological balance.

By transcending traditional-versus-scientific debates, we can craft a shared foundation that integrates cultural, ecological, and technological perspectives for a sustainable future

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A STUDY OF AI AND MODERN EDUCATION: IMPLEMENTING NEP2020 FOR FUTURE LEARNING

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Abstract

Artificial intelligence (AI) refers to the development of computer systems or machines that can perform tasks that typically require human intelligence. These tasks include problem-solving, learning, pattern recognition, speech understanding, decision-making, and even creativity.

Modern education refers to the evolving system of learning that incorporates both traditional methods and the latest advancements in technology, teaching strategies, and curriculum design. It focuses on equipping students with a broad set of skills, knowledge, and values necessary to navigate an increasingly complex and interconnected world.

Implementing the National Education Policy (NEP) 2020 for future learning in India is a significant step toward transforming the education system. The policy emphasizes holistic development, multidisciplinary learning, critical thinking, and the use of technology. Here's a breakdown of how the implementation of NEP 2020 can be aligned with future learning

Key word: Modern Education, critical thinking, multidisciplinary learning

Introduction

AI is usually categorized into two types:

1. **Narrow AI (Weak AI):** This type of AI is designed and trained to perform a specific task. Most of the AI we interact with today falls under this category, like voice assistants (e.g., Siri, Alexa), recommendation algorithms (e.g., Netflix, Amazon), or self-driving cars.
2. **General AI (Strong AI):** This type of AI would possess the ability to perform any intellectual task that a human can do. It's still largely theoretical and doesn't exist yet, but it's a goal for future AI research.

AI works by processing large amounts of data and recognizing patterns within that data. Machine learning (ML) and deep learning (DL) are subsets of AI that focus on the idea of learning from data. Machine learning models "train" on data to improve their performance over time without being explicitly programmed for each task.

Key characteristics of modern education include:

1. **Technology Integration:** The use of digital tools and platforms (like online learning, interactive simulations, virtual classrooms, and educational apps) enhances the learning
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experience, making education more accessible and engaging.

2. **Personalized Learning:** Modern education emphasizes individual learning needs, with tailored programs and adaptive technologies that help students progress at their own pace.
3. **Critical Thinking and Problem Solving:** Instead of rote memorization, students are encouraged to think critically, engage in problem-solving, and apply knowledge to real-world situations.
4. **Collaboration and Communication:** Group work, teamwork, and the development of communication skills are integral parts of the learning process, preparing students for collaborative environments in their careers.
5. **Global and Cultural Awareness:** There's a growing focus on preparing students for a globalized world, where understanding diverse cultures and perspectives is essential.
6. **Flexible Learning Models:** Modern education often includes hybrid models (a mix of online and in-person learning), project-based learning, and competency-based assessments, providing flexibility for students with different needs and schedules.
7. **Life-Long Learning:** The emphasis is also on fostering a growth mindset, where learning continues beyond formal education. Adults are encouraged to continue acquiring new skills and knowledge throughout their careers.
8. **Emphasis on Emotional and Social Skills:** In addition to academic development, modern education recognizes the importance of emotional intelligence, mental well-being, and social skills in student success.

Modern education aims to cultivate well-rounded individuals who are not only academically proficient but also socially responsible, adaptable, and prepared for the future.

Implementation of NEP 2020 can be aligned with future learning:

1. Focus on Holistic Education

Multidisciplinary Learning:

NEP 2020 advocates for integrating multiple disciplines at all levels. This includes breaking traditional barriers between streams like Science, Arts, and Commerce. Schools and universities should offer courses that combine knowledge from different areas to foster creativity and critical thinking.

Implementation Strategy:

Schools and colleges can design flexible curricula that allow students to choose subjects from different fields. For example, a student pursuing a Bachelor's degree in engineering can take electives in humanities, social sciences, or business.

2. Promotion of Critical Thinking and Problem Solving

Shift from rote learning to critical thinking: NEP emphasizes that learning should focus more on the development of thinking and problem-solving skills rather than memorization.

Implementation Strategy: Teachers can incorporate problem-based learning (PBL), case studies, and real-world challenges in their teaching practices. Schools should encourage debates, discussions, and collaborative projects that push students to think critically.

3.1 Integration of Technology

Digital learning and online education: With the increasing importance of technology in education, NEP 2020 stresses the integration of technology in teaching and learning. This includes the use of digital tools for teaching, online resources, and the creation of virtual classrooms.

Implementation Strategy: Schools and universities can invest in digital platforms and e-learning tools. Teachers should be trained in using online platforms like Learning Management Systems (LMS), Virtual Reality (VR), and Artificial Intelligence (AI) to create personalized learning experiences for students.

4. Language Policy

Mother tongue or local language for instruction: NEP 2020 emphasizes the use of the mother tongue or regional languages as the medium of instruction in early education. This aims to improve understanding and cognitive development in the initial stages of learning.

Implementation Strategy: Schools should offer strong language support programs, with teachers trained to use regional languages effectively in teaching. Schools can also introduce multilingual teaching practices where students can learn through both their native language and a second or third language.

5. Curriculum Reforms

Flexible and Reduced Curriculum Load: The policy proposes reducing the curriculum load and making learning more flexible.

Implementation Strategy: Educational institutions should create modular curriculum systems that allow students to explore subjects of their interest while ensuring core competencies are not compromised. This can also include the introduction of online courses that can be integrated into traditional learning.

6. Assessment and Evaluation Reforms

Focus on formative assessments: NEP 2020 advocates for a shift from summative assessments (final exams) to more continuous and comprehensive assessment methods that evaluate the overall development of a student, including creativity, teamwork, and practical knowledge.

Implementation Strategy: Schools should move towards regular project-based assessments, peer reviews, and self-assessments rather than relying solely on traditional exams. This will help in the overall development of skills that are relevant for the future.

7. Teacher Training and Development

Continuous professional development for educators: Teachers are central to the success of NEP 2020. Continuous professional development (CPD) and the use of innovative pedagogical

techniques will be crucial for the implementation of the policy.

Implementation Strategy: Establish teacher training programs focused on enhancing digital literacy, using AI and data analytics in education, and understanding student-centric approaches. Schools can provide workshops, seminars, and access to online courses for educators to keep up with the latest teaching practices.

9. Emphasis on Vocational Education

Skills-based education: NEP 2020 encourages the inclusion of vocational education at an early stage, integrating it with the mainstream education system.

Implementation Strategy: Schools should collaborate with industries and vocational training centers to create curriculum pathways that include both academic learning and vocational skills. Introducing internships and hands-on training in secondary and higher education will provide students with practical experience.

10. Equity and Inclusion

Addressing disparities: NEP 2020 emphasizes the need for inclusive education that ensures equitable access to learning for all students, particularly those from marginalized and disadvantaged groups.

Implementation Strategy: Schools should ensure accessibility for students with disabilities, provide scholarships for underprivileged students, and create programs specifically tailored for the marginalized sections of society. Digital inclusion is also important, where students in remote areas should have access to online learning platforms.

11. Internationalization of Education

Global exposure and partnerships: NEP 2020 encourages international collaboration in education, promoting the exchange of knowledge, and creating opportunities for students to have global exposure.

Implementation Strategy: Universities and institutions can form partnerships with foreign universities to offer joint degree programs, exchange programs, and collaborative research. Encouraging students to take part in global online courses and international internships will expand their global outlook.

12. Sustainability and Environmental Awareness

Green and sustainable development: With an emphasis on sustainability, NEP 2020 encourages students to be aware of the environmental challenges the world faces and teaches them to become responsible citizens.

Implementation Strategy: Schools can introduce subjects and projects related to sustainability, climate change, and environmental conservation. Integrating sustainability into curricula and school practices (e.g., waste management, eco-friendly campuses) will reinforce these values.

Conclusion

To successfully implement NEP 2020 for future learning, a collaborative effort between government bodies, schools, universities, and technology providers is required. The focus should be on flexibility, critical thinking, technology integration, and fostering an inclusive learning environment. The vision of NEP 2020 to create a more holistic, accessible and future-ready education system can be achieved with dedicated effort and resources.

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ANCIENT VS MODERN EDUCATION SYSTEM AND NEP 2020**Ashish Prakash Kute***I/C Principal**K. N. Kela Arts, Commerce College. Nashik.*

Abstract :

Ancient Education System is a vast and ancient repository of knowledge, encompassing diverse fields such as Science, Mathematics, Arts, Philosophy and Spirituality. As per NEP 2020, it is called, Indian Knowledge System, which is focused at School level. It has been nurtured and evolved over millennia, contributing significantly to the world's intellectual heritage. On the contrary Modern Education System is giving focus on student centric method, technology based and aims to prepare students for facing the challenges of global world. It focuses on critical thinking, problem solving and life skills.

Key Words :-Ancient, Modern, Indian Knowledge System, NEP 2020, Life Skills, Experiential Learning.

Introduction of Ancient Education System :-

The Ancient Education System was a traditional Indian Education System that combined academic learning with moral and spiritual growth. Students were called disciples or Shishyas. Their centre of learning was Ashrams, which were called Gurukul. Students lived and studied in secluded forests under the guidance of a Guru. This system originated around 1500BC. Guru and his family were living in the same Ashrama, for a period of time with the students, where they learn and get educated by their Guruji, in a natural environment. It aimed to impart knowledge that was holistic in approach, spiritual, moralistic and practical through personalised mentoring and interaction. Experiential learning helped them for all round development. It was basically non formal way.

Introduction to Modern Education System :-

The Modern Education System of India in 21st century is constituted of a new approach to learning from On line Education to skill development course, digital learning platforms, a grading system as well as the use of educational Technology in the classrooms and a newly introduced New Education Policy 2020. In India, the formal Education System consists of, the revised structure of 5+3+3+4, for school education in India introduced by New NEP 2020.

- Foundational stage :-five years to build a foundation, three years for Nursery, Junior and Senior, first and second standard.
- Preparatory Stage :-from third to fifth standard, three years to prepare for middle school.
- Middle Stage :-from sixth to eighth standard, three years to learn more abstract concepts.

- Secondary Stage :-from Ninth to Twelfth standard, these four years to prepare for higher education or vocational skills.

In this Modern Education System, importance to education is given because it opens up a world of possibilities for individuals by empowering them with knowledge. It is the cultivation of learning in various ways. One of the most common ways to obtain an education is by going to a formal school and learning for trained teachers.

According to many people, CBSE, is widely considered the best education system in India, as it offers a standardized national curriculum, recognised across the country and it is well -aligned with competitive exams like NEET and JEE. So the present Education System in India, emphasizes qualities like confidence, good practices, sympathy and inspiration. It is a complete blend of Culture, history and human values. Of course, we are democratic country, we have to follow the guidelines, principles of our Constitution.

Methods of Teaching in Gurukul :-

- 1) Emphasis on memorization :-In gurukul system, the emphasis was on memorization. Techniques for fast learning were used.
- 2) Communal Living :-Guru shishyas were living together, so continuous learning was in existence. Character development beyond formal instructions were given.
- 3) Oral Tradition: -Learning is primarily with the Guru, transmitting knowledge through story telling, discussions, personalised lectures tailored to each students abilities.
- 4) Experiential Learning:-In Gurukul system, experiential learning was emphasised. It was combining Theory with practice. Students were always engaged in activities like Meditation, Yoga, Agricultural work and community services, promoting hands on learning and holistic development.
- 5) Guru -disciple relationship:-The Gurukul System centres on the Guru Shishyas relationship built on mutual respect, trust and दशना. The teacher imparting knowledge and life skills while students show reverence and obedience.

Methods of Teaching in Modern Education System:-

- 1) Activity Based or Task Based :-These methods encourage hands on activities and tasks that engage students and facilitate practical understanding.
- 2) Utilizing Resources :-Modern teaching leverages various resources, including technology, digital apps to enhance the learning experience and make it more interactive.
- 3) Learner Centric :-It prioritize the students needs and thought processes, making them active participants in their learning journey.
- 4) Natural System :-Natural systems that are interactive and integrative. The modern approach integrates real world scenarios and encourages interactive learning that aligns with natural

learning processes.

- 5) Cross Group Cooperation:-Collaborations among students from diverse backgrounds is promoted, fostering team work and cultural understanding.
- 6) Inquiry based learning:-It encourages students to ponder new concepts and ask questions to deepen understanding, critical thinking and creativity to be developed.
- 7) Problem Based learning:-It emphasizes the practical application of knowledge to solve real world problems. With this approach, students work collaboratively in teams to identify, analyse and solve problems. They participate actively. It relevance to their daily lives.
- 8) Competency Based learning: -It is a teaching strategy that focuses on helping students achieve specific learning objectives. In this method, Evaluation is based on students ability to demonstrate their knowledge and skills. It empowers students to take ownership of their learning. They set their own goals and work towards achieving them, promoting self motivation and self direction, time management, self discipline are developed.
- 9) Project Based Learning:-It involves students in real life projects aimed at solving practical problems. They use to select problems for project work, apply their knowledge to real world scenario. They investigate real life issues and get innovative solutions. It is very effective in fostering critical thinking and problem solving abilities.
- 10) Collaborative Learning:-This strategy encourages students to work together on group projects to achieve common objectives. It promotes the exchange of knowledge, skills and experiences among students. It helps to develop social skills and sense of community. They develop vital life skills like leadership, teamwork and communication.

Benefits of Ancient Education System :-

The gurukul education system continues to inspire the world its unique features which evolved over the years.

- 1) The education given was influenced the culture and religion which were incremental elements of the ancient Indian society.
- 2) The emphasis was on holistic learning with focus on professional, social, religious and spiritual education.
- 3) It helped in building character by imparting moral and ethical education.
- 4) In this system, students directly bond with nature and live in a sustainable way.
- 5) Alongside knowledge of the art, literature, scriptures and philosophy, students were also taught practical skills and trained for different tasks.
- 6) The gurukul system resulted in the all around development of the individual and emphasized a psychological methods of teaching.

In short, it benefitedfor ,Holistic development. For personality growth, for spiritual awakening, awareness about nature and society, passing on the knowledge and culture through

generations, self control and discipline in their life.

So Gurukul System is still valuable.

Benefits of Modern Education System :-

It gives several benefits for students. Technology like smart board, interactive white board and various digital apps, making learning fun and engaging activities are focused.

Projects help to explore topics deeply. They become more creative, better thinking ability is developed. Feedback given by teachers help them to be more critical. Classroom learning becomes more effective and interactive. Students are trained to face 21st century challenges. Modern teaching and learning techniques are used.

Modern education emphasizes the adoption of standardized curricula, which are extra obsessed and technology Savy.

In contemporary society, though the gurukul system is not found, however many of the modern education systems take inspirations from it. So gurukul education system continues to remain relevant even in modern times.

In short, we can say, Education is the most powerful weapon which we can use to change the world.

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ENHANCING PRE-EMPLOYABILITY SKILLS THROUGH NEUROLINGUISTIC TECHNIQUES: A HOLISTIC APPROACH TO SUSTAINABLE SKILL DEVELOPMENT

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Abstract

In the rapidly evolving job market, bridging the skill gap among students is crucial for enhancing their workforce readiness. This paper explores the role of Neurolinguistic Techniques (NLT) in pre-employability skill development, focusing on their potential to improve communication, problem-solving, adaptability, and self-confidence. Through a skill gap analysis of students, the study identifies key deficiencies in employability skills and proposes a neurolinguistic-based training model to address these gaps.

By leveraging cognitive strategies such as reframing, anchoring, and neuro-associative conditioning, NLT can help students overcome self-limiting beliefs, enhance interpersonal skills, and develop a growth mindset. The paper also examines how AI-driven assessment tools and personalized learning techniques can be integrated with neurolinguistic interventions to create a sustainable skill development framework.

The proposed model emphasizes practical training, self-awareness exercises, and experiential learning, aiming to equip students with the resilience and adaptability needed for the modern workforce. The findings suggest that neurolinguistic-based training can significantly enhance employability outcomes, making students more prepared for dynamic career challenges.

His paper contributes to the ongoing discourse on sustainable skill development, providing a theoretical foundation and practical recommendations for implementing NLT-based training programs in educational institutions. Future research can explore empirical validation, longitudinal impact assessment, and AI-driven enhancements to refine this approach further.

Keywords: Neurolinguistic Techniques (NLT), Pre-Employability Skills, Skill Gap Analysis, Sustainable Workforce Development, Cognitive Training for Career Readiness

1. Introduction

The evolving job market necessitates a workforce that is adaptable, skilled, and resilient. However, there exists a noticeable gap between students' skills and employer expectations. This paper aims to examine how Neurolinguistic Techniques (NLT) can bridge this gap, enhance pre-

employability skills, and foster a sustainable workforce. The concept of employability skills has gained importance as industries shift towards automation and require a workforce with strong problem-solving abilities, adaptability, and interpersonal skills. Educational institutions must adopt innovative approaches, such as NLT, to better prepare students for future careers. As artificial intelligence and machine learning continue to redefine traditional job roles, the need for soft skills such as emotional intelligence, creativity, and critical thinking has become even more pronounced. Employers increasingly seek candidates who can demonstrate cognitive flexibility, collaborate effectively, and navigate dynamic work environments.

Moreover, the shift from task-oriented roles to knowledge-driven professions highlights the importance of continuous learning. Organizations are investing in skill development programs, but educational institutions must proactively equip students with the foundational skills required for lifelong learning and adaptability. Integrating NLT into pre-employability training provides students with psychological tools to enhance self-efficacy, improve their learning capabilities, and sustain motivation in their career journeys.

Furthermore, as remote and hybrid work environments gain traction, effective communication and digital collaboration have become critical competencies. Training students in these areas using neurolinguistic techniques can help them overcome communication barriers, manage stress, and maintain productivity in diverse professional settings. By fostering resilience and adaptability, NLT-based training can prepare students for the fluid nature of the modern workforce.

2. Theoretical Framework

NLT encompasses cognitive strategies like reframing, anchoring, and neuro-associative conditioning, facilitating self-improvement and effective communication. These techniques are rooted in multiple theoretical domains, including neuroscience, psychology, skill development, and social learning theories. From a neuroscience perspective, NLT aligns with the concept of neuroplasticity, which suggests that the brain can rewire itself in response to new learning and experiences (Doidge, 2007). Techniques such as reframing and anchoring can help strengthen neural pathways associated with positive thinking, confidence, and adaptability. By repeatedly practicing these techniques, students can enhance their cognitive flexibility, which is essential for problem-solving and decision-making.

In psychology, NLT is closely linked to cognitive-behavioral theories (Beck, 1976) and Bandura's social cognitive theory (1986). Cognitive-behavioral approaches focus on identifying and altering maladaptive thought patterns, a principle that underlies reframing and neuro-associative conditioning. Meanwhile, Bandura's work emphasizes the role of self-efficacy in skill development, suggesting that students who believe in their ability to succeed are more likely to persist in learning and applying new skills. From a skill development perspective, Kolb's

experiential learning theory (1984) provides a framework for integrating NLT into educational settings.

Socially, Vygotsky's sociocultural theory (1978) highlights the importance of social interactions and language in cognitive development. Additionally, Bronfenbrenner's ecological systems theory (1979) underscores how external influences such as mentors, peers, and workplace culture shape skill development and behavioural adaptation. By integrating insights from neuroscience, psychology, skill development, and social learning, NLT offers a holistic approach to enhancing pre-employability skills. These theories provide a robust foundation for structuring effective interventions aimed at preparing students for the dynamic workforce.

2.2. Pre-Employability Skills

Essential pre-employability skills include:

Communication and Interpersonal Skills: Effective communication is crucial for workplace success. It involves verbal and non-verbal communication, active listening, and the ability to articulate thoughts clearly. Strong interpersonal skills facilitate collaboration and teamwork, making individuals valuable assets in any professional setting.

Problem-Solving Abilities: Employers value candidates who can think critically and resolve issues efficiently. Problem-solving requires analytical thinking, creativity, and decision-making capabilities, enabling individuals to navigate workplace challenges effectively.

Adaptability and Resilience: With rapid technological advancements, professionals must be adaptable and resilient. Adaptability ensures individuals can embrace change and new learning, while resilience helps them overcome setbacks and remain focused on career growth.

Self-Confidence and Leadership: Confidence enables individuals to take initiative and execute responsibilities effectively. Leadership skills, including decision-making, strategic thinking, and team management, play a vital role in career advancement and organizational success.

Emotional Intelligence and Teamwork: Emotional intelligence involves self-awareness, empathy, and the ability to manage emotions constructively. It enhances interpersonal relationships and fosters a collaborative work environment. Teamwork is essential for achieving common goals and ensuring workplace harmony. These skills are foundational for professional success and must be cultivated through structured interventions, such as experiential learning, neurolinguistic training, mentorship programs, and industry collaborations.

3. Skill Gap Analysis through secondary research

3.1 Skill Gap Analysis

A structured skill gap analysis was conducted to assess deficiencies among students. Findings from the India Skill Report 2025 and Wipro Research on Future Employability Trends highlight key trends affecting workforce readiness in India:

According to the India Skill Report 2025, only 45.9% of Indian graduates are employable, indicating a significant skills gap in technical and soft skills.

Wipro's research on future job market demands states that over 60% of employers emphasize problem-solving and critical thinking as essential for hiring.

A 2024 survey by the National Skill Development Corporation (NSDC) identified that 50% of fresh graduates lack communication and collaboration skills, affecting workplace performance. Industry reports from FICCI and NASSCOM highlight that automation and AI integration require professionals to develop adaptability, creativity, and emotional intelligence to stay relevant. McKinsey & Company's Workforce Readiness Survey 2024 found that India's workforce faces a 27% skill gap in high-demand sectors like data science, cybersecurity, and automation. These insights reinforce the urgent need for skill development programs tailored to enhance employability in evolving job markets.

3.2 Solutions to Bridge the Skill Gap

- **Industry-Academia Collaboration:** Establish stronger partnerships between educational institutions and industries to align curriculum with current workforce demands.
- **Experiential Learning & Internships:** Provide students with hands-on experience through internships, apprenticeships, and project-based learning.
- **Advanced Digital & Technical Skills Training:** Introduce AI, automation, and data science courses to enhance job readiness.
- **Soft Skills Development:** Implement structured training programs to improve communication, leadership, teamwork, and emotional intelligence.
- **Personalized Learning Approaches:** Use AI-driven assessment tools to identify individual skill gaps and create customized learning pathways.
- **Time Management & Productivity Training:** Offer workshops focused on task prioritization, deadline management, and efficient work strategies.
- **Career Counseling & Mentorship:** Provide continuous guidance through mentorship programs and career coaching to help students navigate career paths effectively.
- **Government & Private Sector Initiatives:** Leverage national and corporate-led skill development programs to equip students with in-demand skills.

By implementing these solutions, educational institutions can better prepare students for the workforce, ensuring they possess the necessary skills for sustainable professional growth.

4. Neurolinguistic Techniques for Skill Enhancement

4.1. Reframing

Encourages students to shift their perspectives on challenges, fostering a growth mindset. Reframing negative experiences helps students see setbacks as learning opportunities, increasing

resilience and adaptability.

4.2. Anchoring

Develops confidence by associating positive emotional states with professional tasks. By repeatedly linking positive emotions with job-related tasks, students can reduce anxiety and enhance performance.

4.3. Neuro-Associative Conditioning

Utilizes reinforcement mechanisms to instill productive behavioral patterns. This technique helps students replace limiting beliefs with constructive habits, improving overall employability skills.

4.4. Visualization Techniques

Encourages students to mentally rehearse job-related scenarios, improving confidence and reducing performance anxiety.

5. Integration of AI in Neurolinguistic Training

The integration of Artificial Intelligence (AI) in neurolinguistic training has the potential to revolutionize skill development by enhancing learning experiences, optimizing feedback mechanisms, and automating assessments. AI-driven tools can significantly improve the effectiveness of pre-employability training programs by personalizing the learning journey, enabling real-time performance tracking, and providing adaptive learning solutions.

5.1. Personalized Learning Experiences

AI-powered platforms analyse individual learning patterns and cognitive strengths to tailor content that aligns with the specific needs of each student. By leveraging machine learning algorithms, these platforms can recommend targeted exercises, interactive simulations, and customized learning paths, ensuring that students receive a training experience best suited to their skill level and progress.

5.2 Real-Time Feedback on Communication and Problem-Solving

AI-driven speech recognition and sentiment analysis tools can evaluate a student's communication skills by analysing tone, fluency, and clarity. Additionally, AI-enabled problem-solving simulations can assess decision-making abilities in real-world scenarios, offering immediate feedback and suggestions for improvement. This ensures continuous refinement of critical thinking and interpersonal communication skills.

5.3. Automated Skill Assessments for Continuous Improvement

Traditional assessment methods often rely on subjective evaluations. AI enhances this process by automating skill assessments through natural language processing (NLP), facial expression analysis, and behavioral analytics. These assessments provide objective, data-driven insights into a student's strengths and weaknesses, enabling continuous monitoring of progress and necessary interventions.

5.4. AI-Powered Chatbots for Interview Simulations

AI chatbots can simulate real-life interview scenarios, allowing students to practice their responses, improve articulation, and gain confidence. These chatbots can adapt to different interview styles, industries, and difficulty levels, providing constructive feedback on aspects such as content relevance, speech fluency, and body language. Students become better prepared for real-world job opportunities by engaging in multiple AI-driven mock interviews.

5.5 Tailored Recommendations for Skill Enhancement

AI tools can analyse student performance across various dimensions and provide actionable recommendations for skill enhancement. By integrating AI into neuro-linguistic training, institutions can provide a more effective, data-driven, and personalized approach to skill development.

6. Training Modules

Developing structured training modules is crucial for effectively integrating neurolinguistic techniques. These modules should be designed in a way that promotes interactive learning while focusing on real-world applications.

6.1 Experiential Learning

Experiential learning is fundamental in ensuring that students can apply theoretical knowledge to practical scenarios. This approach involves hands-on activities that enhance learning through real-world applications:

Role-Playing and Simulated Scenarios: AI-powered simulations can create realistic workplace interactions, enabling students to practice negotiation skills, leadership decision-making, and problem-solving in controlled environments.

Collaborative Projects: Students should engage in team-based projects that require critical thinking and effective communication. AI can provide insights into group dynamics, highlighting areas for improvement.

Industry-Driven Case Studies: Case studies derived from real-world business challenges should be incorporated to help students understand how their skills apply in professional settings. AI can assist in analysing different perspectives and suggesting alternative solutions.

AI-Guided Workshops: Interactive workshops with AI-powered facilitators can help students practice their skills in a structured yet flexible manner, receiving real-time feedback on their performance.

6.2 Self-Awareness Exercises

These exercises include:

Journaling and Reflection Tools: Digital journals can provide prompts and insights, helping students track their thoughts, emotions, and behavioral patterns over time.

Self-Assessment Quizzes: AI-generated self-assessment tools can analyse responses and provide insights on personality traits, cognitive biases, and areas that need improvement.

Cognitive Restructuring Activities: AI-driven feedback mechanisms can help students recognize negative thought patterns and offer strategies for reshaping their mind-set towards a growth-oriented approach.

AI-Powered Sentiment Analysis: Speech and text sentiment analysis tools can assess emotional responses during training exercises, providing feedback on confidence levels and areas for emotional regulation.

6.3 Industry Collaboration

A key aspect of employability training is providing students with exposure to real-world workplace dynamics. Collaborating with industry partners ensures that students develop relevant skills and gain practical experience. Strategies for effective industry collaboration include:

Internship and Apprenticeship Programs: Establishing AI-facilitated internships where students work on projects aligned with their career interests, gaining hands-on experience with industry-specific challenges.

Corporate Training Partnerships: Companies can offer workshops or mentorship programs where students receive guidance from professionals in their field of interest. AI-driven feedback tools can measure skill development throughout the mentorship.

AI-Driven Job Readiness Portals: Institutions can develop AI-powered job-matching platforms that connect students with internship and employment opportunities based on their skills and learning progress.

Expert-Led Webinars and Panel Discussions: Industry leaders can participate in AI-facilitated virtual discussions where students engage in Q&A sessions, learning about emerging trends and workplace expectations.

By implementing these strategies, AI-integrated neurolinguistic training can become a transformative approach to skill development, ensuring students are well-equipped for professional success in a competitive job market.

7. Outcomes and Impact Assessment of Neurolinguistic Training

Neurolinguistic Training (NLT) plays a crucial role in enhancing employability by developing essential cognitive, linguistic, and interpersonal skills. By focusing on how language influences thought and behavior, NLT empowers individuals to communicate effectively, think critically, and adapt to diverse professional environments. Below is a detailed assessment of the expected outcomes and their impact on career readiness.

1. Improved Communication Skills

Effective communication is a key determinant of professional success. NLT enhances both verbal and non-verbal communication by employing techniques such as:

Meta-Model Language Patterns: Helping individuals clarify vague statements, improve specificity, and eliminate misunderstandings in conversations.

Rapport Building Techniques: Teaching individuals how to mirror and match speech patterns, body language, and tone to create stronger connections with colleagues, clients, and employers.

Reframing Negative Language: Training individuals to replace limiting beliefs with constructive language to boost confidence in presentations and workplace interactions.

Impact on Employability:

Enhances interview performance by improving clarity, confidence, and articulation.

Strengthens workplace communication, reducing conflicts and misunderstandings.

Increases effectiveness in professional writing, public speaking, and client interactions.

2. Enhanced Problem-Solving Capabilities

Problem-solving is a critical skill in any profession. NLT fosters analytical thinking and creativity by:

Perceptual Positioning: Encouraging individuals to view problems from different perspectives—self, others, and an objective viewpoint—to make balanced decisions.

Anchoring Techniques: Helping individuals associate positive mental states with challenging situations to improve decision-making under pressure.

Chunking Strategy: Breaking down complex problems into smaller, manageable parts to facilitate structured thinking and solutions.
Impact on Employability: Improves the ability to handle workplace challenges with logical and creative solutions. Enhances decision-making in high-pressure situations. Strengthens strategic thinking, making individuals more effective in managerial and problem-solving roles.

3. Increased Adaptability and Self-Confidence

Adaptability is essential in dynamic work environments. NLT equips individuals with techniques to manage change and uncertainty effectively, such as:

Cognitive Reframing: Teaching individuals to shift their mind-set from fear of change to seeing growth opportunities.

Neurological Levels of Change: Helping individuals align their behaviours, beliefs, and identity to professional goals, ensuring a proactive approach to career development.

Visualization and Mental Rehearsal: Encouraging individuals to mentally simulate success before important events, such as interviews, presentations, or negotiations.

Impact on Employability: Builds resilience and confidence to handle career transitions and new roles.

Reduces anxiety in high-stakes professional situations.

Enhances emotional intelligence, improving adaptability in diverse work environments.

4. Strengthened Leadership and Teamwork Abilities

Effective leadership and teamwork are crucial for professional growth. NLT strengthens these skills by focusing on:

Milton Model Techniques: Using persuasive language patterns to inspire and influence teams.

Calibration Skills: Enhancing the ability to read body language and emotions, improving leadership presence and team interactions.

Pacing and Leading: Teaching individuals to first match a team's energy and then gradually guide them toward a desired goal.

Impact on Employability: Enhances the ability to lead and motivate teams effectively.

Improves conflict resolution and negotiation skills.

Strengthens collaborative abilities, making individuals valuable assets in team-oriented environments.

Final Impact on Employability Through Neurolinguistic Training, individuals develop a comprehensive skill set that significantly improves their employability. They become:

1. Persuasive and articulate communicators.
2. Skilled problem solvers with structured thinking.
3. Adaptable professionals with strong emotional intelligence.
4. Effective leaders and collaborative team players.

By mastering these techniques, individuals can navigate professional challenges with confidence, secure better career opportunities, and achieve long-term success in the workforce.

8. Conclusion

Neurolinguistic Training (NLT) serves as a powerful approach to enhancing employability by refining communication, problem solving, adaptability, and leadership skills. By leveraging techniques such as cognitive reframing, perceptual positioning, and rapport building, individuals can develop the confidence and flexibility needed to excel in dynamic work environments. NLT not only strengthens professional interactions but also fosters resilience, self-awareness, and strategic thinking—key attributes for career success. Implementing structured NLT programs in education and training can bridge the gap between academic learning and workplace demands, ultimately shaping individuals into competent and confident professionals ready for the challenges of the modern workforce.

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THE CHALLENGES AND THE ROAD AHEAD IN THE DIAGNOSIS OF LUNG CANCER

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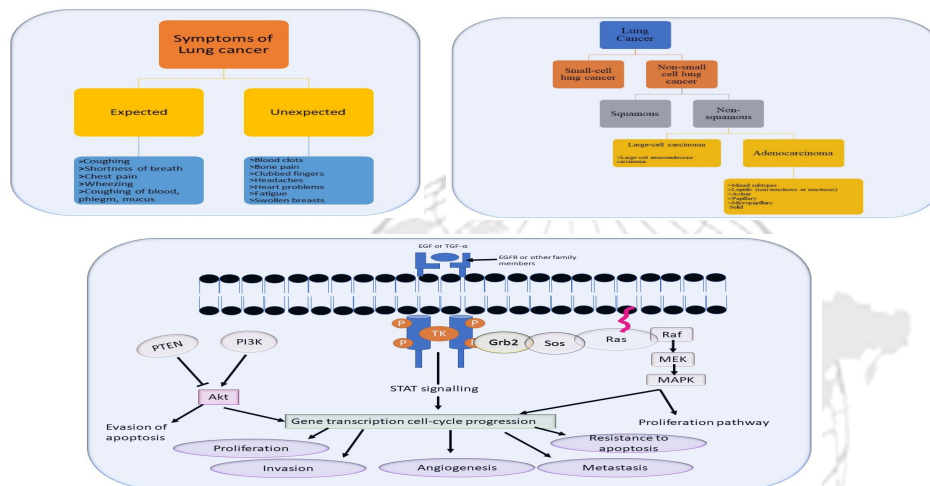
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1. Introduction: -

After cardiovascular illnesses, the major cause of death in the population is found to be cancer. This term 'cancer' was first introduced by Hippocrates in approximately 370 BC but it was stated that the cell growing abnormally were only due to chromosomal alterations[1]. The second most frequent malignancy across both men and women in the United States is lung cancer, including small cell and non-small cell types (not counting skin cancer)[2]. In 2023, it is anticipated that there will be around 238,340 new instances of lung cancer diagnosed with 127,070 fatalities being reported[3]. A chronic or increasing cough, shortness of breath, chest discomfort, hoarseness, or unexplained weight loss are among the most typical symptoms of lung cancer[4].

Lung cancer is caused by any form of tobacco smoking, inhalation of asbestos, incineration of biomass or wood, radon gas, and genetic factors[5]. Polycyclic aromatic hydrocarbons and nicotine-derived nitrosoaminoketone, which cause genetic changes through DNA adduct formation, are highly related with the development of lung cancer. Small-Cell Lung Cancer (SCLC) and Non-Small-Cell Lung Cancer are the two main subtypes of lung cancer (NSCLC). Stage SCLC This is a peri-hilar mass that develops from the airway submucosa as a core tumour[6]. The cells are tiny, spindle-shaped or rounded, have little cytoplasm, granular chromatin, and necrosis is frequently seen[7]. The subtypes of SCLC include pure and mixed with NSCLC [8]. A stem-like, pro-metastatic SCLC phenotype that is PLCG2-high, recurs across subtypes, and predicts a poorer overall survival was identified. Chest X-rays(CXR), computed tomography (CT) scans, magnetic resonance imaging (MRI) scans, positron emission tomography (PET) scans, sputum analyses, and lung biopsies are being used to identify lung cancer[11]. Despite the development of technology and the depth of cancer research, 57% of lung cancer

patients do not receive a diagnosis until the tumour has spread to another part of the body[12,13]. While modest improvements in survival have been made especially in the metastatic setting with chemo-immunotherapy, further research in understanding the biology of SCLC is warranted to develop biomarker-driven therapeutic strategies and combinational approaches for these aggressive diseases[2]. Two out of every three people with SCLC are already in the



advanced stages when they are diagnosed.

Figure 1: (a) Symptoms corresponding to Lung Cancer (b) Classification of different forms of cancer. (c) Pathophysiology of Lung Cancer.[14]

2. Diagnostic Techniques

The complexity of accurate diagnosis of lung cancer is associated with numerous factors like number of causes, different symptoms and several types of tumors. Various techniques used for diagnosis of lung cancer are classified as shown in **Fig 2**. (a) (b)

Advanced Methods	Liquid Biopsy
	Radiogenomics
	Biosensor
	Miscellaneous such as quantum dots, nanorobots
Conventional Methods	Cytology : Sputum Cytology
	Bronchoscopy
	Computer aided tomography
	Biopsy : Needle Biopsy

Figure 2: Conventional and advanced techniques for the diagnosis of lung cancer.

2.1 Conventional methods

2.1.1 Sputum Cytology

It is a straightforward, reliable, cost-effective, and non-invasive approach for diagnosing benign and malignant pulmonary illnesses; however, it has little success in lung cancer screening

because of its low sensitivity[15]. The use of sputum cytology for lung cancer detection has drawbacks, including sampling inaccuracy and the possibility of misdiagnosis[16]. It is a pathologically accepted diagnostic technique that has a sensitivity of 66% and specificity of 99%[17]. Squamous cell carcinoma, which is intimately associated to a history of excessive smoking, has reportedly been seen often[18].

2.1.2. Bronchoscopy

With the advent of endobronchial ultrasonography (EBUS) and electromagnetic navigational bronchoscopy (ENB), endoscopic devices can now evaluate and sample mediastinal and peripheral pulmonary lesions (PPL)[19]. For the diagnosis of lung cancer, flexible fiberoptic bronchoscopy (FFB) continues to be the most significant minimally invasive technique (LC)[20]. Bronchoscopic imaging techniques, such as autofluorescence imaging (AFI), narrow-band imaging (NBI), and high magnification bronchovideoscopy (HMB), make it simpler to detect premalignant lesions and early lung cancer; this may be crucial for carcinogenesis research[21]. Compared to traditional methods, AFI and NBI were superior to standard white light video bronchoscopy in detecting premalignant lesions[22].

2.1.2.1 Autofluorescence Imaging (AFI)

Endogenous fluorophores such as tryptophan, collagen, elastin, and porphyrins absorb and emit green fluorescence when illuminated by violet or blue light, whereas abnormal areas containing a different concentration of fluorophores emit red, purple, or magenta light when illuminated by violet or blue light[23]. These systems are autofluorescence video bronchoscopy devices of the next generation, mainly using video-chip-based video bronchoscopes and the new techniques provide clear, repeatable, and simple images to comprehend [24]. The AFI system consists of an autofluorescence video bronchoscope (BF-F260), a video processing unit (Evis Lucera Spectrum, CV-260SL), and a xenon light source[25].

2.1.2.2 Narrow Band Imaging (NBI)

This method makes vascular patterns within the tracheobronchial tree visible by exploiting the unique characteristics of a spectrum of light wavelengths, including blue light (390-440 nm) absorbed by surface capillaries and green light (530-550 nm) absorbed by blood vessels beneath the mucosa[26]. NBI can be used to distinguish between ASD, CIS, micro-invasive tumours, and invasive. Bleeding, bronchospasm, and laryngospasm are the drawbacks of this technique [27].

2.1.3 Computer-aided diagnosis

The term "computer-aided diagnosis" (CAD) refers to a computerized pathological diagnosis process for cancerous tumors that includes the use of artificial intelligence (AI), CAD uses medical image processing technology, as well as other potential physiological and biochemical techniques combined with analysis and calculation, to help find tumor lesions. Medical pictures are mostly utilized for CADe (computer-aided detection) systems to identify

probable lesions, while CADx (computer-aided diagnosis) systems are used to characterize and further categorize abnormalities[28]. 154 nodules and 93 non-nodules from 247 digitized CXRs were assessed by three thoracic radiologists and are included in the JSRT database, which was created in 1998 in collaboration with the Japanese Radiological Society (JRS)[29]. The main limitations of lung nodule detection: Methods for nodule detection are illustrated using specific datasets, large datasets have not been used to validate many approaches, and ideal feature selection for nodule identification resilience to various nodule kinds, and usage of performance measures that is inconsistent[30]. The process flow of CAD is shown in **Fig 3**.

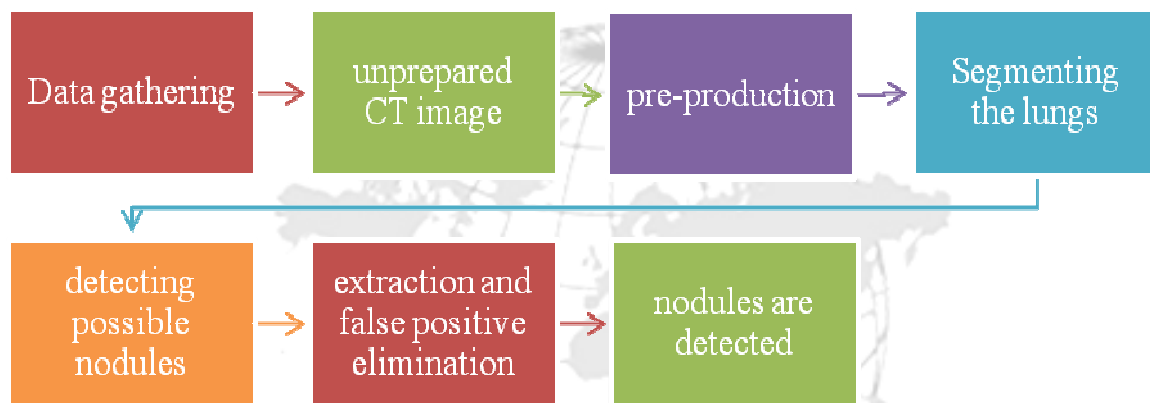


Figure 3: The process flow of CAD.

2.1.4 Needle Biopsy

Percutaneous thoracic needle biopsy (PTNB) is a fast and accurate approach to get a diagnosis in situations of suspected malignancy, isolated benign lesions, or infection. With this method, the patient is put under general anaesthesia[31]. Hematomas at the location of the biopsy, bleeding at the incision, pain, infection, transient hemoptysis, and nerve injury are all potential complications of needle biopsy[32].

2.2 Advanced Methods

2.2.1 Liquid Biopsy

A biomarker functions as an indication of ordinary physiological processes or the changes that take place in the body after the administration of a drug. A biomarker shall serve as useful for prognosis, identification, and prediction of drug response[33]. According to a review of the most current articles, analyzing many biomarkers has proven to be excellent by reducing the false positives and enhancing rates of detection, due to this reason the focus from finding single biomarkers have been shifted[34]. Much recent research on blood biomarkers implies that circulating biomarkers have the most chance of being a cost-effective early lung cancer detection technique [35].

2.2.1.1 Circulating Tumour Cells

As circulating tumour cells (CTCs) are considered to be the origin of metastatic lesions, tracing cancer cells as they travel from the main tumour to distant places by study of these cells might be a useful method for understanding the metastatic process. CTC identification and molecular characterisation is difficult due to their scarcity in peripheral blood, the technological limits of single-cell downstream analysis, and their phenotypic diversity[36, 37]. CTC enumeration and molecular analysis enable monitoring of cancer development, recurrence, and treatment response earlier than standard biopsy[38]. Ex-vivo cultures made from CTCs are crucial for comprehending CTC biology and their function in metastasis. They also enable individualised drug testing and direct treatment decision-making[39]. The most challenging part of CTC is the identification and the isolation of these cells leading to the requirement of sophisticated methods to isolate and pick these cells out of other cells.

2.2.1.2 ctDNA

Circulating (cell-free) tumor DNA also known as ctDNA is made up of 160-180 base pair [bp] double-stranded DNA fragments that are released from tumor cells via exosomes during tissue or cell death; as a result, ctDNA comprises tumor-specific sequences that contain the somatic inheritance changes present in tissue which contains tumor[40]. Sanger sequencing is a standard method for analyzing ctDNA as it takes a long time and a lot of effort to isolate and sequence tumor DNA from a background of normal DNA. In recent years, polymerase chain reaction (PCR) or next-generation sequencing (NGS) have emerged as the most popular platforms for detecting ctDNA. These innovative methods, such as BEAMing (beads, emulsion, amplification, magnetics) and CAPP-seq (cancer personalised profiling by deep sequencing), have sparked a revolution in ctDNA analysis. Several studies have shown that ctDNA is a highly consistent biomarker for cancer prognosis and can detect EGFR mutations in the ctDNA of NSCLC patients[41].

2.2.1.3 miRNA [Micro Ribonucleic acid]

Because (a) serum miRNAs are readily detectable using the widely used technique called RT-qPCR (where q stands for quantitative) and (b) blood-based biomarkers are minimally invasive for screening high-risk subjects and early diagnosis of LC, circulating miRNAs have been shown to be a new promising biomarker for the early detection and screening of LC[42]. Rabinowitz et al. identified the first collection of miRNAs as being beneficial in predicting NSCLC over healthy patients [43]. However, the composition of miRNAs is also affected by storage duration and conditions; they are altered after 24 to 72 hours of storage, regardless of whether the temperature is 4°C or -20°C. MiRNAs do not exhibit specificity for a kind of cancer, and the lack of a proper method for normalizing data remains a major problem[44].

2.2.1.4 Exosomes

Cells, the extracellular space, cancer cells, and other sources of fluids in the body all produce small vesicles called exosomes. Because of the important role they play in tumour biology (through the delivery of oncogenic proteins and nucleic acids to tumour cells), exosomes may serve as helpful indicators in the diagnosis, prediction, and estimation of the response generated from therapy[45]. A wide variety of cutting-edge techniques include magnetically activated cell sorting (MACS), the sucrose gradient method, ultra-centrifugation, and the addition of an extracellular vesicle array or immune beads precipitation[46]. Tamiya et al. recently discovered that two exosomal miRNAs (miR-182 and miR-210) in the pleural fluid might be useful indicators for distinguishing between malignant and benign pleural effusions caused by lung adenocarcinoma[47].

2.2.1.5 Tumor Educated Platelets [TEPs]: Platelets, which are best recognized for their function in hemostasis, also play a key part in tumor growth responses both systemically and locally. Tumor-educated platelets result from a robust interaction between platelets, tumors, and their surroundings (TEP). Platelet size and count have been found in studies to give clinically helpful information concerning the presence of cancer[48]. In patients with NSCLC, tumor-derived platelet factor 4 (PF4, CXCL4) has been demonstrated to increase bone marrow megakaryocyte-mediated platelet formation. This concept might be used for the diagnosis of cancer through distinct mRNA profiles formed as platelets experience specialized pre-mRNAs splicing in response to the activation of platelet surface receptors. There were many studies done for tumor-educated platelets for diagnostic purposes[49].

2.2.3. Radiogenomics

Radiogenomics uses computer-based image synthesis to create radiological pictures from which tumor-related information may be gleaned and characteristics that are often addressed include the tumor's form, volume, intensity, and texture[50].

The radiography pictures are transformed into 3D computer structures, which are then checked for the target location. The physician then segments the site utilizing the computer-aided approach[51]. Once the specific area has been divided, the software is used to measure the tumor's intensity and texture. The integration of imaging, genetic, and clinical data is difficult due to the numerous interconnected biological processes that contribute to carcinogenesis, and large data sets are needed to verify the concept of using radiogenomics to predict therapy response in lung cancer patients, which is still in its initial phases[52].

2.2.4 Biosensors

Biosensors are devices that generate signals proportional to the concentration of an analyte to quantitatively quantify biological or chemical responses. Various biosensor applications are depicted in Fig 4[53].

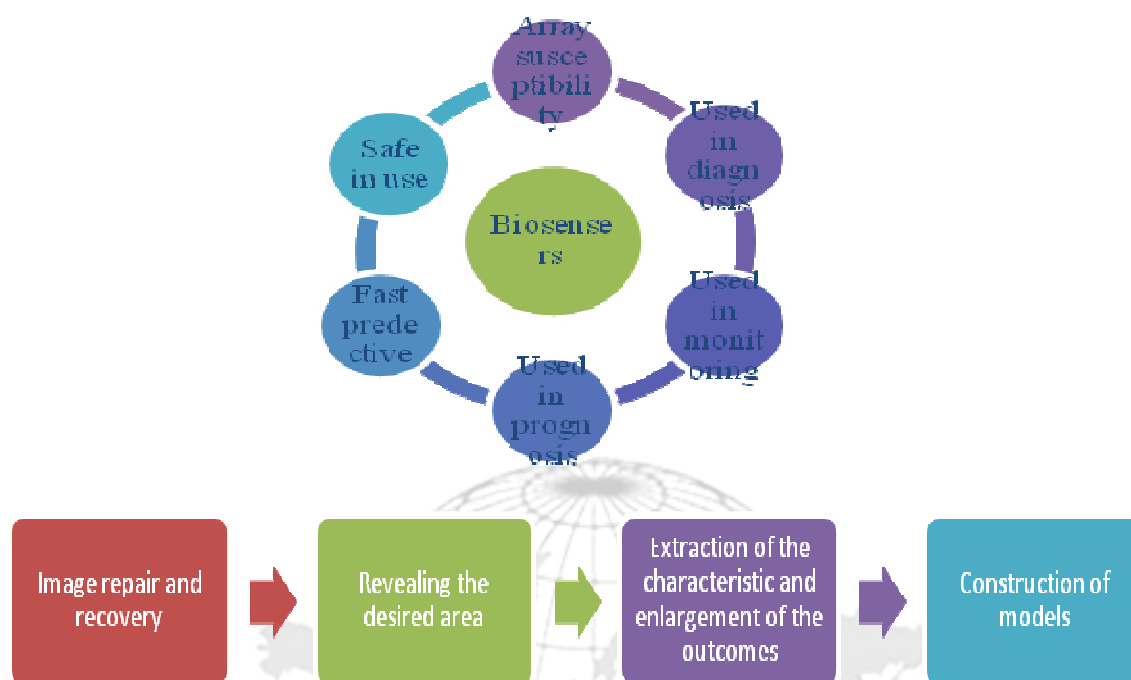


Figure 4: Application of Biosensors.

2.2.4.1 Volatile Organic Compounds [VOCs]

VOCs may be released, or VOC styles can be modified because of metabolic activities in the human body.

These breath profiles have the potential to be used as a biomarker for certain diseases and a candidate for early disease diagnosis and disease analysis. Different breath-prints or patterns may be identified while a VOC concentration is monitored immediately or after being stuck and stored. Even though approximately 3000 VOCs were recorded in clinical literature, the widespread majority of them may be grouped into the categories like alcohols, aldehydes, hydrocarbons, ketones, and aromatic and nitrile VOCs[54].

2.2.4.2 Electronic Nose

A promising new technique that is non-invasive, easy to use, and reasonably priced for the diagnosis of lung cancer is breath analysis based on an electronic nose (e-nose)[55]. It is based on prediction models created with machine learning techniques. Many gaseous VOCs found in exhaled breath have the potential to be employed as non-invasive lung cancer indicators[56]. Due to its comfort, cheap cost, and ease of popularisation, breath-based lung cancer screening has garnered considerable attention.

The electronic nose is a device for detecting volatile organic compounds utilising an array of coated sensors, such as silicon chips[57]. The E-nose system consists of a sensor array, data collection system, signal processing unit, data storage facility, and artificial intelligence. The E-nose technology is depicted in the Fig 5(a).

The electrical resistance of the sensors is changed by exposing them to a mixture of VOCs, and statistical or structural algorithms alter the data to discover numerous volatile patterns, resulting in the creation of a "breath print"[58].

There were many studies done by the researchers; one study was done by Machado et al. They used the Cyranose 320, which had a sensitivity of 71.4 percent and a specificity of 91.9 percent for detecting lung cancer, even though their comparison groups were not well matched since the control group included patients with a variety of pulmonary illnesses[59]. Despite their many benefits, sensors present a number of disadvantages, such as significant sensor drift, especially when repeatedly exposed to gas mixtures within a short period of time, or in the presence of extremely high humidity conditions or sudden temperature variations; such issues could lead to false diagnosis, significantly reducing the accuracy of E-Nose-generated data[60].

2.2.5 Quantum Dots

QDs are nanoscale semiconducting crystals that are typically constructed of elements from groups III-V, IV-VI, or II-VI of the Periodic Table[61]. The classification of QDs is given in Fig 5(b). Along with having good electrochemical and optical capabilities, Cd-based QD has also demonstrated remarkable photoluminescent properties[62].

There are various studies done on QD from which one is done by Goryacheva O.A et al., micro-RNA, a biomarker for numerous illnesses including cancer, is identified using a nanoparticle luminous QD array[63]. Challenges include, expensive preparation method, release of excess and noxious gasses at high temperature, size control issues, low solubility in water and the purification method of QD is very tedious[64]. Innovative multi-functional solutions that will help with both the disorder's diagnosis and treatment must be created in order to improve the prognosis[65]. The Benefits and challenges of diagnostic techniques are given in Table 1.

Table 1: Benefits and challenges of diagnostic techniques

Sr. No.	Technique	Benefits	Challenges	References
1	Liquid biomarkers	Non-invasive and cost-effective; enables tumor biology monitoring at various periods throughout therapy.	Lack of established methodologies and validation data, as well as a low yield	[66]
a	CTCs	Potential for prognosis prediction, early recurrence detection, xenograft creation, and longitudinal tumor evolution	Obtaining sufficient quantities and collecting CTCs requires many blood samples;	[67]
b	ctDNA	prognosis prediction, and the detection of treatment resistance, ctDNA sequencing has improved; can be discovered in blood, lymph, spinal fluid, urine, and saliva.	Target ctDNA is required, which is less stable than non-tumor DNA and has a limited half-life.	[38]

c	TEP	TEPs are more numerous than CTCs.	TEP technologies are continuously developing	[40]
d	miRNAs	The ability to investigate gene fusions	There is a lack of standardized handling and storage strategies for miRNAs to keep them stable.	[68]
2	Electronic Nose	Rapid response time and high sensitivity	Preparation of samples and a high level of experience in analysis	[69]
3	Bronchoscopy	Detection of particular tumor tissue with high accuracy	Scratches in the laryngeal area and airways can be caused by invasive procedures	[70]
4	Sputum Cytology	minimally invasive and extremely sensitive for centrally situated lung cancer.	False positives, and sputum induction causes the patient distress.	[71]

3. Conclusion

One of the challenging aspects of general practice is a late cancer diagnosis at an incurable stage. With advancements in technology, the area of cancer diagnosis has seen tremendous expansion. Biomarkers which are based on blood, which are not invasive and have various therapeutic benefits over tissue biomarkers, might be beneficial in the early detection. The fundamental drawback of the many studies published so far is that some include individuals in the late stages of cancer. In contrast, early diagnosis is not always and frequently not extensively explored. This should be thoroughly addressed in future studies to emphasize the diagnostic approach's crucial role. There's still a lot of space for growth and to improve the detection accuracy of existing methods. Research that combines potential candidate biomarkers, such as biomarkers that are based on molecular and images with the use of AI innovations should be encouraged which might aid in selecting the appropriate combinations. An interprofessional team approach with close communication among members may lead to early diagnosis and treatment, enhancing results.

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TRANSFORMING EDUCATION AND RESEARCH THROUGH ARTIFICIAL INTELLIGENCE: INNOVATIONS, CHALLENGES, AND FUTURE PROSPECTS

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Abstract

Artificial Intelligence (AI) has emerged as a transformative force in education and research, offering innovative solutions to long-standing challenges while reshaping traditional learning and knowledge discovery processes. This paper examines AI's role in education through personalized learning, intelligent tutoring systems, and automated assessment mechanisms, providing a comprehensive analysis of its effectiveness in enhancing learning outcomes. Additionally, AI's integration into research is explored, particularly in data analysis, literature reviews, and collaborative research platforms. While AI presents remarkable opportunities, it also raises significant ethical concerns, such as bias, data privacy, and accessibility. This study concludes by offering insights into the future of AI-driven education and research, emphasizing the need for responsible and ethical implementation strategies.

Keywords: Artificial Intelligence, Education, Research, Personalized Learning, Ethical AI, Knowledge Discovery

1. Introduction

The advent of Artificial Intelligence (AI) in education and research has fundamentally altered conventional paradigms, introducing adaptive, efficient, and scalable methodologies. AI technologies—including machine learning (ML), natural language processing (NLP), and computer vision—address critical challenges such as student engagement, content personalization, and large-scale data analysis. Holmes et al. (2021) argue that AI-driven education (AIEd) marks a paradigm shift from a standardized approach to a learner-centric framework, fostering inclusivity and efficiency.

This paper critically evaluates the role of AI in education and research, highlighting key applications, ethical considerations, and potential future developments. Through case studies and empirical evidence, we present AI's transformative impact and propose guidelines for its responsible implementation.

2. AI in Education–

Artificial Intelligence (AI) has significantly transformed the education sector by enhancing

teaching methodologies, optimizing administrative processes, and personalizing learning experiences. The integration of AI-powered tools in classrooms, online learning platforms, and research institutions has improved efficiency, accessibility, and engagement.

One of the key applications of AI in education is personalized learning, where AI algorithms analyze student performance data to tailor lessons according to individual strengths and weaknesses. Adaptive learning systems, such as AI-driven tutoring programs, provide customized recommendations, helping students grasp complex concepts at their own pace. Intelligent tutoring systems (ITS) like Carnegie Learning and Squirrel AI offer real-time feedback and targeted interventions, enhancing the effectiveness of learning.

Another crucial aspect of AI in education is automated assessment and feedback. AI-powered grading systems reduce the workload of educators by evaluating multiple-choice tests, written assignments, and even coding exercises. Tools like Turnitin and Grammarly assist in checking plagiarism and grammar, ensuring academic integrity and language proficiency. Additionally, AI-driven analytics help educators identify at-risk students by tracking their engagement, participation, and performance, allowing timely intervention and support.

AI also plays a significant role in making education more inclusive and accessible. Speech recognition and natural language processing (NLP) technologies enable voice-assisted learning, benefiting students with disabilities. AI-powered translation tools break language barriers, facilitating learning in multilingual environments. For example, platforms like Duolingo and Google Translate help students learn new languages with interactive exercises and instant translations.

In research, AI assists scholars in data analysis, literature reviews, and academic writing. AI-based tools like Semantic Scholar and Elicit use machine learning to scan vast databases, providing researchers with relevant papers and summarizing key findings. Additionally, AI-driven predictive analytics help forecast trends, enabling data-driven decision-making in educational policies and curriculum development.

However, despite these advancements, the use of AI in education raises ethical concerns. Issues such as data privacy, algorithmic bias, and the digital divide must be addressed to ensure equitable and responsible AI implementation. Over-reliance on AI may reduce human interaction in learning environments, potentially affecting critical thinking and interpersonal skills development.

As AI continues to evolve, its role in education is expected to expand further. Future developments may include fully AI-powered virtual classrooms, emotion-sensitive learning systems, and blockchain-based credential verification. However, to maximize AI's benefits while mitigating risks, educational institutions must adopt ethical guidelines, ensuring AI serves as an aid rather than a replacement for human educators.

2.1 Personalized Learning

One of AI's most significant contributions to education is personalized learning. AI-driven platforms analyze students' learning patterns, preferences, and performance metrics to customize educational content. Adaptive learning systems, such as Knewton and DreamBox, leverage AI algorithms to dynamically adjust instructional materials to suit individual needs, thereby enhancing engagement and academic performance (Pane et al., 2014).

2.2 Intelligent Tutoring Systems (ITS)

Intelligent Tutoring Systems (ITS) emulate one-on-one tutoring by assessing students' progress in real time and offering tailored interventions. These AI-based tutors identify knowledge gaps and provide immediate feedback, facilitating a more effective learning experience. Research by VanLehn (2011) indicates that ITS can improve student learning outcomes by as much as 30% when compared to conventional instructional methods.

2.3 Automated Assessment and Feedback

AI has significantly streamlined grading and feedback mechanisms. Automated tools, such as Gradescope and Turnitin, utilize NLP and ML to assess written assignments, detect plagiarism, and generate detailed feedback. These innovations reduce educators' workload while ensuring grading consistency and objectivity (Zawacki-Richter et al., 2019).

2.4 Bridging Educational Inequality

AI can bridge educational disparities by providing access to high-quality learning resources in underserved regions. Initiatives like Microsoft's AI for Good leverage AI to develop scalable, cost-effective remote learning solutions, thereby fostering educational equity (Microsoft, 2022).

3. AI in Research–

Artificial Intelligence (AI) has revolutionized educational research by enhancing data analysis, automating literature reviews, and providing new insights into learning patterns, teaching effectiveness, and institutional improvements. AI-driven tools and machine learning algorithms are reshaping how researchers collect, interpret, and apply data, leading to more precise, efficient, and impactful studies.

One of the most significant contributions of AI in educational research is data-driven decision-making. AI-powered analytics help researchers process vast amounts of educational data, identifying trends and correlations that would be difficult to detect manually. Machine learning algorithms analyze student performance, engagement levels, and assessment outcomes to generate insights into learning behaviors, curriculum effectiveness, and areas for improvement. These insights assist educators and policymakers in making informed decisions to enhance learning experiences.

AI also plays a crucial role in automating literature reviews and academic research. Natural Language Processing (NLP) tools like Semantic Scholar, Elicit, and Scite scan extensive

databases, summarizing relevant academic papers and extracting key findings. This significantly reduces the time researchers spend on reviewing literature, allowing them to focus on deeper analysis and hypothesis development. AI-powered citation analysis helps researchers track the impact of scholarly works and identify influential studies in their fields.

Another transformative application of AI in educational research is predictive analytics. By analyzing historical and real-time data, AI models can forecast student performance, dropout risks, and academic trends. Institutions use predictive analytics to implement early intervention strategies, ensuring students receive the necessary support before they fall behind. AI can also help in predicting the effectiveness of new teaching methods and policies by simulating different scenarios and assessing potential outcomes.

AI-driven research methodologies have also expanded the scope of qualitative and quantitative studies in education. AI-enabled sentiment analysis tools assess student feedback, social media discussions, and online forums to gauge attitudes toward educational policies, digital learning platforms, and instructional strategies. AI can also assist in analyzing open-ended survey responses and interview transcripts, identifying common themes and patterns with greater accuracy.

Furthermore, AI-powered plagiarism detection and academic integrity tools, such as Turnitin and Copyscape, help maintain research ethics by identifying copied content and ensuring originality in scholarly work. AI-assisted writing tools provide grammar and coherence checks, improving the overall quality of academic papers and research publications.

Despite its advantages, the use of AI in educational research comes with challenges. Ethical concerns regarding data privacy, bias in AI algorithms, and the potential over-reliance on technology must be addressed. The accuracy of AI predictions depends on the quality of input data, making it essential for researchers to verify and validate AI-generated insights.

Looking ahead, AI is expected to further refine educational research through advancements in deep learning, AI-generated simulations, and automated peer review systems. As AI continues to evolve, it will enable more sophisticated, efficient, and ethical research practices, ultimately driving innovation and improvement in education worldwide.

3.1 Accelerating Data Analysis

AI revolutionizes research by expediting data processing and analysis. Machine learning algorithms facilitate the rapid examination of extensive datasets, uncovering complex patterns and correlations that would be infeasible for human researchers to detect manually. In fields such as genomics and climate science, AI has significantly enhanced data interpretation and hypothesis generation (Jordan & Mitchell, 2015).

3.2 Literature Review and Knowledge Discovery

AI-powered tools, such as Semantic Scholar and Iris.ai, optimize literature reviews by automatically extracting key insights from academic papers and recommending relevant studies. These tools enhance research efficiency by minimizing the time required for exhaustive manual searches (Ammar et al., 2018).

3.3 AI-Driven Collaborative Research

AI enhances interdisciplinary collaboration by connecting researchers with shared interests and expertise. Platforms like ResearchGate and Academia.edu employ AI algorithms to recommend collaborators and relevant publications, fostering global academic networking (Thelwall & Kousha, 2015).

4. Ethical Considerations - The integration of AI in educational research raises several ethical considerations, including data privacy, algorithmic bias, accountability, human oversight, and the responsible use of AI in academic publications. AI-driven research relies on vast amounts of student and institutional data, making it crucial to implement strict security measures, encryption, and anonymization techniques while ensuring compliance with data protection regulations. Algorithmic bias is another major concern, as AI models trained on limited or skewed datasets may perpetuate inequalities in education. To promote fairness, researchers must use diverse, representative data and conduct regular audits of AI systems. Transparency and accountability are essential, as AI-generated insights should be explainable and interpretable to ensure responsible decision-making in educational policies and student assessments. While AI enhances research efficiency, human oversight remains crucial to contextualize findings and prevent mechanistic decision-making. Additionally, AI-powered academic tools must be used ethically to maintain research integrity and originality. Beyond immediate applications, the long-term societal impact of AI in education must be considered, ensuring it supports equity, accessibility, and ethical research practices. A balanced approach, combining technological advancements with ethical guidelines, interdisciplinary collaboration, and continuous evaluation, will help harness AI's transformative potential while upholding fairness and integrity in educational research.

4.1 Addressing Algorithmic Bias

AI systems are susceptible to biases inherent in the datasets used for training. Unchecked biases can perpetuate discrimination, particularly in education and research. Ensuring diverse and representative training data, along with implementing transparency in algorithmic decision-making, is crucial to mitigating bias-related concerns (O'Neil, 2016).

4.2 Ensuring Data Privacy and Security

AI's reliance on vast amounts of student and research data raises concerns regarding privacy and security. Adhering to global regulatory standards, such as GDPR and FERPA, is imperative for safeguarding sensitive information (Selbst et al., 2019).

4.3 Promoting Equitable Access

Although AI has the potential to democratize education, its improper implementation could exacerbate existing inequalities. Policymakers must ensure that AI-driven solutions remain accessible to students and researchers irrespective of their socioeconomic background (Williamson, 2017).

5. Future Directions -

The future of AI in educational research holds immense potential, with advancements expected to further refine learning analytics, predictive modeling, and research methodologies. As AI technologies continue to evolve, future developments will likely focus on enhancing personalization, ethical AI implementation, and interdisciplinary collaboration to ensure equitable and effective education. One key direction is the integration of AI-driven adaptive learning systems, which will provide more personalized education by analyzing student behavior, learning styles, and academic performance to tailor teaching methods accordingly. Improved natural language processing (NLP) models and AI-driven simulations will enable more sophisticated data analysis, helping researchers identify deeper patterns in student engagement, learning outcomes, and institutional effectiveness. Ethical AI development will also become a priority, with increased efforts to reduce biases in algorithms, improve transparency, and establish robust data privacy frameworks to protect students and educators. The emergence of AI-powered virtual research assistants is expected to streamline academic work by automating literature reviews, generating research insights, and enhancing academic writing while ensuring authenticity and academic integrity. AI-driven predictive analytics will become more precise, allowing institutions to identify at-risk students early and implement timely interventions to improve retention rates and overall academic success. Additionally, interdisciplinary collaboration between AI researchers, educators, psychologists, and policymakers will be crucial in shaping responsible AI-driven educational practices that align with pedagogical principles and ethical standards. As AI adoption grows, continuous monitoring and evaluation will be necessary to ensure that technology enhances human-led education rather than replacing critical human judgment. The future of AI in educational research lies in striking a balance between technological advancements and ethical responsibility, ensuring that AI serves as a tool for innovation, inclusivity, and meaningful educational progress.

5.1 AI-Enabled Lifelong Learning

AI can support continuous learning by providing personalized education tailored to individuals' evolving needs. Platforms like Coursera and edX already integrate AI to curate courses based on learners' preferences and progress (Luckin et al., 2016).

5.2 The Rise of Explainable AI (XAI)

Explainable AI (XAI) seeks to enhance transparency in AI decision-making processes. In education and research, XAI ensures accountability by making AI-driven conclusions interpretable and justifiable (Gunning et al., 2019).

5.3 AI's Role in Addressing Global Challenges

AI can contribute to solving critical global issues, including climate change, healthcare, and poverty. By leveraging AI-driven education and research, innovative solutions can be developed to tackle these pressing concerns (Vinuesa et al., 2020).

Conclusion

AI is redefining education and research, introducing personalized learning, automating administrative tasks, and accelerating knowledge discovery. However, the benefits of AI must be balanced against ethical considerations such as bias, privacy, and equitable access. By adopting responsible AI implementation strategies, educators, researchers, and policymakers can harness AI's transformative potential while ensuring inclusivity and fairness. Moving forward, the focus should remain on developing AI solutions that enhance learning and research while prioritizing ethical integrity and accessibility for all.

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CONSERVATION OF CULTURAL HERITAGE THROUGH IKS**Dr. Mahesh C. Patel***Principal,**Meghwad Primary School, Ta. Kaprada, Dist. Valsad, Gujarat &***And****Dr. Sarika Patel***Asst. Prof.**SSR College of Education Sayli, Silvassa*

Abstract

The conservation of cultural heritage and Indian Knowledge System are deeply intertwined. Indian Knowledge System provides wisdom and guidelines for the preservation and conservation of valuable cultural heritage. IKS with holistic approach can conserve and provide recognition to cultural heritage. Many challenges may come across the path of conservation of cultural heritage through IKS such as external challenges, internal challenges, societal challenges, ethical challenges etc. On the other hand, we find the opportunities to overcome the challenges. Digital conservation, community-based conservation education and awareness, partnerships and collaborations, funding and resource opportunities can support conservation of cultural heritage through IKS.

Key words: Conservation, Cultural heritage, IKS**Introduction**

Cultural heritage encompasses tangible and intangible aspects of a community's culture, including monuments, artifacts, languages, traditions, and values. Conservation of cultural heritage involves protecting and preserving these aspects for future generations. Indian Knowledge System (IKS) refers to the traditional knowledge and practices of Indian communities, including their sciences, philosophies, arts, and crafts. IKS encompasses various disciplines, such as Ayurveda, Yoga, Jyotish, and Vastu Shastra as well.

Intersection of Conservation of Cultural Heritage and IKS

- Preservation of traditional knowledge: IKS plays a crucial role in the conservation of cultural heritage by preserving traditional knowledge and practices.
- Conservation of cultural artifacts: IKS informs the conservation of cultural artifacts, such as temples, monuments, and artworks, by providing insights into their construction, maintenance, and preservation.
- Community-based conservation: IKS emphasizes community-based conservation, where local communities are involved in the preservation and conservation of their cultural

heritage.

- Sustainable conservation practices: IKS promotes sustainable conservation practices, such as the use of natural materials, minimal intervention, and respect for the cultural and spiritual significance of the artifacts.
- Preservation of texts: Efforts to preserve ancient texts, such as manuscripts, scrolls, and inscriptions, are crucial to conserving the ideals and philosophy they contain.
- Translation and interpretation: Accurate translation and interpretation of ancient texts are essential to understanding the ideals and philosophy they reflect.
- Scholarly analysis: Scholarly analysis and commentary on ancient texts help to contextualize and illuminate the ideals and philosophy they contain.
- Examples of IKS in Conservation of Cultural Heritage
- Conservation of the Taj Mahal: The conservation of the Taj Mahal, a UNESCO World Heritage Site, has involved the use of traditional Indian techniques and materials, such as lime mortar and marble.
- Preservation of traditional Indian manuscripts: IKS has been used to preserve traditional Indian manuscripts, such as the Rigveda and the Mahabharata, through the use of natural materials and traditional conservation techniques.
- Conservation of Indian temples: IKS has informed the conservation of Indian temples, such as the temples of Khajuraho and Hampi, by providing insights into their construction, maintenance, and preservation.
- Conservation of ideals & philosophy reflected in ancient Hindu literature: Ancient literature provides a unique window into the past, offering insights into the culture, values, and beliefs of
- Ancient civilizations. Ancient literature often contains timeless wisdom and philosophical insights that remain relevant today. India has an ancient and rich Literature heritage in form of Vedas, epics like Ramayana and Mahabharata , Bhagvat Geeta, Charak sanhita and Puranas.
- Cultural heritage: Ancient literature is an important part of our cultural heritage, shaping our understanding of ourselves and our place in the world.
- Tangible Heritage
- 1. Traditional conservation methods: IKS practitioners use natural materials and techniques to conserve cultural artifacts, such as wood, stone, and textiles.
- 2. Community-based conservation: IKS emphasizes community involvement in the conservation process, ensuring that cultural artifacts are preserved in their cultural context.
- 3. Sustainable materials: IKS promotes the use of sustainable materials and practices, reducing the environmental impact of conservation efforts.

➤ Intangible Heritage

1. Oral traditions: IKS recognizes the importance of oral traditions in preserving cultural heritage, including stories, songs, and dances.
2. Language preservation: IKS emphasizes the importance of language preservation, as language is a critical component of cultural heritage.
3. Cultural practices: IKS conserves cultural practices, such as traditional medicine, agriculture, and crafts.

Interconnection between Education and Cultural Heritage

Cultural heritage as a teaching tool: Cultural heritage can be used as a teaching tool to promote learning, understanding, and appreciation of history, culture, and traditions. Education for cultural heritage preservation: Education plays a crucial role in preserving cultural heritage by raising awareness, promoting understanding, and developing skills for conservation and management. Integrating cultural heritage into education: Integrating cultural heritage into education can enhance learning outcomes, promote cultural diversity, and foster community engagement.

Benefits of Education in Cultural Heritage

Promoting cultural awareness and understanding: Education can promote cultural awareness and understanding, helping to break down stereotypes and foster tolerance. Developing critical thinking and problem-solving skills: Studying cultural heritage can help develop critical thinking and problem-solving skills, as well as encourage creativity and innovation. Fostering community engagement and social cohesion: Education in cultural heritage can foster community engagement and social cohesion, promoting a sense of shared identity and collective responsibility.

Examples of Successful Education and Cultural Heritage Initiatives

1. The UNESCO World Heritage Education Program: The UNESCO World Heritage Education Program aims to promote education and awareness about cultural heritage, particularly among young people.
2. The Google Arts & Culture Platform: The Google Arts & Culture Platform provides online access to cultural heritage collections and exhibitions from around the world, promoting education and cultural awareness.

Digital Technologies in Education and Cultural Heritage

Virtual and augmented reality experiences can provide immersive and interactive learning experiences, enhancing engagement and understanding of cultural heritage. Online platforms and digital repositories can provide access to cultural heritage collections and exhibitions, promoting education and research. Digital storytelling and gamification can make learning about cultural heritage more engaging and fun, promoting cultural awareness and understanding.

Challenges to Conservation of ancient literature:

External Challenges

Climate change: Rising temperatures, sea levels, and extreme weather events threaten cultural heritage sites and artifacts.

Conflict and war: Armed conflicts and wars result in the destruction and looting of cultural heritage sites and artifacts.

Natural disasters: Earthquakes, floods, and other natural disasters can damage or destroy cultural heritage sites and artifacts.

Tourism and over-visitation: Excessive tourism can lead to wear and tear on cultural heritage sites and artifacts.

Internal Challenges

Lack of funding: Insufficient funding can hinder conservation efforts and lead to the neglect of cultural heritage sites and artifacts.

Limited expertise and resources: Conservation efforts may be hindered by a lack of specialized knowledge, skills, and resources.

Inadequate infrastructure: Inadequate infrastructure includes Poor storage conditions, inadequate facilities, and lack of equipment can compromise the conservation of cultural heritage.

Bureaucratic and administrative issues: Complex administrative procedures and bureaucratic hurdles can slow down conservation efforts.

Societal Challenges

Cultural appropriation and misrepresentation: Cultural heritage can be misappropriated, misinterpreted, or misrepresented, leading to cultural insensitivity and offense.

Community disengagement: Local communities may become disengaged from their cultural heritage due to lack of involvement, consultation, or benefits.

Commercialization of cultural heritage: The commercialization of cultural heritage can lead to the exploitation and degradation of cultural sites and artifacts.

Digital divide and unequal access: The digitization of cultural heritage can exacerbate existing inequalities, with some communities having limited access to digital technologies.

Ethical Challenges Cultural sensitivity and respect: Conservation efforts must balance the need to preserve cultural heritage with the need to respect cultural sensitivities and traditions.

Ownership and repatriation: Questions surrounding ownership and repatriation of cultural artifacts can be complex and contentious. Authenticity and integrity: Conservation efforts must ensure that cultural heritage sites and artifacts are preserved in their original form and context.

Balancing preservation and access: Conservation efforts must balance the need to preserve cultural heritage with the need to provide access to it for education, research, and community engagement.

Conclusion

The conservation of cultural heritage and Indian Knowledge System are deeply intertwined. IKS provides valuable insights and techniques for the preservation and conservation of cultural heritage, and its recognition and integration with modern conservation methods are essential for creating a sustainable and holistic approach to conservation. Balancing the need to preserve cultural heritage with the need to provide access to it can be a challenge.

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INDIAN KNOWLEDGE AND ENVIRONMENTAL SUSTAINABILITY: LESSONS FOR CLIMATE RESILIENCE

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Abstract

The Indian Knowledge System (IKS), with its rich tradition of ecological understanding, offers invaluable insights into achieving environmental sustainability and fostering climate resilience. Rooted in a deep connection with nature, IKS emphasizes harmony between humans and the environment, providing centuries-old practices that advocate for sustainable resource use, conservation, and climate adaptation. This paper explores how ancient Indian philosophies, such as those found in texts like the Vedas, Upanishads, and the teachings of indigenous communities, contribute to contemporary strategies for mitigating climate change and enhancing environmental sustainability. It highlights key principles such as the concept of "Jeevaniya" (life-sustaining), "Dharmic" (ethical) resource management, and community-based conservation practices that promote biodiversity preservation and ecosystem health. The paper also examines modern applications of these traditional practices in addressing current climate challenges, particularly in the context of India's unique socio-cultural and ecological landscapes. Drawing lessons from IKS, it advocates for a holistic approach that combines indigenous knowledge with modern scientific approaches, offering a sustainable framework for climate resilience that is both culturally relevant and globally applicable.

The Indian Knowledge System (IKS) offers a profound and ancient understanding of nature, ecology, and sustainable living that has been practiced for thousands of years. Rooted in diverse traditions, philosophies, and indigenous practices, IKS emphasizes the interconnectedness of all living beings and the environment, advocating for sustainable use of natural resources, preservation of biodiversity, and ecological balance. This paper examines the role of IKS in addressing modern environmental challenges, particularly in the context of climate change and resilience. By exploring ancient Indian texts, cultural practices, and indigenous knowledge systems, the paper highlights critical lessons that can guide contemporary strategies for environmental sustainability. Concepts such as "Vasudhaiva Kutumbakam" (the world is one family), "Jal Dhara" (water conservation), and "Satyagraha" (truth-based sustainable practices) offer valuable insights into climate adaptation, water management, and community-driven environmental stewardship. This paper further discusses how integrating IKS with modern scientific approaches can enhance climate resilience, foster sustainable development, and create robust systems to mitigate the impacts of climate change. In

conclusion, it advocates for a holistic approach that blends ancient wisdom with cutting-edge research to shape a sustainable future for all.

Introduction

As the world grapples with the escalating challenges of climate change, environmental degradation, and the loss of biodiversity, the need for sustainable solutions has never been more urgent. While modern science and technology have made significant strides in addressing some of these issues, there is a growing recognition of the value of traditional knowledge systems that have been tested and refined over millennia. Among these, the Indian Knowledge System (IKS) stands out for its deep-rooted understanding of ecological harmony and sustainability, offering valuable insights into environmental preservation and resilience.

Rooted in a philosophy that emphasizes the interconnectedness of humans, nature, and all living beings, IKS provides a holistic approach to managing natural resources. It is grounded in the teachings of ancient texts, rituals, and indigenous practices that advocate for sustainable practices, respect for the environment, and a balanced coexistence with nature. These principles, which were central to traditional Indian ways of life, continue to hold relevance in the modern context, especially in addressing the pressing challenges of climate change.

This paper aims to explore the contributions of IKS to environmental sustainability, focusing on the lessons it offers for building climate resilience. By examining key philosophical tenets, indigenous knowledge, and time-tested practices, the paper seeks to bridge the gap between ancient wisdom and modern scientific approaches. In doing so, it highlights how integrating IKS with contemporary climate strategies can provide a comprehensive and culturally relevant framework for mitigating the effects of climate change, adapting to its challenges, and fostering a sustainable future for generations to come.

2. Traditional Indian Knowledge and Environmental Sustainability

Indian traditional knowledge systems, derived from Vedic literature, indigenous practices, and community wisdom, emphasize a harmonious relationship between humans and nature. Several key principles from these traditions contribute to environmental sustainability:

2.1 Vedic and Scriptural Wisdom

- The **Atharva Veda** describes Earth (Prithvi) as a mother, urging its protection and conservation.
- The **Bhagavad Gita** promotes balance (samatva) in consumption, discouraging exploitation of natural resources.
- Ayurveda and Siddha medicine stress biodiversity conservation, advocating for the sustainable use of medicinal plants.

2.2 Indigenous Agricultural Practices

- **Zero Budget Natural Farming (ZBNF):** Inspired by traditional farming methods, ZBNF promotes chemical-free agriculture, improving soil health and reducing carbon emissions.
- **Agroforestry:** Practiced for centuries in India, this method integrates trees with crops, enhancing biodiversity and reducing land degradation.
- **Sacred Groves:** These community-protected forest patches, dedicated to deities, serve as biodiversity reservoirs, maintaining ecological balance.

2.3 Water Conservation Methods

- **Stepwells (Baolis):** Ingenious water storage structures built in arid regions to ensure year-round water availability.
- **Tank Irrigation:** Traditional systems like the Eris (tanks) of Tamil Nadu effectively manage water in drought-prone regions.
- **Rainwater Harvesting:** Used for centuries in Rajasthan and Gujarat, this technique sustains communities in arid landscapes.

2.4 Traditional Architecture and Sustainable Living

Traditional architecture is deeply rooted in local culture, materials, and climate-responsive design. It embodies sustainability by utilizing passive design techniques, natural materials, and energy-efficient construction methods. By learning from traditional architecture, we can create modern structures that are both environmentally friendly and culturally rich.

A. Climate-Responsive Design

Traditional architecture is adapted to local climate conditions, ensuring comfort without excessive energy use.

- **Hot and Dry Regions (e.g., Rajasthan, Middle East)**
 - Thick walls for insulation
 - Small windows and jharokhas (overhanging balconies) to reduce heat gain
 - Internal courtyards for passive cooling
 - **Warm and Humid Regions (e.g., Kerala, Bali)**
 - Large windows for cross-ventilation
 - Sloping roofs to drain rainwater efficiently
 - Open courtyards and verandas for natural cooling
 - **Cold Regions (e.g., Himalayas, Scandinavian countries)**
 - Compact structures to conserve heat
 - Wooden construction for insulation
 - Small windows to reduce heat loss
 - **Composite Climates (e.g., North India, Mediterranean regions)**
 - Combination of shaded areas and open courtyards
-

- Adaptable building forms with thick and insulated walls

B. Use of Local and Natural Materials

Traditional buildings use locally available materials, reducing the environmental impact.

- **Mud and Clay:** Provides thermal insulation, used in adobe houses.
- **Stone:** Durable and provides natural cooling (e.g., forts in Rajasthan).
- **Wood:** Used in cold climates for insulation and flexibility (e.g., log houses).
- **Bamboo:** Fast-growing and sustainable, used in tropical architecture.
- **Thatched Roofs:** Natural cooling and rain protection, common in coastal areas.

C. Passive Cooling and Heating Techniques

- **Courtyards & Verandas:** Allow natural ventilation and shade.
- **Wind Catchers (Badgirs):** Funnel cool air into homes (used in Persian architecture).
- **Thick Walls & High Ceilings:** Maintain internal temperature stability.
- **Water Bodies & Greenery:** Used for evaporative cooling in hot climates.

3. Lessons for Climate Resilience

3.1 Community-Led Conservation

India's traditional environmental stewardship models emphasize community participation, offering scalable solutions for climate adaptation. India has a long history of traditional environmental stewardship, where communities play a central role in managing natural resources. These indigenous and grassroots models of conservation offer scalable solutions for climate adaptation, blending ecological sustainability with social and economic resilience. Examples include:

- **Chipko Movement (1973):** A grassroots movement in Uttarakhand, where villagers protected forests through tree-hugging protests.
- **Bishnoi Community (Rajasthan):** Known for sacrificing lives to protect trees, their deep-rooted conservation ethos ensures biodiversity preservation.

3.2 Sustainable Resource Management

- **Sacred Water Bodies:** Traditional beliefs associated with lakes and rivers prevent pollution and over-extraction.
- **Customary Fishing Practices:** Sustainable fishing techniques, like seasonal bans in Kerala, ensure aquatic biodiversity conservation.

3.3 Disaster Resilience Through Traditional Knowledge

- **Cyclone-Resistant Homes in Odisha:** Indigenous construction techniques have helped coastal communities withstand extreme weather events.
- **Mangrove Conservation in Sundarbans:** Protecting natural buffers against cyclones and rising sea levels is key to long-term resilience.

4. Integrating Traditional and Modern Approaches

To build an effective climate resilience strategy, India must integrate traditional knowledge with modern science. Key recommendations include:

- **Policy Support:** Government initiatives should recognize and incorporate indigenous practices into climate action plans.
- **Community Participation:** Empowering local communities to lead conservation efforts ensures sustainability.
- **Technology and Tradition Synergy:** Using AI and remote sensing to enhance traditional water conservation and afforestation efforts.

5. Conclusion

India's traditional knowledge systems provide invaluable lessons for environmental sustainability and climate resilience. By blending these insights with modern scientific advancements, India can develop a holistic approach to addressing climate change. Recognizing and preserving this heritage will not only safeguard ecosystems but also ensure a sustainable future for generations to come.

References

Include relevant books, research papers, and government reports supporting the discussion.

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TRANSFORMING ASSESSMENT PRACTICES: THE ROLE OF ARTIFICIAL INTELLIGENCE IN PERSONALIZED LEARNING AND EVALUATION

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Abstract

Artificial Intelligence (AI) is significantly transforming assessment practices in education by introducing personalized, data-driven, and adaptive evaluation methods. Traditional assessment systems, often criticized for their rigidity and inability to cater to diverse learning needs, are being revolutionized through AI-powered tools that offer real-time feedback, predictive analytics, and automated scoring. This paper explores the integration of AI in educational assessment, emphasizing its role in enhancing personalized learning experiences and ensuring fair and efficient evaluation. It examines key AI-driven assessment techniques such as adaptive testing, learning analytics, and automated grading while addressing the ethical considerations and challenges associated with AI implementation. The paper concludes with recommendations for policymakers, educators, and technologists to ensure responsible and effective AI adoption in assessment and evaluation.

Keywords: Artificial Intelligence, Assessment, Personalized Learning, Adaptive Testing, AI Ethics

Introduction

Assessment and evaluation are fundamental components of the teaching-learning process, providing critical insights into students' progress, competencies, and areas for improvement. However, traditional assessment methods, including standardized testing and manual grading, often fail to accommodate the diverse learning needs of students. These conventional systems are time-consuming, susceptible to human bias, and lack the flexibility needed for personalized learning.

With the advent of AI, assessment is undergoing a paradigm shift, making it more adaptive, automated, and personalized. AI-driven assessment tools analyse student performance in real time, identify learning gaps, and provide tailored feedback, enabling a more learner-centric approach. This paper examines how AI is transforming assessment practices, focusing on personalized learning, adaptive testing, and automated evaluation. It also highlights the challenges and ethical considerations associated with AI-powered assessments.

AI in Assessment and Evaluation: An Overview

AI technologies in assessment leverage machine learning, natural language processing (NLP), and big data analytic to evaluate student performance. These technologies improve accuracy, reduce bias, and provide a more nuanced understanding of learning progress. The following are key AI applications in educational assessment:

Automated Grading Systems

AI-powered grading tools, such as automated essay scoring systems and AI-driven evaluation of multiple-choice questions, reduce educators' workload while ensuring objectivity in assessment. Machine learning algorithms analyse linguistic patterns, coherence, and argument structure in student responses, providing instant feedback and scores.

Adaptive Testing

Unlike traditional one-size-fits-all assessments, AI-driven adaptive testing adjusts the difficulty level of questions based on a student's responses. If a student answers a question correctly, the next question becomes more challenging; if incorrect, the system presents an easier question. This approach ensures a more accurate measurement of a student's proficiency level.

Real-time Feedback Mechanisms

AI-based tools provide immediate feedback to students, allowing them to identify mistakes and improve their understanding. Intelligent tutoring systems and AI-powered learning management systems (LMS) offer detailed insights into student performance, guiding them toward targeted learning strategies.

Learning Analytics for Assessment

AI collects and analyses vast amounts of student performance data to predict learning outcomes, identify struggling learners, and suggest personalized interventions. Learning analytics enable educators to make data-driven decisions and refine instructional strategies for better student engagement.

Personalized Learning through AI in Assessment

One of the most significant contributions of AI to education is its ability to personalize learning experiences. Personalized learning ensures that assessments are tailored to the unique needs, abilities, and learning pace of each student. AI facilitates personalized learning in the following ways:

Customized Questioning and Assessment Paths

AI systems generate personalized assessments by selecting questions that align with a student's knowledge level and learning preferences.

This ensures a more meaningful evaluation process, where students engage with relevant content rather than generic assessments.

Performance Prediction and Early Intervention

By analysing student performance trends, AI can predict future learning outcomes and recommend early interventions. If a student is struggling with a particular concept, AI-driven platforms can provide additional resources, remedial exercises, or alternative teaching methods.

AI Chatbots and Virtual Tutors

AI-powered chatbots and virtual tutors enhance assessment by offering real-time assistance and instant feedback. These tools simulate human-like interactions, guiding students through complex problems and reinforcing learning through interactive assessment methods.

Ensuring Fairness and Ethical Considerations in AI-driven Assessment

While AI offers numerous advantages in assessment, it also raises critical ethical and fairness concerns. Ensuring equitable AI implementation is essential to prevent biases and maintain the integrity of the assessment process.

Addressing Bias in AI Algorithms

AI systems are trained on historical data, which may contain biases related to gender, socioeconomic background, and ethnicity. If these biases are not addressed, AI-driven assessments may perpetuate inequalities. Educators and developers must ensure that AI models are trained on diverse datasets and regularly audited for fairness.

Transparency and Explainability

AI-powered assessment tools must be transparent in their decision-making processes. Students and educators should understand how AI evaluates responses and assigns scores. Explainability ensures trust and accountability in AI-driven assessment systems.

Challenges in AI-driven Assessment

Despite its potential, AI-powered assessment faces several challenges that must be addressed for effective implementation.

Dependence on Technology and Digital Divide

The integration of AI in assessment requires access to advanced technology and internet connectivity. However, disparities in digital access can create inequalities, particularly for students from underprivileged backgrounds. Bridging the digital divide is essential to ensure inclusive AI adoption.

Need for Educator Training and Acceptance

Many educators lack the technical expertise required to integrate AI into assessment effectively. Professional development programs must be designed to train educators on AI-based assessment tools and their pedagogical implications.

Ethical and Legal Considerations

AI-driven assessments must align with ethical guidelines and legal frameworks to ensure fairness, accuracy, and accountability. Governments and educational bodies should establish

regulations governing the use of AI in evaluation.

Future Directions and Recommendations

To maximize the benefits of AI in assessment and evaluation, stakeholders must take proactive steps to ensure responsible and effective implementation. The following recommendations are proposed:

1. **Develop Ethical AI Frameworks** – Establish guidelines for ethical AI use in education, ensuring fairness, transparency, and accountability.
2. **Enhance Educator Training** – Conduct AI-focused professional development programs to equip educators with the necessary skills for AI-driven assessment.
3. **Promote Inclusive AI Adoption** – Bridge the digital divide by ensuring equitable access to AI-based assessment tools.
4. **Encourage Collaborative Research** – Foster interdisciplinary research on AI and assessment to improve technology's effectiveness in educational evaluation.
5. **Implement Continuous AI Audits** – Regularly audit AI algorithms to detect and mitigate biases in assessment processes.

Conclusion

AI is revolutionizing assessment practices by making them more personalized, adaptive, and data-driven. AI-powered tools enhance learning experiences by providing real-time feedback, adaptive testing, and predictive analytics. However, ethical considerations, fairness, and digital accessibility must be addressed to ensure the responsible deployment of AI in education. As AI continues to evolve, its integration into assessment will play a crucial role in shaping the future of education, making evaluations more efficient, equitable, and learner-centric.

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POLYSTYRENE A WORLDWIDE POLLUTANT: IT'S APPLICATION AS A NEW POLYMER BEADS

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Abstract:

Polystyrene, a synthetic polymer widely utilized in the form of polymer beads, presents a significant global pollution challenge due to its slow degradation. Despite its versatile applications in packaging, insulation, and consumer products, the environmental impact of Polystyrene waste necessitates exploration of sustainable alternatives and improved recycling methods. This document will give a general overview of the production and common uses of Polystyrene beads, and touch on the environmental impacts that they cause.

Keyword: Polystyrene, Plastic pollution, Recycling, Waste management, Environmental impact, Health Hazards.

1. Introduction

Polystyrene is a synthetic polymer that is widely used in many applications. It is a lightweight, versatile material that can be molded into a variety of shapes and sizes. However, Polystyrene is also a major source of pollution. It is estimated that 300 million tons of plastic are produced each year, and half of this is single use. Polystyrene is one of the most common types of plastic found in the environment. It can take hundreds of years to decompose, and it can break down into small pieces that can be ingested by animals.

There are many ways to reduce the amount of Polystyrene that ends up in the environment. One way is to use less of it. This can be done by choosing products that are not packaged in Polystyrene, or by bringing your own reusable containers when you shop. Another way to reduce Polystyrene pollution is to recycle it. Polystyrene can be recycled into new products, such as park benches and playground equipment.

In addition to being a pollutant, Polystyrene can also be a health hazard. Studies have shown that Polystyrene can leach chemicals into food and drinks. These chemicals can disrupt hormones and may have other negative health effects. For these reasons, it is important to be aware of the dangers of Polystyrene and to take Polystyrene to reduce your exposure to it.

1.1 Polystyrene

Polystyrene – C_8H_8 is an aromatic polymer formed as a result of polymerization of styrene monomers (F. Styrene (vinylbenzene) is produced from ethylene and benzene. Massive production of polystyrene is carried out by catalytic dehydrogenation of ethylbenzene that leads transformation of styrene monomers polystyrene as a solid material is used for the production of CDs, toys, toothbrushes, etc. polystyrene is also used for the production of the Styrofoam - a material characterized by limited elasticity, expanded or melt-formed. it is produced by rapid heating of polystyrene pellets with a foaming agent. Styrofoam is broadly used in the production of food containers, such as trays, plates, It is also used for food storage and transport, for the production of various packing products, and for the production of toys and office supplies.

1.2 Thermacol

The thermocol is a synthetic substance created from Polystyrene and is another name for Polystyrene made from the synthetic aromatic (benzene derivative) polymer. Thermocol is non-hydroscopic means that it does not absorb water easily which makes it useful in different ways. It is commonly used in food packaging industry as a foam container includes drink cup, food trays and clamshell containers. It is also use as Shock absorbing and as the cushioning material in packaging to ship electronics, furniture and fragile items like vaccines and medicines in medical coolers and even fish. This rigid lightweight foam can be moulded into any shape and offers excellent protection and insulation. Thermocol also use for craft, air conditioning, sound proofing, false ceiling, pipe insulation, etc.

1.3 Toxicity

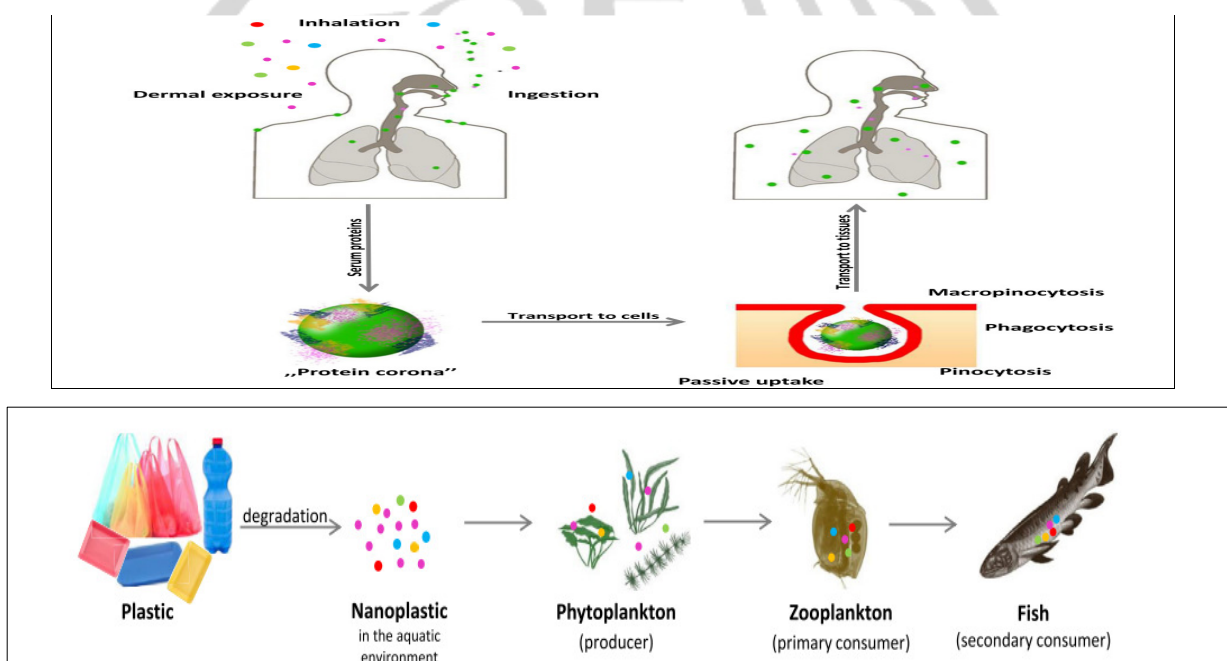


Figure 1 (Toxicity Impact)

One of the most commonly used plastics is Polystyrene (POLYSTYRENE) - a product of polymerization of styrene monomers. It is used for the production of styrofoam and other products like toys, CDs and cup covers. In vivo and in vitro studies have suggested that Polystyrene nanoparticles may penetrate organisms through several routes i.e. skin, respiratory and digestive tracts. They can be deposited in living organisms and accumulate further along the food chain. Here we used normal human lung epithelial BEASJournal Pre-proof 2B cells to clarify the association between pulmonary toxicity and polystyrene-mpolystyrene. results revealed that polystyrene-MPolystyrene can cause cytotoxic and inflammatory effects in BEAS-2B cells by inducing reactive oxygen species formation. polystyrene-mpolystyrene can decrease transepithelial electrical resistance by depleting zonula occludens proteins. indeed, decreased α 1- antitry polystyrenein levels in beas-2b cells suggest that exposure to polystyrene-mpolystyrene increases the risk for chronic obstructive pulmonary disease, and high concentrations of polystyrene-mpolystyrene can induce these adverse responses. While low POLYSTYRENE-MP levels can only disrupt the protective pulmonary barrier, they may also increase the risk for lung disease. On the other hand, the polystyrene monomer (styrene) was classified by the International Agency for Research on Cancer (IARC) as a potentially carcinogenic substance (carcinogenicity class B2). Accumulation of nanoparticles along the food chain, the study involved the lowest level of the food chain that is phytoplankton (algae *Chlamydomonas reinhardtii* - a producer), followed by zooplankton (*Daphnia magna* - primary consumer), *Oryzias sinensis* fish (secondary consumer) and *Zacco temmincki* fish (tertiary consumer). *Chlamydomonas reinhardtii* algae were exposed to changes in fish liver

2. Material and Methods

2.1 Materials

- 1) Thermocol Pieces- 500gm
- 2) Petrol- 50mL
- 3) Petroleum Ether- 50mL
- 4) Acetone- 50mL

2.2 Methods

For Dissolution of Thermocol

1. Collection of thermocol foam sheet and cut them in small pieces.
2. Dissolution of thermacol in suitable polar and non-polar solvents at room temperature.
3. Collection of product after dissolution in suitable solvent.
4. Air dry the product for two days to evaporate the solvent

3. Characterization

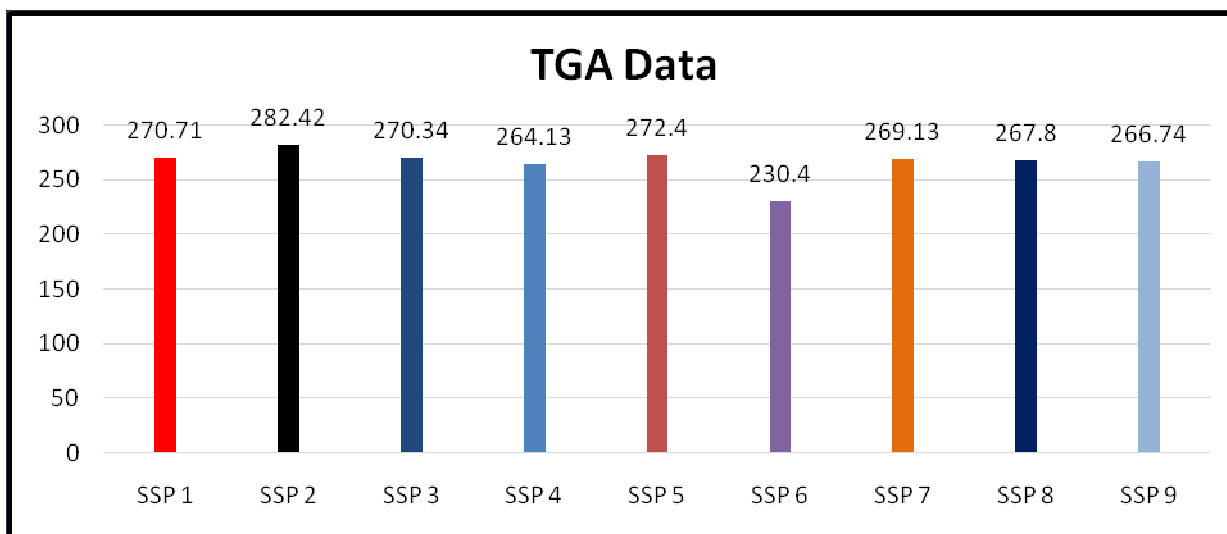
3.1 Thermo-Gravimetric Analysis.

Thermo-Gravimetric Analysis (TGA) is a laboratory technique used to analyze the thermal

stability and decomposition of materials. In TGA, a sample is heated in a controlled atmosphere, and the weight loss is measured as a function of temperature. This provides information on:

- ⊗ Thermal stability: The temperature at which the material starts to decompose.
- ⊗ Decomposition kinetics: The rate at which the material decomposes.
- ⊗ Weight loss: The amount of material lost at different temperatures.

4. Results



Sr. No	Polymer Code	Polymer Formation	Ratio	TGA °C
1	SSP 1	STYRN + Acetone	100:10	270.71°C
2	SSP 2	STYRN + Petrol (Gasoline)	100:10	282.42°C
3	SSP 3	STYRN + Pet-ether (80-120)	100:10	270.34°C
4	SSP 4	STYRN + Acetone + Petrol	100:08:02	264.13°C
5	SSP 5	STYRN + Acetone + Petrol	100:5:5	272.4°C
6	SSP 6	STYRN + Acetone + Petrol	100:2:8	230.4°C
7	SSP 7	STYRN + Pet-ether (80-120) + Petrol	100:8:2	269.13°C
8	SSP 8	STYRN + Pet-ether (80-120) + Petrol	100:5:5	267.8°C
9	SSP 9	STYRN + Pet-ether (80-120) + Petrol	100:2:8	266.74°C

The TGA Results of samples

4.1 Solvent Behavior with the sample

- ⊗ SSP1: The thermacol pieces are completely dissolved and we get thick viscous white liquid with a sweet smell of acetone and the thermacol pieces quickly dissolve.

- ✿ SSP2: The thermacol pieces are completely dissolved and we get thick viscous orange liquid with a smell of petrol and thermacol pieces dissolve but not as quick as Acetone.
- ✿ SSP3: The thermacol pieces are completely dissolved and we get thick viscous liquid but the thermacol pieces not quickly dissolve it take time to dissolve.
- ✿ SSP4: The thermacol pieces are completely dissolved and we get thick viscous little hint of orange liquid with a smell of petrol and thermacol pieces dissolve much more quickly.
- ✿ SSP5: The thermacol pieces are completely dissolved and we get thick viscous orange liquid with a smell of petrol and the thermacol pieces dissolve much more quickly.
- ✿ SSP6: The thermacol pieces are completely dissolved and we get thick viscous orange liquid with a smell of petrol and the thermacol pieces dissolve much more quickly.
- ✿ SSP7: The thermacol pieces are completely dissolved and we get thick viscous orange liquid with a smell of petrol and the thermacol pieces dissolve take time to dissolve.
- ✿ SSP8 : The thermacol pieces are completely dissolved and we get thick viscous orange liquid with a smell of petrol and the thermacol pieces dissolve quickly.
- ✿ SSP9: The thermacol pieces are completely dissolved and we get thick viscous orange liquid with a smell of petrol and the thermacol pieces dissolve much more quickly.

4.2 Sample behavior after evaporating the solvent

After evaporating the solvent from the dissolved polystyrene, it becomes hard which can be cut into small beads. The orange color solid was obtained due to addition of petrol as petrol leave its dye after drying.

- ✿ SSP1: Transparent white solid was obtained.
- ✿ SPP2: Orange solid was obtained.
- ✿ SPP3: White solid was obtained.
- ✿ SPP4: Transparent orange white solid obtained.
- ✿ SSP5: Orange solid was obtained.
- ✿ SSP6: Orange solid was obtained.
- ✿ SSP7: Orange white solid was obtained.
- ✿ SSP8: Orange solid was obtained.
- ✿ SSP9: Orange Solid was obtained.

5. Discussion

The study successfully demonstrated the dissolution of thermocol (polystyrene) in various solvents, including acetone, petrol, and petroleum ether. The results showed that all the solvents were effective in dissolving thermocol, with varying degrees of viscosity and color.

5.1 Implications of the Study

The study's findings have significant implications for the recycling and reuse of polystyrene waste. The ability to dissolve thermocol in various solvents opens up new possibilities

for converting waste polystyrene into valuable products.

5.2 Comparison with Existing Literature

The study's results are consistent with existing literature on the dissolution of polystyrene in various solvents. However, the study's use of a combination of solvents to achieve faster dissolution rates is a novel contribution to the field.

5.3 Limitations of the Study

One limitation of the study is that it only examined the dissolution of thermocol in a limited number of solvents. Further research is needed to explore the use of other solvents and to optimize the dissolution process. Future research should focus on scaling up the dissolution process and exploring the use of dissolved thermocol in various applications. Additionally, the environmental impact of the dissolution process should be assessed to ensure that it is a sustainable solution for managing polystyrene waste.

6. Conclusion

In conclusion, the study demonstrated the effective dissolution of thermocol in various solvents, paving the way for the development of new technologies for recycling and reusing polystyrene waste. Further research is needed to fully explore the potential of this technology and to ensure its sustainability and scalability.

7. Acknowledgements

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ARTIFICIAL INTELLIGENCE IN EDUCATION AND NEP 2020

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Abstract:

In terms of digital education, the National Education Policy 2020, which was unveiled in July 2020, has encouraging aspects. When defining the tenets of the new education policy, the necessity of online learning was taken into consideration as the most pressing need following the COVID-19 pandemic. All of the tech-related elements that are primarily focused on artificial intelligence are included in the National Education Policy 2020. AI will be incorporated into the curriculum for education and used to finance research areas. Additionally, NEP 2020 has suggested the establishment of an Academic Bank of Credits, which would be able to digitally record the academic credits earned by students from different universities. Universities will find it simpler to provide degrees based on the credits that students have earned as a result. According to the policy, technology such as artificial intelligence will fundamentally alter how kids learn in classrooms. The policy highlights the importance of AI in improving learning outcomes, making education more accessible and inclusive, and enhancing the overall quality of education. This paper highlights on Concept of AI, the Integration of AI in teaching, its challenges, and recommendations.

Keywords: Artificial Intelligence, NEP 2020, Education and Learning.

Introduction

A historic reform that seeks to revolutionize India's educational system is the National Education Policy (NEP) 2020. The use of artificial intelligence (AI) in education is one of NEP 2020's main areas of focus. An innovative framework called India's National Education Policy (NEP) 2020 aims to propel the country's educational system into this revolutionary field. NEP 2020 acknowledges the critical role that technology plays in fostering holistic development and equipping students for life in the digital age. The notion of artificial intelligence (AI), its integration into education, the policy's vision for AI in education, its challenges, and its recommendations are all covered in this article.

Concept of AI.

Artificial Intelligence (AI) is the simulation of human intelligence in machines that are programmed to think and learn like humans. The concept of AI involves the development of algorithms and statistical models that enable machines to perform tasks that typically require

human intelligence.

Core Concepts in AI

Artificial Intelligence (AI) operates on a core [set](#) of concepts and technologies that enable machines to perform tasks that typically require human intelligence. Here are some foundational concepts:

1. **Machine Learning (ML)**: This is the backbone of AI, where algorithms learn from data without being explicitly programmed. It involves training an algorithm on a data set, allowing it to improve over time and make predictions or decisions based on new data.
2. **Neural Networks**: Inspired by the human brain, these are networks of algorithms that mimic the way neurons interact, allowing computers to recognize patterns and solve common problems in the fields of AI, machine learning, and [deep learning](#).
3. **Deep Learning**: A subset of ML, deep learning uses complex neural networks with many layers (hence “deep”) to analyze various factors of data. This is instrumental in tasks like image and speech recognition.
4. **Natural Language Processing (NLP)**: [NLP](#) involves programming computers to process and analyze large amounts of natural language data, enabling interactions between computers and humans using natural language.
5. **Robotics**: While often associated with AI, robotics merges AI concepts with physical components to create machines capable of performing a variety of tasks, from assembly lines to complex surgeries.
6. **Cognitive Computing**: This AI approach mimics human brain processes to solve complex problems, often using pattern recognition, NLP, and [data mining](#).
7. **Expert Systems**: These are AI systems that emulate the decision-making ability of a human expert, applying reasoning capabilities to reach conclusions.

Key Characteristics of AI:

1. Learning: AI systems can learn from data and improve their performance over time.
2. Problem-solving: AI systems can analyze problems and develop solutions.
3. Reasoning: AI systems can draw inferences and make decisions based on data.
4. Perception: AI systems can interpret and understand data from sensors and other sources.

Types of AI:

1. Narrow or Weak AI: Designed to perform a specific task, such as facial recognition or language translation.
 2. General or Strong AI: Aims to perform any intellectual task that a human can, with the ability to reason, learn, and apply knowledge across a wide range of tasks.
 3. Superintelligence: Significantly more intelligent than the best human minds, with the potential to solve complex problems that are unsolvable by humans.
-

Applications and use cases for artificial intelligence

- Speech recognition: Automatically convert spoken speech into written text.
- Image recognition: Identify and categorize various aspects of an image.
- Translation: Translate written or spoken words from one language into another.
- Predictive modeling: Mine data to forecast specific outcomes with high degrees of granularity.
- Data analytics: Find patterns and relationships in data for business intelligence.
- Cybersecurity: Autonomously scan networks for cyber-attacks and threats.

Integration of AI In Education

- AI in School Curriculum

NEP 2020 proposes introducing AI education and machine learning to students at all levels. This move aims to equip students with the skills required to thrive in an increasingly automated and AI-driven world. By incorporating AI into the school curriculum, the policy seeks to foster a culture of innovation and entrepreneurship among young Indians.

- Educational Software

The policy claims to create educational software using Artificial Intelligence technology that will be made available to students and teachers in all the regional languages. This software will have wide accessibility and will be helpful to students even in extremely remote locations or to students with disabilities.

- Smart Classrooms

According to the National Education Policy 2020, AI technology would help in creating smart classrooms that will enable online interactions and collaborations with students from different schools across the globe, online assessments, apps with quizzes, and content that can nurture the students.

- National Teacher's Portal

The National Teacher's Portal is a digital platform that shall contain all the e-content prepared by all the state boards, CBSE, NCERT, ICSE, ISC, and others. The content for the professional development of the teachers shall also be provided here.

The National Education Policy 2020 is all set to establish a digital India. Artificial Intelligence-based technologies will help in the development of most of the digital tools that can prove beneficial in the formation of a digitally literate country. The students will be aware of coding and 3D technologies from the basic levels. This will help them stand confidently in the technologically advanced world. India will soon be a leading knowledge hub of innovative technologies.

Steps taken by the Government to use artificial intelligence for education transformation

The National Education Policy (NEP) 2020 has recommended introducing contemporary subjects like Artificial Intelligence in the curriculum, at relevant stages. The National Council of Educational Research & Training (NCERT) has initiated the process for the preparation of a new National Curriculum Framework for School Education in pursuance of the NEP, 2020 during which the possibility of introducing an introductory course on Artificial Intelligence (AI) at secondary level would also be explored. Meanwhile, the Central Board of Secondary Education (CBSE) has introduced Artificial Intelligence as a subject in Class IX from session 2019-2020 and in Class XI from session 2020-2021 in their affiliated schools.

Artificial Intelligence has already been applied to education primarily in some tools that help develop skills and testing systems. Artificial Intelligence can drive efficiency, and personalization and streamline administrative tasks to allow teachers the time and freedom to provide understanding and adaptability. By leveraging the best attributes of machines and teachers, the vision for Artificial Intelligence is one where they work together for the best outcome for students.

All AICTE-approved institutions have been suggested to offer Artificial Intelligence as an elective in B.Tech. courses and also start a B. Tech course in Artificial Intelligence and Data Science to augment the human resources in Artificial Intelligence and Data Analytics. So far as the Indian Institutes of Technology (IITs) are concerned, their Acts and Statutes allow them to have their own curriculum and academic & research collaboration with Institutions and Universities across the world. Most IITs offer various Artificial Intelligence courses such as Deep Learning Foundations & Applications, Foundation of Artificial Intelligence and Machine Learning, Reinforcement Learning, Probabilistic Reasoning in Artificial Intelligence, Predictive & Prescriptive Data Analytics, Deep Learning, System Identification, Cyber-Physical Security, Digital Image Processing, etc. Besides, IITs also organize short-term programs, *inter-alia*, on Artificial Intelligence for working professionals and interested students.

Need for AI-Integrated Learning in the Indian Context

- The National Education Policy (NEP) 2020 is a transformative framework that envisions the holistic development of learners in India. In the context of technology integration in education, NEP 2020 places significant emphasis on harnessing the power of technology to revolutionize learning (Pawan, 2020). It recognizes technology as a crucial enabler, advocating for the integration of digital tools, online resources, and artificial intelligence in education.
 - NEP 2020 outlines the importance of creating digital infrastructure and online resources to expand access to quality education, especially in remote and underserved areas. It encourages the development of personalized, adaptive learning solutions, promoting a
-

student-centric approach(Sharma et al., 2023). Moreover, the policy emphasizes the cultivation of digital literacy and computational thinking from an early age, aligning with the rapidly evolving digital landscape.

- The National Education Policy (NEP) 2020 heralds a transformative shift in India's educational landscape by emphasizing technology integration in learning(Cooper et al.,2019). It seeks to harness the power of digital tools and platforms to modernize education.

Challenges and Opportunities

Implementing AI-integrated adaptive learning in India presents several challenges that must be addressed to harness the full potential of this technology in the educational aspect.

1. **Infrastructure Disparities:** Rural and remote areas often lack the necessary technological infrastructure, including reliable internet connectivity and access to devices. Bridging this digital divide is essential to ensure equitable access to AI-powered learning tools.
2. **Language Diversity:** India boasts a multitude of languages and dialects. Developing AI systems that can cater to linguistic diversity, especially in content creation and communication, poses a significant challenge(JuyeongSong et al., 2022).
3. **Quality: Content:** Creating high-quality, contextually relevant educational content for AI-driven platforms is crucial. Maintaining content quality across multiple languages and regions requires substantial resources.
4. **Teacher Training:** Preparing teachers to effectively integrate AI into their teaching methods is essential. Many educators may not be familiar with AI technology, necessitating comprehensive training programs(Celik et al., 2022).
5. **Data Privacy and Security:** Safeguarding student data is paramount. Implementing robust data privacy measures and complying with relevant regulations, such as India's Personal Data Protection Bill, is crucial(Hu, 2021).
6. **Cultural and Societal Acceptance:** Shifting from traditional teaching methods to AI-integrated learning may face resistance from educators, parents, and students due to cultural norms and a preference for conventional education(Akgun & Greenhow, 2022).
7. **Assessment and Evaluation:** Developing AI-driven assessment methods that accurately measure student performance and comprehension is a complex task. Ensuring that assessments are fair and free from bias is also challenging (González-Calatayud et al., 2021).
8. **Content Localization:** Adapting AI-integrated learning content to align with diverse cultural and regional contexts is an ongoing challenge, requiring continuous updates and refinement. Addressing these challenges demands a concerted effort from the educational institutions, policymakers, technology developers, and the wider community. By doing

so, India can harness the potential of AI-integrated adaptive learning to provide a more inclusive and effective education for its diverse population

Recommendations to address the challenges arising from AI integration in education:

• **Infrastructure Development**

1. Invest in digital infrastructure: Ensure that schools have reliable internet connectivity, devices, and necessary hardware to support AI-based learning.
2. Develop AI-ready classrooms: Create smart classrooms with AI-powered tools, such as interactive whiteboards, virtual reality, and augmented reality.

• **Teacher Training and Support**

1. Provide AI literacy training: Offer teachers training and resources to understand AI, its applications, and its limitations.
2. Develop AI-based teaching tools: Support teachers in developing AI-based teaching tools, such as adaptive assessments and personalized learning plans.

• **Curriculum Development**

1. Integrate AI and STEM education: Incorporate AI, coding, and STEM education into the curriculum to prepare students for an AI-driven world.
2. Develop AI ethics and digital citizenship: Teach students about AI ethics, digital citizenship, and responsible AI use.

• **Data Protection and Security**

1. Develop data protection policies: Establish policies and guidelines for collecting, storing, and using student data in AI-based systems.
2. Ensure AI system security: Implement robust security measures to protect AI systems from cyber threats and data breaches.

• **Accessibility and Inclusion**

1. Ensure AI accessibility: Ensure that AI-based learning systems are accessible and usable for students with disabilities.
2. Address AI-driven inequalities: Monitor and address potential inequalities arising from AI-driven education, such as biased algorithms or unequal access to AI resources.

Conclusion

Artificial intelligence (AI) in education and India's National Education Policy (NEP) 2020 are on a promising and transformational trajectory (Cooper et al., 2019). With a focus on digital infrastructure, individualized learning, and digital literacy, NEP 2020 acknowledges the role of technology in holistic and digital preparation. However, issues including teacher preparation, curriculum quality, linguistic diversity, and infrastructure deficits need to be addressed. Stakeholder cooperation is essential to maximizing AI's advantages while addressing its

drawbacks. In India's digital age, this combination of NEP 2020 and AI-driven innovation empowers students and guarantees a competitive, flexible educational system. In order to prepare the next generation to spearhead innovative ideas and establish India as a knowledge superpower, the National Education Policy 2020 aims to dramatically enhance the educational system.

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INDIAN KNOWLEDGE SYSTEM: A HOLISTIC APPROACH TO EDUCATION AND INNOVATION

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Abstract

The Indian Knowledge System (IKS) embodies a vast repository of ancient wisdom, encompassing disciplines such as philosophy, science, mathematics, medicine, and the arts. This paper explores the significance of IKS in shaping modern education and fostering innovation. By integrating traditional knowledge with contemporary education, India can develop a holistic learning model that blends scientific advancements with ethical and sustainable practices. The present research paper emphasizes the relevance of IKS in addressing modern educational challenges and highlights strategies for its incorporation into mainstream academia. This research paper examines the role of IKS in contemporary education, its contributions to various fields, and potential strategies for its integration into modern curricula.

Keywords: Indian Knowledge System, Innovation, Sustainability, Holistic Development

The Indian Knowledge System is a rich and diverse intellectual tradition that has evolved over thousands of years. Rooted in classical texts such as the Vedas, Upanishads, and Puranas, IKS offers valuable insights into multiple disciplines. As India progresses towards a knowledge-driven economy, integrating IKS with modern education can promote interdisciplinary learning, sustainability, and innovation (Rao 56). IKS refers to the vast body of traditional wisdom, scientific advancements, and cultural heritage that has been developed and practiced in India for centuries. It encompasses education, science, medicine, philosophy, agriculture, and governance, among other fields.

Contributions of IKS to Various Disciplines

1. Science and Technology

- Ancient Indian texts contain knowledge in astronomy, mathematics, metallurgy, and architecture.
- Mathematicians like Aryabhata and Brahmagupta contributed concepts such as zero, algebra, and trigonometry.
- Vastu Shastra and Shilpa Shastra provide guidelines for construction and urban planning.

2. Ayurveda and Traditional Medicine

- Ayurveda, Siddha, and Unani focus on holistic healing and preventive healthcare.

- Yoga and meditation, rooted in ancient Indian practices, are globally recognized for their benefits.
- Medicinal plants like Tulsi, Neem, and Ashwagandha have proven therapeutic applications in modern medicine.

3. Agriculture and Environmental Sustainability

- Traditional organic farming methods, such as crop rotation, natural fertilizers, and seed preservation, are eco-friendly and sustainable.
- Water conservation techniques like step wells, tank irrigation, and check dams have been effective in ancient and modern India.
- Indigenous agricultural knowledge helps maintain biodiversity and soil fertility.

4. Education and Learning Traditions

- The Gurukul system emphasized experiential learning, critical thinking, and moral values.
- Ancient universities like Takshashila and Nalanda were global centers for education in philosophy, science, and literature.
- Sanskrit texts provide extensive knowledge in linguistics, literature, and logical reasoning.

5. Indian Philosophical and Ethical Traditions

- Dharma (righteousness), Ahimsa (non-violence), and Karma (law of action and consequence) form the foundation of ethical living.
- Philosophical schools such as Vedanta, Samkhya, and Buddhism emphasize self-realization and consciousness.
- Ancient self-governance models like the Panchayat system continue to influence modern governance.

6. Contribution to Arts, Music, and Literature

- Classical dance forms (Bharatanatyam, Kathak, Odissi) and music (Carnatic, Hindustani) reflect India's artistic legacy.
- Sanskrit epics like the Mahabharata and Ramayana provide deep philosophical and moral insights.
- Indigenous crafts, textiles, and pottery showcase sustainable craftsmanship.

7. Integration of IKS with Modern Systems

- The New Education Policy (NEP) 2020 promotes the integration of IKS into contemporary education.
- AI and digital technology are used to preserve and digitize ancient manuscripts.
- Traditional practices are being revived to enhance sustainable living and ecological balance.

Integration of IKS in Modern Education

Modern education often emphasizes rote learning and standardized testing, which can limit

creativity and critical thinking. Integrating IKS provides a more holistic, value-based approach to learning. According to Gupta, incorporating indigenous knowledge into curricula enhances cognitive development and promotes sustainability (89). Premier institutions like IITs and other universities have initiated programs to integrate IKS into their syllabi, reflecting its growing significance in higher education.

IKS and Innovation

IKS has contributed significantly to scientific and technological advancements. For instance, ancient Indian mathematicians like Aryabhata and Bhaskara developed mathematical concepts foundational to modern science (Das 74).

Challenges in Implementing IKS in Academia

Despite its vast potential, integrating IKS into modern education faces several challenges:

- Lack of standardized documentation and research on traditional knowledge.
- Skepticism regarding the scientific validation of certain aspects of IKS (Patel 45).
- Limited collaboration between traditional scholars and modern academics.

Addressing these challenges requires:

- Interdisciplinary research to scientifically validate traditional knowledge.
- Government initiatives to support IKS-based academic programs.
- Increased collaboration between universities, research institutions, and indigenous scholars.

Conclusion

The Indian Knowledge System offers a holistic approach to education and innovation by integrating ancient wisdom with contemporary advancements. Its incorporation into modern academia can enhance interdisciplinary learning, promote sustainability, and foster innovation. However, structured efforts are needed to overcome documentation, validation, and implementation challenges. By embracing IKS, India can develop a knowledge-based society that harmonizes tradition and modernity.

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CHHATRAPATI SHIVAJI MAHARAJ'S ADMINISTRATION

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Abstract

stressing the importance of resource management and respectful behavior towards civilians during the monsoon season. He warns against wasting resources like grain and fodder, as it will lead to starvation for both soldiers and horses. He also forbids looting or mistreating peasants, emphasizing that the treasury provides for their needs. He further cautions against carelessness with fire, as it could destroy vital resources. He concludes by stating that those who disobey will face serious consequences.

Introduction :It is said that 'Bole taisachaletyachivandaavipaule'. Shivaji Maharaj always followed this saying in his life. His battles, valour, forts, escape from Agra, killing of Afzal Khan are all famous. While keeping his valour in front of our eyes, we tend to ignore 'his administration'. Instead of writing about these usual topics, in this article today I will try to write a little about his military system and governance. While writing about his administration, we will get to know Maharashtra of that time a little on this occasion. Shivaji Maharaj did not intend a social revolution. The social life during Shivaji's time was not very different from that before Shivaji or it cannot be said that it changed later. He also followed the established traditions and methods, but while doing so, he tried to bring social stability by making all the sections and institutions of the society aware of their duties, that is why Shivaji Maharaj is different.

Background of the research:Along with the increase in independence, it was important to establish a government system for that region, otherwise that part would go back to the Mughals or other kings and Maharaj took steps in that direction. (Later, when the Marathas went to the north, they only took revenge without establishing a system for that region, due to which it became a habit to conquer the same kings every one or two years and the Maratha Empire became weak). The Maharaja's system of government was based on the prevailing Muslim system of government and Indian ethics. The Maharaja was the head of the administration. Along with the political administration system, local, popular government institutions and a caste-based caste system were also functioning.

The seven main parts of the royal administration: the king, the minister, the friend, the treasury, the nation, the fort and the army. If any of these parts were missing, the state would be destroyed. This system of administration was called 'Raja Kalasya Karanam'. The Smriti texts have

considered the limits of religion as supreme and have limited all the systems of the state and society according to their categories. The state religion itself included the protection of the nation, the protection of the people, and the protection of religion. To carry out all these functions, the king had to form a Pradhan Mandal and administer by distributing the work through them. In the Muslim system, there was an institution called 'Rakhtkhana', but its form was slightly different. The Maharaja established the Pradhan Mandal to implement the 'SaptangamRajyam'. The formation and growth of the Ashtapradhan Mandal continued with the expansion of the state. When Maharaj returned from Bangalore, Shahaji Maharaj had sent with him officers like Neelkanth Peshwa, Balkrishnapant Dixit, Hanumante, Majumdar (the state's amatya), Sonopant Dabir (Sumant), Raghunath Ballal Sabnis (military writer). In 1649, Maharaj had appointed Tukoji Chor as the Sarnaubat of the then existing army. (That is, the idea of Pradhan Mandal was created and adopted when Swarajya was in its infancy). Later, the Sarnaubat came to MankojiDahatonde and later to Netaji Palkar. At that time, the army was seven thousand and the Pagas (horsemen) were 3000. Annaji Datto, Moropant Peshwa, Sonopant Dabir, Niraji Pant, Shamrao Neelkanth were handling their respective areas of work independently even before the coronation. The king planned the next work after consulting all these people. Later, when the coronation took place, the Maharaja created the following posts. While creating these posts, he emphasized on avoiding Persian words and bringing Marathi synonyms. For this, he asked Raghunathrao Hanumante to compile a new Marathi kosha.

Ashtapradhan and their responsibilities: 1. Chief Pradhan (Peshwa): To do all state work. The gazettes should be stamped, the army should be taken to war. The region will be handed over and should be guarded and obeyed by the Maharaja. All the chiefs and the army should march with them. Moro Trimbak Pingle became Peshwa and his annual salary was fixed at 15,000. (One hon is about three to four rupees). 2. Amatya Phadnis should do their work. Fadnishi and Chitnishi letters should be marked. This position came to brothers Naro and Ramchandra Neelkanth. Salary became 12000. 3. Secretary (Surnis): The contents of the gazettes should be read and corrected. The gazettes should be stamped 'Samt'. Annaji Datto became the secretary. 4. Minister (Vaknis): He should do all politics carefully. The routine of the king should be written down. There should be a war situation. Dattaji Trimbak became the minister. (Mujumdar): - Deposit should be kept in the state. Daftdardar and These four Pradhans were sitting on the right of the Maharaja. 5. Commander-in-Chief (Sarnaubat): The commander-in-chief of all armies, should conduct war. Hambirrao Mohite became the commander. 6. Sumant (Dabir): One should think of foreign states. If their lawyers come, they should be felicitated, their lawyers should be encouraged. Ramachandra Trimbak became Sumant. 7. Judges: The justice and injustice in all the states should be reported to the king. Niraji Rauji became the judge. 8. Panditrao (charity president): Yanj had all

religious authority. Donating, performing rituals are all under his authority. + Salina salary of the last six chiefs was 10000 han.

The provinces of the state were demarcated and handed over to Ashtapradhan. When Ashtapradhan goes on a ride, his Mutalik looks after him. Darakdar was appointed to see every work in Ashtapradhan's office. Mainly 1. Diwan, 2. Mujumdar, 3. Phadnis, 4. Sabnis, 5. Factory, 6. Chitnis, 7. Jamdar (Treasurer) and 8. There were potnis (numerists). The post of Chitnisa is not included in Ashtapradhan Mandal. Chitnis is the main writer of Maharaj. He was included in the Rajmandal. He was responsible for writing all the gazettes of the state. He also writes the answers. Phadnis also arranged the documents related to the prize. Ashtapradhan had the task of arranging further factories and palaces. The kingdom depended on these factories and palaces. Factories: 1. Treasure 2. Jawahir Khana 3. Ambarkhana (Elephant) 4. Sharbatkhana (medicines) 5. Artillery 6. Office 7. Jamdarkhana (Coins) 8. Jaratkhana (agriculture). 9. Mutbakkhana 10. Oyster Khana 11. Nagarkhana 12. Rehearsal 13. Peelkhana 14. Faraskhana 15. Abdarkhana (Beverages) 16. Shikarkhana 17. Barukhana and 18. Sharatkhana. Palace: 1. Sacks (treasures) 2. Saudagar (goods) 3. palanquin 4. Kothi 5. Building 6. Bahirla (Rath) 7. Paga 8. Sheri 9. Daruni 10. Thatti (Khillar) 11. Taksal and 12. Chhabina.

Chhatrapati Shivaji Maharaj's Administration: For the administration of the province, the state was divided into two divisions. One was a contiguous region and the other was a scattered southern region. The first division was divided into three parts. The northern region was given to the Peshwa, which included the Varghat from Saler to Pune in Kolvan and North Konkan. The central division included South Konkan, Sawantwadi and Karwar - this was entrusted to the secretary. In the third division, the eastern Varghat region, i.e. the region from Satara-Wai to Belgaum Koppal - this part was entrusted to the minister. A separate subah of Karnataka was made and Hambirrao Mohite and Raghunath Narayan Amatya were appointed over it. Sarsubhedars were appointed over all these divisions and they worked with the Pradhans. This was called Rajmandal. The Maharaja himself appointed the fort chiefs and clerks. The Pradhans could increase or decrease the army in this region as they wished. There was an arrangement in which the Pradhans had to submit their accounts to the Maharaja every year.

The Sarsubhedars helped in the divisional administration and were called Deshadhikaris. The following Sarsubhedars are mentioned in the letter: 1. Kalyan-Bhiwandi 2. Talkonkan 3. Kudal 4. Pune 5. Satara-Wai 6. Panhala 7. Bankapur 8. Koppal. A Sarsubhedar was appointed to look after the management of two or three subhedars. In the true sense, this method was popular, which is why Shivaji was called the 'Knowing King'. The farmer had to pay 40 percent of the total income in tax. In earlier times, 2/5 tax was popular. Even in Mughal times, the same amount of tax was paid. New villages were established. The new ryot was given cattle for cultivation, grain for seed, and grain for daily living, and in return, when the crop came after two years, it was cut off.

Shivaji Maharaj established many villages by giving permission. This method was called the 'Batai method'.

While increasing the income of the state, it was also necessary to look at the welfare of the subjects, or what is the difference between Mughal and *Shivshahi*! How conscious Shivaji Maharaj was about this can be seen from the following letter: AD 1676 to Subhedar Ramaji Anant, to the influential Mahala,

“Saheb has been kind and has ordered Subhas. Such theft should not be done. Work with faith, sir. You have done this. Act justly and correctly without showing any mind to each vegetable stalk. The land is being divided, but the share of the ryots should be given to the ryots and the ryots should get their share and the king should do it if the rajbhang comes. It is better to understand that the ryots are not satisfied with you, sir. Make a tent for the ryots and make a kird. Go from village to village. Collect the number of kunbis in the village you go to. If anyone has the strength and manpower to do the sowing, then if he has a set of oxen and grain, he will do it. If he has the strength and manpower to do the sowing and he does not have oxen to plow, plough, or grain in his stomach, even if he has gone bankrupt, he should take cash in hand and give him two or four oxen's packs, get an ox and give him two kirds of grain in his stomach. Whatever the tax is, he should do as much as he can. The farmer should not increase the money of the bull and cows from it, but should gradually take the money and get it back. If he gets a loan, he should be treated accordingly. Even if he spends two lakhs of lacs on this article and takes the news of the Kunabis and Kunabis and gets the loan, he will write it down and do whatever he wants by planting the fallow land, then the kulabi will be accepted. Hope to work hard in the future.”

From the above letter, it will be seen how much Shivaji Maharaj cared for the people. As described by the member, the income of Swarajya was about one crore, that is, three crore rupees, and the income of the fourth was 80 lakh rupees. The dead were given to the post.

Military system of Chhatrapati Shivaji Maharaj's: A letter from Maharaj dated May 13, 1671: “The Chipluni army was stationed. For this, due to the monsoon, the crops, grains and fodder were brought to the village of Dabhol, which cost a lot of money. For this, the clerk and the Gadogadi gang have been given as gifts to the village. You will ask for such grains, grass, and hay as you wish, if there is any, then you will beg for it and the fodder will be destroyed. Then you will not get anything in the coming monsoon, you will go hungry. The horses will start dying. That is, you will kill the horses and start giving them to the villagers. People will go in droves, someone will bring some grains, someone bread, someone grass, someone leaves, someone vegetables, someone leaves. If you start doing this, those who have taken their lives by holding on to their homes will also start leaving. Some will have to starve to death. That means that it will be more than you who came to the Mughal country! There will be such a commotion. Then the reputation of the people and the horses will come upon you. You know this well, be it a soldier or a soldier,

behave very respectfully. If someone is a peasant or has stayed in a village in the country, there is no need to give the peasant a disease of cadre. Sahebi has put a lot of money in the treasury so that whoever wants to buy what he wants. There is no need to oppress anyone or do anything or any art and the peasants have been satisfied. That rainy season should be buried. In such a way, the grains and rice given by the clerks should be taken as much as they can, so that without going hungry, you will find food to eat every day and gradually the horses will be stabled. There is no need to enter the MP's house and loot it. They will have stayed and will stay. Some will make fires, some will make the wrong place for cooking, some will take a tobacco fire, the grass has fallen. Without keeping this in mind, there will be a lot of trouble. Listen, if the fire catches fire, then the whole fire will burn; only the wise know this; if you are a special person, you should always go around and light the fire for cooking, if there is a lamp in the house at night, the wise person will take the wick, that should not happen. There will be no trouble due to fire. Do what will save the fire, the grass; that is, the horses will be saved in the rainy season. As much as there are special people, policemen, constables, and clerks, listen to this detail and be smart. "The one who is distanced from him for behaving in this manner will be a crime, the one who is defamed will not be saved by the honor of the Marathis, then how will he get employment."

The above letter shows how closely Shivaji Maharaj paid attention to the army. He asked him to be so careful that even a mouse would carry away a wick at night. The yearning for the care of the subjects and the army is evident from this letter. The counting was so slow! If you leave the four castes and religion, you will not be able to follow the teachings of the sages, if Sivaji is not there, then everyone will know it!!

At the end of Maharaj's reign, Maharaj had no faith in Sambhaji. Rajaram was very young. Aurangzeb was coming to Swarajya, the British were getting stronger, yet Maharaj was confident that his kingdom would never be destroyed. His words were that Swarajya would only grow, "The three Brahmins and the three Marathas will save the broken kingdom." These three Brahmins were Prahlapant, Ramchandra and Nilopant and the three Marathas were Santaji Ghorpade, Bahirji Ghorpade and Dhanaji Jadhav. And as Maharaj had said, these three also supported Sambhaji first, then Rajaram and even after that, Chhatrapati Shahu and established the kingdom. The reason for this loyalty was that this king was not just a king but a 'Knowing King'.

Conclusion: Before becoming sovereign, Samarth, who wrote, "Even if the Lord of War moves, where will this Sahu wound his head?", writes, "Where the heavenly waters flow, where Ram, Ganga, the great river, the pilgrimage site is not comparable to Anandavanbhuvani." This is the essence of Shivaji's reign. Chhatrapati Shivaji Maharaj tried to establish peace order by creating Swarajya. He tried to bring equality, Brotherhood, and justice in Swarajya. He created Swaraj by taking the ryots along with him, that is why he is called the ryot king. His work will not be forgotten.

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BUILDING INCLUSIVE COMMUNITY: DIVERSITY, EQUITY & SOCIAL JUSTICE THROUGH AI**Dr. Bhagirath S. Pande***Assistant Professor,**SSR College of Education, Saily, Silvassa,**U.T. of Dadra and Nagar Haveli**bhagirathpande@gmail.com*

Abstract:

Diversity "Diversity, equity, and social justice" means creating a society where people from various backgrounds are represented (diversity), everyone has fair access to opportunities and resources regardless of their differences (equity), and systemic inequalities are actively addressed to achieve a just and equitable environment for all (social justice) - essentially promoting inclusivity and fairness across different demographics. Although there are so many fundamental values and ethical point of views in Indian Knowledge system but there are some restrictions or obstacles also which create hurdles in creating inclusive society and common developing goal oriented homogeneous community with equity, accessibility and social justice from diversified society like Indian situation.

DEI is about creating a more just society, where everyone has equitable opportunities, regardless of their race, ethnicity, gender, sexual orientation, or other personal characteristics. Social justice is about ensuring that everyone has equal rights and opportunities, regardless of their social or economic status. For achieving these goals we have a powerful tools or instrument in this era which was coined as AI-i.e. Artificial Intelligence. AI having a potential of providing all the possible way for creating inclusive community with proper accessibility, equity and social justice .Country like India where the situation is fully diversified and accompanied with various types of divergent opinion, life styles, beliefs, socio-economical-cultural variations and the even variety of natural settings including climate, weather, soil, water and regional differences. With available features and facilities in AI and proper inclusion in education and training process, the dream of building inclusive community comes in true with all the necessary elements of inclusion like equity, equality, accessibility, social justice apart from number of differences and variations in human being as well s situations.

Key words: Inclusive community, diversity, equity, social justice.

Introduction:

Diversity is not a plight its an opportunity for creating inclusive society in the country like India. by providing equal access of social, educational & economical elements of human

development is the fundamental principle behind the target of creating inclusive society and the overall development of the society where the number of aspects we find in form of diversity. The diversity is not always man made of due to social,religious economical structures but its also by nature and by birth of human being. It is our responsibility as a developed human citizen or cultured social elements to overcome on the all types of differentiation or discrimination elements which create a wall between people and people as well as one person to other person. and for that reason we need to adopt all the possible way which can be help us for

Inclusive communityan inclusive community is a welcoming space that values and embraces diversity. It ensures that all members feel a sense of belonging and have equal opportunities.

Diversity"Diversity, equity, and social justice" means creating a society where people from various backgrounds are represented (diversity), everyone has fair access to opportunities and resources regardless of their differences (equity), and systemic inequalities are actively addressed to achieve a just and equitable environment for all (social justice)- essentially promotinginclusivity and fairness across different demographics.

Diversity:

The presence of a variety of characteristics among people, including race, ethnicity, gender, sexual orientation, socioeconomic status, age, and ability.Diversity focuses on representation; equity goes further by addressing the underlying causes of disparities to achieve fair outcomes.

Diversity is the presence of a variety of people or things, including differences in their backgrounds, characteristics, and experiences. It can also refer to the practice of including people from a range of different backgrounds.

Examples of diversity

- **Cultural:** Different races, ethnicities, religions, and nationalities
- **Social:** Different economic statuses, social classes, and educational backgrounds
- **Personal:** Different genders, sexual orientations, abilities, and physical attributes
- **Beliefs:** Different values, ethical systems, and political beliefs
- **Life experiences:** Different backgrounds, experiences, and learning styles

Benefits of diversity

Diversity can promote growth and learning, and enrich our experiences. It can also help to challenge implicit bias and discrimination.

Equity:

Equity in policy,practice & position, equity, in legal terms, is defined as justice according to natural law, free from bias or favoritism. It originated in the English chancery and was developed to ensure fairness, supplementing or even overriding common law in cases where strict

legal rules might lead to unjust outcomes. In finance, equity refers to the value of ownership in a property after subtracting debts, such as mortgages, and also represents common stock in a corporation.

Many people use “equity” and “equality” interchangeably when discussing important topics. It can be hard to see the difference between equity and equality, and many people assume they are synonymous. In both social justice and racial justice movements, the difference between equity and equality becomes clear as equity addresses individual needs for fair outcomes.

The difference between equity and equality is that equity recognizes each person has different circumstances, meaning different resources must be allocated based on individual needs for all to thrive. Equality, on the other hand, is giving everyone the exact same resources across the board, regardless of individual or groups of people’s actual needs or opportunities/resources already provided to them.

The principle of ensuring everyone has the resources and opportunities they need to succeed, which may require different approaches based on individual circumstances to address historical inequalities.

Social Justice:

Social justice is a political and philosophical theory that refers to fair and equal division of resources, opportunities, access to wealth and social privileges in a society. The pursuit of a society where everyone has equal access to rights, opportunities, and resources & actively working to dismantle systems of oppression and discrimination. Social justice is a concept of fairness in relations between human beings in a society and their fair and equal rights. It was first developed during the industrial revolution. It means everyone is entitled to rights and freedoms without distinction of any kind, such as race, color, gender, socio economical cultural background, educational status etc. Social justice attempt to create opportunities and political platforms for individuals to participate in decision-making, social justice aims to actively challenge and change systems that perpetuate inequality, not just acknowledge differences.

DEI is about creating a more just society, where everyone has equitable opportunities, regardless of their race, ethnicity, gender, sexual orientation, or other personal characteristics. Social justice is about ensuring that everyone has equal rights and opportunities, regardless of their social or economic status.

Aspects of inclusive community:

As shown in the figure 2, there are various aspects which make’s community more inclusive. Among these aspects we need to take consideration.

Representation matters. It means at the all level of participation, decision making, policy and planning, celebration etc. the involvement of all social elements need compulsory. This should be the first priority and criteria for the representation of all stakeholders from the society should be the

part of all type of committees and groups. Its need to take care that every part of the society should get opportunity & representation in all type of decision making, planning and policy as well as involvement in celebrations too.

Community awareness is the next aspect which is very essential and basic need of building inclusive community. Everyone should be aware of all the things happening in the society and also about the future plan and tentative schedule of the upcoming changes.

Belonging and inclusion are the aspects which makes community more reliable and integrated because belongingness is the term shows the closeness and bond of love between two things, person, or groups, so this is very essential for creation of inclusive community properly and fundamentally strong as well as close connected.

Collaboration is very important aspect which make community more inclusive and effectively connected. Collaboration between every stakeholder of the society and community make all the events, programs and task successful due to collective efforts and integration of expertise from all members of the society.

Education and learning opportunities to everyone gives platform not only for self development but also promote the collective development of the all social elements in all the way i.e. educational, economical, cultural, social etc. So the equal opportunity and accessibility of the education can be support and help creating community more inclusive automatically.

Benefits of inclusive communities

- **Problem solving:** A variety of perspectives can lead to more creative and holistic solutions
- **Mental well-being:** A sense of belonging and acceptance can contribute to better mental health
- **Innovation:** Diverse communities are more likely to be innovative and resilient
- **Stronger communities:** Inclusive communities are stronger, more vibrant, and more transformative

Examples of inclusive communities

- Communities that have integrated allies into their conversations
- Communities that have policies to ensure equal pay between men and women
- Communities that have actively involved women in politics and society

How to build an inclusive community

As per the above all benefits of inclusive community, we can build an inclusive community with adopting and inculcating following things in our daily practices in personal as well as social life effectively and efficiently

- **Value inclusivity:** it means we need to give more weightage and importance for the

inclusivity, we always focus on the thought that inclusivity is an opportunity not a plight.

- **Create safe spaces:** creating safe spaces for every individual with their dignity, security and safety point of view should be the highest priority for building inclusive community at any society at any stage.
- **Promote diverse representation:** Promotion to divers representation in the best way and method for promoting inclusion at various level. It help to give equal opportunity to every stakeholder of the society and each kind of social aspects can be included in mainstream social inclusion.
- **Encourage open dialogue** through the various platforms of the communication and interaction for the proper integration of all type of opinions in the process of social inclusion and building inclusive community. Elimination of discrimination with the promotion, inclusion and integration of all social elements apart form their cast, creed, race, gender etc basis is the best way for creating inclusive community. Consider the voices of people with different opinions or life experiences
- **Implement strategies to promote equal opportunities** is the systematic way for the achieving the goal of inclusive community. With the help of proper strategies for promoting inclusion we can create a systematic inclusive community with proper equity, equality and equal opportunity not only in the field of social, cultural and economical aspects but as per the value based ethically oriented human beings for the target of universal brotherhood the ultimate goal.

AI for achieving the goal of inclusive community with social justice

The Importance of AI for Inclusion In the context of AI, this means creating systems that recognize and respect user diversity, avoiding the perpetuation of existing biases. Inclusive AI not only expands access and equity but also enriches innovation by incorporating a wide range of perspectives and experiences.

AI for inclusive community" refers to using artificial intelligence technology to actively promote inclusivity within a community by designing systems that consider diverse perspectives, needs, and experiences, ensuring everyone can access and benefit from AI tools regardless of background or ability, effectively minimizing bias and promoting equity across the community.

Key aspects of AI for inclusive community:

Diverse data sets: Training AI models with data that represents a wide range of demographics and experiences to avoid perpetuating existing biases. It promote participation and involvement possibilities for each elements of the community.

Accessibility features: Implementing features like text-to-speech, screen readers, and language translation to make AI tools usable for people with disabilities. This is the special feature of AI

for accessible to all type of needy individual and provide opportunity not only for learning but also participation in all social events

Multilingual support:Enabling communication and access to information in multiple languages to cater to diverse populations. It really boon for the country like India where more than 22 official languages and approx500 local languages means of interactions. It is the tool which is create the opportunity for interaction, learning, understanding and opportunity to take part in conversation with the world.

Bias detection and mitigation:Developing mechanisms to identify and address potential biases within AI algorithms. It may avoids the autocracy and the effect of majority social elements which can be prevents other small social elements participation and representation.

Community engagement:Involving diverse members of the community in the design and development process to ensure their needs are considered. Its provides an opportunity to all community members to contribute their share in form of values, culture, thoughts, arts, intellectual expertise for the betterment of the community and create community more inclusive.

Examples of how AI can foster an inclusive community:

Translation tools:Real-time translation services to facilitate communication across language barriers.

Personalized learning platforms:Adapting educational content to individual learning styles and abilities.

Accessibility assistants:AI-powered tools to assist people with visual, hearing, or motor impairments.

Community engagement platforms:AI-driven tools to facilitate inclusive dialogue and discussion within online communities.

Conclusion:

For building inclusive community in the society like India where the diversified stakeholders of the society are from the various religion,caste,creed,race,gender,socio-economical-cultural and educational background and rural, urban, tribal locations need to preferably for integration with equity, equality and respect for ultimate goal of social justice and equal opportunity apart from various types of diversity. In this connection all the possible elements of inclusion should be adopt with the priority of social inclusion and community involvement in the all round development of the society. With the use of traditional system and the Indian knowledge system with its high culture,tradition, values and ethical foundation, we also focus on the use of possible and available technological devices and methods for effective integrationand inclusion of various social element's by providing equal opportunities, justice and respect for self development of every individuals. And in this connection Artificial Intelligence is the very effective device or

tool which can be use for the better building of inclusive communitywith its features like diverse data sets, multilingual support, anywhere, anytime, anyone accessibility features for achievement of ultimate goal of inclusive communityArtificial intelligence (AI) can help make education more inclusive by providing personalized learning, assistive technologies, and behavioral support. AI can also help reduce bias and subjectivity in assessments.

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GOEIJR

**BRIDGING THE ARTIFICIAL KNOWLEDGE DIVIDE: A STUDY OF SENIOR
COLLEGE TEACHERS' CURRENT STATE OF KNOWLEDGE AND
AWARENESS**

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Abstract:

This research paper has focused on AI. Artificial Intelligence (AI) is the ability of computer systems to mimic human cognitive functions such as learning and problem-solving. Similarly, machine learning uses data to help computers learn. Though the terms are closely related, they have different meanings. With the release of accessible AI technology such as ChatGPT, Google Gemini, Canva, Fireflies, Synthesia, Jasper, Click Up etc. It is increasingly important to consider how AI can affect and improve education. The impacts of AI on education can be loosely categorized into "Guidance," "Teacher," and "Student" to more easily consider their benefits and drawbacks. As AI continues to advance and spread, it is useful to have an organizational structure to make informed decisions about its implementation and implications for the future of education. AI is a branch of computer science that seeks to create machines capable of thinking and acting like humans. The rise of Artificial Intelligence (AI) is a double-edged sword when it comes to jobs. There are valid concerns about some positions being automated, but also reasons to believe it will create new opportunities. The rise of artificial intelligence will make most people better off over the next decade, but many have concerns about how advances in AI will affect what it means to be human, to be productive and to exercise free will. This era is under the influence of AI, so through this research paper, researcher has tried to find out the knowledge about AI among Senior College Teachers, and in future AI will be very useful in teaching and learning.

Key Words: Artificial intelligence, Technology, senior college teachers, Machine Learning, Education, Assessment, future, Human intelligence

Introduction:

"Artificial intelligence will transform the relationship between people and technology, charging our creativity and skills."- Ginni Rometty

John McCarthy coined the term "artificial intelligence" in 1956 and drove the development

of the first AI programming language, LISP, in the 1960s. Early AI systems were rule-centric, which led to the development of more complex systems in the 1970s and 1980s, along with a boost in funding. Artificial intelligence has become a broad and revolutionary tool with countless applications in our daily lives. Able to give birth to robots that act with human-like responses and to respond to voice requests with practical functionalities in mobiles and speakers, artificial intelligence has attracted the attention of Information and Communications Technology (ICT) companies around the world and is considered the Fourth Industrial Revolution following the proliferation of mobile and cloud platforms. Despite the innovation it brings to our lives, its history is a long process of technological advancement.

Definition of Artificial Intelligence:

It refers to the simulation of human intelligence in machines that are programmed to think and learn like humans. The term can also be applied to any machine that exhibits traits associated with a human mind such as learning and problem-solving.

Artificial technology is divided into two main categories, like

1. **Narrow AI:** Also known as weak AI, this type of artificial intelligence is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, Amazon's Alexa, and Google Assistant, are examples of narrow AI.
2. **General AI:** Also known as strong AI, this type of artificial intelligence will be able to understand, learn, and apply its intelligence broadly, not just for specific tasks. This type of AI does not yet exist and is a subject of ongoing research and development.

AI operates through algorithms that enable machines to, Learn, Reason and Perceive. AI has also many applications like Virtual assistants, Image recognition, Natural language processing etc.

There are several types of Artificial Intelligence (AI), which can be categorized based on their functionality, learning ability, and complexity. Here are some of the main types of AI:

1. **Narrow or Weak** is designed to perform a specific task, such as facial recognition, languagetranslation, or playing chess.
2. **General or Strong** on the other hand, is a type of AI that can perform any intellectual task that a human can. This type of AI is still in the development stage.
3. **Superintelligence** refers to an AI system that is significantly more intelligent than the best human minds. This type of AI is still purely theoretical.
4. **Reactive Machines** are a type of AI that can only react to currently existing situations. They do not have the ability to form memories or use past experiences to influence their decisions.
5. **Limited Memory** systems have the ability to store and recall past experiences, but only for a limited time.

6. **Theory of Mind** systems have the ability to understand and interpret human emotions and behaviors.
7. **Self-Aware** systems have the ability to recognize themselves as entities and have a sense of their own consciousness.
8. **Natural Language Processing (NLP)** is a type of AI that enables machines to understand and interpret human language.
9. **Machine Learning (ML)** is a type of AI that enables machines to learn from data and improve their performance over time.
10. **Deep Learning (DL)** is a type of ML that uses neural networks to analyze data and make decisions.

The invention of Artificial Intelligence (AI) is a story that involves the contributions of many researchers, scientists, and engineers over several decades. Alan Turing, Marvin Minsky, John McCarthy, Frank Rosenblatt, Arthur Samuel, Yann LeCun, Andrew Ng are also known as the magicians of Artificial intelligence. In the world there are few AI companies like, Google Deep Mind, Amazon AI, Facebook, IBM Watson, AI for all, Digital India.

Review of Related Literature:

Roza Sh. Akhmadieva¹, Nadezhda A. Kalmazova (Research gate 2024) Paper deals about the contribution of AI to education also includes benefits for instructors to assess student performance and present personalized learning opportunities to students. Hence, using AI in higher education is essential for examining the contribution of new technologies to instruction. Furthermore, researchers using AI technologies in education utilize machine learning techniques to improve students' and lecturers' learning and teaching processes. Depending on the use of AI in education, researchers have conducted research studies to incorporate AI in higher and have examined the effect of AI on instruction in higher education.

1. Rationale: People back in the 1960s could not have imagined how our lives would be transformed with the advent of Artificial Intelligence. An AI-powered assistant like Alexa, Siri, or Google Assistant on your smartphone to get things done. Nowadays it's a given to have an assistant on all smartphone devices. Taking notes, or controlling your house with a few verbal commands. It's just become so convenient. Another way that Social Media giants like Facebook, Twitter, and LinkedIn implement AI's machine learning technique to deliver an engaging and personalized experience every day to billions of users. Every Industrial sector from Media, Financial, Educational, Legal, Manufacturing, and more is trying to use artificial intelligence to improve operational efficiency. We need to support AI and it should be used wisely.

2. Theoretical base: This research study has the base of psychological theory of Self-Determination Theory (SDT) was proposed by Edward Deci and Richard Ryan. It was introduced in 1980. It explores how senior college teachers form attitudes and intentions to use AI.

3. **Statement of Problem:** ‘To Study the Current State of Knowledge and Awareness about Artificial Intelligence of Senior College Teachers’

4. **Operational Definitions:**

- a) **Current State:** Present situation of the Senior college Teachers in a particular area.
- b) **Knowledge:** Acquisition, organization and utilization of information of certain area.
- c) **Awareness:** Consciousness or interest of teachers in specific area of technology.
- d) **Artificial Intelligence:** It is a development of computer systems that performs the tasks and solves complex problems.
- e) **Senior College Teachers’:** Teachers who teach at Graduation and Post graduation level students at senior college

5. **Objectives:**

- 1) To assess the current level of Artificial Intelligence Knowledge and awareness among Senior College Teachers
- 2) To explore about the various tools of Artificial Intelligence among senior college teachers.
- 3) To provide recommendations for improving AI education and awareness among senior college teachers.

Scope: Research is related to Senior College Teachers in Maharashtra state.

7. **Limitations:**

- 1) Sample was selected from one Senior College from the Maharashtra State.
- 2) The results of research are depended on the responses received from teachers.

8. **Delimitations:**

- 1) Present Research study is delimited only for Artificial Intelligence.
- 2) Senior College Teachers were considered for the research.
- 3) A Senior college was selected from Savitribai Phule Pune University, Pune.
- 4) Present study is limited for the academic year 2024-25.

9. **Methodology:**

Survey method was used for the present study which is a type of Descriptive research.

Procedure: Selection of Research area---review of related literature---defining the Problem---Developing the data collection tool---Data collection--- data analysis--Results--- Report writing.

11. **Population & Sample:** Teachers from one senior college of Maharashtra State.

Sample: One senior college has been selected by using purposive sampling method for the data collection. Total 20 Senior college Teachers have been selected by using incidental sampling method.

11. Tools of Data Collection:

A questionnaire is developed by researcher, 15 multiple choice questions were included in the questionnaire. Around 30 minutes were allotted to senior college teachers to place right tick mark for appropriate answer. But only few questions have been included in this research paper.

12. Data Analysis: The data of this study analyzed by the researcher using tabulation techniques and percentage in the following way....

Table 1. Who has coined the term ‘Artificial Intelligence’

No.	Answer	No. of Respondents	Percentage
1	John McCarthy	05	25%
2	Frank Rosenblatt	10	50%
3	Arthur Samuel	05	25%

Observation: Only 25% Senior college Teachers know about the term of AI

Table 2.AI (USA) provides AI powered services for computer vision, natural language processing and machine learning.

No.	Answer	No. of Respondents	Percentage
1	Facebook	05	25%
2	IBM Watson	09	45%
3	Amazon	06	30%

Observation: 70% Teachers don't have knowledge about companies.

Table 3. In India is using AI for route optimization demand prediction and customer service

No.	Answer	No. of Respondents	Percentage
1	Ola	10	50%
2	Flipkart	03	15%
3	Paytm	07	35%

Observation: 50% Teachers have the idea about Indian AI customer service.

Table 4. AI technology is divided into main categories.

No.	Answer	No. of Respondents	Percentage
1	Two	08	40%
2	Three	04	20%
3	Four	08	40%

Observation: 40% Teachers even don't know the main categories of AI technology.

Table 5. Alexa is example of

No.	Answer	No. of Respondents	Percentage
1	Gen AI	05	25%

2	Neural AI	05	25%
3	Both a & b	10	50%

Observation: 25% Teachers are unaware about the proper example of specific AI.

Table 6. What is the primary goal of Using AI in education.

No.	Answer	No. of Respondents	Percentage
1	To replace human teachers	08	40%
2	To support human teachers	05	25%
3	To provide personalized learning experiences	07	35%

Observation: 65% Teachers don't know about the goal of AI in Education.

Table 7. In this...AI have the ability to understand the human emotions and behaviours.

No.	Answer	No. of Respondents	Percentage
1	Theory of Mind	09	45%
2	Self-aware	04	20%
3	Machine learning	07	35%

Observation: 55% Teachers do not know about the type of AI

Table 8. Which is the following an example of AI in Education?

No.	Answer	No. of Respondents	Percentage
1	Online learning platforms	10	40%
2	Automated grading system	02	08%
3	Virtual Teaching Assistance	06	24%
4	All of above	07	28%

Observation: Almost 72% Teachers have not clear idea about the nature of AI in Education.

13. Results:

- 1) Only 25% College Teachers have the knowledge about the term AI and its inventor.
- 2) Almost 70% College Teachers do not have knowledge about AI companies.
- 3) Almost 75% Teachers have not proper knowledge about types of AI.
- 4) Most of the College Teachers don't have the knowledge about Machine learning, Deep learning.
- 5) Almost 72% College Teachers do not know about the aim of AI in Education.

14. Conclusion:

The growth of Artificial Intelligence in recent times has been exponential. We cannot even imagine how big and impactful AI is going to be in the near future and how drastically it is going to change and upgrade the world we live in today. There are a lot more to learn about AI and its

rapidly growing applications in our life. We have to believe it would be wise to adapt to this changing world and acquire skills related to Artificial Intelligence and technology. Just like AI learns and develops, we should too - to make this world a better place.

15. Recommendations:

1. Senior College Teachers have to learn about the different types of AI.
2. All Teachers have to utilize the online platforms such as Coursera, edX and Udemy.
3. Senior College Teachers have to attend workshops and conference on Artificial Intelligence.
4. Teachers have to do experiments with all types of AI tools to get deep knowledge about AI.
5. Teachers have to develop a growth mindset and should be ready to try new things.
6. Teachers have to focus on using AI to enhance pedagogy and students' learning outcomes.
7. Teachers have to seek support from administrators for integration of AI into the curriculum and Pedagogy.

Discussion of the Results:

The study aimed to investigate the knowledge and awareness about AI among Senior College Teachers; It is found that senior college teachers have limited knowledge of Artificial intelligence. Major responders were unaware about the various tools, applications of AI in Education. The majority of responders indicated a need for professional development opportunities to learn more about AI and its application in education.

“AI won't replace humans, but those who use AI will replace those who don't.”

-Garry Kasparov

Contribution:

This research will be helpful for all stakeholders, teachers and students and all aspirants who want to learn with AI and enhancement in teaching and learning experiences.

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IMPLEMENTING TEACHER EDUCATION REFORMS (NEP 2020):**CHALLENGES IN BRIDGING POLICY AND PRACTICE****Mr. Nandkishor Damodhar Bodkhe***Assistant Professor**SSR College of Education, Silvassa**Email: - nkishor.bodkhe@gmail.com*

Abstract

Implementing the National Education Policy (NEP) 2020's vision for teacher education reform faces significant challenges in translating policy into practice. This study analyzes perceived obstacles to successful implementation, based on perspectives gathered from policymakers and government officials. Data reveals that resistance to change within the educational system is the most prominent barrier, emphasizing the crucial need for strategies that address the human dimension of reform and cultivate stakeholder buy-in. Beyond resistance, resource limitations, including funding and infrastructure, alongside difficulties in scaling up promising initiatives, pose substantial challenges. Effective reform necessitates a comprehensive approach that goes beyond policy design to encompass robust change management strategies, sustainable resource allocation, and careful logistical planning. Successfully bridging the gap between policy and practice requires a nuanced understanding of the on-the-ground realities experienced by educators, ensuring that reforms are not only theoretically sound but also practically feasible and sustainable over time. Further research exploring teacher perspectives, the role of policy clarity, and effective scaling mechanisms is vital for realizing the NEP 2020's ambitious goals for teacher education.

Key Words: -Reforms, Teacher Education, Implementation, challenges**Introduction**

The education sector worldwide is experiencing substantial transformation, with a renewed emphasis on teacher quality and improved student outcomes. Teacher education reforms are a critical component of these systemic changes, designed to strengthen teacher preparation, professional learning, and pedagogical practice. However, the successful implementation of these reforms presents a complex and multifaceted challenge, particularly in bridging the persistent gap between policy formulation and practical application. While innovative policies and programs are being developed, the implementation of teacher education reforms is often hampered by factors such as inadequate infrastructure, limited financial resources, and resistance to change among teachers, administrators, and other key stakeholders.

The policy-practice gap is particularly pronounced in teacher education, where the translation of policy intentions into tangible classroom practices is influenced by a constellation of factors, including teacher beliefs, school climate, and the broader community context. This study aims to critically examine the challenges associated with implementing teacher education reforms, with a specific focus on closing the gap between policy and practice. By exploring the lived experiences and perspectives of teachers, school administrators, and policymakers, this research seeks to identify both the key challenges and potential opportunities related to the implementation of teacher education reforms and to develop evidence-based strategies for addressing these challenges and enhancing the overall effectiveness of these reforms.

Objectives

1. To identify the challenges faced by policymakers, teacher educators, and school administrators in implementing teacher education reforms.
2. To examine the gap between policy and practice in teacher education reforms.
3. To develop strategies for bridging the gap between policy and practice in teacher education reforms.
4. To analyze the impact of teacher education reforms on teacher quality and student outcomes.

Limitations:

1. Geographical limitations: The study may focus on a B.Ed. colleges affiliated to Savitribai Phule Pune University.
2. Sample size and selection bias: The study has a limited sample size.

Scope:

1. Focus on teacher education reforms: The study focusses specifically on teacher education reforms, exploring the challenges and opportunities in implementing these reforms.
 2. Exploration of policy-practice gap: The study investigates the gap between policy and practice in teacher education reforms, examining the factors that contribute to this gap.
 3. Investigation of stakeholder perspectives: The study explores the perspectives and experiences of various stakeholders, including policymakers, teacher educators, school administrators, and teachers.
 4. Analysis of challenges and opportunities: The study analyzes the challenges and opportunities in implementing teacher education reforms, identifying potential strategies for addressing these challenges.
 5. Development of recommendations: The study provides recommendations for policymakers, teacher educators, and school administrators to improve the implementation of teacher education reforms.
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Research Design

1. Mixed-methods approach: The study employed a mixed-methods approach, combining both qualitative and quantitative methods to collect and analyze data.
2. Case study design: The study used a case study design, focusing on a specific teacher education reform initiative or program.

Sampling Strategy

1. Purposive sampling: The study used purposive sampling to select participants who have expertise and experience in teacher education reforms.
2. Snowball sampling: The study used snowball sampling to recruit additional participants through referrals from initial participants.

Data Collection Methods

1. Document analysis: The study analyzes policy documents, reports, and other relevant documents related to teacher education reforms.
2. Surveys: The study conducts surveys among teachers, school administrators, and policymakers to gather information about their experiences and perceptions of teacher education reforms.

Data Analysis**SWOT Analysis of Teacher Education Reforms under NEP 2020**

The National Education Policy (NEP) 2020 envisions a transformative shift in India's education landscape, with significant implications for teacher education. This analysis examines the strengths, weaknesses, opportunities, and threats associated with these reforms.

Strengths:

- **Integrated Teacher Education Programs (ITEP):** The four-year ITEP offers a more holistic and cohesive approach to teacher preparation by integrating subject matter knowledge with pedagogical training. This integrated structure can potentially lead to more well-rounded and effective teachers.
- **Emphasis on Quality and Accountability:** NEP 2020 prioritizes quality in teacher education, focusing on accountability mechanisms and continuous professional development. This focus aims to enhance teacher competence and promote ongoing improvement in the profession.
- **Focus on Experiential Learning:** The policy promotes hands-on, experiential learning for teacher trainees. This practical approach can better equip teachers with the skills and experience needed to engage students and create effective learning environments.

Weaknesses:

- **Infrastructure and Resource Constraints:** Successful implementation of NEP 2020's ambitious teacher education reforms may be hampered by existing infrastructure
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limitations, resource scarcity, and potential funding gaps. These practical constraints could hinder the rollout and effectiveness of new programs.

- **Potential Resistance to Change:** Introducing significant changes to established systems can encounter resistance from educators and other stakeholders accustomed to traditional practices. This resistance may impede the smooth adoption and implementation of the new reforms.
- **Addressing Marginalized Groups:** While NEP 2020 articulates a commitment to inclusivity, concerns remain about the policy's specific measures to address the unique needs of marginalized groups, including students with disabilities and those from disadvantaged socioeconomic backgrounds.

Opportunities:

- **Enhanced Teacher Training and Professional Development:** The policy's emphasis on continuous professional development creates an opportunity to significantly improve the quality of teacher training. This focus can empower teachers with updated knowledge, skills, and pedagogical approaches.
- **Increased Focus on Technology Integration:** NEP 2020's promotion of technology integration in education presents an opportunity to modernize teaching and learning. Technology can enhance accessibility, personalize learning experiences, and improve educational outcomes.
- **Enhanced Collaboration and Partnerships:** The policy encourages collaboration among educators, policymakers, and other stakeholders. These partnerships can foster innovation, knowledge sharing, and more effective and sustainable reform implementation.

Threats:

- **Inadequate Funding and Resource Allocation:** Insufficient financial resources and inadequate resource allocation pose a significant threat to the successful implementation of NEP 2020's teacher education reforms. Without adequate support, the policy's goals may not be realized.
- **Resistance from Vested Interests:** Resistance to change may also stem from vested interests within the existing educational system. These groups may actively oppose reforms that challenge established norms or power structures, potentially hindering progress.
- **Challenges in Scaling Up Reforms:** Successfully scaling up reforms from pilot projects to nationwide implementation presents a major challenge. Logistical complexities, variations in local contexts, and the need for consistent quality control can create significant hurdles.

Analysis of Survey

Google form created for survey. The link is shared to Teacher Educator, Teachers, Student Teachers and School Administrators.

1. Respondents

Total 48 responses received

Teacher Educators: - 19, Student Teachers: - 23, Teachers: - 5 and School Administrators: - 1

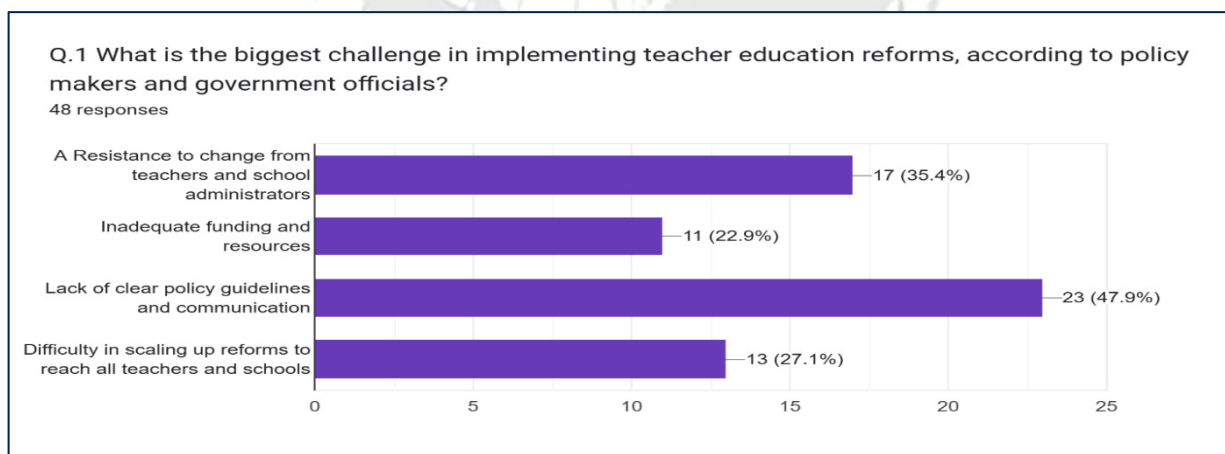
2. Key Challenge: Lack of Clear Policy Guidance

This is the most significant challenge, representing 26.5% of the responses. This suggests a major need for clearer, more defined policies to guide the implementation of reforms.

Other Significant Challenges:

Difficulty in Scaling Up Reforms: This is the second largest challenge at 16.3%. It indicates that while pilot programs or small-scale reforms might be successful, expanding them to a larger scale faces significant hurdles.

Inadequate Funding: This is a recurring concern, mentioned twice in the chart with a combined percentage of 16.3%. This underscores the critical role of financial resources in



successful reform implementation.

Resistance to Change: This is another significant challenge, also mentioned multiple times with a combined percentage of 30.6%. This highlights the importance of addressing resistance from stakeholders to ensure smooth implementation.

Analysis and Implications:

Overall, the chart emphasizes the complex and multi-faceted nature of implementing teacher education reforms. Addressing policy gaps, developing scaling strategies, managing resistance to change, and ensuring adequate resource allocation are crucial for successful reform efforts.

It's important to note that the chart represents the perceptions of policymakers and government officials. Understanding the perspectives of other stakeholders, such as teachers and students, would provide a more comprehensive picture of the challenges involved.

3. Strategies for Improvement

Key Observations:

Top Strategies: The most favored strategies for improving teacher education reforms, according to policymakers and government officials, are:

Conducting regular evaluations and assessments: This received the highest number of responses (21, 43.8%), indicating a strong belief in the importance of monitoring and feedback.

Providing more training and support for teachers: This closely follows with 20 responses (41.7%), emphasizing the need for ongoing professional development.

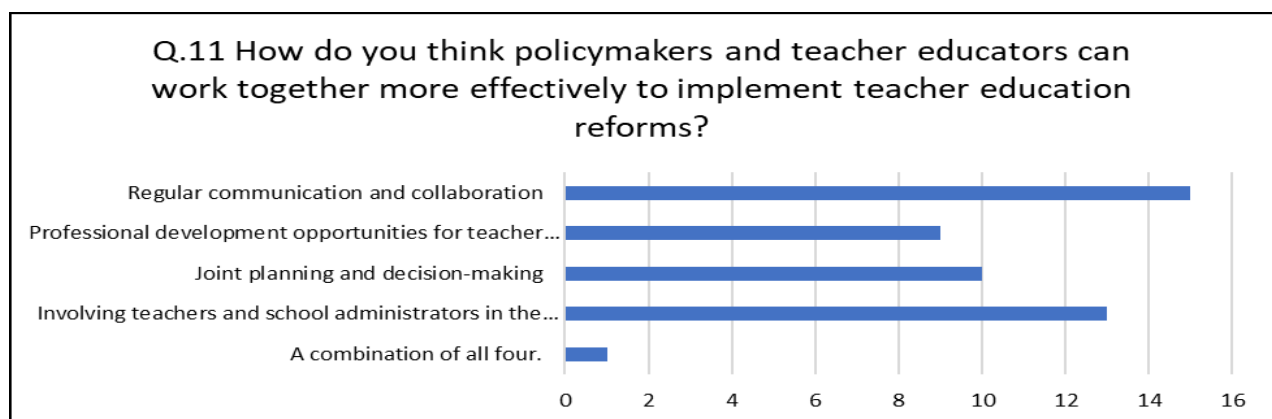
Funding as a Factor: Increasing funding and resources, while important, is considered less impactful than the other two strategies, with 14 responses (29.2%).

Involving Stakeholders: Involving teachers and school administrators in the reform process received the fewest responses (11, 22.9%), suggesting that while their involvement is likely still seen as valuable, it's perceived as less critical than evaluations/assessments and direct teacher support.

In conclusion, this chart reveals a preference for data-driven, teacher-centric approaches to improving teacher education reforms. Policymakers and government officials appear to prioritize evaluations, teacher support, and strategic resource allocation over direct stakeholder involvement. It's important to consider the potential limitations of this perspective and ensure that the voices of teachers and administrators are adequately heard and addressed in the reform process.

4. Strategies for Effective Collaboration:

- **Regular communication and collaboration:** 27.1%
- **Joint planning and decision-making:** 18.8%
- **Professional development opportunities for teacher educators:** 20.8%
- **Involving teachers and school administrators in the reform process:** 31.3%
- **A combination of all four:** (This slice is too small to determine a percentage, but it's clearly present)



Interpretation:

The data suggests that effective collaboration between policymakers and teacher educators requires a multi-faceted approach that prioritizes communication, involvement of practitioners, and

support for educators.

- **Involving Practitioners:** The high response rate for involving teachers and school administrators underscores the importance of including those who are directly involved in implementing reforms. This suggests that reforms are more likely to succeed when they are informed by the experiences and perspectives of practitioners.
- **Communication and Collaboration:** The emphasis on regular communication and collaboration highlights the need for ongoing dialogue and cooperation between policymakers and teacher educators. This implies that effective collaboration requires establishing clear channels of communication and creating opportunities for shared learning and problem-solving.
- **Supporting Teacher Educators:** The significant response rate for professional development opportunities for teacher educators suggests that providing educators with the necessary training and support is crucial for successful reform implementation. This might include opportunities to learn about new teaching strategies, develop culturally responsive practices, or use technology effectively.
- **Shared Decision-Making:** The response rate for joint planning and decision-making suggests that shared leadership and decision-making are important for effective collaboration. This implies that policymakers and teacher educators should work together to develop and implement reforms, rather than working in isolation.

In conclusion, this chart emphasizes the importance of a multi-faceted approach to collaboration between policymakers and teacher educators. The most highly valued strategies include involving practitioners, fostering regular communication, supporting teacher educators, and promoting shared decision-making. A combination of these strategies is likely to be most effective in implementing teacher education reforms successfully.

Based on the analysis of the charts and considering the topic "Implementing Teacher Education Reforms (NEP 2020): Challenges in Bridging Policy and Practice," here are some recommendations for further studies:

5. Obstacles to implementing teacher education reforms

Key Findings:

Resistance to Change is the Biggest Obstacle: The most significant challenge, by a considerable margin, is the "Resistance to change from teachers and school administrators." This suggests that human factors and ingrained practices are major impediments to reform efforts.

Lack of Funding and Resources is a Significant Issue: "Lack of funding and resources" is the second largest obstacle. This highlights the practical and financial constraints that often hinder successful implementation of new programs.

Inadequate Infrastructure and Scaling Difficulties: "Inadequate infrastructure and technology for teacher education programs" and "Difficulty in

scaling up reforms" represent similar levels of challenge. These point to logistical and systemic issues related to implementation capacity.

Further Analysis and Considerations:

Magnitude of Difference: The resistance to change is substantially higher than the other obstacles, indicating it's a particularly critical issue to address.

Interconnectedness of Challenges: The obstacles are likely interconnected. For instance, scaling difficulties might be exacerbated by limited funding and resources. Inadequate infrastructure could also contribute to resistance to change, as teachers may be hesitant to adopt new methods without proper support.

Implications for Policy: The findings suggest that successful teacher education reform requires more than just well-designed policies. It necessitates strategies to address resistance to change, secure adequate funding, improve infrastructure, and develop effective scaling mechanisms.

Limitations of the Data: The chart presents a specific viewpoint (policymakers and government officials). It would be valuable to understand the perspectives of teachers, school administrators, and other stakeholders to gain a more comprehensive understanding of the challenges.

6. Measurement methods for the new reforms:

- **Through student achievement data:** 16 responses (33.3%)
- **Through teacher evaluation and feedback:** 17 responses (35.4%)
- **Through school-level data on teacher quality and retention:** 13 responses (27.1%)
- **Through a combination of these metrics:** 16 responses (33.3%)

In conclusion, this response reveals a preference for using a combination of metrics, particularly teacher evaluation and feedback and student achievement data, to assess the effectiveness of teacher education reforms. While school-level data is considered, it's not seen as the most critical measure. A comprehensive approach that incorporates multiple perspectives and data sources is likely to provide the most accurate and nuanced understanding of the impact of reforms.

Recommendations for Further Studies:

- **Understanding Teacher Perspectives:** Conduct qualitative research to explore teachers' experiences with and perceptions of the reforms. This will provide valuable insights into the reasons for resistance to change and identify strategies for addressing it.
- **Impact of Policy Clarity:** Investigate the relationship between policy clarity and implementation success. This could involve comparative case studies of reforms implemented under different policy conditions.
- **Scaling Strategies:** Research effective strategies for scaling up successful pilot programs. This should include examining the role of infrastructure, funding, and logistical planning.

- **Long-Term Impact:** Conduct longitudinal studies to assess the long-term impact of teacher education reforms on teacher quality, student achievement, and school improvement.
- **Stakeholder Engagement:** Explore the effectiveness of different stakeholder engagement strategies in promoting buy-in and successful implementation of reforms.
- **Resource Allocation:** Investigate the relationship between resource allocation and reform success. This should include examining the impact of funding levels, resource distribution, and resource utilization.

Conclusion:

Implementing teacher education reforms is a complex undertaking with multiple challenges. Addressing these challenges requires a multi-faceted approach that considers the perspectives of all stakeholders, focuses on clear policy guidance, provides adequate resources and support, and fosters effective collaboration. Further research is needed to deepen our understanding of the factors that contribute to successful reform implementation and to develop evidence-based strategies for overcoming the obstacles that hinder progress.

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THE ROLE OF ARTIFICIAL INTELLIGENCE IN SHAPING HUMAN VALUES

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Abstract

Artificial intelligence (AI) has become increasingly pervasive in modern society, influencing various aspects of human life. As AI systems become more prevalent, their influence extends to the shaping of human values and beliefs. This paper explores the role of AI in shaping human values, examining both the positive and negative impacts. We argue that AI has the potential to both reinforce and challenge existing values, and that its influence will depend on how it is designed and used.

Key Words- Artificial intelligence, Human Values, Impact.

Introduction

Artificial Intelligence (AI) has permeated contemporary life, influencing communication, work, and many other activities. The increasing sophistication and integration of AI systems raise crucial questions about their effect on human values. This paper explores whether AI's influence on human values will ultimately be constructive or detrimental. AI has profoundly altered fields ranging from healthcare and education to finance and entertainment. Its growing pervasiveness necessitates an examination of its influence on human values. Does AI strengthen existing values, or does it promote novel ones? Can AI-driven value formation contribute to a more equitable society, or does it threaten human dignity and autonomy?

Human values are the foundational principles that inform our behaviour and structure our societies. They represent our core beliefs about what is ethically desirable and important. These values are dynamic, evolving through the influence of culture, education, and individual experiences.

Some examples of human values include:

- **Respect:** Recognizing and honouring the inherent worth of every individual.
 - **Compassion:** Showing empathy and concern for the suffering of others.
 - **Honesty:** Being truthful and sincere in our words and actions.
 - **Justice:** Upholding fairness and equality for all.
 - **Responsibility:** Being accountable for our actions and their consequences.
 - **Integrity:** Adhering to strong moral principles.
 - **Kindness:** Being generous and considerate towards others.
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- **Courage:** Facing challenges and adversity with strength and determination.
- **Wisdom:** Seeking knowledge and understanding to make sound judgments.

Positive Impacts of AI on Human Values

AI has the potential to positively shape human values in several ways:

1. **Promoting Efficiency and Productivity:** AI can automate routine tasks, freeing humans to focus on more creative and meaningful work. This can lead to a greater sense of purpose and fulfillment (Brynjolfsson & McAfee, 2014).
2. **Enhancing Education:** AI-powered educational tools can provide personalized learning experiences, helping students to develop important skills and values such as critical thinking and empathy (Luckin et al., 2016).
3. **Improving Healthcare:** AI can help doctors and healthcare professionals to make more accurate diagnoses and develop more effective treatment plans. This can lead to a greater appreciation for the value of human life and health (Esteva et al., 2017).

Negative Impacts of AI on Human Values

However, AI also has the potential to negatively shape human values:

1. **Reinforcing Bias and Discrimination:** AI systems can perpetuate existing biases and discrimination if they are trained on biased data. This can lead to a reinforcement of negative stereotypes and values (Barocas & Selbst, 2019).
2. **Eroding Privacy:** AI-powered surveillance systems can erode individuals' right to privacy, leading to a devaluation of this important human value (Zuboff, 2019).
3. **Creating Dependence and Addiction:** AI-powered technologies such as social media and video games can be designed to be highly addictive, leading to a devaluation of important human values such as relationships and community (Kuss & Griffiths, 2011).
4. **Erosion of Empathy:** As AI takes on more tasks, especially those involving social interaction, there's a risk of decreased human-to-human contact. This could lead to a decline in opportunities to practice empathy and develop social skills.
5. **Diminished Respect for Human Labor:** Increased automation may lead to a devaluation of human labour, particularly in repetitive or manual tasks. This could affect our respect for the contributions of others and create social inequalities.
6. **Devaluation of Human Connection:** As AI becomes more sophisticated in mimicking human interaction, there's a risk that we may start to value these artificial connections over genuine human relationships, potentially impacting our sense of humanity.

Research Question

How does Artificial Intelligence (AI) influence human values, and what are the implications of AI-driven value formation for individuals and society?

Methodology

This study employed a mixed-methods approach, combining qualitative and quantitative data collection and analysis methods.

1. Literature Review: A comprehensive review of existing research on AI, ethics, and human values was conducted to identify key themes and debates.
2. Survey: An online survey was administered to a sample of 50 individuals, aged 18-65, to gather data on their perceptions of AI and its impact on human values.
3. Interviews: In-depth interviews were conducted with 5 experts in AI, ethics, and philosophy to gather more nuanced insights into the relationship between AI and human values.

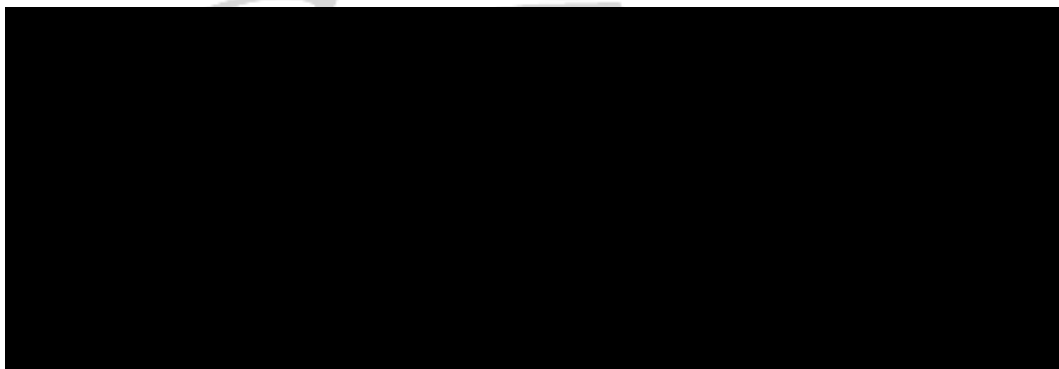
Sample:

The survey sample consisted of 50 individuals, aged 18-65, from diverse backgrounds and professions. The expert interviewees were selected based on their expertise in AI, ethics, and philosophy.

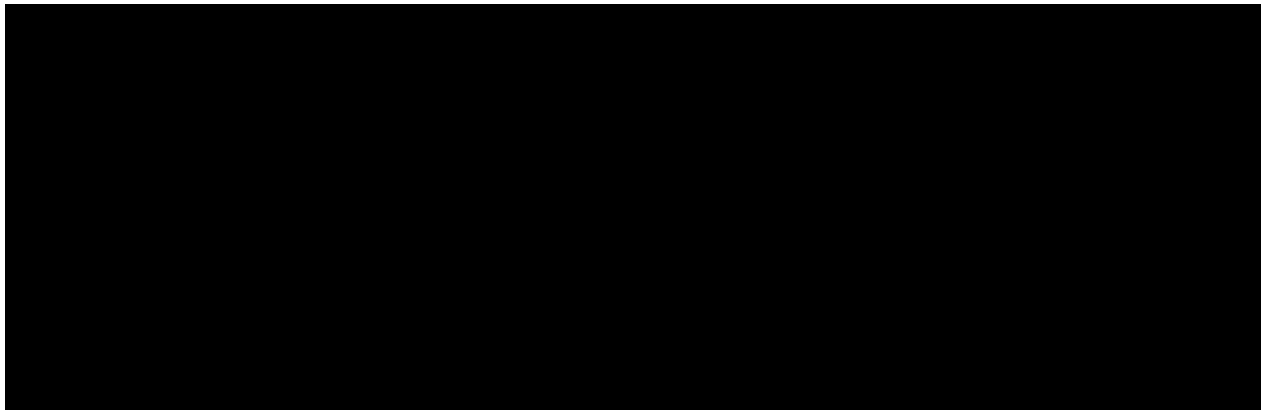
Findings

The study's findings can be summarized as follows:

1. AI's influence on human values: The majority of survey respondents (70%) believed that AI has the potential to shape human values(Yes), with 40% indicating that AI already influences their personal values(No).



2. Value alignment: Experts emphasized the importance of aligning AI systems with human values, highlighting the need for value-aware AI design and development.
3. Risks and challenges: Respondents and experts alike identified potential risks and challenges associated with AI-driven value formation, including bias, manipulation, and erosion of human autonomy.
4. Opportunities for value enhancement: Despite these risks, many respondents (60%) believed that AI can enhance human values, such as empathy, fairness, and cooperation.



Conclusion

Human values are not merely abstract concepts; they are lived experiences that shape our interactions and define our character. By consciously cultivating and practicing positive human values, we can create a more just, compassionate, and harmonious world for ourselves and future generations.

AI has the potential to both positively and negatively shape human values. While it can promote efficiency, education, and healthcare, it can also reinforce bias, erode privacy, and create dependence. Ultimately, the impact of AI on human values will depend on how it is designed and used. As we continue to develop and integrate AI into our lives, it is essential that we prioritize human values such as empathy, fairness, and transparency.

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TRANSFORMING EDUCATION WITH AI: IMPLEMENTING NEP 2020 FOR FUTURE-READY LEARNING

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Abstract

Artificial Intelligence (AI) in education stands to transform the dynamics of the teaching-learning process and align with the vision expressed in India's National Education Policy (NEP) 2020. This study outlines the role of AI-integrated technologies in enriching personalized learning, promoting administrative productivity, and empowering teachers to build a more diversified and future-ready vocational framework. Using the power of AI and adaptive assessments, intelligent tutoring systems and automated content generation, we could turn the vision of NEP 2020 into reality in a holistic, flexible and multidisciplinary way. It also discusses the challenges of AI adoption in education including issues of data privacy, ethical concerns, and a digital divide. It better signifies the need for reinforcements of policies, skill training and AI enabled training for teachers to shape learning spaces that are equal and effective. The paper based on a curation of global best practices/case studies provides actionable insights on effective and efficient use of AI within the framework of NEP 2020. The results showcase how AI can completely transform India's education landscape, paving the way for an age of innovation, accessibility and lifelong learning. The project closes with suggestions for how policymakers, educators and technologists can collaborate to effectively harness AI for the next-gen learning ecosystem.

Keywords: Artificial Intelligence, NEP 2020, Personalized Learning, AI in Education, Teacher Training, Ethical AI, Future-Ready Learning.

1. Introduction

1.1 Overview of AI's role in modern education

Artificial Intelligence (AI) has been transforming education through better learning experiences, teaching methods and administrative efficiencies. As countries and educational institutions embark on the road towards digital transformation, AI-based tools are enabling a more

personalized, adaptive and data-driven approach towards education. AI analyses data from students and creates a personalized learning path for them. But intelligent tutors offer just-in-time personalized support, helping students develop an understanding of challenging material. Chatbots also serve as an aid to students by answering their queries which has helped reduce the work of the educators while providing adequate learning assistance to students 24*7. For education sector, prediction analytics, automated grading system, and smart content development, AI enhances teaching methodologies. With AI-powered insights, educators can identify struggling students early on and customize lesson plans, focusing on individual learning needs[1]. AI is also used to facilitate teacher training programs by providing interactive simulations, and even AI-driven coaching and feedback systems to help improve pedagogic strategies. Administrative processes are another area where AI can help as automated attendance systems, AI-driven scheduling, and predictive enrollment analytics assist institutional operations. AI alleviates the routine by automating the administrative tasks, allowing educators to focus that time on teaching and mentoring their students. But the application of AI in education has its challenges, including data privacy concerns, ethical considerations, and a digital infrastructure. So overcoming these challenges with responsible AI implementation can ensure tech complements, and not diverts from, human educators. Besides, AI integration focusses in line with India's National Education Policy (NEP) 2020 that advocates flexible, inclusive and tech powered learning. With the technological transformation of India, AI has the potential to bridge the learning gap, promote accessibility, and digitally-upskill students and revolutionize the Indian education system[2].

1.2 Introduction to NEP 2020 and its vision for education reform

The path to flexibility and technology-driven learning is long for India, a journey set in motion by the National Education Policy (NEP) 2020. The policy replaces the National Education Policy (NEP) which was framed in 1986 and aims to align Indian education system with 21st century, ensuring equity and inclusion. The learner remains at the center of the experience emphasizing understanding, analysis, interdisciplinary learning[3]. The policy prescribes a 5+3+3+4 curricular structure, experiential learning, competency-based assessment, and reduction of syllabus overburden. Integrating technology: modernization education with AI, machine learning, and digitalization It encourages AI-driven personalized learning, online and blended learning models and EdTech innovations to make learning possible for everyone, particularly in the hinterlands. It also promotes teacher training program combining AI and digital pedagogies[4]. NEP 2020 seeks equitable access, ambitious 2030 targets for quality education in school, including a target of 100% Gross Enrollment Ratio (GER) in school education, and a significant increase in higher education enrollment. It is a recommended program to become a well-rounded individual with the additional flexibility to change direction midway through your course work with vocational training with the valuable skills needed on current job markets. NEP

2020 addresses the digital divide, lifelong learning, and future-ready skills through the integration of AI and emerging technologies[5].

1.3 The need for AI-driven transformation in Indian education

The Indian education system is seeing a paradigm shift with the National Education Policy (NEP) 2020. Artificial Intelligence (AI) will play the most vital role in the delivery of learning that is holistic, flexible, and future-ready. AI is able to fill learning gaps, provide additional support to teachers, provide resources for teacher training, promote equitable access to education, automate administrative processes, prepare students for the future job market, and tackle learning loss and dropout ratios. AI-based personalized learning solutions have the capacity to adapt to individual learner's requirements and can suggest personalized content and assessments. AI based intelligent tutoring systems offer a way for real-time insights to be gained in terms of student performance and also towards improving the teaching methodologies. AI-powered EdTech platforms can help democratize learning for those in rural and economically challenged backgrounds and build an inclusive and multilingual system of learning. AI-powered education also prepares students for the Fourth Industrial Revolution, equipping them with skills such as problem-solving, critical thinking and data literacy[6].

1.4 Research Objectives and Scope

- Exploring how AI fits into the vision of the NEP 2020 regarding digital transformation.
- Assessing AI augmented personalized learning systems for increased student involvement and learning efficacy.
- The influence of AI on the training and development of teachers.
- The use of automation solutions in areas such as education administration such as automated grading and predictive analytics.
- Observing challenges and ethics in AI-directed pedagogy.
- Providing guidelines for seamless infiltration of AI in Indian academic institutions.

This research explores the implementation of AI technologies in educational institutions, focusing on K-12 schools, higher education, and vocational training centers. It discusses the alignment of AI with policy goals, challenges, and future prospects, including ethical AI adoption and regulatory policies.

2. NEP 2020 and the Need for AI in Education

2.1 Key highlights of NEP 2020 relevant to AI integration

NEP 2020 focuses on technological driven education; It points out the pivotal role of Artificial Intelligence (AI) in learning outcomes, accessibility and administrative efficiency. Also Read: Highlights include learning from digital and AI-driven learning platforms, promotion of AI-powered platforms for blended and remote learning, and establishing the National Educational Technology Forum (NETF) for promoting AI adoption. It also promotes personalized and all-

inclusive education, calling for the use of AI-powered multilingual learning platforms and AI-assisted tools for disabled students. It also aims for AI-enabled teacher training and professional development, enabling virtual classrooms and AI-enabled mentoring systems[7]. And it also recommends administrative streamlining and data-driven decision-making, suggesting the use of AI-powered education management systems for automated grading and attendance tracking. It also highlights AI as “catalyst” skills for students and encourages partnerships with AI industry leaders. Finally, the program encourages AI-based EdTech innovations to create better digital learning experiences and supports AI-based research programs to make education more accessible and efficient.

2.2 AI’s role in personalized learning, teacher training, and curriculum design

Personalized learning is powered by AI systems and offer personalized education experiences. Some examples of these systems are adaptive learning systems, intelligent tutoring systems, chatbots, and gamification and interactive learning. Utilizes real-time feedback to adjust the difficulty of content as a student progresses (or struggles), gamified content, and VR and AR integration for improved engagement and retention. Coursera and Duolingo track user progress with AI[8].Google O2Platform’s interactive teaching insights offer coaching for educators like Google’s “AI for Education.”

Using data up to October 2023, AI is transforming curriculum planning, studying students learning trends, suggesting places to change, and anticipating changes in job market. It automates even content creation, freeing from static textbooks, and makes content more suitable for different language speakers. This is a data-driven approach that also allows universities to optimize courses and schedule based on student performance and industry trends in real time[9].

3. AI Applications in Future-Ready Learning

AI is revolutionizing education; it has opened up doors for future-ready learning environments that are personalized, adaptable, and efficient. AI applications are transforming how students learn, how teachers teach and the nature of assessments.

3.1 Personalized Learning & Adaptive Assessments

On the frontiers of personalized learning & adaptive assessments, AI are bringing platforms like Coursera and Byju's that modify lesson complexity with respect to the student progress. For instance, AI-enabled chatbots and virtual assistants can help students get their doubts cleared instantly, content recommendations, and help with a study schedule. VR and AR bring immerse learning experiences, and AI-powered multi-lingual content support to ensure inclusivity in education. Some of its application areas include real-time performance tracking, automated grading, predictive analytics of student success, skill-based assessment, and exam proctoring for adaptive assessments. AI-powered tools offer predictions of learning deficits and risks of dropping out, as well as possible intervention strategies. Skill-based exams test critical

thinking, problem-solving, and domain-specific skills. Likewise, exam/proctoring systems can actually sense indeterminate behavior in the online examinations, validating the language proficiency results. For example, Khan Academy's AI-based tutor personalizes content according to the specific requirements of each student[10].

3.2 Intelligent Tutoring Systems & Virtual Assistants

Artificial Intelligence (AI) is making a difference in education in several ways, including Intelligent Tutoring Systems (ITS) and Virtual Assistants. These systems aim to support students through tailored, real-time educational experiences while also helping teachers to alleviate workload and enhance engagement, accessibility, and effectiveness. Intelligent tutor system (ITS) generates some human factor such as how human tutor acting, personalized adaptive learning paths. They provide real-time feedback, tailor content difficulty based on student performance, and generate personalized study plans. AI virtual assistants can provide help to analyze student reports, educators, and administrators for managing queries, scheduling tasks, providing educational support and more. They act as an instant query responder to students, assist in homework and assignments, make lesson plans for the teachers, help to automate the administrative work of an institution and enhance language learning. Carnegie Learning's AI-powered tutor, for instance, tailors' math problems to a student's progress. These systems based on artificial intelligence work as a link between students and teachers, making learning easier, more enjoyable, and more effective[11]. The role of these technologies is significant in customizing the education, streamlining the administrative work and deepening the engagement process thus, showing the relevance of these technologies in developing and executing a future-ready learning ecosystem in correspondence with the ethos of NEP 2020.

3.3 AI in Teacher Training & Professional Development

Artificial intelligence is transforming teacher training and professional development, providing personalized learning experiences, automated feedback, and data-driven insights. AI-Powered Platforms Support Educators AI-enabled platforms assist teachers in honing their skills, discovering new teaching methods, and increasing student engagement. Some examples of AI-powered personalized teacher training include adaptive learning modules, AI-driven skill assessment, real-time feedback on teaching methods, virtual reality and simulated classrooms. AI is improving teacher efficiency by helping automate administrative and academic processes, allowing teachers to spend more time on student engagement and pedagogy. Features of AI that aid ongoing professional development include personalized learning paths, collaboration, reports on teaching practices, and analysis of speech and interaction. With the integration of AI, Besides empowering teachers, it can also aid in improving student learning outcomes and preparing a future-ready education system, as articulated in NEP 2020[12].

3.4 Automated Administration & Smart Classrooms

The educational sector is significantly being aided by utilizing AI towards its automation of administrative exercise, enhancing how lessons are taught in the classroom. This reduces workload for teachers, increase efficiency, and helps to create interactive learning environments. Attending automation through AI, Automatic Attendance Tracking and Grading, Scheduling, Chatbots for student support, Predictive Analytics. AI, IoT, and cloud computing is used in smart classrooms to create learning spaces. These encompass interactive whiteboards, virtual and augmented reality tools, real-time student engagement monitoring, adaptive content delivery, and seamless integration with learning management systems. Such innovations complement the NEP 2020 vision of bringing technology into the education system, leading to a future-ready, digitally empowered learning ecosystem[13].

4. Ethical and Implementation Challenges

Challenges of Ethics in Artificial Intelligence Integration:

- **Data Privacy & Security:** As AI tools depend upon student data, they lead to safety concerns like data breaches, unauthorized access, and misuse of sensitive information.
- **Algorithmic Bias & Fairness:** If the training data is biased, it will also reinforce gender, socio-economic and regional biases in AI Models.
- **Black Box of AI Decision Making:** AI-driven grading and assessment algorithms are black-box systems that is, the algorithms used to make these decisions are not generally well explained.

Challenges in Adopting AI: Implementation Challenges

- **Infrastructure & Digital Divide:** Many rural and underprivileged areas still do not have access to high-speed internet, AI powered devices, or even regular electricity.
- **AI Integration Cost:** Implementing AI in education systems demands considerable investment in technology, teacher training, and maintenance.
- **Resistance to Change:** Teachers and administrators may resist AI-driven tools for various reasons such as lack of awareness, fear of job loss or insufficient technical training.
- **Regulatory & Ethical Compliance:** Regulatory and ethical compliance is compulsory for AI implementation, which includes government policies, cybersecurity and ethical guidelines overall slowdown the adoption.

5. Global Best Practices and Case Studies

Many countries have already achieved success in deploying AI-driven education, showcasing best practices and innovative approaches that India can take inspiration from while implementing NEP 2020. Global case studies including successful integration of AI in areas such as personalized learning, teacher training, automated administration and smart classrooms.

- **Finland:** AI in Educator Development & Curriculum Planning: Integrates AI-powered professional development tools for educators and embeds AI into the national curriculum.
- **China:** Squirrel AI: AI-driven Smart Classrooms & Adaptive Learning Based Intelligent Delivery Systems | Analysis of Learner's Learning Effectiveness Using AI | AI-powered Squirrel AI provides the effective feedback based on face recognition and closures.
- **USA:** AI-Driven Assessments & Automated Administration: Tools like Edgenuity and Knewton personalize learning paths, automate grading and use predictive analytics for dropout prevention.
- **UK:** AI for Inclusive & Special Education: AI-based assistive technologies, such as Seeing AI, Voiceitt, can help with students with visual or speech impairments.

Case Studies

- Carnegie Learning's AI-Based Math Tutor (USA): Increases math mastery and self-assurance among pupils, closing learning gaps in subjects such as mathematics and science.
- Squirrel AI Adaptive Learning Platform (China): An adaptive learning system that analyses students' strengths, weaknesses and learning patterns with a goal of increasing student engagement, retention and academic performance
- Microsoft's AI Teacher Training (Finland): AI enabled professional development program helps educators with customized training, content recommendations based on AI technology & real-time analytics in a classroom.

In conclusion, AI has the potential to help with personalized learning, teacher training, smart classrooms, and inclusive education and accelerate AI-driven educational reforms under NEP 2020.

6. Future Directions and Policy Recommendations

Future Directions for AI in Education:

- **Centralized AI-driven educational** platform for personalization, automatic assessment tools and teacher training.
- **AI for Multilingual & Inclusive Learning:** AI-enabled language translation and voice assistants to learn in a regional language.
- **AI Powered Smart Assessment & Predictive Analytics:** AI can forecast trends in student performance/behavioral patterns, and automate proctoring of online examinations making it secure.
- **Building a response to ethical AI in education:** National frameworks to mitigate bias, data privacy, and fairness in AI-driven educational tools.
- **Collaboration between Industry and Academia in AI for Education:** AI startups, EdTech companies collaborate with universities to build AI-led educational products.

Policy Recommendations for Implementing AI in Education:

- **National AI Education Strategy:** Developing an all-encompassing AI strategy for education under the NEP 2020.
- **AI Infrastructure Development:** Investment in AI-enabled smart classrooms and providing high-speed internet and digital devices, primarily for villages and underserved regions.
- **Teacher Training:** AI-powered training and development for teachers at the national level through DIKSHA and NISHTHA platforms.
- **AI-Based Research & Development Incentives:** Support for AI research in education technology via grants and innovation hubs.

7. Conclusion

Integrating Artificial Intelligence (AI) into education offers a groundbreaking opportunity to improve educational outcomes, optimize administrative functions, and assist teachers, thus resonating with the aspirations of the National Education policy (NEP) 2020. AI-powered solutions like personalized learning, adaptive assessments, intelligent tutoring systems and smart classrooms can bridge the learning gap, promote inclusion, and impart future-ready skills to students. Nonetheless, harnessing the power of artificial intelligence in education will involve significant challenges, consequences of which include ethical issues, data protection and privacy, algorithmic bias, and the issue of available infrastructure. By adopting global best practices, investing in AI powered teacher training, and ensuring equitable access to AI-driven education, India can harness the full potential of AI to build a robust and inclusive learning ecosystem. Recommending future policy directions such as formulating a national AI education plan, enhancing AI infrastructure, upholding ethical standards, and encouraging partnerships between industry and academia. However, implementing such initiatives will help India to achieve the goals while establishing itself as a leader in AI-powered education worldwide. This study connects the philosophical aspects of education with the application of AI, and reshape our mindset from the technological approach to humanity-based scenarios. With the proper policies, investment and vision, AI can be a game-changer for our education system in India and prepare the future generation of digitally empowered citizens.

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IKS AND THE DIGITAL LIBRARY: BRIDGING TRADITIONAL KNOWLEDGE WITH MODERN TECHNOLOGY

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Abstract:

Indigenous Knowledge Systems (IKS), encompassing the accumulated wisdom, practices, and beliefs of indigenous communities, are vital for understanding and addressing contemporary challenges. However, IKS faces threats of erosion and loss. Digital libraries offer a powerful platform for preserving, accessing, and disseminating IKS, bridging the gap between traditional knowledge and modern technology. This paper explores the potential of digital libraries to support IKS, examining the benefits, challenges, and strategies for effective integration. It emphasizes the importance of community involvement, ethical considerations, and culturally sensitive approaches to ensure the preservation and accessibility of IKS for future generations.

Keywords: IKS, AI, Digital Library ,Integration, Modern Technology.

1. Introduction:

Indigenous Knowledge Systems (IKS) are dynamic and evolving bodies of knowledge, practices, beliefs, and values developed by indigenous communities over generations. They encompass a deep understanding of local environments, natural resources, and cultural practices. IKS is crucial for addressing issues like climate change, biodiversity conservation, and sustainable development. However, IKS is often marginalized and threatened by globalization, modernization, and a lack of recognition. Digital libraries, with their capacity to store, organize, and disseminate information, offer a valuable tool for preserving and promoting IKS.

IKS and the Digital Library: A Powerful Partnership

Indigenous Knowledge Systems (IKS) represent a vast and invaluable treasure trove of wisdom, practices, and beliefs developed by indigenous communities over generations. This knowledge, deeply rooted in their unique experiences and connection to their environments, holds immense potential for addressing contemporary challenges and fostering sustainable development. However, IKS faces threats of erosion and loss due to various factors, including globalization, modernization, and a lack of recognition.

Digital libraries have emerged as a powerful tool for preserving, accessing, and disseminating IKS, bridging the gap between traditional knowledge and modern technology. By digitizing and organizing IKS materials, digital libraries can:

- **Preserve:** Safeguard IKS from physical deterioration and loss, ensuring its longevity for future generations.
- **Enhance Accessibility:** Make IKS accessible to a wider audience, including indigenous communities, researchers, policymakers, and the general public, regardless of geographical location.
- **Promote Dissemination:** Facilitate the sharing and dissemination of IKS, fostering intercultural understanding, knowledge exchange, and appreciation for diverse perspectives.
- **Empower Communities:** Enable indigenous communities to manage, control, and share their own knowledge, fostering cultural revitalization, self-determination, and ownership of their heritage.
- **Organize Knowledge:** Utilize metadata and classification systems to organize and categorize IKS, making information searchable and retrievable, enhancing its usability and impact.

However, integrating IKS into digital libraries presents unique challenges that must be addressed with careful consideration and sensitivity:

- **Cultural Sensitivity:** IKS often contains sensitive information, restricted knowledge, and intellectual property rights that must be meticulously respected.
- **Community Ownership:** Indigenous communities must be at the center of the digitization and preservation process, with their participation in decision-making, data management, and knowledge dissemination being crucial.
- **Language and Format Diversity:** IKS is often expressed in indigenous languages and diverse formats, requiring digital libraries to support multilingual interfaces and accommodate various media types.
- **Bridging the Digital Divide:** Many indigenous communities lack access to reliable internet connectivity and digital devices, necessitating efforts to bridge this divide and ensure equitable access to digital libraries.
- **Long-Term Sustainability:** Maintaining digital libraries and ensuring the ongoing preservation of IKS requires long-term funding, technical support, and infrastructure.

To effectively integrate IKS into digital libraries, a multi-faceted approach is essential:

- **Community-Based Approach:** Prioritize community participation in all project stages, from planning and implementation to evaluation and management.

- Ethical Frameworks: Develop and implement ethical protocols for handling sensitive information, respecting cultural protocols, and ensuring intellectual property rights.
- Culturally Appropriate Metadata: Utilize metadata schemas that are culturally appropriate and reflect the specific characteristics of IKS.
- Multilingual Support: Develop multilingual interfaces and support the use of indigenous languages in digital libraries.
- Capacity Building: Provide training and education for indigenous communities in digital literacy, data management, and digital preservation.
- Collaborative Partnerships: Foster collaboration between libraries, archives, museums, research institutions, and indigenous organizations.

By embracing a culturally sensitive and community-based approach, digital libraries can play a vital role in safeguarding IKS for future generations. This partnership not only preserves invaluable knowledge but also contributes to global knowledge diversity, supports the resilience and self-determination of indigenous communities, and fosters a deeper understanding of our shared human heritage.

2. The Potential of Digital Libraries for IKS:

Digital libraries offer numerous benefits for IKS preservation and access:

- **Preservation:** Digitization allows for the creation of digital surrogates of physical artifacts, audio-visual recordings, and textual documents related to IKS, safeguarding them from physical deterioration and loss.
- **Accessibility:** Digital platforms make IKS accessible to a wider audience, including indigenous communities, researchers, policymakers, and the general public, regardless of geographical location.
- **Dissemination:** Digital libraries can facilitate the sharing and dissemination of IKS, promoting intercultural understanding and exchange.
- **Community Engagement:** Digital platforms can empower indigenous communities to manage, control, and share their own knowledge, fostering cultural revitalization and self-determination.
- **Knowledge Organization:** Digital libraries can utilize metadata and classification systems to organize and categorize IKS, making it easier to search and retrieve information.

3. Challenges and Considerations:

Integrating IKS into digital libraries presents several challenges:

- **Cultural Sensitivity:** IKS often contains sensitive information, restricted knowledge, and intellectual property rights that must be respected. Digital libraries must implement protocols for managing access and ensuring cultural protocols are followed.

- **Community Ownership:** Indigenous communities must be at the center of the digitization and preservation process. Their participation in decision-making, data management, and knowledge dissemination is crucial.
- **Language and Format:** IKS is often expressed in indigenous languages and diverse formats. Digital libraries must support multilingual interfaces and accommodate various media types, including oral traditions, songs, and traditional art forms.
- **Technological Infrastructure:** Many indigenous communities lack access to reliable internet connectivity and digital devices. Bridging the digital divide is essential for ensuring equitable access to digital libraries.
- **Sustainability:** Long-term funding and technical support are necessary for maintaining digital libraries and ensuring the ongoing preservation of IKS.

4. Strategies for Effective Integration:

Effective integration of IKS into digital libraries requires a multi-faceted approach:

- **Community-Based Approach:** Prioritize community participation in all stages of the project, from planning and implementation to evaluation and management.
- **Ethical Guidelines:** Develop and implement ethical protocols for handling sensitive information, respecting cultural protocols, and ensuring intellectual property rights.
- **Metadata Standards:** Utilize metadata schema that are culturally appropriate and reflect the specific characteristics of IKS.
- **Multilingual Support:** Develop multilingual interfaces and support the use of indigenous languages in digital libraries.
- **Capacity Building:** Provide training and education for indigenous communities in digital literacy, data management, and digital preservation.
- **Collaboration and Partnerships:** Foster collaboration between libraries, archives, museums, research institutions, and indigenous organizations.

5. Conclusion:

Digital libraries offer a powerful tool for bridging traditional knowledge with modern technology, enabling the preservation, access, and dissemination of IKS.

However, successful integration requires a culturally sensitive and community-based approach.

By prioritizing community ownership, ethical considerations, and technological accessibility, digital libraries can play a vital role in safeguarding IKS for future generations and supporting the resilience and self-determination of indigenous communities.

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A STUDY ON GEOPOLITICAL FACTORS AFFECTING THE GLOBAL ECONOMY

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Abstract

This study examines the influence of geopolitics on the global economy by identifying the key geopolitical issues that shape international relations, economic policies, and global trade. The research focuses on the impact of geopolitical tensions, such as supply chain disruptions, trade wars, cyber attacks, wars, energy security, and climate risks, on the development of economies worldwide. Using secondary sources, the study explores how geopolitical factors such as geography, power dynamics, conflicts, and international relations affect national development policies and the global economy's overall stability. Through this exploration, the paper highlights the risks posed by geopolitical uncertainties and their potential consequences for global economic growth, inflation, trade, and investment patterns. Additionally, the study investigates strategies for mitigating these risks, including supply chain resilience, technological innovations, and energy diversification.

Keywords: Geopolitics, Global Economy, Geopolitical tensions, Risks, Consequences

Introduction

Geopolitics relates to the study of relation between the nation's geographical phenomena and the politics which affects the international relations. Rudolf Kjellén, coined the term geopolitics "as the science of states as life forms, based on demographic, economic, political, social and geographical factors." The political, financial and economic activities carried out in the nation affects the investment pattern that drives the growth of the nation. Emerging trends and current issues among countries have led to changes in the capital market. These risks are termed as geopolitical risk and it affects the normal and peaceful relations among the nation. Geopolitics is the study of the political, economic, and strategic interactions between different countries and regions on a global scale. It seeks to understand how geography, resources, and power dynamics influence international relations and the behaviour of states. The geopolitical tensions among nations create a threat for the global financial stability and have intensified the financial fragmentation. According to the survey conducted by the Oxford Economics Geopolitical tensions are perceived to be the biggest threats to the world economy. Rise in inflation is identified as the significant near time risk for businesses whereas the same shall ease out in the moderate term. The

estimated inflation rate for the year 2024 is 3.7% which is 0.2 points below the latest baseline forecast. (Bala, 2023)

Objectives of the Study

The study aims to understand the relation between geopolitics of a nation with the development of the Global economy. It further focuses on identifying the major geopolitical issues that play a vital role in shaping a nation's development policies

Research Methodology

The research adopted an exploratory design, primarily relying on secondary data collected from academic journals, government reports, industry analysts, and global economic surveys. The study examines major geopolitical events and issues that have recently impacted the global economy, including conflicts, trade relations, energy crises, and climate risks. This method enables the researcher to analyze the dynamic relationship between geopolitical factors and economic outcomes, offering a comprehensive understanding of how global events shape national and international financial markets. Qualitative and quantitative analyses were employed to identify trends, risks, and strategies related to geopolitical tensions and their effects on the global economy.

Key Factors affecting Geopolitics

- a. **Geography:** Geopolitical analysis often begins with the examination of a country's location, borders, topography, and access to key natural resources, such as waterways, energy reserves, and arable land. Geography can shape a nation's strategic imperatives and vulnerabilities.
- b. **Power and Influence:** Geopolitics is concerned with the distribution of power in the international system. Major powers, such as the United States, China, Russia, and the European Union, play significant roles in shaping global events. The competition for power and influence among these actors is a central theme in geopolitics.
- c. **Geopolitical Interests:** Nations pursue their interests in the international arena, which can include security, economic prosperity, access to resources, and the promotion of their values and ideologies. These interests often drive a country's foreign policy decisions.
- d. **Geopolitical Strategy:** Nations employ various strategies to pursue their interests, which can include diplomacy, military power, economic leverage, and alliances. Geopolitical strategy also involves assessing risks and opportunities in a constantly changing global landscape.
- e. **International Organizations:** Institutions like the United Nations, NATO, and the World Trade Organization play a role in shaping geopolitics by providing frameworks for international cooperation, conflict resolution, and economic interaction.
- f. **Conflicts and Alliances:** Geopolitical dynamics often lead to conflicts between states, as

- well as the formation of alliances and partnerships to achieve common objectives. These can be regional or global in scope.
- g. Energy and Resources: Access to and control of vital resources, particularly energy sources like oil and natural gas, can be a significant driver of geopolitical competition and conflict.
 - h. Technology and Information: The digital age has introduced new dimensions to geopolitics, with cyber warfare, information warfare, and technological advancements playing a crucial role in shaping global power dynamics.
 - i. National Security: Geopolitical considerations are a central aspect of a nation's security policy. Defense and military strategy are often informed by assessments of potential threats and vulnerabilities.
 - j. Globalization: The increasing interconnectedness of the world, through trade, communication, and transportation, has both positive and negative effects on geopolitics. It can lead to economic interdependence but also create new security challenges.

Geopolitical factors affecting Global Economy

Global Economy is affected by the various political, economic, legal and social issues that occur across the regions. It hampers the direct capital flows and disrupts the supply chain infrastructure between the nations. Heightened restrictions resulting from tensions between countries can disrupt trade flows and create supply chain issues, even for third-party nations. These restrictions can also impact commodity prices, leading to shortages of critical resources like oil and gas, which in turn affects industrial production on a global scale. When these factors combine and reinforce one another, the global economy may face higher inflation, slower growth, and substantial welfare losses during periods of geopolitical tension (How are geopolitical risks affecting the world economy) .

Figure 5: AI and Business Advantage



(Tina, 2023)

India is the largest economy in terms of population, third largest in the global economy growth measured through Purchasing Power Parity (PPP), but it contributes to only 7% of the global output. For the past several years the nations GDP has been around 6% and is expected to be around 6-8% for the next two decades. The contribution of service sector in the development of the nation has seen a drastic rise as compared to the manufacturing and agricultural sector.

Where for majority of the nations, the focus of development shifts from agriculture to manufacturing and then to service, in India it has directly shifted from Agriculture to Service. The Service sector has provided the low cost skilled professionals that have led to increase in the percentage of export services in the areas of Information Technology. (AO, 2018). Amidst all these are the geopolitical risks that surround the nations. It has significant impact on the nation's outlook thereby affecting the growth, inflation, financial markets and supply chain.

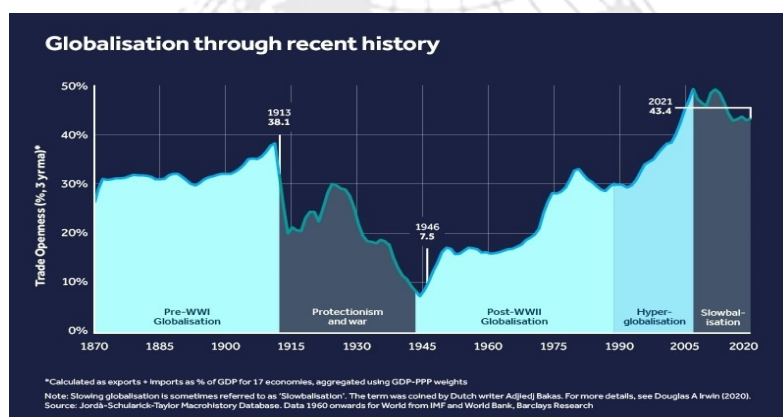
Major Geopolitical issues shaping the Global Economy

- **Supply Chain Disruptions** –A systematized supply chain is an essential element that ensures smooth functioning of industry. Supply chain disruptions caused due to various internal and external factors have triggered a huge cost across industries. The Suez Canal obstruction in 2021 that lasted for nearly 7 days, disrupted the global supply chain and it led to daily loss of approximately \$10billion (Reyes, 2024). The Global Pandemic covid-19, US-China trade relations, Russia-Ukraine War have all been events that have led to disruptions in the supply Chain. Building a stronger supply Chain resilience strategies shall be at the heart of every business at the risk of such disruptions. Creating buffer stock or building new spare manufacturing capacity, diversifying purchase across different nations, relying more on local sourcing, collaborations with supply Chain partners, investing into a unified supply chain software, etc. are some of the alternatives that emerge (GEP Software, 2025). The use of Large Language Models (LLM) an Artificial Intelligence (AI) based generative can be useful in designing and optimizing the supply chains. (Ishai Menache, 2025). AI in supply chain can help to identify new customers and predict the product demand, assist in warehouse management and overcoming issues in warehousing, identify workplace safety issues and provide warnings to avoid major accidents, etc. (Tina, 2023). AI applications can help to strengthen the Supply Chain system thereby ensuring timely availability of goods and services across the globe.
 - **Cyber Attacks** – The COVID-19 pandemic has not only driven a surge in digitalization—through government e-services, remote work, digital currencies, and e-learning—but has also significantly accelerated the extent to which we live and connect online. While digital technology has brought people together like never before, it has also opened the door for cybercriminals to operate with greater aggressiveness. The same technological advancements that facilitate global connectivity also enable cyber threat actors to exchange innovations, skills, and tools, escalating the frequency and complexity of cyberattacks. This growing concern has prompted governments and businesses alike to closely monitor these risks. Cyberattacks, essentially a tool used by malicious actors, allow for considerable anonymity and deniability, enabling these actors to pursue political or financial agendas. As the intersection of geopolitics and cyber threats becomes more evident, it is essential to
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examine the political and social factors that drive the use of cyberattacks. Hybrid warfare, which blends traditional and cyber tactics, is becoming increasingly normalized, making it imperative for governments and companies to be ever more vigilant in the face of escalating global cyber threats (Cyber Attacks: What the Hack).

- **US- China Trade relations** – The tensed relations between US and China saw major tariff being imposed by both the nations, which has led to shifts in global trade patterns (US-China Trade War: Timeline, Impact, Summary, 2024). Economists argue that both countries imposing tariffs and those targeted by them experience a decline in economic welfare, while nations not directly involved in the disputes also face indirect consequences. Both US and Chinese officials have expressed a commitment to easing trade tensions. (Global Economy in China) Key areas for negotiation include market access, intellectual property rights, and the transfer of technology in joint ventures.
- **War and Conflicts** –The global relations have been strained due to the ongoing war between Russia & Ukraine and Israel & Hamas. The economic consequences of conflicts are no longer limited to war zones; they have become a global issue. The interconnected nature of financial systems, energy markets, and supply chains means that violence in one part of the world is felt across the entire globe. This reality calls for new, innovative strategies for conflict resolution and economic resilience. By aligning economic interests with security strategies, nations could transform their approach to engaging with fragile states (The Global Conflict Economy: How Wars Shape Economic Landscapes, 2025).
- **Energy Security** – continuous rising prices of energy resources have made it an area of concerns. Post Covid-19 Pandemic, the consumption of energy resources has risen and so is the cost. Russia - Ukraine war had further added fuel to the rising prices. The energy sector is transiting into renewable energy sources. The mining sector is giving way to decarbonisation in the future operational plans. The energy and utilities sector is set to overcome the challenges posed by the renewable sources and traditional energy infrastructure. India's power sector is set for significant growth in 2024, with a sharp focus on expanding renewable energy capacity alongside the continued development of coal-based power plants. As the country faces an annual surge in power demand exceeding 8%, India is on track to achieve its highest-ever increase in renewable energy capacity, adding an estimated 19 GW in total. This growth will include around 16 GW-17 GW from solar energy and 2 GW-3 GW from wind power, reflecting the nation's commitment to diversifying its energy mix even as it continues to rely on thermal power expansion (Global Energy Security).

- Deglobalisation** - The rise of Globalization has never been smooth, rather it has witnessed two world wars, post which globalization has recorded tremendous growth which is referred to as hyper globalization from 1990 till 2020. Covid-19, followed by the increased tensions between Russia and Ukraine, Hamas and Israel, environmental changes, competitions, have led to the slowing down of globalization, which is referred to as “Slowbalisation.” Recently there has been a decrease in the number of Mergers and Acquisitions across the globe. In Asia, on shoring of jobs have been in rise, also in Europe and Asia domestic employment is rising. Deglobalization possess its own challenges and opportunities which the nations need to encash on. Deglobalization in today’s world refers to the hastening of globalization due to digitalization. (Raj, 2024) The increasing tension between US and China can also led to fuel up the outflow of capital from various nations.



(Deglobalisation: what you need to know, 2025)

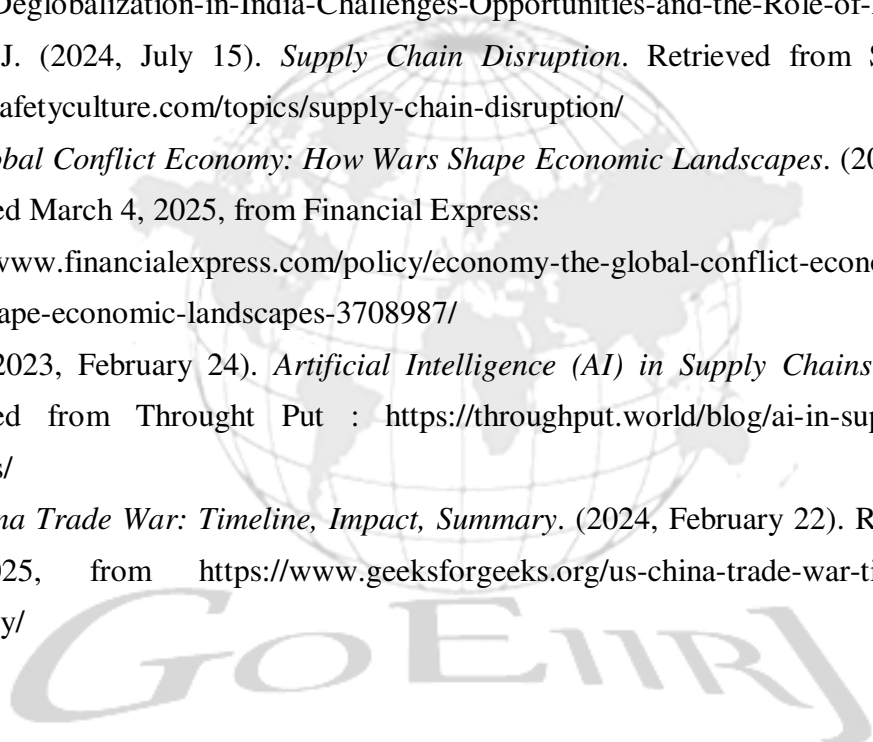
- Climate Risk:** Rapidly rising climate risk and increasing changes in the climatic conditions affect the trade and economic scenarios across the globe. Shifting climatic conditions and evolving policies to combat them are reshaping global comparative advantage. Countries dependent on climate-sensitive sectors face growing risks, while those rich in renewable energy resources—such as wind, solar, and critical minerals for clean infrastructure—stand to gain new economic opportunities (Business and Climate change, 2023). AI applications can help to strengthen the Supply Chain system thereby ensuring timely availability of goods and services across the globe. AI is of immense importance in monitoring the climatic conditions by capturing the data from satellites and identifying deforestation. AI has been assisting in identifying the under-water levels, examine wildlife population, etc. AI is making remarkable contribution in revolutionizing and recycling waste in various industries.

Conclusion

Geopolitical factors are crucial in determining the trajectory of global economic growth and stability. The tensions arising from conflicts, trade wars, energy security concerns, and climate risks have a profound impact on international trade, investment patterns, inflation rates, and economic resilience. While challenges like supply chain disruptions, cyber threats, and deglobalization present substantial risks, they also offer opportunities for nations to adopt innovative strategies for economic adaptation and sustainability. The study emphasizes the importance of building resilience through technology, diversified supply chains, and energy security measures. As geopolitics continues to evolve, understanding its impact on the global economy remains essential for shaping informed policies that promote stability and growth in an increasingly interconnected world.

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IMPORTANCE OF INDIAN KNOWLEDGE SYSTEM IN TEACHER TRAINING AND EDUCATION

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Abstract

The Indian Knowledge System (IKS) embodies a diverse and profound heritage of traditions, philosophies, and practices that have influenced Indian culture for thousands of years. This research explores the significance of integrating IKS into teacher training and education, emphasizing its potential to enhance pedagogical practices, promote holistic development, and foster critical thinking. By analysing various frameworks and methodologies rooted in IKS, the paper reflects on a comprehensive approach that respects local contexts and traditions while preparing educators for the challenges of modern education. The integration of IKS not only enriches the educational landscape but also empowers teachers to cultivate a more inclusive and culturally responsive learning environment. This research underscores the necessity of adopting IKS as a vital component in the educational framework, ensuring that education is relevant, effective, and deeply connected to students' cultural identities.

The Role of NEP 2020 in Promoting IKS

- The National Education Policy (NEP) 2020 underscores the importance of the Indian Knowledge System as a cornerstone for transforming education in India. It advocates for the inclusion of IKS in teacher training programs to:
- Connect students with their cultural heritage and identity.
- Foster a multidisciplinary approach to learning, integrating traditional knowledge with contemporary sciences.
- Enhance educators' ability to create curricula that are rooted in local contexts while addressing global challenges.
- Importance of IKS in Teacher Training
- Cultural Relevance: Equips educators with the tools to integrate indigenous knowledge into their teaching, making education more relatable and meaningful for students.

Introduction

The Indian Knowledge System (IKS) refers to the vast array of knowledge, practices, and traditions that have developed over thousands of years in the Indian subcontinent. It encompasses diverse fields such as philosophy, mathematics, astronomy, medicine, and the arts, rooted in a

holistic understanding of knowledge that interlinks various domains. In recent years, there has been a growing recognition of the importance of incorporating IKS into teacher training and education to promote a more culturally relevant and effective educational framework (Rao, 2018). This paper examines the role of IKS in shaping teacher education, highlighting its importance in enhancing pedagogical practices, fostering critical thinking among students, and promoting inclusivity.

A significant aspect of the Indian Knowledge System is its rich oral tradition, which has been instrumental in preserving and transmitting knowledge across generations. Fields such as the Vedas, classical arts, and indigenous practices relied on oral transmission to ensure the continuity of knowledge. Oral traditions emphasize memorization, recitation, and an experiential approach to learning, fostering a deep connection to cultural and intellectual heritage (Kapoor, 2020). Incorporating these oral methodologies into modern teacher training can enhance educators' ability to teach in ways that engage students holistically and contextually.

Theoretical Framework of Indian Knowledge System

Historical Context

The roots of IKS can be traced back to ancient texts such as the Vedas, Upanishads, and various scholarly works that laid the groundwork for a comprehensive understanding of multiple domains (Sarma, 2019). The traditional Bhartiya educational system, exemplified by the Gurukul model, emphasized experiential learning, moral values, and community involvement, in stark contrast to the rote learning prevalent in contemporary systems (Kumar, 2020). This historical context highlights the need to revisit and integrate IKS into modern education paradigms, offering insights into holistic learning and teaching methods.

Philosophical Underpinnings

The philosophical foundations of IKS, particularly concepts like Dharma (duty), Karma (action), and Moksha (liberation), provide a framework for understanding the interconnectedness of knowledge and moral development (Chatterjee, 2021). These principles can guide educators in developing curricula that not only impart knowledge but also foster ethical reasoning and personal growth. The emphasis on moral and ethical education in IKS encourages teachers to instill values that promote a just and equitable society, vital for nurturing responsible citizens in a globalized world.

Significance of IKS in Teacher Training

Pedagogical Practices

Incorporating Indian Knowledge Systems (IKS) into teacher training fosters innovative pedagogical practices that align with India's rich cultural and historical heritage. Traditional methods such as storytelling, debates, and community engagement have long been integral to Indian pedagogy, with roots in ancient educational practices (Narasimhan 17). These methods,

when combined with narratives from Indian myths and epics, not only enhance critical thinking and creativity but also foster cultural literacy and ethical reasoning.

For example, storytelling drawn from Indian epics like the *Mahabharata* and the *Ramayana* serves as powerful tools for imparting moral values and complex philosophical ideas. Episodes such as the Bhagavad Gita's discourse on duty and morality or Lord Rama's adherence to dharma (righteousness) provide frameworks for discussions on ethics and decision-making. Similarly, the *Panchatantra*, known for its fables, stimulates critical thinking and problem-solving skills by encouraging students to analyze the consequences of actions (Sharma 45).

Debates, inspired by philosophical discussions from ancient Indian texts such as the Upanishads or the dialogues between Gargi and Yajnavalkya, help students develop reasoning and oratory skills. These debates encourage them to question assumptions and explore diverse perspectives, fostering a more inclusive and analytical approach to learning (Bhattacharya 32). Furthermore, the integration of arts, crafts, and local narratives from epics and myths, such as the depiction of scenes from the *Mahabharata* or stories of Krishna in local art forms, connects students to their cultural roots. Such practices stimulate imagination while reinforcing lessons in history, culture, and ethics. By exploring local myths like the tale of Savitri and Satyavan, students learn about themes of perseverance, devotion, and courage, creating an emotional connection to their heritage (Doniger 221).

Holistic Development

Indian Knowledge Systems (IKS) emphasize holistic development by integrating emotional, social, and intellectual growth. This approach is deeply rooted in ancient Indian texts and philosophies, particularly the concept of *Panchakosha* (the five sheaths of human existence) as described in the *Taittiriya Upanishad*. *Panchakosha* outlines a layered understanding of human development, encompassing the physical (*Annamaya Kosha*), vital energy (*Pranamaya Kosha*), mental (*Manomaya Kosha*), intellectual (*Vijnanamaya Kosha*), and blissful (*Anandamaya Kosha*) layers of being. Education based on this framework addresses not only the intellectual and physical aspects but also emotional and spiritual dimensions, fostering true holistic growth (Radhakrishnan 137).

This integrative approach aligns seamlessly with the National Education Policy (NEP) 2020, which advocates for a more comprehensive educational framework (Government of India 21). Training teachers to adopt the *Panchakosha* perspective enables the cultivation of well-rounded individuals who excel academically, contribute responsibly to society, and embody emotional intelligence (Singh 74).

Incorporating mindfulness practices, emotional literacy, and value-based education into teacher training aligns with ancient Indian teachings such as *Dharma* (righteousness) and *Satyam* (truth) as elaborated in texts like the *Bhagavad Gita* and *Manusmriti*. For instance, the *Bhagavad*

Gita emphasizes self-awareness and balanced living: “*Yogaḥkarmasukauśalam*” (*Gita* 2.50), which translates to "Yoga is skill in action." Similarly, the *Manusmriti* advocates for moral and ethical education to create socially responsible individuals.

Additionally, *Panchatantra* stories can be utilized to instill emotional and social intelligence in learners through relatable narratives that promote critical thinking and problem-solving. These ancient methodologies, combined with modern pedagogical techniques, provide a robust framework for nurturing holistic growth.

Cultural Relevance

India is a land of remarkable diversity, encompassing a multitude of languages, traditions, and cultures. Integrating Indian Knowledge Systems (IKS) into teacher training ensures that educators are equipped to address this diversity effectively. One of the core elements of IKS is Hinduism, not merely as a religion but as a way of life. Rooted in the principles of *Sanatana Dharma*, Hinduism emphasizes inclusivity, self-awareness, and harmony with nature, which align seamlessly with culturally relevant pedagogy.

Culturally relevant pedagogy allows teachers to connect with students on a deeper level, fostering a sense of belonging and enhancing learning outcomes (Desai 45). By incorporating the Hindu worldview, educators can introduce concepts such as *Dharma* (righteousness), *Karma* (action), and *Ahimsa* (non-violence) into teaching practices. These principles are essential for fostering moral responsibility and ethical conduct in students, promoting holistic development.

The Bhagavad Gita underscores the importance of self-awareness and the pursuit of knowledge as essential aspects of life: “*Vidya vinayasampanne*” (*Gita* 5.18), highlighting humility and equality as key values in education. Similarly, the Upanishads advocate for self-realization and learning as pathways to enlightenment, aligning with the modern emphasis on student-centered pedagogy (Radhakrishnan 112).

Case Studies and Examples

Innovative Practices in Schools

Several educational institutions in India are successfully integrating Indian Knowledge Systems (IKS) into their curricula, fostering a deeper connection between students and their cultural and environmental contexts. For instance, the Vidya Niketan School in Bangalore emphasizes the use of local resources and indigenous knowledge to teach subjects like science and mathematics (Mishra 56). By blending traditional practices with modern pedagogical approaches, the school has reported improved student engagement and academic outcomes.

Similarly, the Shiksha Kendra in Uttarakhand employs local environmental knowledge to educate students about sustainability and ecological balance, thereby nurturing a sense of environmental responsibility (Mehta 122). This approach is inspired by ancient Indian texts like the *Atharva*

Veda, which emphasizes harmony with nature: “*Mata BhumiPutrohamPrithivyah*” (Atharva Veda 12.1.12), meaning "Earth is my mother, I am her son."

Furthermore, the Vivekananda Kendra Vidyalayas in the Northeast integrate the philosophy of Swami Vivekananda to inculcate values of service, discipline, and cultural pride in students. The schools use traditional practices like meditation and storytelling to inspire character building and leadership (Joshi 47).

Teacher Training Programs

Programs such as the Teacher Education and Training (TET) initiative have included modules on IKS, aiming to equip teachers with the necessary tools to integrate local knowledge into their teaching practices. Feedback from participants indicates a significant increase in confidence and competence in teaching culturally relevant content (Kumar & Roy, 2023). Furthermore, workshops and seminars on IKS have been conducted to raise awareness among teachers about the importance of integrating local knowledge into the classroom.

Challenges in Integration

Despite its importance, integrating IKS into teacher training and education faces several challenges. These include a lack of awareness and understanding of IKS among educators, rigid curricula, and limited resources for training (Rao, 2018). Overcoming these barriers requires a concerted effort from educational policymakers, institutions, and communities to create a conducive environment for the integration of IKS.

Policy Recommendations

To facilitate the integration of IKS, it is essential to implement supportive policies that encourage the incorporation of local knowledge into teacher training programs. Key recommendations include:

1. **Curriculum Development:** Designing curricula that reflect the values and knowledge of local communities, allowing for a more relevant educational experience.
2. **Capacity Building:** Providing training and resources for teachers to develop skills in integrating IKS into their teaching, including workshops and online resources.
3. **Community Involvement:** Encouraging collaboration between schools and local communities to share knowledge and resources, fostering a sense of partnership in education.
4. **Assessment and Evaluation:** Developing assessment frameworks that value the integration of IKS, ensuring that teachers are recognized and rewarded for their efforts in incorporating local knowledge into their classrooms.
5. **Research and Documentation:** Conducting research to document successful practices and case studies of IKS integration, which can serve as models for other institutions.

Outcomes of Policy Recommendations:

1. A curriculum reflecting local community values and knowledge makes education more relevant, fostering cultural pride and enhancing student engagement and academic performance.
2. Teachers equipped with training and resources can confidently integrate IKS into their teaching, using methods like storytelling and traditional practices to create dynamic, inclusive classrooms.
3. Collaboration between schools and local communities promotes shared responsibility, strengthens bonds, and ensures active participation in the educational process.
4. Assessment frameworks that value IKS integration motivate teachers to incorporate local knowledge, ensuring preservation and appreciation of traditional systems while offering holistic evaluation for students.
5. Research and documentation of successful practices provide a repository of case studies and models for IKS integration, preserving indigenous cultures and serving as references for other institutions.
6. Encourages cultural awareness, ethical learning, and sustainable practices among students, fostering a sense of identity and responsibility.
7. Supports the revitalization of traditional knowledge systems, ensuring their sustainability for future generations.

The Role of Technology in IKS Integration**Digital Resources**

The advent of digital technology provides a significant opportunity to enhance the integration of Indian Knowledge Systems (IKS) into teacher training and education. Digital platforms serve as repositories for local knowledge, offering teachers access to culturally relevant teaching materials. These platforms can host a variety of resources, including digitized ancient manuscripts, interactive storytelling, and culturally significant teaching aids. Online courses, webinars, and digital storytelling can also facilitate knowledge-sharing among educators, ensuring a collaborative and resource-rich learning environment (Kumar 78; Mishra 54). Initiatives such as the Digital India program have emphasized digitizing India's cultural heritage, making it accessible to educators and students alike (Mehta 112).

E-Learning and Blended Models

E-learning platforms provide a flexible approach to incorporating IKS, allowing educators to engage with local knowledge systems from anywhere. Blended learning models, combining traditional methods with digital tools, enrich both teaching and learning experiences. For instance, NPTEL and SWAYAM have incorporated modules on Indian philosophies, traditional practices, and cultural histories, reaching educators in remote areas (Sharma 45). This hybrid model

effectively bridges geographical divides and ensures access to quality resources. Additionally, platforms like BYJU's have integrated local contexts into their teaching content, helping students connect academic concepts with their cultural heritage (Desai 78).

Collaboration with Tech Companies

Collaborations between educational institutions and technology companies play a vital role in promoting IKS. Such partnerships result in the development of interactive educational tools, including gamified apps based on local myths and augmented reality applications showcasing heritage sites. For example, Google Arts & Culture has worked on digitizing cultural artifacts and providing virtual tours of heritage sites, offering unique learning experiences (Singh 39). Similarly, Microsoft's AI for Cultural Heritage program has contributed to preserving regional languages and traditional knowledge through advanced digital solutions (Gupta 86).

Academic Achievement

Research has shown that integrating IKS into education positively impacts academic achievement. Students exposed to culturally relevant curricula demonstrate higher levels of engagement, motivation, and academic performance (Patel, 2021). By linking learning to students' cultural contexts, educators can foster a deeper understanding of the subject matter and enhance critical thinking skills.

Social and Emotional Development

The integration of IKS also plays a crucial role in fostering social and emotional development among students. By emphasizing values such as empathy, respect, and collaboration, IKS encourages students to build positive relationships and develop emotional intelligence (Singh, 2022). This holistic approach to education not only benefits individual students but also contributes to creating a positive classroom environment.

Preparing Global Citizens

In a globalized world, it is essential to prepare students to navigate diverse cultures and perspectives. IKS equips students with the knowledge and skills necessary to engage with various cultural narratives, fostering a sense of global citizenship (Narasimhan, 2017). By understanding and appreciating their own cultural heritage, students are better prepared to interact with others in a multicultural society.

Scope for Further Research

Measuring the Impact of IKS in Education

Studies can investigate the long-term effects of integrating IKS into school and teacher training curricula on student engagement, academic performance, and cultural awareness. Comparative research between IKS-integrated and non-IKS-integrated educational models can provide valuable insights into its effectiveness and scalability.

Localization of Pedagogy

Research can explore ways to adapt IKS for specific regions, focusing on the unique traditions, practices, and knowledge systems of local communities. This can involve case studies of schools successfully implementing localized IKS-based teaching methods and their impact on students' learning outcomes.

Developing Multidisciplinary Approaches

Further studies can examine how IKS can be integrated into interdisciplinary education, connecting subjects like science, history, and environmental studies with traditional knowledge to create a holistic and contextualized learning framework.

IKS and Sustainable Development

Investigating the application of IKS in addressing modern challenges such as climate change, sustainable agriculture, and resource management can be a key area of research. For instance, ancient water conservation techniques and farming practices documented in Indian texts can provide innovative solutions for contemporary problems.

Impact on Teacher Training Programs

Research can assess the effectiveness of incorporating IKS modules in teacher training programs, focusing on how it enhances educators' ability to connect with students and improve classroom dynamics.

Conclusion

The Indian Knowledge System holds immense potential for transforming teacher training and education in India. By integrating IKS into educational frameworks, we can create a more inclusive, culturally relevant, and effective learning environment. This approach not only respects and values local knowledge but also empowers educators to develop critical thinkers and socially responsible citizens.

Moving forward, it is crucial for policymakers, educators, and communities to work collaboratively to realize the full potential of IKS in education. The integration of IKS not only enriches the educational landscape but also empowers teachers to cultivate a learning environment that reflects the diverse cultural identities of their students. As we continue to navigate the complexities of modern education, the wisdom of IKS offers valuable insights that can guide us toward a more equitable and effective educational system.

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GOEIJR

**CURRENT PHARMACEUTICAL CHALLENGES AND THE
TRANSFORMATIVE ROLE OF ARTIFICIAL INTELLIGENCE: A
COMPREHENSIVE REVIEW**

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Abstract

The pharmaceutical industry faces numerous challenges, including high drug development costs, stringent regulatory requirements, counterfeit medicines, supply chain disruptions, and antimicrobial resistance. Artificial Intelligence (AI) has emerged as a transformative technology to address these issues by optimizing drug discovery, enhancing clinical trials, ensuring regulatory compliance, and improving manufacturing processes. This review provides a comprehensive analysis of the current challenges in the pharmaceutical sector and explores the role of AI-driven technologies in overcoming these obstacles. Key AI applications, including machine learning, deep learning, natural language processing, and blockchain integration, are discussed in the context of pharmaceutical research, quality control, and patient-centered medicine. The integration of AI has the potential to revolutionize drug development, streamline regulatory processes, and enhance healthcare outcomes. Despite its promise, challenges such as data privacy, ethical concerns, and regulatory approval of AI-driven models must be addressed to ensure its successful implementation.

Keywords: Artificial Intelligence, Pharmaceutical Challenges, Drug Discovery, Clinical Trials, Regulatory Compliance

Introduction

The pharmaceutical industry drives healthcare advancements but faces challenges like high drug development costs, stringent regulations, counterfeit medicines, supply chain disruptions, and antimicrobial resistance (AMR), affecting innovation, accessibility, and safety. Integrating advanced technologies is essential to improve efficiency across drug development and distribution.

AI is transforming the sector through machine learning, deep learning, natural language processing, and blockchain, optimizing drug discovery, clinical trials, regulatory compliance, and manufacturing. AI accelerates R&D, predicts drug interactions, personalizes treatments, and detects counterfeit drugs. Additionally, AI-driven predictive analytics enhance supply chain resilience and support data-driven decision-making in pharmaceutical operations.

2. Challenges in the Pharmaceutical Industry

The pharmaceutical industry plays a crucial role in advancing global healthcare by

developing life-saving medications; however, it faces numerous challenges that hinder innovation, efficiency, and affordability. Rising drug development costs, lengthy approval processes, supply chain vulnerabilities, counterfeit medicines, and antimicrobial resistance (AMR) pose significant barriers to progress. These challenges not only delay patient access to essential treatments but also place financial and operational strain on pharmaceutical companies, healthcare providers, and regulatory agencies worldwide.

2.1 High Drug Development Costs and Time Constraints

The process of developing a new drug is both time-consuming and cost-intensive. On average, drug discovery and development take 10–15 years and cost billions of dollars, with high attrition rates at every stage of the process (DiMasi, Grabowski, & Hansen, 2016). The failure of drug candidates during clinical trials due to safety concerns, lack of efficacy, or unforeseen side effects leads to significant financial losses. Traditional drug development methods rely heavily on trial-and-error approaches, making them inefficient. There is a pressing need for more efficient and predictive tools to enhance drug discovery and improve the success rates of clinical trials.

2.2 Stringent Regulatory Requirements

The pharmaceutical industry follows strict regulations to ensure drug safety and quality, with agencies like the FDA, EMA, and ICH imposing rigorous standards (Gu et al., 2025). Compliance is complex due to frequent updates, such as ICH M10's stricter bioanalytical validation (Ramezani et al., 2025). Drug approval takes 6–12 years, with high attrition rates and extensive post-marketing surveillance (Harrison, 2023; Ramezani et al., 2025).

AI, blockchain, and automation help streamline compliance, improving efficiency and drug traceability (Talib et al., 2025). Global harmonization and AI-driven compliance tools are essential for balancing safety with faster approvals (Ganeshpurkar et al., 2025).

2.3 Counterfeit Medicines and Drug Safety

Counterfeit medicines threaten global health, causing treatment failures, ADRs, and AMR (Singh & Akhai, 2025). WHO estimates 10% of medicines are counterfeit, with higher prevalence in LMICs (Rao, Narendra, & Gayatri, 2025). Weak supply chain tracking enables counterfeits despite regulations like the U.S. DSCSA and European FMD (Ganeshpurkar, Prajapati, & Ganeshpurkar, 2025).

Blockchain ensures drug traceability (Wason et al., 2025), AI detects fake packaging (Venkataraman, 2024), and QR codes, NFC tags, and RFID enable real-time verification (Palanivel & Madhan, 2024). Strengthening supply chain controls, regulatory collaboration, and consumer awareness is crucial for drug safety (Pudumalar, 2025).

2.4 Supply Chain Disruptions

The pharmaceutical industry depends on global supply chains, with China and India supplying over 70% of APIs, making it vulnerable to geopolitical instability and global crises (Chandar et al., 2025). The COVID-19 pandemic highlighted these risks, causing drug shortages and production delays (Pandey et al., 2025). Regulatory changes, climate disruptions, and conflicts like the Russia-Ukraine war further strain supply chains (Gill et al., 2025; Rizvi et al., 2025).

To enhance resilience, companies are leveraging AI for predictive analytics, demand forecasting, and real-time monitoring (Gill et al., 2025). AI-driven supply chain management optimizes inventory, while blockchain improves traceability (Alemsan & Tortorella, 2025). Leading firms like Pfizer and Merck have adopted these technologies to mitigate risks (Atanda et al., 2025). Strengthening supply chains through AI, supplier diversification, and blockchain-based tracking is crucial for future stability.

2.5 Antimicrobial Resistance (AMR)

AMR is a major global health threat, driven by antibiotic overuse in healthcare and agriculture, leading to resistant bacterial strains and ineffective treatments (Zavaleta-Monestel et al., 2025). WHO estimates AMR could cause 10 million deaths annually by 2050, surpassing cancer fatalities (Salgado & Ojkic, 2025). However, new antibiotic development has declined due to high costs and low financial incentives (Bhukya et al., 2025).

Scientific, economic, and regulatory barriers hinder antibiotic discovery, as bacteria develop resistance faster than new drugs emerge. Additionally, the short treatment duration of antibiotics makes them less profitable for pharmaceutical companies (Jonnalagadda, 2025; Donà et al., 2025; Bagdad & Miteva, 2025).

2.6 Quality Control and Manufacturing Challenges

Ensuring pharmaceutical quality is crucial for patient safety and regulatory compliance, yet contamination risks, manufacturing defects, and process inefficiencies remain persistent challenges (Sierra-Vega et al., 2025). Despite stringent GMP regulations, lapses in quality control lead to recalls and regulatory penalties, necessitating advanced monitoring systems and automation (Hu, Monticolo, & Ghadimi, 2025).

Contamination from microbial, chemical, or particulate impurities can result from improper handling or faulty equipment, leading to recalls and legal issues. Recent cases of nitrosamine contamination in medications highlight the urgent need for enhanced quality assurance measures (Melocchi et al., 2025; Kapoor et al., 2025).

2.7 Personalized Medicine and Data Management

Personalized medicine tailors treatments based on genetic, environmental, and lifestyle factors, enhancing efficacy and reducing adverse effects (Bhavani et al., 2025).

Advances in genomic sequencing, AI, and big data analytics enable targeted therapies in oncology, neurology, and rare diseases (Megías, 2025).

Genomic analysis identifies mutations and biomarkers, improving drug response prediction. Targeted therapies like HER2 and PARP inhibitors have significantly increased survival rates (Parks, Mis, & Trotter, 2025).

Blockchain ensures secure, decentralized data management, enabling encrypted record-sharing while maintaining confidentiality (Husnain, 2025). AI-driven predictive analytics further optimize drug development, clinical trial recruitment, and treatment personalization (Wang et al., 2025).

3. The Role of AI in Overcoming Pharmaceutical Challenges

Artificial intelligence (AI) is revolutionizing the pharmaceutical industry by enhancing drug discovery, optimizing clinical trials, ensuring regulatory compliance, improving quality control, strengthening supply chains, combating antimicrobial resistance, and advancing personalized medicine. AI-driven machine learning (ML), deep learning (DL), natural language processing (NLP), and blockchain integration have transformed pharmaceutical research and manufacturing, making processes more efficient, cost-effective, and accurate (Talib et al., 2025).

3.1 AI in Drug Discovery and Development

AI accelerates drug discovery by predicting drug-target interactions, optimizing lead compounds, and streamlining virtual screening (Talib et al., 2025). ML and deep learning analyze large datasets to identify therapeutic compounds efficiently (Tyagi et al., 2025; Kaur et al., 2025). AI-driven virtual screening reduces experimental assays, expediting drug development (Lichtfouse et al., 2025).

Generative modeling, including GANs and reinforcement learning, enables AI-designed drug molecules with optimal properties (Harry, 2025). Companies like DeepMind and Insilico Medicine use AI to identify high-affinity molecules for diseases (Loveth, 2025).

3.2 AI in Clinical Trials

AI-driven predictive analytics improves patient recruitment by analyzing real-world data, ensuring diverse cohorts and reducing timelines (Blonquist et al., 2025). AI automates data processing, protocol compliance, and adaptive trial designs, enhancing efficiency and reducing costs (Hu et al., 2025).

AI-powered NLP rapidly screens EHRs and genetic databases to identify eligible participants, improving trial enrollment and retention (Stavarakaki et al., 2025; Suryana et al., 2025). Adaptive trial designs use AI to modify protocols dynamically, optimizing treatment responses and dosage regimens (Rodriguez et al., 2025; Crawford & Chengelis, 2025).

AI enhances risk-based monitoring by detecting data irregularities and adverse events (Rugină et al., 2025). Blockchain integration ensures tamper-proof records, strengthening data security and

regulatory compliance (Zo'ubi, 2025; Ng et al., 2025). Real-time AI analytics also support post-marketing surveillance, tracking long-term drug efficacy and safety (Meyers & Vlachos, 2025).

3.3 AI in Regulatory Compliance and Pharmacovigilance

AI is transforming regulatory compliance and pharmacovigilance by automating documentation, adverse event detection, and drug safety monitoring (Joshi et al., 2025). AI-powered NLP and ML models streamline compliance, reducing manual effort and improving regulatory efficiency.

AI-driven NLP automates documentation management, expediting submissions to regulatory agencies like the FDA, EMA, and ICH (Gomase, 2025). Virtual assistants help pharmaceutical companies navigate evolving guidelines, ensuring compliance (Maria, 2024).

In pharmacovigilance, AI enhances early detection of adverse drug reactions (ADRs) by analyzing EHRs, social media, and clinical databases in real time (Pargaïen et al., 2025). ML models improve signal detection and causality assessment, ensuring rapid identification of safety concerns (Jain et al., 2024).

3.4 AI in Quality Control and Manufacturing

AI-driven systems enhance quality control by ensuring regulatory compliance and reducing inefficiencies (Kodumuru et al., 2025). AI-powered image recognition detects manufacturing defects, improving product consistency and minimizing recalls (Talib et al., 2025; Chang et al., 2025).

AI-driven predictive maintenance prevents equipment failures by analyzing sensor data, reducing downtime and repair costs (Lee et al., 2025; Plath, 2025).

3.5 AI in Supply Chain Management

One of the primary advantages of AI in supply chain management is predictive analytics, which enables companies to anticipate demand fluctuations and potential disruptions. Machine learning models analyze historical sales data, real-time market trends, and external factors (e.g., geopolitical events, pandemics, climate conditions) to predict supply chain risks and recommend proactive measures (Talib et al., 2025). For example, during the COVID-19 pandemic, AI-driven demand forecasting models helped pharmaceutical companies prevent shortages of critical medications and vaccines, ensuring an uninterrupted global supply chain (Gill et al., 2025).

Another critical challenge in pharmaceutical logistics is inventory optimization, where AI-driven solutions help companies maintain optimal stock levels, reduce storage costs, and prevent drug wastage. Traditional inventory management systems rely on static forecasting models, whereas AI-powered systems dynamically adjust stock levels based on real-time data (Russo & Rao, 2025). AI-driven automated warehouses and robotic process automation (RPA) further streamline inventory operations, ensuring timely and cost-effective distribution (Balasubramanian & Gurushankar, 2025).

3.6 AI in Combating Antimicrobial Resistance (AMR)

AI accelerates antibiotic discovery by analyzing chemical databases, predicting drug-target interactions, and identifying novel antimicrobial compounds with high bactericidal activity (Carpenter, 2025; Bhukya et al., 2025).

AI-driven genomic and proteomic analysis enables rapid detection of resistance mechanisms. Bioinformatics tools analyze bacterial genomes to identify mutations linked to AMR, while metagenomics integration aids in detecting resistance genes for precision medicine applications (Mishra et al., 2025; Xu & Wu, 2025).

4. Challenges and Future Prospects of AI in Pharma

The adoption of artificial intelligence (AI) in the pharmaceutical industry has brought about significant advancements, including enhanced drug discovery, improved clinical trials, and optimized manufacturing processes. However, several challenges hinder its full integration, including data privacy concerns, regulatory approval complexities, and resistance to AI adoption. Addressing these challenges while leveraging future AI-driven innovations, such as quantum computing and automated drug formulation, will shape the trajectory of AI in pharma (Fu & Chen, 2025). Future Prospects of AI in Pharmaceutical Industry shown in table 2.

4.1 Data Privacy and Security

One of the most pressing challenges in AI adoption for pharmaceuticals is ensuring data privacy and security. AI-driven drug development and personalized medicine rely on vast amounts of patient data, including genomic sequences, electronic health records (EHRs), and real-world evidence (RWE) (Manion, 2025). However, the sharing of such sensitive information raises ethical concerns regarding patient confidentiality, informed consent, and potential AI biases. AI models can inadvertently exhibit biases in clinical decision-making, leading to disparities in treatment recommendations (Niazi & Mariam, 2025).

4.2 Regulatory Approval of AI-Driven Models

Despite AI's potential to accelerate drug discovery and development, regulatory approval remains a significant hurdle. Traditional drug approval processes follow rigid clinical validation frameworks, which may not align with AI-generated drug candidates (Niazi & Mariam, 2025). Regulatory agencies require explainability in AI models, demanding that AI-generated decisions be transparent, reproducible, and clinically validated (Kodumuru et al., 2025).

To facilitate AI integration, the FDA's Center for Drug Evaluation and Research (CDER) has introduced AI-specific regulatory guidelines, emphasizing the need for real-world evidence, algorithmic audits, and AI model validation before approving AI-assisted drug discovery and clinical trials (Unanah&Mbanugo, 2025). However, the lack of standardized AI validation frameworks across different regulatory agencies delays AI-driven drug approvals, necessitating global harmonization of AI regulations (Roy et al., 2025).

4.3 Integration Challenges

AI implementation in pharmaceuticals faces resistance from industry professionals due to a lack of technical expertise and fear of job displacement (Amin et al., 2025). Many pharmaceutical companies struggle with integrating AI into existing workflows, as AI models require advanced computational infrastructure, high-quality datasets, and interdisciplinary collaboration between AI engineers and biomedical scientists (Shen et al., 2025).

Future AI Application	Description	Potential Impact	Key Challenges
AI-Driven Drug Repurposing	AI-based platforms (e.g., IBM Watson, BenevolentAI) analyzed drug-disease interactions, clinical trial data, and molecular docking simulations to identify new therapeutic applications for existing drugs (Ma, 2025).	<ul style="list-style-type: none"> - Reduces drug development time and costs by leveraging existing drugs. - Successfully identified remdesivir & dexamethasone for COVID-19 treatment (Wang et al., 2025). 	<ul style="list-style-type: none"> - Regulatory challenges in repurposing approved drugs for new indications. - Data quality issues in AI models may lead to false predictions.
Quantum Computing for Faster Molecular Simulations	Quantum computing enables ultrafast molecular simulations, predicting drug-target interactions with unprecedented accuracy (Han et al., 2025).	<ul style="list-style-type: none"> - Accelerates drug discovery timelines by processing millions of molecular structures simultaneously (Shen et al., 2025). - Major pharmaceutical firms (Pfizer, Merck, GSK) are investing in quantum computing partnerships (Vaishnav et al., 2025). 	<ul style="list-style-type: none"> - High computational power & costs make implementation challenging. - Limited accessibility due to early-stage development of quantum hardware.
AI-Assisted Automated Drug Formulation & Delivery	AI optimizes drug solubility, stability, and bioavailability, ensuring efficient and targeted drug release (Mandal et al., 2025).	<ul style="list-style-type: none"> - Enhances drug efficacy & reduces side effects through nanotechnology-based drug delivery systems (TUFqIzz et al., 2025). - Enables personalized medicine by designing customized dosage forms using machine learning models (Wong et al., 2025). 	<ul style="list-style-type: none"> - Regulatory & ethical concerns over AI-designed formulations. - Need for extensive validation of AI-driven drug delivery systems.

Table 2: Future Prospects of AI in Pharmaceutical Industry

5. Conclusion

Artificial intelligence (AI) is revolutionizing the pharmaceutical industry and healthcare sector, driving advancements in drug discovery, clinical trials, regulatory compliance, and manufacturing. By leveraging machine learning, deep learning, and predictive analytics, AI accelerates the identification of drug candidates, streamlines trial processes, enhances quality control, and optimizes supply chain management. The integration of AI in pharmaceuticals not only reduces costs and development timelines but also improves patient outcomes by enabling personalized medicine and precision drug delivery.

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**TRADITIONAL INDIAN EDUCATION SYSTEMS: GURUKUL, PEDAGOGY,
AND NEP 2020****Vikram Dinkar Ghuge***Research Scholar**Gokhale Education Society's College of Edu.
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ABSTRACT

This paper examines the traditional Gurukul education system in India and its relevance to the National Education Policy (NEP) 2020. The Gurukul system, rooted in ancient Indian traditions, emphasized holistic learning, values, and a connection with nature. NEP 2020 aims to modernize the Indian education system while incorporating valuable aspects of the Gurukul approach, such as holistic and multidisciplinary education, and integrating Indian knowledge systems alongside modern technology. The paper analyses how NEP 2020 bridges the gap between traditional practices and contemporary needs to foster well-rounded, critically thinking, and socially responsible citizens.

Keywords: Gurukul System, Pedagogy, National Education Policy (NEP) 2020, Traditional Education, Holistic Development

Introduction

India's education system has a long and rich history, rooted in diverse philosophies and practices. Among the earliest and most influential forms of education in ancient India was the Gurukul system. This system, based on the teacher-student relationship, played a pivotal role in transmitting knowledge across generations. Gurukuls were informal learning environments, often located in remote, natural settings, where students received personalized education from a guru (teacher) in a holistic manner. The curriculum focused not only on intellectual development but also on the cultivation of values, discipline, and spirituality. Subjects included ancient scriptures, philosophy, mathematics, arts, and moral education.

However, with the advent of British colonial rule and the introduction of Western-style education, the traditional Gurukul system began to fade. The colonial education system introduced a formalized, curriculum-based approach that prioritized subjects like science, technology, and literature, ultimately leading to a decline in the importance of indigenous knowledge systems. In post-independence India, educational reforms continued to focus on modernization and standardization, creating a more structured but less flexible learning environment.

In recent years, the need to integrate India's traditional educational practices with contemporary approaches has gained renewed attention. The National Education Policy (NEP)

2020, introduced by the Government of India, aims to overhaul the country's education system, focusing on making it more inclusive, holistic, and multidisciplinary. This policy emphasizes creativity, critical thinking, and skill development while recognizing the significance of India's ancient educational traditions, such as the Gurukul system.

This paper examines the evolution of India's education system from the Gurukul model to the modern school system, analysing the strengths and limitations of the Gurukul system. It further explores how the NEP 2020 seeks to incorporate traditional pedagogies into contemporary education, striving to create a balanced and flexible system that nurtures both academic excellence and overall development. By exploring this intersection, the research aims to highlight how India's educational future can benefit from the integration of traditional and modern teaching methodologies.

OBJECTIVES

1. To explore the historical significance of the Gurukul system, its pedagogical methods, and its impact on shaping India's ancient education framework.
2. To understand the teaching and learning techniques used in the Gurukul system, including the personalized, mentor-based approach and its emphasis on holistic development.
3. To critically evaluate the advantages, such as individual attention and moral education, as well as the challenges, such as limited accessibility and lack of standardization, of the Gurukul system.
4. To provide an in-depth analysis of the National Education Policy 2020, focusing on its aims to modernize the education system while integrating traditional knowledge and pedagogical methods.
5. To investigate how NEP 2020 seeks to incorporate Indian knowledge systems, including elements from the Gurukul system, into modern education.
6. To compare and contrast the Gurukul system with the contemporary schooling system and the reforms proposed by NEP 2020, highlighting the similarities and differences in pedagogical practices.
7. To evaluate how effectively the holistic and student-centric methods of the Gurukul system can be integrated into the modern education framework under NEP 2020.
8. To assess the potential challenges faced in implementing the provisions of NEP 2020, especially in terms of combining traditional and modern teaching methods in a diverse and rapidly changing society.

SIGNIFICANCE OF THE STUDY

1. The Gurukul system is an integral part of India's rich educational history. By examining its pedagogical methods and their holistic approach to learning, this study helps in preserving

and reviving aspects of traditional education that have shaped the Indian worldview for centuries. Understanding these systems ensures that India's educational heritage is not lost in the rush toward modernization.

2. NEP 2020 emphasizes integrating India's traditional knowledge systems with modern education. This research is significant in identifying how the Gurukul system's content, such as Vedic education, spiritual teachings, and practical learning, can be harmoniously combined with contemporary academic disciplines. This will aid in reviving traditional subjects like Sanskrit, philosophy, and Indian arts within the modern education curriculum.
 3. The Gurukul system was designed to promote a balanced development of intellect, character, and spirituality. This study underscores the importance of holistic education, which is also a core principle of NEP 2020. By evaluating the benefits of the Gurukul model, the study can highlight the need for a balanced approach to education in today's world, where the focus is often narrowed to academic and professional achievements.
 4. NEP 2020 seeks to address the limitations and challenges of India's current education system, such as rigid curricula, rote learning, and lack of critical thinking. This research contributes to the ongoing discourse by providing insights into how traditional models of education like the Gurukul can offer innovative solutions to current educational challenges, such as fostering creativity, emotional intelligence, and leadership skills in students.
 5. The significance of this study lies in its ability to bridge the gap between India's traditional education systems and the demands of modern society. The research offers a framework for integrating values and pedagogies from the past with the globalized educational environment of the present, promoting a balanced curriculum that prepares students for the future while staying rooted in cultural traditions.
 6. This research is highly relevant for policymakers and educators involved in curriculum design and educational reforms. By offering an in-depth analysis of NEP 2020 and its potential to incorporate traditional educational values, this study can guide future educational reforms that strive to achieve a more inclusive, accessible, and value-based system for all learners.
 7. The study also has a social and cultural significance. The integration of traditional knowledge systems with modern pedagogy can help address issues related to caste, gender, and regional disparities in education, promoting a more equitable and culturally sensitive education system. The holistic approach of the Gurukul can lead to the development of socially responsible and ethically grounded individuals.
 8. By analysing the integration of ancient pedagogical practices with modern educational needs, the research offers valuable insights into the future of education. It suggests how education systems can evolve in India to be more inclusive, diverse, and reflective of the
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country's historical and cultural values, which is vital for preparing future generations to thrive in a globalized world.

9. The study contributes to global discussions on education by offering an Indian perspective on how traditional knowledge systems can enrich modern pedagogy. It provides valuable input for educationalists and researchers worldwide, especially in countries with rich cultural heritages, on how to blend the old with the new to develop well-rounded, future-ready learners.

THE GURUKUL SYSTEM: FOUNDATIONS AND PEDAGOGY

The Gurukul system of education, deeply rooted in ancient India, was a unique model that emphasized a holistic approach to learning. It was based on the relationship between the guru (teacher) and the shishya (student), where students lived with their teachers in an ashram or secluded setting, often in forests or natural surroundings. This system was deeply interwoven with spiritual, intellectual, and moral development, offering a balanced education not just in academic subjects but also in life skills, ethics, and values.

The curriculum in a Gurukul was not formalized like modern schooling systems but was tailored to each student's needs. Subjects taught included philosophy, mathematics, grammar, astronomy, Vedic scriptures, arts, and music. Importantly, the focus was on experiential learning and discussions, with the guru offering guidance and wisdom drawn from their own life experiences and knowledge. This intimate learning environment fostered a deep connection between teacher and student, allowing for personalized attention and mentorship.

Pedagogically, the Gurukul system prioritized oral transmission of knowledge, through dialogue, debates, and storytelling, which encouraged critical thinking and dialogue. The learning process was interactive, and students were expected to question, reflect, and internalize what they learned, as opposed to rote memorization. The system also emphasized character-building, discipline, and a strong connection with nature, ensuring that learning extended beyond textbooks to life itself.

The Gurukul was a community-based education model that integrated personal development and spiritual growth, shaping individuals who were not only knowledgeable but also ethically grounded and socially responsible. While the system's focus on the guru-shishya relationship and personal attention was its strength, it was also limited in accessibility, primarily benefiting those with access to the ashrams. However, in the context of today's world, many of the principles of the Gurukul system — like individualized learning, value-based education, and experiential learning — remain relevant and influential in shaping modern educational practices.

TRANSITION FROM GURUKUL TO MODERN SCHOOLING SYSTEM

The transition from the ancient Gurukul system to the modern schooling system in India marks a significant shift in educational practices and philosophies. The Gurukul, an informal and

deeply personalized education model, thrived for centuries and was primarily based on one-on-one interaction between the guru (teacher) and the shishya (student). Learning took place in natural, secluded environments, where the focus was on holistic development, character building, and deep philosophical understanding. Education was largely based on oral transmission, experiential learning, and the development of moral values.

However, with the advent of British colonialism in the 18th and 19th centuries, Western education models began to infiltrate India, leading to a shift towards a more formalized, institutionalized system. The introduction of English-language education, standardized curriculums, and subjects such as science, mathematics, and literature were aligned with the needs of colonial administration. The Gurukul's personalized approach was replaced by mass schooling, with fixed hours, classrooms, and a rigid curriculum.

The rise of the modern schooling system led to significant changes in how knowledge was imparted. The new system emphasized quantitative assessment, examinations, and structured learning, which differed from the holistic and flexible approach of the Gurukul. The emphasis shifted towards academic subjects, and practical life skills or spiritual teachings that were central to the Gurukul were often sidelined.

Despite these changes, elements of the Gurukul system continued to influence education. Value-based education, personalized attention, and student-teacher relationships remained important in some educational institutions. The modern schooling system, while offering a more structured and globalized approach, has faced criticism for neglecting the emotional, ethical, and moral development that the Gurukul so carefully nurtured.

Today, there is a growing interest in re-integrating certain aspects of the Gurukul system into modern education. The push for holistic education, critical thinking, and individualized learning found in the National Education Policy (NEP) 2020 aims to merge the best of both worlds. In this way, India's educational evolution continues, balancing the traditional wisdom of the Gurukul with the demands of the modern, globalized world.

NEP 2020: VISION AND REFORMS

The National Education Policy (NEP) 2020 marks a groundbreaking shift in India's education landscape, with a vision to make education more inclusive, holistic, and flexible. The policy emphasizes a multidisciplinary approach, promoting learning across various subjects, rather than restricting it to rigid academic silos. One of the key reforms is the focus on early childhood care and education (ECCE), recognizing the importance of foundational learning in a child's development.

NEP 2020 also aims to reduce the pressure of exams by introducing a more formative and competency-based assessment system. The policy stresses critical thinking, creativity, and holistic development, ensuring that students not only excel academically but are also equipped with life

skills and emotional intelligence. Furthermore, NEP seeks to integrate technology in education, making learning more accessible and adaptable to the needs of modern learners.

The policy also proposes a flexible curriculum that accommodates the diverse learning styles of students, encouraging experiential learning and hands-on activities. It advocates for a strong emphasis on local languages and recognizes the importance of mother tongue in early education. In higher education, the NEP envisions the creation of multidisciplinary institutions, promoting research and innovation across disciplines.

COMPARING GURUKUL PEDAGOGY AND NEP 2020

The Gurukul pedagogy and the National Education Policy (NEP) 2020 represent two distinct educational approaches, yet both share underlying principles of holistic development, personalized learning, and the emphasis on values in education. The Gurukul system, prevalent in ancient India, was a highly individualized and mentor-driven model where the focus was not just on academic knowledge but on the spiritual, moral, and emotional growth of the student. Learning took place in natural, tranquil environments, promoting experiential learning and self-reflection, where the teacher-student relationship was central.

In contrast, NEP 2020 advocates for a modernized educational approach that combines both traditional and contemporary pedagogical methods. It aims to make education more inclusive, flexible, and multidisciplinary, addressing the diverse needs of students. NEP introduces a rigorous curriculum with an emphasis on critical thinking, creative problem-solving, and competency-based assessments, which align with some aspects of the Gurukul system's focus on inquiry and debate. The policy also highlights the importance of learning through exploration and experiential learning, reminiscent of the hands-on education at the Gurukul.

While the Gurukul system operated within a personalized one-on-one setting, NEP 2020 envisions a more broad-scale implementation, emphasizing technology integration and inclusive education to cater to large populations across diverse backgrounds. Language and regional diversity are also prioritized, with a focus on the mother tongue in early education, which echoes the Gurukul's focus on culturally relevant knowledge.

However, the modern schooling system under NEP faces the challenge of scaling the Gurukul's personalized attention to larger classrooms and diverse educational contexts. While NEP 2020 introduces reforms such as flexible curricula and skill-based education, there is still a gap in fostering the deep emotional connection between students and teachers that the Gurukul system naturally encouraged.

In conclusion, Gurukul pedagogy and NEP 2020 share a common vision of nurturing holistic individuals, but while the Gurukul was a more personalized and community-based system, NEP seeks to implement these principles on a broader and more formalized scale, integrating modern technologies and innovative assessment systems to enhance the learning experience.

FINDINGS

1. Both the Gurukul system and NEP 2020 emphasize holistic education, focusing not only on academic knowledge but also on emotional, moral, and spiritual growth.
2. The Gurukul system was highly individualized, with close teacher-student relationships, while NEP 2020 aims to implement personalized learning on a larger scale through flexible curricula and multidisciplinary learning.
3. The Gurukul system relied on experiential learning in natural environments, fostering practical and hands-on knowledge, a principle now reflected in NEP 2020, which promotes learning through exploration and real-life experiences.
4. Both systems prioritize value-based education. The Gurukul was rooted in the transmission of moral and ethical values, while NEP 2020 encourages a curriculum that instills critical thinking, ethics, and social responsibility.
5. In the Gurukul, the relationship between the guru and shishya was central to learning, focusing on mentorship. NEP 2020, while promoting teacher-student engagement, seeks to address teacher shortages and formalize education on a larger scale.
6. The Gurukul system's curriculum was dynamic and adaptable to individual needs, an aspect NEP 2020 attempts to bring into the modern school system through flexible subject choices and skill development.
7. The Gurukul system, though personalized, was limited in its accessibility and often available only to a select few. NEP 2020 aims to make education more inclusive and accessible to all students, especially in marginalized and rural areas, through technology integration and open learning pathways.
8. The Gurukul system often used local and regional languages for instruction, while NEP 2020 advocates for mother tongue education in the early years, recognizing the value of regional diversity in learning.
9. While the Gurukul system was grounded in traditional, oral forms of education, NEP 2020 integrates technology to enhance learning, ensuring that it reaches a larger and more diverse population across India.
10. The Gurukul system did not rely on formal examinations but rather on continuous assessment through debates and discussions. NEP 2020, while moving towards competency-based and formative assessments, still incorporates more structured assessments compared to the Gurukul's informal model.

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GOEIIRJ

**A REVIEW STUDY ON THE ROLE OF AI IN THE WORKPLACE:
TRANSFORMING HR FUNCTIONS FOR EFFICIENCY AND EMPLOYEE
ENGAGEMENT**

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ABSTRACT:

The integration of Artificial Intelligence (AI) into Human Resource (HR) functions has significantly transformed workplace operations, optimized efficiency and enhancing employee engagement. This study explores how AI-driven technologies are reshaping HR processes, including talent acquisition, performance management, and employee well-being initiatives. By analyzing real-world implementations, this case study investigates the benefits of AI in reducing administrative burdens, enabling data-driven decision-making, and fostering a personalized employee experience. However, the adoption of AI in HR also presents challenges, such as ethical concerns, data security risks, and potential biases in algorithmic decision-making. This research provides insights into best practices for AI adoption in HR, emphasizing the need for a balanced approach that integrates AI capabilities with human oversight. The findings contribute to understanding how organizations can strategically leverage AI while maintaining a human-centric work culture.

KEY WORDS: Artificial Intelligence (AI), Human Resource Management (HRM), Employee Engagement, AI-driven HR Analytics, Talent Acquisition, Performance Management, Workplace Automation, Ethical AI in HR, AI and Workforce Productivity, AI-driven Decision-Making

INTRODUCTION:

The integration of Artificial Intelligence (AI) into Human Resources (HR) has marked a revolutionary transformation in how organizations manage their workforce and enhance employee engagement (Osborne, C). As we progress through 2025, AI technologies have become increasingly sophisticated, offering unprecedented capabilities in streamlining HR processes and decision-making. The evolution of HR technology has been particularly notable with the emergence of advanced platforms and tools that have fundamentally altered traditional HR practices. From recruitment and onboarding to performance management and employee development, AI-powered solutions have demonstrated remarkable efficiency in handling complex HR functions. Organizations have witnessed significant improvements in their HR operations through the implementation of AI-driven analytics platforms, which provide deep insights into

employee behaviour, performance patterns, and organizational dynamics. The adoption of these technologies has been accelerated by successful implementations across various industries, with companies reporting enhanced productivity and improved employee satisfaction levels.

OBJECTIVES OF THE STUDY:

- To understand the concept of Artificial Intelligence and discuss its implications at Organisations.
- To study the influence of AI at work place with special reference to transforming HR functions for efficiency and employee engagement.

RESEARCH METHODOLOGY:

Type of Research: Descriptive Research

Data Collection: Secondary Sources

Scope of the study: The domain of AI and influence on Organisations

Limitation of the study: The Researcher has generalised the results through secondary data investigation. Hence the inferences are indicative in nature.

TRANSFORMING HR FUNCTIONS FOR EFFICIENCY AND EMPLOYEE ENGAGEMENT

Modern HR departments are leveraging AI to create more personalized employee experiences, automate routine tasks, and make data-driven decisions that positively impact both organizational performance and employee engagement. This technological revolution in HR not only promises greater operational efficiency but also enables HR professionals to focus on more strategic initiatives that drive organizational growth and foster a more engaged workforce.

Current AI Applications in HR

Artificial Intelligence has fundamentally transformed Human Resource Management, revolutionized traditional processes and enabled data-driven decision-making across organizations. The integration of AI technologies has enhanced operational efficiency while simultaneously improving employee experience and organizational outcomes(Maghsoodi, M). This transformation represents a significant shift from conventional HR practices to more sophisticated, automated systems that leverage advanced analytics and machine learning capabilities.

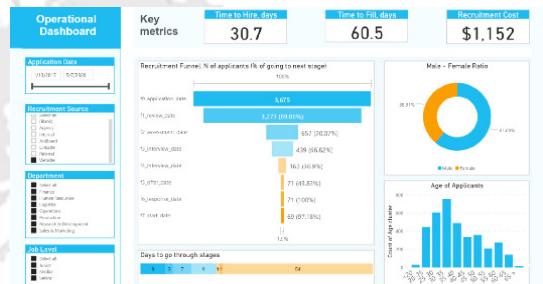
AI-Driven Talent Analytics

Modern HR departments have embraced AI-powered talent analytics to process and interpret vast amounts of employee data, generating actionable insights for strategic decision-making. These systems analyse patterns in employee performance, engagement, and behavioural data to predict workforce trends and identify potential issues before they escalate(Aydin, O). Through sophisticated algorithms, organizations can now track key performance indicators, measure employee satisfaction, and forecast talent needs with unprecedented accuracy. The

implementation of AI-driven analytics has enabled HR professionals to move beyond intuition-based decision-making to a more scientific approach, utilizing predictive modelling and pattern recognition to understand organizational behaviour. These systems can identify flight risks among high-performing employees, recommend personalized development paths, and optimize workforce planning based on historical data and future projections. The integration of machine learning algorithms has particularly enhanced the ability to identify correlations between various workplace factors and employee outcomes, leading to more effective talent management strategies.

Automated Recruitment Systems

The recruitment landscape has been revolutionized by AI-powered systems that streamline the hiring process while reducing human bias and improving candidate matching efficiency. These systems employ natural language processing to screen resumes, analyse candidate responses, and evaluate qualifications against job requirements with remarkable precision (Maghsoudi, M). Advanced AI algorithms can now assess candidates' potential cultural fit, technical capabilities, and long-term success probability within the organization. The automation of initial screening processes has significantly reduced time-to-hire while improving the quality of candidate shortlists. Modern recruitment platforms utilize machine learning to continuously refine their matching algorithms based on successful hiring outcomes, creating an increasingly accurate selection process.



The implementation of these automated systems has particularly benefited organizations by standardizing the evaluation process and minimizing unconscious bias in hiring decisions. Through sophisticated matching algorithms, these platforms can identify candidates whose skills and experiences align with job requirements, while also considering factors such as company culture and team dynamics. This technological advancement has transformed recruitment from a largely subjective process to a more objective, data-driven approach that enhances both efficiency and fairness in hiring practices.

(*Note.* AI recruitment dashboard interface showing candidate screening metrics and analytics visualization)

Employee Well-being and Engagement

The integration of Artificial Intelligence in workplace management has fundamentally transformed how organizations approach employee well-being and engagement. As organizations increasingly rely on AI-driven systems for human resource management, understanding the relationship between technological advancement and employee wellness has become crucial for

sustainable workplace development. The implementation of AI solutions has demonstrated significant potential in enhancing both organizational efficiency and employee satisfaction when properly managed with transparency and clear communication(Sadeghi, S).

Performance Monitoring and Support

Modern AI systems have revolutionized performance tracking and employee development initiatives by providing real-time analytics and personalized feedback mechanisms. These systems utilize advanced algorithms to monitor workplace productivity patterns while maintaining employee privacy and autonomy. Organizations have implemented AI-driven performance management tools that offer continuous feedback loops, enabling managers to identify areas for improvement and provide targeted support more effectively. The success of these systems largely depends on maintaining transparency in their implementation and ensuring employees understand how their data is being used to support their professional growth. When properly executed, these AI-driven performance monitoring systems have shown to increase job satisfaction and reduce turnover intentions while fostering a more engaged workforce.

Health and Wellness Integration

The incorporation of AI-powered health and wellness systems represents a significant advancement in workplace well-being initiatives. These systems utilize sophisticated biometric feedback mechanisms to monitor stress levels, work patterns, and overall employee health indicators. Organizations have successfully implemented AI-generated health prompts that provide personalized recommendations for breaks, exercise, and stress management techniques. The integration of these systems has proven particularly valuable in identifying early signs of burnout and facilitating proactive interventions. By leveraging AI to support employee wellness, organizations have created more supportive work environments that prioritize both physical and mental health. The key to successful implementation lies in ensuring these systems enhance rather than intrude upon employee well-being, maintaining a careful balance between technological capability and human needs. This approach has demonstrated positive outcomes in improving overall workplace satisfaction and employee retention rates while fostering a culture of well-being and sustainable productivity.

IMPLEMENTATION CHALLENGES:

The integration of AI technologies into HR functions presents significant challenges that organizations must carefully navigate to ensure successful implementation.

While AI promises enhanced efficiency and data-driven decision-making, several critical obstacles need to be addressed for effective deployment. The primary concerns revolve around technical infrastructure requirements, data quality management, and the fundamental need to protect sensitive employee information while maintaining compliance with evolving regulations(Leech, G).

Technical and Privacy Concerns

The implementation of AI systems in HR departments faces substantial technical hurdles, particularly regarding data security and privacy protection. Organizations must invest heavily in robust infrastructure capable of handling large volumes of sensitive employee data while ensuring compliance with data protection regulations such as GDPR and other regional privacy laws (Sastry, G). The technical challenges extend beyond mere infrastructure setup, encompassing the need for sophisticated encryption protocols, secure data storage solutions, and comprehensive access control systems. Privacy concerns have become increasingly critical as AI systems process vast amounts of personal employee information, from performance metrics to health records and financial data. The risk of data breaches and unauthorized access poses significant threats to both organizational security and employee trust.

The complexity of integrating AI systems with existing HR infrastructure while maintaining data integrity and security has emerged as a significant challenge. Organizations must establish robust protocols for data handling, implement regular security audits, and ensure transparent communication about data usage policies. The technical requirements for AI implementation often necessitate substantial investments in both hardware and software solutions, creating potential barriers for smaller organizations or those with limited resources (Bjarnason, R). Additionally, the need for continuous system updates and maintenance to address emerging security threats adds another layer of complexity to the implementation process.

(*Note.* cybersecurity threats in HR AI systems visualization infographic)



FUTURE OUTLOOK AND RECOMMENDATIONS:**Change Management Strategies**

The integration of AI in HR functions represents a transformative shift that requires careful orchestration of change management strategies. Organizations must adopt a comprehensive framework that addresses both technological implementation and human adaptation (Sastry, G). The key to successful AI adoption lies in creating a culture of transparency and continuous learning. HR leaders should focus on developing clear communication channels to address employee concerns about AI integration, emphasizing how AI tools augment rather than replace human capabilities. Training programs should be implemented in phases, allowing employees to gradually build confidence in working alongside AI systems. Organizations must also establish cross-functional teams that include both HR professionals and technical experts to ensure smooth implementation and knowledge transfer. The change management process should incorporate regular feedback loops to identify and address challenges early in the implementation phase (Bengio, Y).

Success Metrics

Measuring the effectiveness of AI implementation in HR requires a multi-dimensional approach to evaluation. Organizations should establish both quantitative and qualitative metrics to assess the impact of AI integration (Leech, G). Key performance indicators should include reduction in time-to-hire, improvement in employee engagement scores, and decrease in administrative task processing time. Return on Investment (ROI) calculations should consider both direct cost savings and indirect benefits such as improved decision-making quality and enhanced employee experience. Organizations should track metrics such as the accuracy of AI-driven predictions in talent acquisition, the effectiveness of AI-powered learning recommendations, and the overall satisfaction levels with AI-enabled HR services. Regular assessments should be conducted to measure the adoption rate of AI tools among HR professionals and employees, along with monitoring the impact on HR team productivity and strategic contribution to business objectives. Success metrics should also include measures of bias reduction in HR processes and improvements in workforce diversity and inclusion outcomes.

CONCLUSION:

The integration of AI into HR functions has fundamentally transformed workplace dynamics, enhancing both operational efficiency and employee engagement. Through automated processes, data-driven decision making, and personalized employee experiences, AI has demonstrated its potential to revolutionize traditional HR practices (Veličković, P). However, successful implementation requires a balanced approach that maintains human oversight and ethical considerations. Organizations must focus on upskilling their workforce while leveraging AI capabilities to create a harmonious work environment. The future of HR lies in the strategic

combination of artificial intelligence and human expertise, where technology augments rather than replaces human judgment. This synergy promises to deliver more effective, equitable, and engaging workplace experiences while addressing traditional HR challenges with innovative solutions. As we move forward, the key to success will be maintaining this delicate balance between technological advancement and human-centric values in HR management.

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STRENGTHENING HEALTHCARE SYSTEMS: STRATEGIES FOR ENHANCING RESILIENCE AND ACHIEVING GLOBAL HEALTH EQUITY

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Abstract

This study investigates the impact of staff competency, resource availability, patient experience, technology integration, and leadership support on healthcare quality in primary healthcare facilities. Using a structured questionnaire with a 5-point Likert scale, data were collected from 198 respondents and analyzed using R Studio. Regression analysis revealed that staff competency, resource availability, and leadership support positively influence healthcare quality, highlighting the importance of skilled personnel, adequate resources, and strong managerial support. However, technology integration negatively impacts healthcare quality, suggesting challenges in implementation or adaptation. Patient experience was not statistically significant, implying that objective factors may play a greater role than subjective perceptions. The study contributes to healthcare management by providing empirical insights into key determinants of healthcare quality. Future research could explore additional organizational and policy-driven factors. Strengthening healthcare quality through effective leadership, resource management, and staff training has global relevance, enhancing patient satisfaction and healthcare efficiency worldwide.

Keywords: Healthcare Quality, Staff Competency, Resource Availability, Technology Integration, Leadership Support

Introduction

The global healthcare landscape has undergone profound transformation, particularly in response to the COVID-19 pandemic, which exposed vulnerabilities while accelerating innovation in healthcare management. Müller et al. (2024) highlight how the crisis catalyzed rapid adaptation, underscoring the need for systemic resilience and equitable access. Strengthening healthcare systems requires an integrated approach encompassing human resource management, technological advancements, and operational efficiency. Ceschel et al. (2024) emphasize the importance of workforce management, while Mutebi et al. (2024) stress capacity building and logistics for operational agility. Technological integration has reshaped healthcare delivery models, with Harvey et al. (2017) demonstrating the effectiveness of nurse-led, patient-centered care. Holly et al. (2023) highlight the need for robust health data governance, while Massarvva et al. (2025) explore telehealth's role in advancing equity for displaced populations. In resource-constrained settings, Wekullo et al. (2018) examine Kenya's healthcare challenges, and Chowdhury et al.

(2023) analyze vaccine distribution strategies. Leadership is key to transformation, with Sebastian et al. (2014) stressing strategic healthcare leadership amid organizational change. Balancing short-term needs with long-term sustainability, Laila et al. (2024) propose innovative financing models to support healthcare development. A holistic approach is essential for addressing global and local healthcare challenges effectively.

Literature Review

The literature on healthcare system strengthening and resilience encompasses leadership, technological innovation, organizational change, and sustainable development. Adaptive leadership and organizational resilience are key themes, with Panchamia et al. (2025) comparing leadership responses in India and the USA during COVID-19, emphasizing strategic adaptability. Rojko et al. (2025) highlight evolving nursing leadership roles in system transformation. Organizational change remains crucial, as Da Ros et al. (2024) analyze sustainable healthcare transformations, while Reynolds Kueny et al. (2024) explore simulation-based approaches in rural healthcare management. Technology and cybersecurity play vital roles, with Lnenicka et al. (2025) providing cybersecurity guidelines for healthcare's integration with smart city infrastructure. Supply chain resilience is critical, as Gera and Singh (2025) identify pharmaceutical supply chain drivers, and Cao et al. (2024) examine ambidextrous strategies for resilience. Human resources remain central, with Malik and Singh (2024) focusing on HR practices that enhance employee resilience, while Abdalla et al. (2024) emphasize psychological health interventions. Sustainable financing is essential, with Anago (2024) exploring alternative financing and Arora (2024) assessing microfinance's role in healthcare development. Moja et al. (2024) highlight strategic partnerships for sustainable healthcare goals.

Digital transformation is reshaping healthcare, with Thapa and Gandhi (2024) addressing telemedicine challenges and Sankar et al. (2024) examining smart city integration for improved healthcare access. Supply chain resilience is emphasized by Sharma et al. (2024) in smart supply chains and Sutar et al. (2024) in digital food supply chains. Governance and accountability remain vital, as studied by Sharma and Kaur (2024) in New Zealand and Siboni and Canestrini (2023) in Italy. Organizational resilience during crises is explored by Bradley and Alamo-Pastrana (2022), while Ogunyemi and Onaga (2023) highlight responsible leadership. Sustainability and ESG practices are gaining prominence, ensuring long-term healthcare resilience. Technological advancements are crucial in healthcare transformation, with Palas and Bunduchi (2021) exploring blockchain's potential and Flanding et al. (2018) emphasizing digital change leadership. Access to healthcare remains a challenge, as highlighted by Dumalanede et al. (2020) and Davey et al. (2021) across profit, non-profit, and faith-based models. Human resource management is vital, with Lee et al. (2020) examining prosocial advocacy and Ogunyemi and Onaga (2022) discussing values-based management post-pandemic. Financial sustainability is a concern, addressed by Palea

(2022) and Ganziro and Vambery (2016). MasdeuYélamos et al. (2019) propose the Universal Transformational Management Framework for structured healthcare reform.

RQ1: To what extent do staff competency and resource availability influence overall healthcare quality in primary healthcare facilities as perceived by healthcare workers and patients?

RQ2: How does the integration of technology and leadership support affect healthcare quality outcomes while accounting for patient experience in healthcare settings?

Research Methodology

The research methodology assesses the impact of staff competency, resource availability, patient experience, technology integration, and leadership support on healthcare quality in primary healthcare facilities. A structured questionnaire using a 5-point Likert scale (ranging from "Strongly Disagree" to "Strongly Agree") was employed to collect 198 responses from healthcare workers and patients, ensuring a diverse and comprehensive sample. Data were gathered through surveys conducted in healthcare facilities, with responses carefully recorded and validated. The study utilized a cross-sectional design, capturing respondent perspectives at a single point in time. After data cleaning and checking for missing values, statistical analysis was conducted using R Studio, chosen for its robust data modeling and visualization capabilities. Regression analysis examined the relationship between independent variables and healthcare quality, while diagnostic tests, including Q-Q plots and residual analysis, ensured the model's validity. These tests confirmed normality, homoscedasticity, and the absence of multicollinearity, ensuring reliable results for understanding healthcare service effectiveness.

Objectives:

- To assess the relative impact of staff competency, resource availability, and patient experience on healthcare quality by analyzing primary data collected through 5-point Likert scale responses from healthcare workers and patients
- To evaluate the relationship between technological integration and leadership support in predicting healthcare quality while controlling for other organizational factors

Hypotheses:

H1: Staff competency and resource availability have no significant relationship with overall healthcare quality

H2: Technology integration and leadership support, when controlling for patient experience, have no significant effect on healthcare quality

Regression Line:

Healthcare Quality (HQ) = β_0 + β_1 Staff Competency (SC) + β_2 Resource Availability (RA) + β_3 Patient Experience (PE) + β_4 Tech Integration (TI) + β_5 Leadership Support (LS) + ϵ

The methodology ensures the reliability and validity of the study findings by using a structured approach to data collection and analysis. By employing statistical techniques in R Studio, the study

provides empirical evidence regarding the factors that influence healthcare quality. The structured Likert scale responses enable precise measurement, while the sample size of 198 participants ensures meaningful insights that can be generalized within the studied healthcare context.

Analysis

The demographic profile of 198 participants ensures diverse representation in healthcare services, including workers and patients. The sample consists of 55% female and 45% male respondents, offering balanced insights into healthcare quality. Age distribution includes 30% aged 18–30, 40% between 31–45, 20% from 46–60, and 10% above 60, capturing perspectives across life stages. Educational backgrounds vary, with 25% holding a high school diploma, 35% a bachelor's, 30% a master's, and 10% a doctorate. Occupationally, 40% are healthcare professionals, 35% administrative staff, and 25% patients. Income levels range from low (20%), middle (35%), to high (45%), ensuring a holistic understanding of healthcare perceptions.

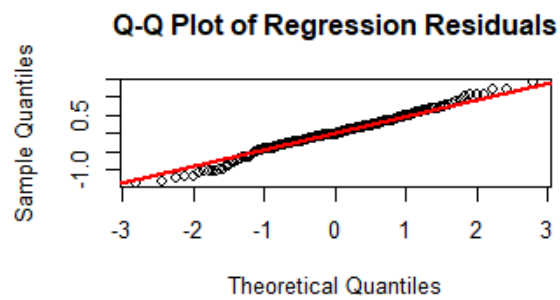


Table 1: Regression line for Healthcare Quality

Call:

```
lm(formula = HQ ~ SC + RA + PE + TI + LS, data = Paper_1)
```

Residuals:

Min	1Q	Median	3Q	Max
-1.36133	-0.28235	-0.01277	0.32601	1.39491

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	1.42155	0.19368	7.340	5.89e-12 ***
SC	0.26322	0.06563	4.011	8.66e-05 ***
RA	0.23482	0.08290	2.833	0.00511 **
PE	-0.04242	0.07219	-0.588	0.55748
TI	-0.21882	0.07015	-3.119	0.00209 **
LS	0.19700	0.08644	2.279	0.02376 *

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.5166 on 192 degrees of freedom

Multiple R-squared: 0.3563, Adjusted R-squared: 0.3396

F-statistic: 21.26 on 5 and 192 DF, p-value: < 2.2e-16

[Sources: R Studio Analysis]

Table 1 presents the regression analysis results assessing the impact of staff competency (SC), resource availability (RA), patient experience (PE), technology integration (TI), and leadership support (LS) on healthcare quality (HQ). The study addresses two research questions: (1) To what extent do staff competency and resource availability influence healthcare quality? and (2) How does technology integration and leadership support affect healthcare quality while accounting for patient experience? The findings reveal a statistically significant relationship between staff competency and healthcare quality ($\beta = 0.263$, $p < 0.001$), indicating that higher staff competency enhances healthcare outcomes. Similarly, resource availability positively influences healthcare quality ($\beta = 0.234$, $p = 0.005$), highlighting the importance of well-equipped healthcare facilities. These results confirm that both staff competency and resource availability are critical determinants of healthcare quality, rejecting Hypothesis H1. Patient experience does not significantly impact healthcare quality ($\beta = -0.042$, $p = 0.557$), suggesting that objective factors such as staff skills and infrastructure may play a more dominant role. Technology integration negatively affects healthcare quality ($\beta = -0.219$, $p = 0.002$), indicating possible implementation challenges. Conversely, leadership support has a positive and significant effect ($\beta = 0.197$, $p = 0.024$), emphasizing the role of strong leadership in maintaining healthcare standards. These findings partially reject Hypothesis H2, demonstrating that while leadership support enhances healthcare quality, ineffective technology integration may hinder service delivery.

The Q-Q plot in Figure 1 evaluates whether the residuals of the regression model follow a normal distribution. The x-axis represents theoretical quantiles, while the y-axis shows standardized residuals. If residuals are normally distributed, points align along the diagonal reference line; deviations, especially at the ends, suggest skewness or outliers, potentially affecting model assumptions. In healthcare quality analysis, normality is crucial for valid hypothesis testing and confidence intervals. Significant deviations may require transformations or alternative regression methods. Ensuring normality enhances model reliability when assessing the impact of staff competency, resource availability, patient experience, technology integration, and leadership support.

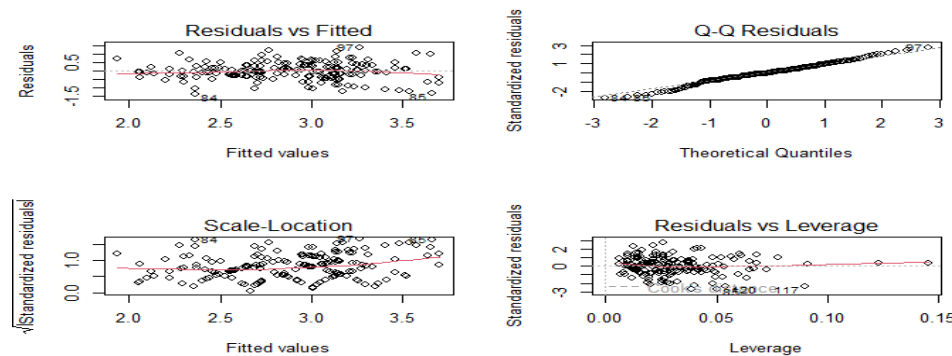


Figure 2: Residual Vs Fitted, Q-Q Plot, Scale Location and Residual Vs Leverage Plots

Figure 2 presents four key diagnostic plots to assess the validity of the regression model analyzing healthcare quality determinants. The residual vs. fitted plot checks for non-linearity and heteroscedasticity, where a random scatter around zero confirms model assumptions. The Q-Q plot evaluates residual normality, with deviations from the diagonal line indicating potential normality issues. The scale-location plot examines homoscedasticity, ensuring constant variance. Lastly, the residual vs. leverage plot detects influential points that may distort the model. These diagnostics collectively validate the regression model's robustness, ensuring reliable insights into the factors influencing healthcare quality.

Conclusion

This study examines key factors influencing healthcare quality in primary healthcare facilities, focusing on staff competency, resource availability, patient experience, technology integration, and leadership support. Regression analysis reveals that staff competency and resource availability significantly enhance healthcare quality, highlighting the need for well-trained professionals and adequate resources. Leadership support also plays a crucial role, emphasizing the importance of effective management in maintaining high healthcare standards. However, technology integration negatively impacts healthcare quality, suggesting challenges in implementation, usability, or adaptability. Patient experience does not show a statistically significant effect, indicating that objective factors like infrastructure and staff competence may have a stronger influence on healthcare perceptions. These findings offer valuable insights for policymakers and healthcare administrators, emphasizing investment in human resources, infrastructure, and leadership training. Future research could explore additional factors such as financial investments, government policies, and cultural influences to build a more comprehensive healthcare quality model. Longitudinal studies can assess long-term impacts, while qualitative research can provide deeper insights into patient and provider experiences. Addressing technology-related challenges through proper training and strategic implementation can enhance efficiency, accessibility, and healthcare quality worldwide.

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पर्यटन विकासासाठी : कौशल्य विकास आणि व्यावसायिक प्रशिक्षण

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मार्गदर्शक

सारांश :

भारतीय शिक्षणाचा विकास ख-या अर्थाने स्वातंत्र्योत्तर काळामध्ये झालेला दिसून येतो. भारतातील शिक्षण प्रणालीने प्राचीन काळापासून आजपर्यंत मोठा प्रवास केला आहे. प्राचीन काळात गुरुकुल प्रणाली प्रचलित होती, जिथे विद्यार्थ्यांना नैतिक, धार्मिक आणि व्यावहारिक शिक्षण दिले जात होते. त्यानंतर ब्रिटीश काळामध्ये 1857 मध्ये भारतातील पहिली तीन विद्यापीठे - कलकत्ता, मुंबई आणि मद्रास येथे स्थापन झाली. त्यानंतर भारतीय स्वातंत्र्यानंतर 1948-49 मध्ये राधाकृष्णन आयोग आणि 1964-66 मध्ये कोठारी आयोग यांनी शिक्षणव्यवस्थेच्या सुधारासाठी महत्त्वपूर्ण शिफारसी केल्या. 1966 आणि 1976 च्या राष्ट्रीय शिक्षण धोरणांनी सक्तीच्या प्राथमिक शिक्षणावर भर दिला. तसेच सर्व शिक्षा अभियान (2001) आणि शिक्षणाचा अधिकार कायदा (2009) यांनी मोफत आणि सक्तीचे शिक्षण लागू केले. त्यानंतर राष्ट्रीय शिक्षण धोरण 2020 मध्ये झालेले विविध बदल जसे 10+2 प्रणालीऐवजी 5+3+3+4 अशी नवीन शैक्षणिक रचना आखण्यात आलेली आपणास दिसून येते. यामध्ये बहुप्रवाही शिक्षण, मातृभाषेतून शिक्षण, व्यावसायिक आणि तांत्रिक शिक्षण, उच्च शिक्षणात सुधारणा: एकल नियामक मंडळ, क्रेडिट ट्रांसफर प्रणाली, आणि संशोधन व नावीन्यता वाढवण्यासाठी राष्ट्रीय संशोधन संस्था या सारखे विविध बदल शिक्षणामध्ये दिसून येतात. म्हणजेच गुरुकुल पद्धतीपासून ते आधुनिक डिजिटल शिक्षणापर्यंतचा हा प्रवास समाजाच्या विविध बदलत्या गरजांशी जुळवून घेत आला आहे. आज शिक्षण क्षेत्रात मोठे सुधारणात्मक बदल घडत आहेत, विशेषतः नवीन राष्ट्रीय शिक्षण धोरण यामुळे शिक्षण अधिक समय, समावेशक आणि व्यावसायिकदृष्ट्या उपयुक्त बनत आहे.

प्रस्तावना :

पर्यटन हा भारताच्या आर्थिक विकासाचा महत्त्वाचा घटक आहे. भारताची समृद्ध सांस्कृतिक वारसा, नैसर्गिक सौंदर्यस्थळे, आध्यात्मिक केंद्रे आणि विविध खाद्यसंस्कृती यामुळे देशात तसेच आंतरराष्ट्रीय स्तरावर पर्यटन क्षेत्राचा मोठा विस्तार होऊ शकतो. मात्र, पर्यटनाचा शाश्वत विकास करण्यासाठी कौशल्य विकास आणि व्यावसायिक प्रशिक्षण आवश्यक आहे. राष्ट्रीय शिक्षण धोरण 2020 मध्ये भारतीय शिक्षणामध्ये विविध गोष्टींवर मोठ्या प्रमाणात बदल घडवून आणल्याचे दिसून येते. यामुळे आजचा शिक्षण घेणारा विद्यार्थी भविष्यामध्ये विविध क्षेत्रामध्ये पारंगत असेल त्याचबरोबर प्रत्येक व्यक्तीच्या अंगी शिक्षणाबरोबर विविध कौशल्य अंगीकृत असतील. प्रत्येक व्यक्तीच्या अंगी व्यावसायिक क्षमता परिपूर्ण

असतील व त्यामुळे भविष्यामध्ये विविध कौशल्य आणि व्यावसायिक क्षमतांच्या क्षमतांमुळे व्यक्ती हा प्रत्येक क्षेत्रामध्ये सक्षम असल्याचे दिसून येईल.

शाश्वत भविष्याच्या सक्षमीकरणासाठी कौशल्य विकास आणि व्यावसायिक प्रशिक्षण अत्यंत महत्त्वाचे आहेत. आजच्या वेगवान तंत्रज्ञानयुगात आणि बदलत्या रोजगाराच्या संधींमध्ये टिकून राहण्यासाठी तसेच सामाजिक आणि आर्थिक प्रगती साधण्यासाठी योग्य कौशल्ये आत्मसात करणे आवश्यक आहे. यातून व्यक्तीला रोजगार निर्मिती होण्यासाठी मदत होते. व स्थानिक बाजारपेठ निर्मिती व विकास होण्यास मदत होते.

• **पर्यटन क्षेत्रातील कौशल्य विकासाचे महत्त्व**

- **रोजगार निर्मिती** - पर्यटन हा मोठ्या प्रमाणावर रोजगार देणारा उद्योग वा व्यवसाय आहे. व्यक्तीला योग्य प्रशिक्षण आणि त्याच्या अंगी योग्य कौशल्यांचा विकास झाल्यास तेथील पर्यटन पर्यटन क्षेत्रातील स्थानिक युवकांना अधिक संधी मिळतील.
- **गुणवत्तापूर्ण सेवा** - व्यक्तीला योग्य व गुणवत्तापूर्ण प्रशिक्षण वेळोवेळी दिले तर अशा प्रशिक्षित कर्मचाऱ्यांमुळे ग्राहकांशी योग्य संप्रेषण होते व यातून अनुभव चांगला राहतो, ज्यामुळे पर्यटन उद्योगाला गती मिळते.
- **स्थानीय अर्थव्यवस्थेचा विकास** - स्थानिक गोष्टींचा विकास करून त्याचे स्थान जागमिक पातळीवर आणणे घेवून जावून शकतो. व चांगले आर्थिक स्थैर्य प्राप्त करू शकतो. स्थानिक लोकांना पर्यटनाशी जोडल्याने ग्रामीण आणि शहरी भागाचा विकास शक्य होतो.
- **शाश्वत पर्यटनाची जाणीव** - पर्यावरणपूरक आणि जबाबदारीने पर्यटन व्यवस्थापन करण्यासाठी प्रत्येक व्यक्तीस शालेय स्तरापासून वा महाविद्यालयीन जीवनापासून योग्य प्रकारचे प्रशिक्षण देणे वा मिळणे अत्यंत आवश्यक आहे.

• **पर्यटनासाठी आवश्यक कौशल्ये :**

पर्यटन उद्योग हा कोणत्याही देशाच्या आर्थिक वाढीस चालना देणारा महत्त्वाचा घटक आहे. याला अधिक व्यावसायिक आणि दर्जेदार बनवण्यासाठी पर्यटनाशी संबंधित व्यक्तींना आवश्यक कौशल्ये आणि प्रशिक्षण देणे आवश्यक आहे. त्यामध्ये खालिलप्रमाणे काही मूलभूत कौशल्ये अवगत असणे आवश्यक आहे, जर पर्यटनासाठी आवश्यक मुलभूत कौशल्य व्यक्तीच्या अंगी असतील तर अशा सर्वगुण संपन्न व्यक्तीमत्वाचा फायदा स्वतःच्या विकासाबरोबर राष्ट्राच्या विकासासाठी निश्चित होईल. त्यासाठी शासनाने, त्याचबरोबर खाजगी संस्थेने यासाठी जाणिव पुर्वक प्रयत्न करणे आवश्यक आहे.

• **व्यावसायिक कौशल्ये :**

1. **हॉटेल व्यवस्थापन आणि अतिथी सेवा** - हॉटेल व्यवस्थाने या आस्थापनांमध्ये अतिथी सेवा, रिसेप्शन व्यवस्थापन आणि आदरातिथ्य कौशल्ये इ. बाबतचे ज्ञान व योग्य प्रशिक्षण कौशल्य असणे आवश्यक आहे.
2. **संवाद कौशल्ये आणि परकीय भाषा** - आंतरराष्ट्रीय पर्यटकांशी, राष्ट्रीय पर्यटकांशी विविध भाषेमध्ये सुगम संवाद साधण्यासाठी इंग्रजीसह इतर परदेशी भाषांचे व राष्ट्रामध्ये बोलल्या जाणा-या विविध स्थानिक भाषेचे यथोचित ज्ञान असणे अत्यंत आवश्यक आहे.

3. **पर्यटन मार्गदर्शक कौशल्ये** - बाहेरून आपल्याकडे अथवा विविध पर्यटक क्षेत्राचे ज्ञान अवगत असणे, त्याबाबतचा इतिहास, सांस्कृतिक वारसा, संस्कृती, वा इतर बाबी जसे स्थानिक वारसा, संस्कृती आणि ऐतिहासिक स्थळांबद्दल माहिती असणे आणि ती माहिती योग्य देण्याचे उत्तम कौशल्य असणे आवश्यक आहे.
 4. **स्वरोजगार आणि उद्योजकता** - पर्यटन हा एक उत्तम व्यवसाय आहे. यातून अनेक व्यक्ती स्वरोजगार निर्मिती करून आपला योग्य उदरनिर्वाह करू शकतात व इतरांसाठी देखिल चांगल्या रोजगाराच्या संधी उपलब्ध करू शकतात. त्याच बरोबर उत्तम ज्ञानार्जन करू टूर एजन्सी, होमस्टे, ईको-टूरिझम यासारख्या विविध उपक्रमांसाठीचे योग्य प्रशिक्षण घेवून विविध कौशल्यांचा विकास करून उद्योजकता विकासाची कौशल्ये आत्मसात करावी लागतात.
- **तांत्रिक आणि डिजिटल कौशल्ये:**
 1. **डिजिटल मार्केटिंग आणि सोशल मीडिया व्यवस्थापन** - पर्यटन व्यवसायाचा अणिकाधिक विकासा होण्यासाठी तंत्रज्ञाच्या विविध साधनांचा वापर करून पर्यटन क्षेत्रांचा विकास होण्यासाठी त्या क्षेत्राची परिपूर्ण माहिती, कधी यावे, कसे यावे, राहण्याची उत्तम व्यवस्था, वाहतूकीच्या विविध सुविधा, आर्थिक बजेट वा अंदाजे येणारा खर्च, इतर पर्यटनाची स्थळे याबाबतीतील सर्व माहिती डिजिटल मार्केटींगच्या साधनांचा वापर करणे आवश्यक आहे.
 2. **ई-टिकटिंग आणि पर्यटन व्यवस्थापन सॉफ्टवेअर** - विविध क्षेत्रातील माहितीचे प्रसारण झाल्यानंतर त्याठिकाणी जाण्यासाठी - येण्यासाठी ऑनलाइन प्रवासाची बुकिंग, यामध्ये रेल्वे, बस सेवा, वा इतर सुविधा, हॉटेल व्यवस्थापन व त्यांची बुकिंग व या सर्वांचे बुकिंग करण्यासाठी अद्ययावत असलेले विविध सॉफ्टवेअरचे ज्ञान ते सर्व सॉफ्टवेअर कसे वापरायचे याबाबतचे ज्ञान असणे आवश्यक आहे.
 3. **फोटोग्राफी आणि व्हिडिओ निर्मिती** - विविध भागातील पर्यटकांना पर्यटन स्थळांकडे आकर्षित करण्यासाठी त्या पर्यटन स्थळांचे विविध फोटो, व्हिडीओज, छोट्या युट्युब क्लिप, इ. व्दारे सर्व माहिती सोशल मिडीयाच्या साधनांचा वापर करून त्या पर्यटकांपर्यंत पोहचणे आवश्यक आहे. त्यामुळे पर्यटक आपोआप आकर्षित होतात व यातून पर्यटकांना त्या ठिकाणी भेट देण्याची उत्कंठा वाढते व पर्यटक सेवा सुविधा पाहून त्याठिकाणी भेट देतात.
 - **शाश्वत आणि जबाबदार पर्यटन कौशल्ये:**
 1. **इको-टूरिझम आणि पर्यावरण व्यवस्थापन** - पर्यटनस्थळांच्या संवर्धनासाठी शाश्वत पर्यटन कौशल्ये आत्मसात करणे आवश्यक आहे.
 2. **स्थानिक हस्तकला आणि कला संवर्धन** - स्थानिक व्यवसायांना चालना देण्यासाठी पारंपरिक कला व हस्तकला विक्रीसाठी प्रशिक्षण दिल्यामुळे स्थानिक बाजारपेठेत तयार होणा-या वस्तुंना जागतिक स्तरावर योग्य बाजारपेठ निर्माण होते. व त्यातून आपल्या स्थानिक गोष्टींमुळे स्थानिक कला संवर्धन आणि स्थानिक हस्तकला याबाबतचे व्यवस्थापन होणे आवश्यक आहे.
 3. **आरोग्य आणि आपत्कालीन व्यवस्थापन** - पर्यटकांना पर्यटन करत असतांना पर्यटकांना आरोग्य विषयक काळजी घेण्यासाठी विविध मेडीकल स्टोअर्स, उच्च प्रतीच्या गोळ्या व औषधी, चांगल्या वैद्यकीय सुविधा, पर्यटनाच्या ठिकाणी असणे अत्यंत आवश्यक आहे. त्यासाठी विद्यार्थ्यांना वा

व्यक्तीजवळ त्या स्वरूपाचे प्राथमिक ज्ञान असणे आवश्यक आहे. त्यामुळे आपत्कालीन परिस्थितीत त्वरित मदत देण्यासाठी प्राथमिक वैद्यकीय ज्ञान असणे आवश्यक आहे. वैद्यकीय सुविधांचा प्रसार झाल्यामुळे पर्यटन क्षेत्राचा विकास आपोआप होतो.

- पर्यटन क्षेत्रातील कौशल्य विकास कार्यक्रम आणि प्रशिक्षण योजना
- भारत सरकारच्या योजना:
- स्वदेश दर्शन योजना - थीम आधारित पर्यटन स्थळांचा विकास आणि पर्यटनाशी संबंधित कौशल्य प्रशिक्षण.
- प्रधानमंत्री कौशल विकास योजना - हॉटेल व्यवस्थापन, गाईड प्रशिक्षण आणि टूर ऑपरेटर प्रशिक्षण.
- हुनर से रोजगार तक योजना - गरीब व वंचित युवकांसाठी पर्यटन क्षेत्रात कौशल्य विकास करण्यासाठी प्रशिक्षण देणे.
- खाजगी क्षेत्र आणि ऑनलाइन प्रशिक्षण:
- आणि पर्यटन महाविद्यालये - हॉटेल आणि पर्यटन व्यवस्थापन अभ्यासक्रमांची सुविधा उपलब्ध होणे आवश्यक आहे.
- प्लॅटफॉर्म - पर्यटन क्षेत्रातील विविध कौशल्यांचे ऑनलाईन कोर्सेस सध्या आहेत.
- पर्यटन कौशल्य विकासासाठी आवश्यक उपाय :
- स्थानिक युवकांसाठी प्रशिक्षण केंद्रे स्थापन करणे त्यामुळे प्रत्येक युवकास प्रशिक्षणातून मार्गदर्शन भेटून त्याद्वारे उदयोजकता विकासासाठी मदत मिळेल.
- स्थानिक पर्यटनातून शेती-पर्यटन, संस्कृती-पर्यटन आणि साहसी पर्यटनाला चालना देणे.
- पर्यटन व्यवसायिकांसाठी नियमित कार्यशाळा आणि प्रशिक्षण कार्यक्रमांची अंमलबजावणी करणे.
- महिला आणि वंचित गटांसाठी विशेष पर्यटन प्रशिक्षण योजना तयार करणे त्यामुळे स्थानिक भागातील महिला योग्य प्रशिक्षणामुळे योग्य स्वरोजगार निर्मितीकडे वळतील व त्यातून त्यांना आर्थिक स्थैर्य मिळेल.
- उत्तम पर्यटन विकासासाठी शासन आणि खाजगी संस्थांची भूमिका अत्यंत महत्वाची आहे. शासन आणि खाजगी संस्थांमध्ये योग्य समन्वय असणे आवश्यक आहे.
- पर्यटन विकासासाठी शासनाने व्यावसायिक प्रशिक्षण केंद्रे आवश्यक त्या ठिकाणी उघडली पाहिजेत.
- हॉटेल आणि टुरिझम कंपन्यांनी कर्मचारी प्रशिक्षणासाठी विशेष कार्यक्रम हाती घ्यावेत.
- ऑनलाईन कोर्सेस, कार्यशाळा आणि इन्टर्नशिपच्या संधी उपलब्ध करून द्याव्यात.

निष्कर्ष :

व्यावसायिक प्रशिक्षण हा पर्यटन विकासाचा एक महत्त्वाचा आधारस्तंभ आहे. प्रशिक्षित कर्मचारी आणि आधुनिक कौशल्यांनी सुसज्ज पर्यटन उद्योग अधिक समृद्ध होईल आणि देशाच्या अर्थव्यवस्थेला चालना मिळेल. पर्यटन क्षेत्राच्या दीर्घकालीन विकासासाठी प्रशिक्षित मनुष्यबळ तयार करणे अत्यावश्यक आहे. योग्य कौशल्य विकास आणि व्यावसायिक प्रशिक्षण दिल्यास भारताचे पर्यटन क्षेत्र जागतिक स्तरावर अधिक सक्षम होईल आणि रोजगाराच्या नव्या संधी निर्माण होतील. शाश्वत भविष्यासाठी कौशल्य विकास ही केवळ गरज नसून ती एक गुंतवणूक आहे. नव्या संधींचा लाभ घेण्यासाठी, सामाजिक समृद्धी

वाढवण्यासाठी आणि पर्यावरणपूरक उद्योगसंधी निर्माण करण्यासाठी कौशल्य प्रशिक्षण अनिवार्य ठरत आहे. भारतीय शिक्षण प्रणालीने मोठी वाटचाल केली असून, NEP 2020 मुळे भविष्यातील शिक्षण अधिक लवचिक, समावेशक आणि व्यावहारिक होणार आहे. शिक्षण हा देशाच्या प्रगतीचा पाया असून त्याला मजबूत करण्यासाठी दर्जेदार, तांत्रिक आणि व्यावसायिक शिक्षणाला अधिक प्राधान्य द्यावे लागेल. यामुळेच शिक्षणातून व्यक्तीचे शाश्वत सक्षमीकरण होवून पर्यटन विकास होणार आहे.

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GOEIIRJ

AI AND MODERN EDUCATION: IMPLEMENTING NEP 2020 FOR FUTURE LEARNING

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Abstract:

The National Education Policy (NEP) 2020 envisions a transformative shift in India's education system, aiming for holistic development, personalized learning, and a future-ready generation. Artificial intelligence (AI) has the potential to be a powerful catalyst in realizing this vision, offering innovative tools and approaches to enhance learning and teaching. This essay explores how AI can be effectively implemented to support the goals of NEP 2020 and shape the future of learning.

AI is rapidly transforming modern education, offering a range of tools and techniques to personalize learning, automate tasks, and enhance the overall educational experience. Here's a brief overview:

Keywords: AI Tools, Development, Learning, Education

Key Applications of AI in Education:

- **Personalized Learning:** AI-powered platforms analyse student data to tailor educational content, pacing, and feedback to individual needs and learning styles.
 - **Intelligent Tutoring Systems:** AI tutors provide personalized guidance and support to students, adapting to their strengths and weaknesses.
 - **Automated Administrative Tasks:** AI automates tasks like grading, scheduling, and report generation, freeing up teachers' time for instruction and student interaction.
 - **Enhanced Learning Experiences:** AI creates immersive learning environments through virtual reality (VR) and augmented reality (AR), making learning more engaging and interactive.
 - **Data-Driven Decision Making:** AI analyses vast amounts of educational data to provide insights into student performance, identify trends, and inform instructional strategies.
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- Accessibility: AI tools can support students with disabilities, such as text-to-speech for visually impaired students and speech-to-text for hearing-impaired students.

Benefits of AI in Education:

- Improved Learning Outcomes: Personalized learning and intelligent tutoring can lead to better student understanding and achievement.
- Increased Teacher Efficiency: Automation of administrative tasks allows teachers to focus on teaching and student support.
- Enhanced Engagement: Interactive learning experiences and personalized content can increase student motivation and engagement.
- Greater Accessibility: AI tools can make education more accessible to students with diverse needs.
- Data-Driven Insights: AI provides valuable data and insights that can inform educational decisions and improve outcomes.

Challenges and Considerations:

- Ethical Concerns: Ensuring fairness, avoiding bias, and protecting student data are crucial considerations.
- Digital Divide: Equitable access to technology and internet connectivity is essential for all students.
- Teacher Training: Teachers need training and support to effectively integrate AI tools into their teaching practices.
- Cost of Implementation: Investing in AI technology and infrastructure can be expensive.

Despite these challenges, AI has the potential to revolutionize education, making it more personalized, engaging, and effective for all learners. As AI technology continues to develop, its role in modern education is likely to grow even further.

NEP 2020's Vision and AI's Potential:

NEP 2020 emphasizes several key areas, including:

- **Holistic Development:** Moving beyond rote learning to focus on cognitive, social, emotional, and physical development.
- **Personalized Learning:** Catering to individual learning styles and paces.
- **Experiential Learning:** Integrating hands-on activities, projects, and real-world applications.
- **Technology Integration:** Leveraging technology to improve access and quality of education.
- **Teacher Development:** Equipping teachers with the skills and resources to effectively use technology.

AI can contribute significantly to each of these areas:

- **Personalized Learning:** AI-powered platforms can analyse student data to identify learning gaps, recommend personalized learning paths, and provide customized feedback. Adaptive learning platforms can adjust the difficulty and content based on student performance, ensuring optimal learning.
- **Experiential Learning:** AI can create immersive learning environments through virtual reality (VR) and augmented reality (AR). Students can explore historical events, conduct virtual experiments, and interact with simulations, making learning more engaging and interactive.
- **Holistic Development:** AI can support social and emotional learning (SEL) by analyzing student interactions and providing insights into their emotional well-being. AI-powered tools can also help identify students at risk and provide timely interventions.
- **Technology Integration:** AI can automate administrative tasks, freeing up teachers' time to focus on teaching. AI-powered chatbots can answer student queries, provide support, and offer personalized guidance.
- **Teacher Development:** AI can provide teachers with data-driven insights into student performance, helping them identify areas where students are struggling and adjust their teaching strategies accordingly. AI-powered tools can also provide personalized professional development resources for teachers.

Implementing AI in Education:

Successful implementation of AI in education requires careful planning and execution:

- **Infrastructure Development:** Ensuring access to reliable internet connectivity and devices is crucial for AI-powered tools to function effectively.
- **Teacher Training:** Teachers need to be trained on how to use AI-powered tools and integrate them into their teaching practices.
- **Data Privacy and Security:** Protecting student data is paramount. Robust data privacy and security measures must be in place.
- **Ethical Considerations:** AI algorithms must be free from bias and ensure equitable access to education for all students.
- **Collaboration and Partnerships:** Collaboration between educators, technology developers, and policymakers is essential to ensure that AI is implemented effectively.

Challenges and Opportunities:

While AI offers immense potential, there are also challenges to overcome:

- **Digital Divide:** Ensuring equitable access to technology for all students, regardless of their socioeconomic background.

- **Teacher Resistance:** Addressing concerns about job displacement and the need for teachers to adapt to new technologies.
- **Cost of Implementation:** Investing in the necessary infrastructure, software, and training.

Despite these challenges, the opportunities presented by AI in education are immense. By strategically implementing AI, India can create a more personalized, engaging, and effective education system that prepares students for the challenges and opportunities of the 21st century. NEP 2020 provides a strong framework for this transformation, and AI can be a critical enabler in achieving its goals.

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**A STUDY OF THE CHALLENGES AND IMPACTS OF EMPLOYABILITY
TRAINING PROGRAMME FOR WEAKER SECTION WOMEN RESIDING IN
THE URBAN SLUMS OF PUNE**

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Abstract:

Dr. Babasaheb Ambedkar famously stated, "The progress of any society can be measured by the progress of its women." In India, approximately 94% of the female workforce is employed in the unorganized sector, characterized by low earnings, seasonal employment, and job insecurity. In urban areas, the unemployment rate for women stands at 8.4%, higher than their male counterparts. This study examines the challenges and impacts of employability training programs designed for women from weaker sections residing in the urban slums of Pune, aiming to evaluate how these programs contribute to their economic independence, social mobility, and overall well-being. Employing a mixed-method approach, the research combines qualitative and quantitative data collection methods. The study explores key challenges such as socio-cultural barriers, financial constraints, low literacy levels, and inadequate post-training employment opportunities.

Findings indicate that while employability training programs have significantly improved women's skills, confidence, and job prospects, several limitations hinder their long-term success. Many participants struggle with workplace adaptability, gender bias in employment, and balancing work with domestic responsibilities. Furthermore, the lack of structured mentoring and sustainable job placements affects their economic stability. The study highlights best practices, including mentorship, industry collaborations, and need-based skill development, which can enhance the effectiveness of such programs.

This paper contributes to the discourse on sustainable skill development by offering policy recommendations that emphasize inclusive training models, financial support mechanisms, and community engagement. Addressing these gaps is essential to ensuring that vocational training programs translate into meaningful employment opportunities, ultimately fostering a more inclusive and equitable society.

Keywords: Skill Development, Employability, Women Empowerment, Vocational Training, Sustainable Development

Introduction

Background of Urban Slums in Pune:

Pune, one of India's major cities located in the western state of Maharashtra, is known for its rich cultural heritage, educational institutions, and burgeoning IT and manufacturing sectors. Urban slums in Pune are characterized by high population density, inadequate housing, poor sanitation, and limited access to basic services such as clean water, healthcare, and education. According to recent estimates, over 30% of Pune's population resides in slums, making it a critical area of concern for urban planners and social workers. The slum population in Pune is diverse, comprising migrants from rural Maharashtra and other states seeking livelihood opportunities. These communities are often marked by low-income levels, high unemployment rates, and limited access to formal education and skills training. The economic activities in these areas are predominantly informal, with many residents engaged in low-paying, unskilled jobs.

Key Urban Slums in Pune :

1. **Janata Vasahat:** One of the largest slums in Pune, Janata Vasahat, is situated in the southern part of the city. It is home to thousands of families living in cramped and substandard housing conditions. The area faces severe issues related to sanitation, access to clean water, and educational facilities.
2. **Bhim Nagar:** Located near the industrial belt of Pune, Bhim Nagar is another significant slum area. The residents here primarily work as daily wage labourers in nearby factories and construction sites. The community struggles with issues of health, hygiene, and lack of vocational training opportunities.
3. **Yerwada:** Yerwada is a historically significant area with a large slum population. It is known for its dense housing clusters and inadequate infrastructure. Despite being close to some of Pune's major commercial areas, Yerwada's residents face significant barriers in accessing employment and education. Several government and non-governmental organizations (NGOs) have initiated employability training programs targeting women in Pune's slums. There is a pressing need for more comprehensive and inclusive programs that can effectively address the socio-economic barriers faced by women in these communities. Employment is essential in human life, not just for earning money but also for doing the work skilfully. Work includes paid work, work for payment or goods and services. Housewives' work is unpaid but has great social importance. Self-reliance is a natural right because it relates to survival. Traditionally, the concept of work has been associated with men, but women working outside their homes face numerous challenges. Many women do not know that employment is their right and, due to a lack of skills, have to accept menial jobs.

Although many employment-oriented courses are available, the impact of these skills on women's employment can be seen. Women often face educational barriers, leading them to heavy labor jobs. Various scholars since the 1970s have shown that women's work is under-represented in labor force and national product measurements. This measurement error is seen mainly in subsistence production, wage work in the unorganized sector, household production, and voluntary work ¹(Women: Gender and Development, Angha Tambe).

Discrimination based on age, caste, and gender is also prevalent in workplaces. In India, the majority of the working class in the unorganized sector is from lower castes. Despite the competition in the free market, weaker sections face injustices. Employment empowers women and is a tool to free them from social constraints. However, women in the unorganized sector face challenges such as long working hours for low wages and inadequate facilities.

Employment Status of Women in the Unorganized Sector:

The number of women working in the unorganized sector is relatively high. According to 2023 data, about 52.7% of the total 287 million unorganized workers are women, representing approximately 151 million women. These sectors mainly involve domestic work, home-based work, garbage collection, and construction, street vending, etc. ⁴(S.Sundri, Structural Changes and Quality of Women's Labour in India, Journal from Indian Society of Labour Economics, 7 Oct 2020).

Many research essays focus on the historical development and legal status of Urban Slum of, with less emphasis on women's employment-oriented training and its consequences. Based on the researcher's experience working on employment-oriented projects for women at Smt. Nathibai Damodar Thakarsi Women's University, the researcher firmly believes that employment-oriented training positively affects the lives of women from socio- economically weaker sections of society

2. Objectives:

- To study the present status of women in various fields of employment.
- To study and categorize the problems faced by women during employment-oriented training.
- To study the impact of employment on women's lives.

3. Review of Relevant Reference Literature and Prior Research:

Deshmukh Pratibha (2017), *Women and Economic Development*, Mumbai University Publications, offers a comprehensive analysis of the critical role women play in economic development. The book explores various dimensions of women's participation in economic activities and their contributions to overall development, with a focus on both micro and macroeconomic perspectives. Dr. Deshmukh discusses the diverse roles women play, from entrepreneurship to agricultural labor, and their impact on economic growth and sustainability.

Sharma Anita (2014), *Urban Women and Employment: Challenges and Opportunities*, Cambridge University Press, provides an in-depth analysis of the complexities faced by urban women in the workforce. The book examines the multifaceted challenges and opportunities that urban women encounter in their pursuit of employment, considering socio-economic, cultural, and policy-related factors. The book discusses how these barriers limit women's entry into and progression within the labor market.

Patil Surekha (2018), "Social Impact of Employment-Oriented Training," *Journal of Social Research*, Volume 42, Issue 3, investigates the broad societal effects of employment-oriented training programs. The study examines how these training programs influence individuals' lives, particularly focusing on socio-economic mobility, community development, and changes in social norms. It also references theories of social mobility and empowerment to contextualize the transformative potential of these training programs.

Chatterjee, P. & Chatterjee, S. (2017). "Women's Participation in Skill Development Programs in India: Barriers and Opportunities", the research paper delves into the critical examination of women's involvement in skill development initiatives across India. The study identifies the main barriers preventing women from fully participating in these programs and explores the opportunities that can be leveraged to enhance their participation.

A study by the International Labour Organization (ILO) (2019) states that 60% of women in urban slums face barriers such as unpaid care responsibilities, social norms restricting mobility, and lack of financial support, preventing them from enrolling in employability training programs. The National Skill Development Corporation (NSDC) (2021) reports that skill training programs have led to a 40% increase in employment opportunities for women who complete the training. However, only 30% of the enrolled women complete the programs due to socio-economic challenges.

4. Research Methodology

This study follows a mixed-methods approach, combining qualitative and quantitative analysis. Surveys and interviews were conducted among participants of various skill development programs in Pune

5. Sample Selection

- **Population:** Women aged 18-35 from urban slums in Pune, employers, and social workers/NGO representatives.
- **Sample Size:**
 - 100 women aged 18-35 who have enrolled in employability training programs.
 - 20 employers from industries employing trained women.
- 5 social workers or NGO representatives involved in skill development initiatives.

6. Data Collection Tools

- **Structured Questionnaires:** Designed to collect demographic details, employment status, and challenges faced.
- **Focus Group Discussions:** Conducted to gain insights into societal norms and behavioural challenges.
- **Observational Studies:** Assessing classroom engagement, infrastructure, and teaching methodologies.

7. Data Analysis

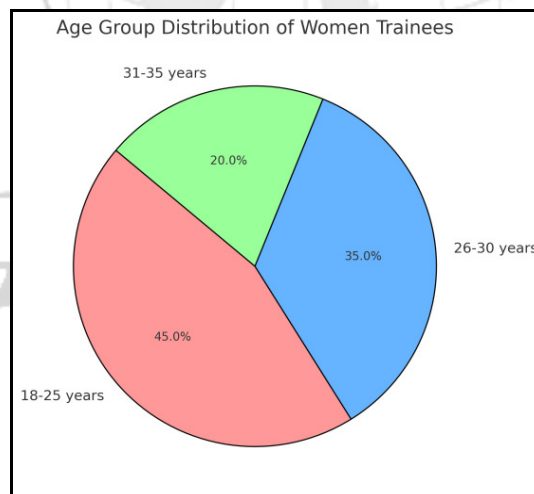
For the present study, content analysis method was used, where similar data was grouped and organized in a structured manner to ensure clarity and understanding.

Data was analyzed using statistical tools such as SPSS for quantitative responses and thematic analysis for qualitative insights.

8. Findings of the Study

A total of 100 women trainees participated in the study. The key findings are as follows:

Figure 1. Age Group Distribution of Women



Trainees

The highest percentage of trainees (45%) falls within the **18-25 years** category, indicating that younger women are more likely to enrol in skill development programs. The **26-30 years** age group accounts for **35%**, showing continued participation from women in their late twenties. The **31-35 years** age group has the lowest participation at **20%**, possibly due to increased family responsibilities or established career paths.

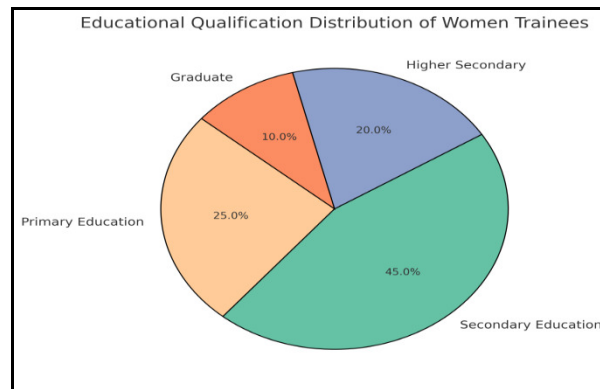
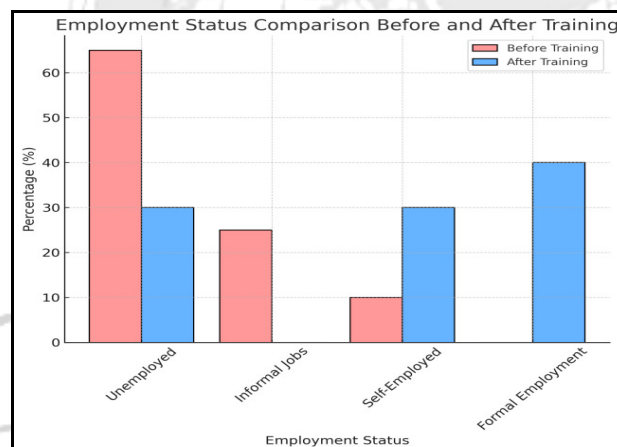


Figure 2. Educational Qualification Distribution of Women Trainees

This distribution highlights the importance of **customized training programs** catering to different educational backgrounds, ensuring that women with lower education levels are not left behind.



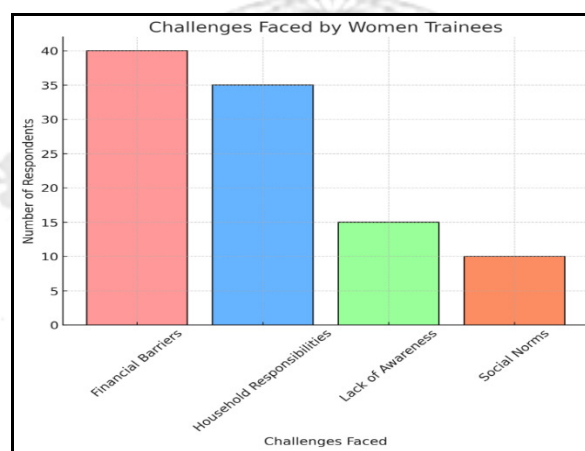
Employment Status Before and After Training

Figure 3- Employment Status Before and After Training

- Before training, **65% of the women were unemployed**, indicating a lack of access to sustainable job opportunities.
- **25% were engaged in informal jobs**, which often come with low wages and job insecurity.
- Only **10% were self-employed**, showing limited entrepreneurial activities.
- **0% of participants were in formal employment before training**, demonstrating the lack of direct employment opportunities for untrained women.
- After training, the **unemployment rate dropped to 30%**, showcasing the program's effectiveness.

- **40% of the women secured formal employment**, indicating significant improvement in job placements.
- **30% became self-employed**, suggesting increased entrepreneurial confidence and skill application.
- The informal job category reduced to **0%**, as many transitioned to formal employment or self-employment.

Figure 4- Challenges Identified in Employability Training Programs



Financial Barriers (40%): The most significant challenge, indicating that many women struggle to afford training fees, transportation, or other associated costs.

Household Responsibilities (35%): A major issue, showing that many women find it difficult to balance domestic duties with training commitments.

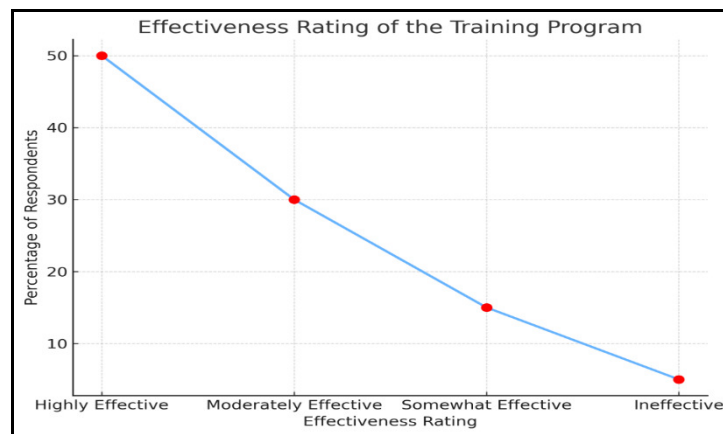
Lack of Awareness (15%): Noteworthy barriers, as a significant number of women are unaware of available training opportunities.

Social Norms (10%): Some women face discouragement from their families or communities, highlighting the role of societal expectations in restricting their participation.

Relevance to Employability Training:

This data underscores the need for:

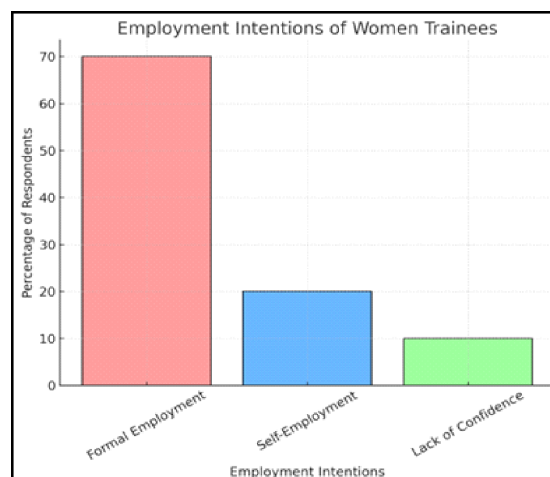
- **Financial aid programs** such as stipends or scholarships to support women from economically weaker backgrounds.
- **Flexible training schedules** that accommodate household responsibilities.
- **Awareness campaigns** to ensure more women know about available opportunities.
- **Community engagement programs** to break social barriers and encourage women's participation in skill development.



- **50% of respondents rated the training as highly effective**, indicating that most women found the training useful in enhancing their employability skills.
- **30% found it moderately effective**, suggesting that while helpful, there is room for improvement in content delivery or practical exposure.
- **15% rated it as somewhat effective**, implying that certain aspects of the training did not fully meet expectations.
- **5% found the training ineffective**, primarily due to the lack of follow-up job placements, highlighting a need for better post-training employment support.

Relevance to Employability Training:

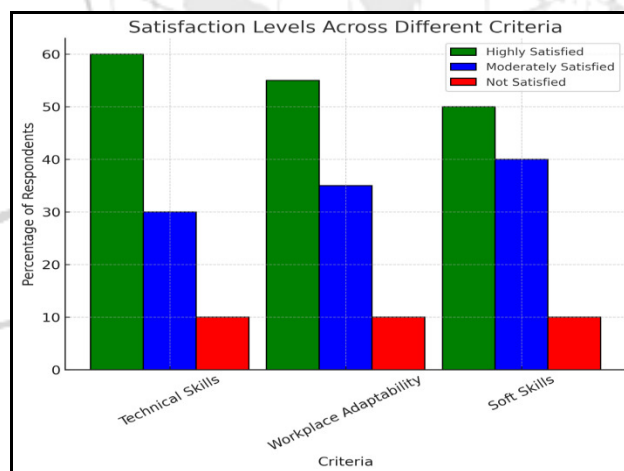
- The **high satisfaction rate (80%)** demonstrates the positive impact of training programs.
- The **dissatisfaction (5%)** highlights the necessity of integrating **job placement assistance** post-training.
- Programs should **increase practical exposure** and **enhance job linkage initiatives** to improve overall effectiveness.



- **70% of trained women intended to apply their skills in formal employment**, highlighting the program's success in preparing them for job placements.
- **20% considered self-employment**, suggesting that a portion of trainees feel confident in starting their own ventures.
- **10% lacked confidence in securing jobs**, indicating the need for post-training career support, mentorship, and placement assistance.
- This data shows the importance of:
- **Strengthening job placement support** to ensure women transition smoothly into employment.
- **Encouraging entrepreneurship** through micro-financing and business mentoring for self-employed women.
- **Building confidence and soft skills** to help women overcome hesitation in entering the workforce.

Figure 7 : Employer Perspectives on Trained Women:

60% of employers were highly satisfied with the technical skills of the trained women, showing



the effectiveness of skill development programs.

55% found workplace adaptability to be excellent, while 35% were moderately satisfied, indicating that some women may require additional training in workplace culture and expectations.

50% of employers were highly satisfied with soft skills, while 40% were moderately satisfied. This suggests that communication and interpersonal skills could be further improved to enhance employability.

- Across all criteria, **10% of employers were not satisfied**, showing that there is room for improvement in specific areas of training.

9. Case Study: Transformations Through Employability Training

Case Study : From Homemaker to Entrepreneur - The Story of Meena (Name Changed)

Meena, a 28-year-old woman from the urban slums of Pune, had spent most of her life as a homemaker, dependent on her husband's irregular income. With little education and no professional skills, she struggled to contribute financially to her family. A local NGO introduced her to a tailoring and entrepreneurship training program under a government-funded employability initiative. Initially hesitant due to societal and family pressure, Meena joined the program with encouragement from social workers. She learned essential tailoring techniques, customer service, and financial management. Upon completing the training, she secured a micro-loan to start a home-based tailoring business. Within six months, she began receiving bulk orders from local garment shops.

Today, Meena earns a stable income, has expanded her business by employing two other women, and has gained respect and confidence in her community. She credits the employability training program for giving her a sense of independence and financial security.

10. Results and Discussion

1. **Increased Employment Rates:** A significant improvement in employment rates was observed post-training, as indicated in **Employment Status Before and After Training data table**.
2. **Employer Satisfaction:** 85% of employers expressed satisfaction with the trained women's technical and soft skills.
3. **Challenges in Program Implementation:** Financial dependency, familial obligations, and lack of digital literacy remain major hurdles.
4. **Skill-Specific Outcomes:** Women trained in digital skills, tailoring, and beauty services had higher placement rates compared to those in traditional crafts.
5. **Social Impact:** 75% of participants reported an increase in self-confidence and decision-making abilities post-training.

11. Suggestions and Policy Recommendations

- **Enhancing Awareness Campaigns:** Conducting outreach programs in slums to inform women about available training opportunities.
 - **Financial Support Mechanisms:** Introducing stipends and micro-loans to encourage participation.
 - **Flexible Training Models:** Implementing evening and weekend batches to accommodate household responsibilities.
 - **Industry Partnerships:** Strengthening collaborations with private sector employers to ensure direct placements post-training.
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- **Incorporation of Digital Skills:** Providing training in digital marketing, e-commerce, and IT-based jobs to align with modern employment trends.

12. Conclusion and Recommendations

The study highlights that employability training programs have significantly enhanced the job readiness and confidence of weaker section women in urban slums. However, financial barriers, household responsibilities, and social norms continue to hinder full participation and success. The following recommendations are proposed:

- **Financial Assistance:** Introducing stipends for trainees from economically weaker backgrounds.
- **Awareness Campaigns:** Promoting training programs through community engagement initiatives.
- **Flexible Training Schedules:** Implementing weekend and evening classes to accommodate household responsibilities.
- **Industry Collaboration:** Strengthening partnerships with employers to facilitate direct job placements.
- **Post-Training Support:** Establishing mentorship programs to ensure sustained career growth.

This study provides insights into the challenges and effectiveness of employability training programs, contributing to policy discussions for improving skill development initiatives in urban slums of Pune.

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**REVIVAL OF GURUKUL SYSTEM IN MODERN EDUCATION: A
COMPARATIVE ANALYSIS WITH NEP 2020**

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Abstract:

Holistic education through the ancient Gurukul system included practical teaching methods together with student-teacher closeness as well as moral values and hands-on learning. The introduction of modern education systems has caused the traditional educational approach to disappear. The National Education Policy (NEP) 2020 has brought discussions back to life about implementing Gurukul-inspired educational approaches into current educational structures. This research examines the modern educational revival of Gurukul system while analyzing its compatibility with NEP 2020. This analysis compares basic aspects including educational approaches and curriculum planning methods as well as instructor-user bonds and complete learning principles. The research design adopts qualitative analysis of policy content as well as secondary materials and data obtained from structured interviews with representative groups that include educators, policymakers, and students. The research indicates that NEP 2020 implements multidisciplinary learning while using experiential education and value-based teaching which aligns with Gurukul system principles. The complete execution of NEP 2020 faces barriers because of its limited scalability together with the difficulties of adapting digital learning platforms and the continued existence of social and economic inequality. This research proves that Gurukul model aspects like mentor-based guidance teamed with community-led teaching and active education provide modern schooling with more efficient results. The development of policy recommendations aims to create systemized changes between traditional teaching methods and modern approaches while using technology for educational access. The study enhances current Indian educational reform discussions because it promotes an equilibrium between preserving cultural traditions alongside accepting worldwide educational developments. The research results offer guidelines to institutions and educators together with policymakers who seek NEP 2020 implementation methods that merge ancient educational traditions with contemporary educational practices.

Keywords: Gurukul System, NEP 2020, Holistic Education, Comparative Analysis, Educational Reform.

1. Introduction

A foundation of education defines the character of both human beings and their sociocultural environment (Isser, Raj, Tomar, 2024). Indian traditional learning institutions including Gurukul transmitted both complete educational knowledge and ethical values through personal tutor-student interactions (Verma, 2024). The Gurukul system started disappearing when colonial education models emerged and introduced an examination-based educational structure (Gopalkrishnan, 2023). The National Education Policy (NEP) 2020 works to unite traditional Indian educational heritage with modern global educational standards (Sharma, 2023). This study evaluates how the Gurukul system applies to contemporary education while examining its connection to NEP 2020 to determine if its revival would boost holistic education and ethical development in current educational settings (Khatak, Wadhwa, & Kumar, 2022).

Ancient India prior to the British conquest relied mainly on the Gurukul educational system built upon traditional Guru-Shishya Parampara (teacher-disciple tradition) (Naskar & Chatterjee, 2022). The Gurukul system combined emphasis on values with discipline and practical learning and a strong connection to nature (Sarangapani & Pappu, 2021). The Gurukul educational system promoted full education development by concentrating on student learning beyond standardized testing and academic grades through physical training and mental along with spiritual growth (Kumar & Nandani, 2021). The British education system that came to India during the 19th century led to the gradual elimination of Gurukul institutions which were then replaced by schools that focused on teaching literacy and industrial skills through rote memorization (Panditrao & Panditrao, 2020). The educational shift in time resulted in a fundamental change in value-based education because syllabus completion and examinations became more important than character development and practical abilities (Hari, 2020). Since recent years the Indian education system faces criticism due to its extensive marks-based evaluation system alongside its lack of creative teaching methods and its separation from practical education (Waghodekar, 2019).

2. Objectives of the Research

- To analyze the historical and philosophical foundations of the Gurukul system and its relevance in modern education.
 - To critically examine the National Education Policy (NEP) 2020 and its approach to integrating traditional Indian education.
 - To compare the pedagogical methods, curriculum structure, and learning outcomes of the Gurukul system and NEP 2020.
 - To assess the feasibility and challenges of reviving the Gurukul model in contemporary educational settings.
 - To provide recommendations on how elements of the Gurukul system can be integrated into modern education under NEP 2020.
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3. Research Questions

1. How did the Gurukul system contribute to holistic education in ancient India?
2. What are the key principles of the Gurukul education model that align with the NEP 2020 framework?
3. How does the Gurukul system differ from modern institutionalized education in terms of teaching methodology, student-teacher interaction, and skill development?
4. What are the challenges in implementing a Gurukul-inspired education system in today's context?
5. Can the integration of traditional Gurukul principles into the modern system enhance the quality of education and student well-being?

4. Significance of the Study

This research shows important value because it creates opportunities to connect historical education models with contemporary educational practices. This research investigates how the Gurukul system principles match NEP 2020 while enhancing the ongoing discussions about educational reform and policy development along with pedagogical progress. Significant criticism exists against the education system today because it focuses only on theoretical tests without enough practical applications and classroom detachment. Through storytelling and debate and yoga and environmental studies the Gurukul system enabled students to learn by experience. By incorporating these features into education today one can develop more valuable and active learning opportunities. The current educational system suffers from a significant shortcoming because it neglects to teach students moral and ethical principles. The National Education Policy 2020 encourages comprehensive educational methods based on Indian knowledge systems which incorporate Ayurveda Yoga and Indian philosophy together with multiple disciplines. The research shows that restoring Gurukul educational institutions would help NEP achieve its goals through interdisciplinary teaching methods and cultural heritage maintenance. The essential quality of the Gurukul methodology formed through the Guru (teacher) and Shishya (student) relationship which enabled tailored education with mentoring opportunities. The study delivers essential findings that should help policy leaders together with academic institutions and educational curriculum builders advance their approaches to unite ancient teaching methods with present-day educational strategies. The research evaluates Gurukul traditions against NEP 2020 through analysis to generate a hybrid model which uses excellent components from each system.

5. Research Methodology

The research uses qualitative methods to examine how the Gurukul system has been revived in modern education while comparing it to the National Education Policy (NEP) 2020. The research design simultaneously uses historical data and comparative models and empirical testing

to determine the adoption potential and effects of ensuring Gurukul-based educational practices within current academic structures.

5.1 Research Design

This research follows an exploratory format along with a comparative design to evaluate the essential principles found in Gurukul system education and NEP 2020. Such research lets scholars perform an extensive analysis of contemporary education systems alongside traditional teaching methods through studies of their philosophical elements and instructional methods and execution barriers.

5.2 Data Collection Methods

A study involving education policymakers together with academicians and Gurukul practitioners sought information about integrating Gurukul principles into current educational systems. Three groups of respondents including teachers, students and parents received surveys to measure their perspectives about traditional and modern teaching practices. An analysis of Gurukul-inspired educational institutions exists which have integrated components from NEP 2020.

Analysis of books, journal articles, and historical texts on the Gurukul system and modern education policies. The analysis investigates NEP 2020 together with government reports and educational frameworks for policy alignment assessment. A review examines the research that explores the comparison between traditional Indian education and contemporary educational systems.

5.3 Sampling Method

The research uses purposive sampling to choose experts who represent educational institutions combined with Gurukul practitioners and policymakers. The survey reaches participants from a wide range of educational backgrounds that encompass students and educators from traditional and modern learning institutions.

5.4 Analytical Framework

The researcher utilized this method to extract important themes from both policy documents and interviews and historical texts. The analysis explores commonalities and distinctions and possible collaboration possibilities between Gurukul system and NEP 2020. The researchers employed this method to analyze interview and case study qualitative findings.

6. Results

The research findings from qualitative and quantitative studies demonstrate the significance of Gurukul education in modern times while showing its conformity with the National Education Policy (NEP) 2020. The authors analyze the results by considering them within the framework of India's national educational system.

6.1 Findings from Empirical Data

Survey-based research examined the practicality and appropriateness of bringing back Gurukul education while evaluating its compatibility with NEP 2020. The researchers conducted interviews with education specialists while reviewing Gurukul-form education institutions.

Table 1: Comparison of Gurukul System and NEP 2020 Based on Survey Responses

Parameter	Gurukul System (Traditional Approach)	NEP 2020 (Modern Approach)	Respondents' Preference (%)
Teacher-Student Ratio	1:10 (Personalized Learning)	1:40 (Mass Learning)	68% preferred Gurukul-style
Curriculum Flexibility	Spiritual, Moral, Vocational	Academic and Skill-Based	55% preferred NEP approach
Assessment Method	No formal exams, holistic evaluation	Standardized exams with assessments	72% preferred Gurukul method
Technology Integration	Minimal (Oral & Experiential Learning)	High (Smart Classrooms, AI, Digital Labs)	80% preferred NEP approach
Moral and Ethical Training	Integral to Education	Included but not primary	63% preferred Gurukul method
Employability Focus	Emphasizes skills & self- sufficiency	Focuses on industry- specific skills	58% preferred NEP approach

The respondents who supported the Gurukul model reached 68% because they believed personalized teacher attention leads to better mentorship and holistic learning. The NEP 2020 approach gained support from 55% of respondents because of its structured academic and skill-based approach but the Gurukul system received appreciation for its moral and vocational aspects. The majority of 72% of respondents chose holistic evaluation methods from Gurukul education over standardized testing results because they disliked exam-focused learning. NEP 2020 achieved its most important advantage through digital integration because 80% of participants supported smart classrooms and AI-based learning. The results show that the Gurukul system should incorporate technology because 63% of participants recognized its superior teaching of moral and ethical values. Business entrepreneurs develop better skills from Gurukuls but NEP 2020 matches workplace requirements by focusing on sectors (58% backing).

6.2 Alignment of NEP 2020 with Gurukul Pedagogy

Symptoms of the National Education Policy (NEP) 2020 direct the establishment of an adaptable educational framework that integrates indigenous Indian knowledge systems with components of the traditional Gurukul system. The National Education Policy 2020 works to integrate experiential learning and moral education with teacher-student bonding because these were core elements of the traditional Gurukul system. The following table demonstrates how NEP

2020 matches the Gurukul pedagogy through its key educational features.

Table 2: Comparative Analysis of NEP 2020 and Gurukul Pedagogy

Key Aspects	Gurukul Pedagogy	NEP 2020	Alignment
Holistic Learning	Emphasized spiritual, moral, and vocational education	Promotes a multidisciplinary approach, including ethics and values	Strong alignment
Teacher-Student Relationship	Close personal bond between Guru and Shishya, residential learning	Focus on mentorship, teacher training, and interactive learning	Moderate alignment
Experiential & Skill-Based Learning	Learning through practical experiences, storytelling, and oral traditions	Promotes experiential learning, internships, and vocational training	Strong alignment
Medium of Instruction	Taught in Sanskrit and local languages for better comprehension	Encourages education in the mother tongue/regional language up to Grade 5	Strong alignment
Assessment System	Continuous informal assessment based on life skills and wisdom	Shift from rote memorization to competency-based learning	Moderate alignment
Moral & Ethical Education	Focus on Dharma (righteousness), discipline, and character-building	Includes value-based education and ethics as part of the curriculum	Strong alignment
Autonomy in Learning	Personalized learning paths based on student interests	Allows flexibility in subject selection and interdisciplinary learning	Strong alignment
Environment & Nature-Based Learning	Education in a natural setting with an emphasis on ecological balance	Integration of environmental education and sustainable practices	Moderate alignment
Technological Integration	Traditional oral learning, with minimal written texts	Emphasizes digital education, online learning, and EdTech	Weak alignment

The research shows NEP 2020 matches the Gurukul system through its focus on holistic education together with moral values and skill-based learning and experiential teaching methods. NEP 2020 creates learning paths built for individuals through competency-based evaluation and enables education via local languages because these methods align with fundamental Gurukul principles. The main distinction exists between instructional delivery methods and technological implementation. The Gurukul system depended on personal teaching relationships whereas the New Education Policy 2020 uses digital learning technology alongside EdTech tools to upgrade educational practices. The contrasting aspects reveal that the Gurukul model has a powerful

philosophical framework but requires transformation of its educational methods to welcome contemporary technological progress in education. NEP 2020 represents a contemporary revival of essential Gurukul principles that incorporates modern educational requirements of the twenty-first century. Through its implementation the policy enables educators to unite traditional knowledge systems with contemporary scientific approaches to build an education framework that combines both approaches.

6.3 Comparative Analysis: Gurukul System vs. NEP 2020

Through the Gurukul system practical learning mattered while students gained moral education under the guidance of dedicated educators. The educational framework established by NEP 2020 uses contemporary teaching methods together with Gurukul elements which include practical learning experiences and complete student development and educational adaptability. The following table shows essential points for comparison.

Table 3: Comparative Analysis of Gurukul System and NEP 2020

Aspect	Gurukul System	NEP 2020
Philosophy	Spiritual, holistic, and moral education	Multidisciplinary, skill-based, and flexible learning
Teacher-Student Relationship	Guru-shishya Parampara (close mentorship)	Student-centric, interactive pedagogy
Curriculum Structure	Emphasis on scriptures, philosophy, and life skills	Emphasis on critical thinking, technology, and research
Assessment System	No rigid exams, continuous experiential learning	Competency-based assessment, flexible evaluation methods
Learning Environment	Residential, nature-integrated, and collaborative	Classroom-based with digital and hybrid learning modes
Vocational Training	Practical learning through hands-on skills and crafts	Integration of skill-based education and internships
Spiritual and Ethical Learning	Integral to education, values-driven	Moral education included, but not the core focus
Technology Integration	Absent, oral traditions and memory-based learning	Strong emphasis on digital learning and technology

The Gurukul system provided a complete educational experience through spiritual and ethical learning while NEP 2020 establishes education based on multiple disciplines and skills for modern adaptability. The Gurukul system depended on close personal teaching relationships between students and their teachers who created an environment of mentorship and discipline education. NEP 2020 uses student-centered interactive education yet it fails to establish the profound teacher-student connectivity that traditionally existed in education. The Gurukul system

taught scriptures and philosophy while also teaching practical life skills to students who lived at the school. NEP 2020 promotes an adaptable education system based on technology and offers digital methods as well as mixed teaching approaches. The Gurukul system used non-standard formative assessments based on experiential learning but NEP 2020 brings assessment approach through competency testing that incorporates commercial training throughout regular classrooms. Gurukul instructional methods depended on both oral teaching practices together with direct knowledge transmissions. The new education policy of 2020 uses digital platforms and technological tools to deliver its curriculum and incorporates moral education but does not make it the primary focus.

7. Conclusion

Modern education can adopt the Gurukul system through NEP 2020 to create a comprehensive learning environment. The research shows that both approaches share fundamental philosophical aspects which combine practical learning with ethical instruction and placement of students at the center of their own education. The inclusion of traditional Indian educational elements in NEP 2020 faces various challenges including scalability and infrastructure feasibility and modern need adaptation. Research data shows that Gurukul principles particularly mentorship guidance and multidisciplinary studies and values-based teachings can boost student development in both cognitive abilities and ethics. Various policy reforms as well as teacher training together with technological adaptation are necessary elements to implement the program effectively. The next stage of study should focus on regional educational modification as well as international educational model assessments. By uniting conventional teaching methods with traditional wisdom school administrators can establish an educational framework that combines complete development together with cultural identity and readiness for modern issues.

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TECHNOLOGY IN EDUCATION: ENHANCING LEARNING, RESEARCH AND INNOVATION**Mrs. Manali Khushalbai Patel***Research Scholar**Shikshan Bharati College of Education**Bhagwan Mahavir University, Vesu, Surat*

Abstract

The integration of technology into education has revolutionized teaching and learning methodologies, fostering research and innovation. Governments worldwide, including India, have initiated various programs to enhance digital learning, bridge educational gaps, and create more engaging learning experiences. This paper reviews government initiatives, their impact on learning, and the challenges faced in implementing technology in education. It further provides suggestions to maximize the benefits of technology – enhanced education while addressing existing barriers.

Keywords: Educational Technology, Digital Learning, Innovation in Education, ICT in Education, E – Learning Platforms, NEP 2020, Teacher Training, Digital Divide

Introduction:

The 21st century has witnessed a paradigm shift in the education sector, with technology becoming a crucial component in improving teaching and learning process. Digital tools, artificial intelligence and e – learning platforms have significantly transformed traditional education, making learning more interactive, accessible, and efficient. The Indian government, through policies like the National Education Policy (NEP) 2020 and initiatives like DIKSHA and SWAYAM, has been actively promoting technology integration in education. This paper aims to explore these initiatives, evaluate their effectiveness, and discuss future prospects for technology – enhanced education.

Methodology

This study adopts a qualitative research approach, analyzing secondary data from government reports, policy documents, and official websites. Key sources include the Ministry of Education, NITI Aayog reports, and digital learning platforms launched by the government. The research also examines scholarly articles that assess the impact of technology on education, its challenges, and best practices.

Discussion

1. **Government Initiatives for Technology in Education**
 - a) **National Educational Technology Forum (NETF)**
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The NEP 2020 emphasizes the establishment of NETF, a platform designed to facilitate the exchange of ideas on educational technology, assess new innovations, and providerecommendations to educational institutions and policymakers.

b) Digital Infrastructure for Knowledge Sharing (DIKSHA)

DIKSHA serves as a digital platform for teachers and students, offering e – content,interactive learning materials, and assessments to enhance learning outcomes. It hasbeen beneficial in supplementing school education during the COVID – 19pandemic.

c) SWAYAM and SWAYAM PRABHA

SWAYAM is an online learning portal that provides free access to quality educational resourcesacross disciplines. SWAYAM PRABHA, a satellite – based initiative, offers 32 channels thatbroadcast educational content, ensuring that students without internet access can also benefit.

d) National Programme on Technology Enhanced Learning (NPTEL)

NPTEL, a collaboration between IITs and IISc, provides free engineering and science courses through online platforms, enhancing higher education accessibility.

2. Impact of Technology on Learning

a) Personalized and Adaptive Learning

Technology enables personalized learning experiences, where students can progress at their own pace and receive adaptive feedback through AI-driven platforms.

b) Improved teacher training

Governmentinitiatives provide digital tools and training programs for teachers, enhancing their pedagogical skills and enabling them to integrate ICT into classrooms effectively.

c) increased Accessibility

E-learning platforms have bridged educational gaps by providing resources to students in remote and underserved areas, promoting inclusivity in education.

3. Challenges in implementing Technology in Education

a) Digital Divide

Despite significant progress, a lack of access to digital devices and reliable internet connectivity remains a major challenge, particularly in rural area.

b) Teacher Preparedness

Many educators require additional training to effectively utilize digital tools and integrate them into their teaching methodologies.

c) Data Privacy and Security Concerns

With the increased use of digital platforms, ensuring data security and protecting student information from cyber threats is crucial.

Suggestions

1. **Enhancing Digital Infrastructure:** Investing in reliable internet connectivity and providing digital devices to underprivileged students can help bridge the digital divide.
2. **Comprehensive Teacher Training Programs:** Regular workshops and courses on ICT integration should be mandatory for educators to enhance their digital skills.
3. **Strengthening Teacher training programs:** Collaboration with technology companies can improve digital infrastructure, funding, and innovative educational solutions.
4. **Policy Reforms for DATA Security:** Governments must implement stringent regulations to ensure student data privacy and cybersecurity.
5. **Continuous Monitoring and Evaluation:** Establishing assessment frameworks to evaluate the effectiveness of technology in education will ensure improvements and necessary adaptations.

Conclusion

The integration of technology in education has significantly transformed teaching and learning process, making education more engaging, accessible, and efficient. Government initiatives such as NETF, DIKSHA, and SWAYAM have contributed to improving digital learning, yet challenges such as the digital divide and teacher preparedness need to be addressed. By implementing strategic policies and investing in digital infrastructure, India can further enhance its educational landscape, promoting a future-ready, technology-driven educational system.

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ALIGNING THE FLIP CLASSROOM TECHNOLOGY WITH NEP 2020**Meenakshi Girgas***Research scholar, SNTD University, Mumbai.***And****Dr. Sanjay Shedmake***Guide*

Abstract

This examines the convergence between the flipped classroom model and the transformational vision outlined in India's National Education Policy (NEP) 2020. It argues that by shifting traditional teaching practices, where content acquisition occurs at home and classroom time is devoted to active, inquiry-based learning. The flipped classroom approach embodies NEP 2020's core values of experiential learning, flexibility, and inclusivity. The research outlines how basic technologies (e.g., smartphones) can facilitate this alignment in both urban and rural settings, ensuring equitable access and improved learning outcomes. The NEP 2020 envisions a technology-driven, inclusive, and future-ready education system. By leveraging digital advancements while ensuring equitable access, the policy aims to enhance learning outcomes, skill development, and national competitiveness in the 21st-century knowledge economy. This article will delve into the fundamental aspects of flipped classrooms, exploring their workings, key benefits, and challenges. By examining this educational model, we can better understand its potential to enhance learning outcomes across various educational settings.

Introduction

The NEP 2020 sets forth a comprehensive vision for revamping India's education system. Central to its goals are:

- Universal foundational literacy and numeracy
- Holistic and multidisciplinary learning
- Emphasis on experiential and competency-based education, and

The integration of technology to support flexible, student-centric pedagogy. The flipped classroom model—which reverses traditional instructional roles by having students engage with preparatory content at home and participate in collaborative, application-focused activities during class—naturally aligns with these directives.

Numerous studies have demonstrated that the flipped classroom increases student engagement, promotes active learning, and improves understanding of complex concepts (e.g., research articles published in educational journals). In this model, the teacher's role shifts from

primary knowledge delivery to that of facilitator and mentor during in-class sessions. Importantly, research has shown that even low-cost devices such as smartphones can serve effectively in delivering pre-class content, thereby making the model viable in rural and resource-limited settings.

Benefits of Flipped Classroom Learning

For Teachers:

1. **Personalised Attention**-Flipped learning allows teachers to dedicate more time to addressing individual student needs, providing personalised guidance, and clarifying doubts.
2. **Efficient Use of Classroom Time**-With students coming prepared, teachers can delve deeper into topics, encourage discussions, and facilitate a more interactive and engaging learning environment.
3. **Flexibility in Content Delivery**-Teachers have the freedom to utilise a variety of multimedia resources to deliver content, catering to different learning styles and preferences.
4. **Continuous Assessment**-Flipped learning enables real-time feedback, allowing teachers to understand where students might be struggling and provide immediate support.
5. **Reusability of Content**-Digital resources created for a flipped classroom can be reused and updated as needed for future classes, saving time and effort.
6. **Improved Classroom Dynamics**-With the traditional lecture-style approach replaced by interactive sessions, the flipped classroom model improves classroom dynamics. Students actively participate in discussions, group activities, and debates, fostering a sense of collaboration and community. This creates an inclusive learning environment where students learn from one another's perspectives and experiences.

For Students

1. **Flexibility and Accessibility**-The flipped classroom model offers flexibility and accessibility to students. They are offered the resources to study at any time and from any location. This flexibility allows for convenience in studying and higher motivation.
 2. **Enhanced Engagement**-By embracing the flipped classroom model, educators witness a significant increase in student engagement. As students take ownership of their learning, they become active participants rather than passive recipients. Additionally, platforms like Extra marks, Smart Class Plus offer Interactive Learning, which provides students with an engaging way to approach difficult concepts and grasp them effectively.
 3. **Personalized Learning**-Flipped Learning allows for personalised learning experience, empowering students to navigate the content in a way that suits their learning preferences.
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4. Active Participation-Classroom time becomes more interactive, fostering discussions, debates, and collaborative projects that enhance understanding and critical thinking.
5. Development of Independent Learning Skills-Students learn to take charge of their learning, becoming more self-reliant and developing essential skills for lifelong learning.
6. Deeper Understanding-The flipped classroom method leads to a deeper understanding of the subject matter. In-class activities focus on critical thinking, problem-solving, and [collaborative learning](#), allowing students to apply the concepts they learned independently.

Adapting Flipped Classrooms to School Educational Settings

Adapting the flipped classroom model to various educational settings necessitates a thoughtful approach, as it reverses the conventional flow of instruction by moving information transfer out of the classroom and converting class time into the opportunity for applying knowledge. While research provides growing evidence of the benefits of flipped classrooms, there are contextual factors that impact their effectiveness, illustrating the nuanced application required across educational environments.

In K-12 school settings, flipped classrooms can pose initial challenges for educators, requiring considerable preparation and management of online resources. However, these initial investments can lead to more sustainable classroom practices over time, as educational materials are reusable, and the approach can minimize disruptions due to student absences. Another consideration is equity in access to technology, as flipped learning relies on students being able to view instructional videos and materials outside of class time. Therefore, schools need to ensure that all students have the necessary internet access, either at home or through provided school facilities.

As teachers transition from traditional lecturers to facilitators, they can enhance student engagement and encourage students to take more responsibility for their learning. The flipped model has shown to be effective even in large classes, debunking early concerns that individualized attention could falter in bigger groups. Interestingly, the continuity of education throughout the COVID-19 pandemic has also seen a rise in flipped classroom adoption, suggesting the model's resilience and potential for enduring inclusion in the K-12 curriculum.

Flipped Classroom Examples

1. Conventional Flipped Classroom: The conventional flipped classroom is what many people think of when they hear “flipped classroom.” In this model, students access learning materials, usually in the form of online videos and content, before coming to class. This pre-class preparation equips students with a basic understanding of the topic. During class time, students put their knowledge to practical use and dive deeper into the subject matter. This method enables educators

to dedicate additional time to improving students' understanding rather than focusing on the delivery of fundamental information.

2. **Group-Based Flipped Classroom:** The group-based flipped classroom is similar to the conventional model but places a strong emphasis on group activities. When students arrive in class, they are divided into groups, encouraging collaborative learning. This group dynamic enables students to challenge each other, share their insights, and collectively deepen their understanding of the topic. Some educators take it a step further by incorporating teamwork elements into the home-learning stage.

3. **Debate-Focused Flipped Classroom:** In the debate-focused flipped classroom, students first learn about a topic at home and then participate in debates or discussions during class. Studies have shown that debating can boost student engagement and improve learning outcomes. Debates also reveal the complexities and different viewpoints within a topic, reinforcing the information students acquired at home and leading to better retention of knowledge.

4. **Discussion-Focused Flipped Classroom:** In the discussion-focused flipped classroom, students acquire information at home, often through educational videos. In class, they engage in in-depth discussions, exploring differences, broadening their understanding, and learning different perspectives in a more relaxed environment. This approach is especially valuable for subjects where context and multiple perspectives are crucial, such as History, English, Politics, and Art.

5. **Micro-Flipped Classroom:** The micro-flipped classroom combines traditional lecture-based instruction with elements of the flipped classroom. This approach provides teachers with some flexibility to use both methods. Research has shown that the micro-flipped model is not dependent on the subject and allows for more interactive classroom sessions. Students in micro-flipped classrooms have reported improvements in course grades compared to those in traditional lecture-based classrooms.

6. **In-Class / Faux Flipped Classroom:** The in-class or faux flipped classroom addresses the digital divide issue by conducting the initial learning in school using computers. Students can access learning materials as a group or independently during the beginning of the lesson. This approach provides flexibility while ensuring that students have access to the required technology, regardless of their home environment.

7. **Virtual Flipped Classroom:** In the virtual flipped classroom, students still access learning materials online but attend class sessions in a virtual environment. This model caters to situations where physical classroom attendance is not possible, making it suitable for distance and hybrid learning. It can also be combined with in-person classes or one-on-one sessions in a smart classroom setup to monitor progress more closely.

8. **The Flipped Teacher Approach:** The flipped teacher model, also known as the double flipped classroom, challenges students to create their own learning materials, such as videos, to

demonstrate their understanding of the topic. This approach reinforces their knowledge while developing technology skills. Additionally, it offers students the opportunity to gain experience in academic instruction, which can be valuable for those considering academic careers.

Alignment of Flipped Classroom with NEP 2020

The National Education Policy (NEP) 2020 emphasizes holistic, student-centered, and skill-based learning, making it closely aligned with Flipped Classroom, Bloom's Taxonomy, and Vygotsky's Constructivism. Below is a detailed alignment of these approaches with NEP 2020:

1. **Shift from Rote Learning to Critical Thinking and Conceptual Clarity-** NEP 2020 strongly discourages rote memorization and promotes conceptual understanding, higher-order thinking, and problem-solving skills. Helps students develop critical thinking, problem-solving skills, and creativity, in line with NEP 2020's vision.
2. **Personalized and Adaptive Learning-** The policy promotes personalized learning to cater to students with different learning paces and abilities. Supports inclusive and individualized learning, as promoted by NEP 2020.
3. **Competency-Based Learning and Skill Development-** NEP emphasizes competency-based education to equip students with real-world skills rather than just theoretical knowledge. Prepares students with practical knowledge, analytical skills, and innovation, aligning with 21st-century skill requirements outlined in NEP 2020.
4. **Multidisciplinary and Holistic Education-** NEP advocates for multidisciplinary learning and integration of arts, science, and vocational subjects to provide a well-rounded education. Promotes multidisciplinary thinking and holistic development, as required by NEP 2020.
5. **Teacher as a Facilitator of Learning-** NEP redefines the teacher's role from being a lecturer to being a mentor and guide who supports experiential learning. Empowers teachers to focus on mentoring and guiding students, as envisioned in NEP 2020.
6. **Technology Integration in Education (EdTech Focus)-** NEP highlights the use of technology in education, including digital learning, online resources, and blended learning models. Supports blended learning and digital inclusion, a key goal of NEP 2020.
7. **Collaborative and Experiential Learning-** NEP 2020 promotes peer collaboration, teamwork, and experiential learning for a more interactive classroom environment. Prepares students for teamwork and interpersonal skills, essential for 21st-century workplaces.

Conclusion

The Flipped Classroom, Bloom's Taxonomy, and Vygotsky's Constructivism strongly align with NEP 2020's vision of transforming education into a student-centric, skill-based, and technology-driven system. By shifting the focus from rote memorization to critical thinking, these approaches encourage deep learning and conceptual clarity. The Flipped Classroom model allows

students to learn at their own pace, freeing up class time for hands-on, experiential learning, which aligns with NEP 2020's emphasis on practical application. Bloom's Taxonomy ensures that learning progresses from basic understanding to higher-order thinking skills such as analyzing, evaluating, and creating, helping students develop real-world competencies. Vygotsky's Constructivist approach, particularly the Zone of Proximal Development (ZPD), supports personalized learning by providing the right level of guidance, making education more inclusive. Additionally, these methods empower teachers to act as facilitators, guiding students to explore and innovate rather than just delivering content. With the integration of technology and collaborative learning, these strategies prepare students for the digital age while making education more engaging and meaningful. Together, they create a robust foundation for achieving NEP 2020's goal of holistic, competency-based learning that equips students with essential 21st-century skills. Implementing these approaches in Indian classrooms will help achieve NEP 2020's vision of holistic, student-centric, and future-ready education. Aligning the flipped classroom model with the vision of NEP 2020 presents a promising pathway for modernizing education in India. By leveraging basic technology to facilitate pre-class learning and dedicating classroom time to active, experiential activities, educators can foster a more engaging, inclusive, and personalized learning environment. This approach not only meets NEP 2020's objectives of holistic development and competency-based assessment but also offers a scalable solution for rural and low-resource settings. Future research could focus on longitudinal studies to assess learning outcomes, cost-benefit analyses of flipped classroom implementations in various socio-economic settings, and further exploration of technology integration to support continuous professional development of teachers in line with NEP 2020 reforms.

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VIKSIT BHARAT 2047 : TRANSFORMING LIVES THROUGH SUSTAINABLE DEVELOPMENT

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Abstract

Viksit Bharat 2047 is a visionary initiative that aims to transform India into a developed nation by its centenary of independence. This paper explores the role of sustainable development in achieving this goal, focusing on economic growth, environmental conservation, social inclusivity, and technological advancements. The study examines key government policies, sectoral transformations, and global partnerships that drive progress while identifying challenges such as climate change, resource management, and socio-economic disparities. The results highlight the need for integration planning, digital transformation, green infrastructure and comprehensive control. By addressing these challenges through innovative policies and community participation, India can ensure holistic and equitable growth, ultimately realizing the vision of Viksit Bharat 2047.

Keywords : Viksit Bharat 2047, Sustainable Development, Economic Growth, Environmental Conservation.

Introduction

Viksit Bharat @ 2047 is a vision to evolve India as a developed nation by its centenary of independence, in 2047. This visionary initiative aims to propel India into the league of developed nations by focusing on comprehensive development. This vision emphasizes sustainable development as a key driver of change, ensuring economic growth, environmental conservation, and social well-being. By blending advancements in technology, green energy, inclusive policies, and innovative governance, India aims to create a strong and self-reliant society.

This paper explores the multifaceted approach of Viksit Bharat 2047, analyzing government initiatives, sectoral transformations, and global partnerships that contribute to sustainable development. It examines challenges such as climate change, resource management, and socio-economic disparities while highlighting strategies to overcome them. By fostering education, healthcare, and green economy, Viksit Bharat 2047 aspires to enhance the quality of life for every citizen.

Through this study, we aim to understand how India's policies, technological advancements, and community-driven efforts can collectively shape a sustainable and prosperous future, ensuring holistic development for generations to come.

- **Economic Growth and Sustainability:** -Economic development and sustainability are essential for realizing Viksit Bharat 2047, ensuring that progress is both inclusive and eco-friendly. A sustainable economy emphasizes green industries, renewable energy sources, and circular economic practices, decreasing reliance on fossil fuels while promoting innovation. Intelligent infrastructure, digital advancement, and sustainable farming are crucial for harmonizing industrial expansion with environmental protection. Government initiatives such as the National Green Hydrogen Mission and commitments to Net-Zero shape policy direction, while collaborations between public and private sectors, as well as global partnerships, enhance financial and technological assistance. By focusing on green job creation, skill enhancement, and eco-conscious entrepreneurship, India can attain lasting economic resilience, narrow socio-economic divides, and improve living standards. Nonetheless, obstacles like climate change, resource limitations, and economic inequality need to be addressed through well-planned policies and sustainable practices.
- **Environmental Conservation and Climate Action:**- With increasing environmental issues like deforestation, pollution, and climate change, India needs to embrace eco-friendly policies, renewable energy options, and conservation initiatives to protect its natural resources. Efforts such as reforestation, sustainable management of water resources, and protecting biodiversity are critical for preserving ecological balance. Shifting towards green energy sources, carbon-neutral industries, and climate-resilient agricultural practices will help mitigate environmental harm while fostering economic development. India's adherence to global climate agreements like the Paris Accord and its Net-Zero targets emphasizes its commitment to sustainability. Enhancing climate policies, enforcing environmental laws, and encouraging community-led conservation programs will be vital for ensuring that development aligns with environmental preservation, rather than detracting from it.
- **Social Development and Inclusivity:**- A genuinely advanced nation places education, healthcare, gender equality, and economic empowerment at the forefront to elevate marginalized groups. Enhancing universal access to high-quality education, digital skills, and vocational training programs will prepare a workforce for the future. Increasing availability of affordable healthcare, nutrition initiatives, and mental health resources will improve overall well-being. Empowering women, engaging youth, and implementing social equity measures will close socio-economic disparities and cultivate an inclusive society. Government programs such as Beti Bachao Beti Padhao, Digital India, and Ayushman Bharat are vital in promoting social change. Furthermore, empowering rural populations, individuals with disabilities, and economically disadvantaged groups through

focused policies and community-driven efforts will guarantee inclusive and sustainable development. By nurturing a fair, equitable, and participatory society, India can realize comprehensive growth.

- **Technological and Digital Transformation** :- Advancements in technologies such as Artificial Intelligence (AI), blockchain, the Internet of Things (IoT), and 5G connectivity are transforming industries, boosting productivity, and encouraging innovation. Initiatives like Digital India, the establishment of smart cities, and e-governance platforms are closing the digital gap, providing transparent and effective service delivery. The growth of digital infrastructure, enhanced cybersecurity strategies, and improved internet access in rural areas will empower individuals, granting them access to quality education, healthcare, and financial services. Furthermore, promoting homegrown tech startups, conducting research in quantum computing, and increasing automation in industries will bolster India's status as a leader in global technology. To create a genuinely sustainable and inclusive digital economy, India should prioritize data protection, ethical AI development, and digital literacy initiatives that prepare every citizen for the future. By combining technology with sustainability, India can build a competitive economy on a global scale.
 - **Policy Implementation and Challenges**:-Successful execution of policies is essential for achieving the objectives of Viksit Bharat 2047, ensuring that sustainable development goals lead to tangible results. Significant government initiatives like Digital India, Make in India, Atmanirbhar Bharat, Smart Cities Mission, and National Green Hydrogen Mission create a robust foundation for economic, social, and environmental advancement. Nonetheless, obstacles such as bureaucratic delays, shortcomings in policy implementation, lack of financial resources, and regional inequalities impede effective execution. Effective management requires coordination of interpretations, reliable monitoring mechanisms, and assurance of community participation. Moreover, the battle between economic growth balance and environmental conservation, and the impact of climate change and assurance of social inclusion remains an important task. Strengthening public-private partnerships, leveraging technology for governance, and enhancing transparency and accountability will be key to overcoming these obstacles. By addressing these challenges proactively, India can create a policy ecosystem that fosters long-term sustainability, equitable growth, and an inclusive society, ultimately fulfilling the vision of Viksit Bharat 2047.
 - **Findings and Analysis** :-Viksit Bharat 2047 Vision is seeking to transform India into a developed, stable and inclusive country with particularly economic growth, social development, technological development, environmental conservation and political reform. The results show that a stable economic model, green infrastructure and digital transformation are driving India's progress. Initiatives such as Digital India, Make in India
-

and Atmanirbhar Bharat are accelerating industry growth and job creation, but there are issues such as income inequality, skills and resource distribution.

Environmental analysis shows that renewable, overwhelming energy sources and climate resistance stability programs increase stability, but issues such as pollution prevention, water management, and climate adaptation are more powerful in politics. It indicates that safety is required. In social terms, programs such as Ayushman Bharat, Beti Bachao Beti Padhao, and rural education reforms, improved inclusiveness, but not differences in access to healthcare, gender equality and quality of education are preserved. Technological achievements in the field of artificial intelligence, automation and intellectual infrastructure create opportunities for an economy based on knowledge, but digital literacy and problems of cybersecurity should be resolved. Policy implementation analysis highlights bureaucratic delays, financial constraints, and governance inefficiencies as major hurdles, requiring stronger public-private collaborations and regulatory reforms.

Conclusion:-

In conclusion, India has taken important measures against Viksit Bharat 2047, but is keen to achieve sustainable development by integrated planning, effective management, and citizen innovation and active participation. A policy is needed. Solutions to existing problems with long-term adaptation strategies ensure that their goals will become a stable country developed by 2047.

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ENHANCING SCHOOL LEADERSHIP THROUGH TECHNOLOGY-DRIVEN SKILL DEVELOPMENT AND INNOVATION

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Abstract

Technology has revolutionized the education sector, including school leadership and administration. By integrating digital tools and innovative training methodologies, school leaders can improve decision-making, operational efficiency, and overall educational outcomes. This research highlights key components of technology-enabled leadership training, its benefits, and best practices for implementation. In an era of rapid technological advancement and evolving educational landscapes, the role of school principals as leaders is more critical than ever. This paper highlights the importance of enhancing school leadership through technology-driven skill development and innovation. By equipping principals with digital literacy, data analysis, and innovative leadership skills, schools can better adapt to the demands of the 21st century, improve decision-making, and foster a culture of continuous improvement. Technology-driven leadership programs enable principals to streamline administrative processes, promote equity and inclusion, and prepare students for a future workforce that prioritizes creativity, critical thinking, and digital competence. Furthermore, such programs empower leaders to drive systemic change, build resilient institutions, and create collaborative, student-centered learning environments. Investing in the professional development of school principals through technology not only enhances their capacity to lead but also ensures that educational institutions remain relevant, equitable, and future-ready.

Keywords: School Leadership, Technology Integration, Skill Development, Educational Innovation, Digital Training.

Introduction : The evolving educational landscape demands that school principals develop new skills to navigate administrative, instructional, and policy-related challenges. With the integration of technology, leadership training programs have become more dynamic and accessible, offering interactive learning experiences that improve professional development. This paper examines the role of technology in enhancing school leadership, focusing on digital platforms, online training modules, and AI-driven decision-making tools.

Key Components of Technology-Driven Skill Development Technology-driven leadership training comprises several crucial elements that contribute to effective school management:

- **E-Learning Platforms:** Providing flexible, self-paced learning for leadership development.
- **Artificial Intelligence in Decision-Making:** Utilizing AI-driven analytics for data-informed educational policies.
- **Digital Communication Tools:** Enhancing stakeholder engagement and collaboration.
- **Virtual and Augmented Reality:** Offering immersive experiences for real-world problem-solving.
- **Cloud-Based Administrative Systems:** Streamlining school operations and data management.

Benefits of Technology-Driven Leadership Training The integration of technology into skill development programs offers numerous advantages, including:

- **Improved Accessibility:** Principals can engage in training anytime, anywhere.
- **Enhanced Decision-Making:** Data-driven insights improve school management.
- **Increased Collaboration:** Digital tools facilitate communication among educators, policymakers, and stakeholders.
- **Cost-Effectiveness:** Online training reduces expenses related to traditional in-person workshops.
- **Personalized Learning:** AI-powered platforms tailor training to individual needs.

Challenges and Recommendations Despite the advantages, several challenges hinder the adoption of technology-driven training programs:

- **Digital Divide:** Unequal access to technology affects participation.
- **Resistance to Change:** Traditional mindsets may slow adoption.
- **Training Gaps:** Lack of technical expertise among educators. To overcome these barriers, educational policymakers should invest in digital infrastructure, provide incentives for participation, and create comprehensive training frameworks that integrate emerging technologies.

Importance of skill development programme for Principals through technology:

Enhancing school leadership through technology-driven skill development and innovation is crucial for several reasons, as it directly impacts the quality of education, student outcomes, and the overall effectiveness of educational institutions. Here's why it's important:

1. Adapting to a Rapidly Changing World

- The world is evolving rapidly due to technological advancements, globalization, and shifting societal needs. School leaders must be equipped with the skills to navigate these changes and prepare students for a future that demands digital literacy, critical thinking, and adaptability.

- Technology-driven leadership ensures schools remain relevant and responsive to emerging trends.
- 2. Improving Decision-Making and Efficiency**
- Technology provides tools for data collection, analysis, and visualization, enabling school leaders to make informed, evidence-based decisions.
 - Automation of administrative tasks (e.g., scheduling, attendance tracking) frees up time for leaders to focus on strategic planning and improving teaching and learning.
- 3. Fostering Innovation in Teaching and Learning**
- School leaders play a key role in creating a culture of innovation. By leveraging technology, they can encourage the adoption of new teaching methods, such as blended learning, flipped classrooms, and personalized learning.
 - Technology also enables access to global resources, collaboration platforms, and cutting-edge educational tools.
- 4. Enhancing Communication and Collaboration**
- Technology facilitates better communication among stakeholders, including teachers, students, parents, and the community. Tools like learning management systems (LMS), video conferencing, and social media platforms help bridge gaps and foster collaboration.
 - Effective communication strengthens relationships and builds trust, which is essential for a positive school culture.
- 5. Developing 21st-Century Leadership Skills**
- Modern school leaders need skills such as digital literacy, data analysis, and the ability to manage virtual teams. Technology-driven professional development helps leaders acquire these competencies.
 - Leaders who are proficient in technology can model its effective use, inspiring teachers and students to embrace it.
- 6. Promoting Equity and Inclusion**
- Technology can help bridge gaps in access to quality education, especially for underserved communities. School leaders can use technology to provide equitable learning opportunities and resources.
 - Digital tools also support differentiated instruction, catering to diverse learning needs and abilities.
- 7. Preparing Students for the Future Workforce**
- School leaders have a responsibility to ensure students are prepared for the demands of the 21st-century workforce, which increasingly relies on technology and innovation.
 - By integrating technology into leadership practices, schools can create environments that foster creativity, problem-solving, and digital skills.
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8. Building Resilient and Agile Institutions

- The COVID-19 pandemic highlighted the importance of technology in maintaining continuity in education. School leaders with strong technological skills can better manage crises and adapt to unforeseen challenges.
- Technology-driven leadership ensures schools are agile and resilient in the face of disruptions.

9. Encouraging Lifelong Learning

- Technology provides access to online courses, webinars, and professional networks, enabling school leaders to engage in continuous learning and stay updated on best practices.
- A culture of lifelong learning among leaders sets a positive example for teachers and students.

10. Driving Systemic Change

- Technology-driven leaders are better positioned to drive systemic change within their schools and districts. They can implement innovative policies, streamline processes, and create sustainable improvements.
- By embracing technology, leaders can transform traditional educational models into dynamic, student-centered systems.

Conclusion

The integration of technology into skill development programs for school principals is essential for fostering innovation and enhancing educational leadership. By leveraging digital tools and data-driven strategies, school leaders can optimize administrative efficiency, improve teaching outcomes, and drive meaningful change. Future research should focus on refining technology-enabled leadership models to ensure their sustainability and impact. Enhancing school leadership through technology-driven skill development and innovation is not just about keeping up with trends; it's about creating a future-ready education system that empowers students, supports teachers, and strengthens communities. By investing in the technological competence of school leaders, we ensure that educational institutions remain effective, equitable, and forward-thinking in an increasingly digital world.

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**REDEFINING SCHOOL LABORATORIES: THE REVIEW OF POWER OF AI
POWERED VIRTUAL LABS****Kirtimala Shankar Parab***Research Scholar**Department of Education**Sub Centre Pune**SNDT Women's University, Mumbai**Kirtipnaik29@gmail.com***Dr. Bhaskar Vishnu Igawe***Assistant Professor**Department of Social Work**Sub Centre Pune**SNDT Women's University, Mumbai**bigawe@caepune.sndt.ac.in*

Abstract

The laboratory practical component in school subjects and vocational & skill- based courses have always been the integral part of the syllabus. Whereas, more focus is seen on the theory component, the practical component although being vital, is seen mostly neglected. The growth in enrollment, lack of infrastructural facilities, shortage or unavailability of the sophisticated instruments, insufficient time duration allotted for the lab work, inability of the lab instructor to supervise and guide the individual student presents significant challenges faced by the subjects having practical components. Due to which the students are forfeited of learning by hands -on experimenting and opportunity to gain meaningful hands- on experience. The explosion of technology and the expansion of artificial intelligence has shown the brighter outlook in mitigating the challenges faced in providing the experiential learning. The formulation of NEP 2020 suggests to merge the education and technology, especially AI to overcome the challenges faced in delivering the in- depth knowledge. This paper through the systematic literature review using PRISMA Methodology, therefore, explores the potential of complementing ai powered virtual labs with physical labs. The study will review the related literature from last decade to find the benefits, shortcomings, challenges and mitigations in integrating the ai powered virtual labs in complementation with the traditional lab- based courses. The study will provide a proof and in-depth insight for all the concerned stakeholders to design the course so as to provide the satisfying ai powered virtual lab experience which in turn will help the learner to enhance their understanding of theoretical concepts and prepare them for the physical lab activities.

Key Words: - Artificial intelligence, AI powered virtual labs, Physical Labs.

INTRODUCTION

The practical and hands- on experience is the integral part of the learning and imparting knowledge and skills. Therefore, the education system and the training centers tries to provide the well- equipped laboratories. But with the increasing enrollment in the schools and training centers

the labs are falling short of providing the personalized training and individualized hands-on experiences. Also due to the safety, security and maintenance issues most of the lab in-charges shows the negative attitude in allowing the learners to handle the lab equipment and instruments. This often abstain the learner from hands on and practical experiences which are the salient features of deep learning and skilling.

With the growth in technology, virtual labs came up as a great relief for the skill, vocation and science-based courses. Use of the virtual labs and simulations rescued the struggle of space, time, safety and maintenance issues. Using the virtual labs and simulations the learner can perform the experiments repeatedly till get skilled without the fear of damaging the actual equipment or posing risk to the safety of self or others. This brought the reform not only in schools but also in other skill and mastery demanded courses like medicine, air force training, driving and other lab-based skills.

With further explosion in technology and inventions, AI entered each and every global sector. The limitations of virtual labs like personalized instruction, individualized feedback, space, time, monitoring individual progress and one to one mentoring were overcome by integrating AI with virtual labs. This redefined the physical laboratories from physical setting with the watertight compartments to the space for exploration and experimentation to answer the curiosity and inquisitiveness.

Before concluding on the effectiveness of AI powered virtual lab one need to take an in-depth review regarding its effectiveness, challenges faced in implementation, pros and cons. This paper therefore dives into the related researches and reviews of the various researcher from last decade carefully examined and selected by the inclusion and exclusion process using PRISMA method. The descriptive analysis of which will provide the concrete evidence to the various stakeholders to integrate the ai-powered virtual-labs in their daily practice of skill development and hands-on trainings with ease and confidence.

OBJECTIVES OF THE STUDY

To find the impact of ai powered virtual labs in lab-based courses and trainings using systematic review.

SIGNIFICANCE OF THE STUDY

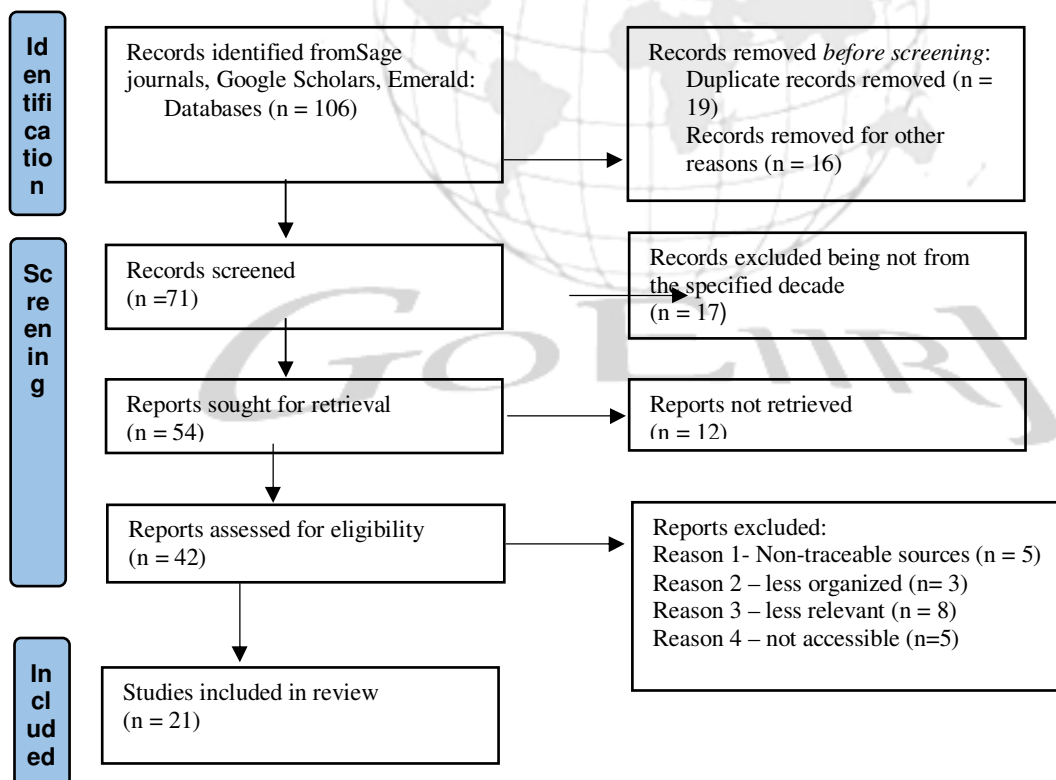
The advent of the technology is changing the way the instructions are delivered today. The framework of NEP 2020 and targets set by 17 SDGs advocates the use of emerging technology especially AI in all the fields including education. Before indiscriminately merging every sector in AI-sphere, there is a need to verify its plus and minuses. This study therefore through proper mapping will survey the literature to find out what the various researchers upholds. This will help the various stakeholders to confidently decide as to why and how to integrate the ai based virtual

labs in their instructions and labs. This will help in proper planning, implementing and evaluating the lab instructions so as to get the maximum outcomes without any deface.

METHODOLOGY USED

For the present study various literatures and databases from Google, Google Scholar, Emerald, Sage Publications were used to search the researches related to the topics. The inclusions and exclusions were carried out using the PRISMA method which includes three phases Identification, Screening and Inclusion for choosing the most relevant and credible reports for the study and analysis. In the first phase, exclusion was done by excluding the duplicates and checking the validity of the source. In the second exclusion the only the research from the selected decade was included. In the third phase the exclusion was done based on the retrievals. The final exclusion was done based on traceability, relevancy, organization of work and access type. Those researches successfully coming out from this filtration process were studied thoroughly. (as shown in the fig 1)

PRISMA 2020 flow diagram for new systematic reviews which included searches of databases and registers only



(fig-1)

REVIEW OF EFFECTIVENESS OF AI POWERED VIRTUAL LABORATORIES

A. Artificial Intelligence in Education

According to the library research by Tira Nur Fitria (2021), review of selected articles from 1993-2020 by Zhang and Aslan (2021) claimed that the use of artificial intelligence tools can

reform the education process. The researchers uphold that ai has the potential to bridge the gap between the learner and school. Zawacki-Richter et al. (2019), and Parab K. S. & Igawe B. V. (2024), highlighted that the features of AI like virtual mentoring, voice assistance, smart content, presentation translator, global courses, automatic assessment, personalized learning, educational games, intelligent tutoring system, instant feedback has the potential to enhanced the learning outcomes, improve learning experiences, enhance engagement leading to collaborative learning bringing about equity and equality among the learners by addressing the individual needs. Virtual agents can act like a teachers, facilitators and peers for example as in remote laboratories Perez et. al (2017). The majority of AI tools are used in lab-based subjects Dagmar Mercedes Heeg and Avraamidou (2023).

B. Virtual labs and AI powered virtual labs

According to Qawaqneh et al., (2023), the semi experimental study on 80 students, strongly recommended using the ai powered virtual labs and all its applications in the learning process. The study proved that the ai powered virtual labs has very high positive impact on the motivation of the learners towards learning mathematics as compared to any other method. Sharma, N. (2024), proponed that the use of ai in the labs breaks the barriers of time and location, supports concept clarity, ensures students safety, engages learners, offers instant feedback, provides flexibility in learning and is an affordable alternative to physical labs leading to active learning. This allows the learner to find he futuristic solutions. Santos, M. L., & Prudente, M. (2022), Li, J., & Liang, W. (2024), Byukusenge et al. (2022), through the systematic meta-analysis of the work from Google Scholar and Scopus databases, revealed that the secondary school benefits most with the use of virtual labs. The studies proved the virtual-labs to be useful in teaching the lab-based subjects and to provide the concept clarity, enhance lab skills, increase motivation and builds positive attitude among the learners. The repetition of the experiments using the virtual-labs without any added cost leads to enhanced cognitive outcomes, deeper understandings and clarity of the concepts. With the integration of the features of AI such as augmented reality, virtual reality, and interactive simulations, the virtual labs have become more complex and interactive hance providing the greater scope for hands-on learning experience with flexibility without burdening the teachers. Virtual-labs used as the supplementary instruction proved to be the means of active involvement in safer and cost-effective scientific inquiry and can be effectively used for active engagement in learning activities and pursue knowledge and skills. Cui et al. (2021), developed the laboratory with VR simulation for the students to perform various basic experiments at their own convenience independently. The experimental study by Brinson, J. R. (2015), to find the effect of the virtual-non-traditional laboratories over traditional laboratories indicated that non-traditional virtual laboratories were not less than the traditional-laboratories with the added point as experiments can be carried out without posing question on the safety, security and maintenance of

the laboratories. Sanzana et al. (2023), investigated different methods to include the gamified elements in the virtual-labs. The findings showed that virtual-labs can be used as an effective pedagogical tool for low-risk interactive-learning and enhanced engagement. Lau et al. (2017), developed Stereoscopic Chemical Laboratory digital virtual platform to investigate its impact on textile students. It revealed that use of virtual platform to conduct the laboratory experiments associated with the coloration and finishing of the technologies enhanced the learning experiences of students. It supported learning of other relevant experiments, experimental processes and procedures with safety and health precautions. Wijenayaka, L. A., & Iqbal, S. S. (2021), created the resource consisting of the virtual-chemistry simulations and animations using OER. It revealed that if the cons are tackled, virtual-labs proved to be advantageous in saving time and being flexible and helpful to overcome the limitations of demographic location and develop positive attitude towards using technology during future laboratory activities. Errabo et al. (2024), investigated the epistemic fluency in virtual-labs in flipped classrooms and examined the post-lab outcomes. It provided evidence that virtual-labs can enhance the quality and equity, develop the scientific literacy, foster scientific inquiry, support problem-solving and develop scientific-temper leading to solid performance of the students in long term with development of high self-efficacy and positive attitude among the learners. Murali et al. (2024), Cubillos, D., & Chandramouli, M. (2025), concluded that virtual-reality can be powerful teaching instrument, AI-powered virtual-labs can be viable method of teaching complex topics, making it interactive and engaging. AI powered virtual-labs along with enhancing the learning experiences, also fosters critical thinking and problem-solving skills of the learners.

DISCUSSIONS AND CONCLUSIONS

Experiments and hands-on trainings in the laboratories and training centres has always been the crucial part of the teaching and are the basis for strengthening the theoretical knowledge and acquiring mastery in the skills. The traditional laboratories have always been struggling to fulfill the demand put by the growing enrolment, insufficient time, lack of human resource to provide the personal assistant and lab guidance, provision of safe, secure and sophisticated lab apparatus. The exploring technology made it easier to tackle the shortcomings by introducing the virtual labs in the field of education. Virtual-labs provided the lab like virtual-experiences for the learners without remaining present in the physical lab. This overcame the issue of distance and time, as the learners were able to acquire the practical knowledge and skills independent of his location. Since the virtual labs allowed the learner to perform the lab experiments at his/her own space and time, the individualized mentoring and guidance became a challenge. Integrating AI with the virtual labs provided the solution to the barriers of space, time, individualized instruction, personalized learning, initiating curiosity, perception and inquiry skills. This also leads to deeper knowledge and understanding among the learner which are also the basics of STEAM education.

In the present study, the researcher through the systematic literature review using PRISMA explored the impact of using ai powered virtual labs. After applying the various filters, 21 most relevant and credible researches were selected for the rigorous study and descriptive analysis to find the impact of ai powered virtual labs. The descriptive analysis of the relevant literature upholds that even though the physical labs have its own features of providing the real-lab experience during the hands-on experimentation, it has many shortcomings. The descriptive analysis of the selected literature showed that the integration of technology and AI has uplifted the laboratory experience. The ai-powered virtual-labs has broken the boundaries of physical infrastructure, time, space and need of presence of the mentor. Ai-powered virtual-labs has given the powered the learner with autonomy to acquire skills without any risk. Questions are pose on the safety of using the technology, but if used ethically and sensibly under the proper guidance of experts, the integration of technology and AI can complement the traditional-teaching method and elevate the experiential learning outcomes.

The present study in the form of the review and analysis of the existing literature will provide clearinsights to the stakeholders to design, plan their ways and methods of acquiring and providing the skill based and lab- based education so as to yield the maximum learning outcomes.

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GOEIIRJ

**INDIAN KNOWLEDGE SYSTEM : GURUKUL PEDAGOGY AND ACTIVITY
BASED LEARNING BASED ON NEP 2020****Sanjana Sanjay Bhalkar***Researcher,**Department of Education,**Shivaji University, Kolhapur,**Maharashtra**sanjanabhalkar12@gmail.com***Prof. Dr. Pratibha S. Desai***Guide,**Principal,**Aacharya Javadekar College**of Education, Gargoti, Maharashtra**drpratibhadesai@gmail.com*

Abstract :-

India has a long history of well-established education system. The modern educational systems are the outcomes of educational systems prevailing during the past. Modern or contemporary systems of education draw their essence from the past educational systems. It is the historical outlook which helps in studying the problems of education. India has a magnificent history of education since the Vedic age. Indeed, there was an ideal education system during Vedic, Brahminic and Buddhist era. Further, the ancient system of education was nourished by the Mughals who came to this land and settled in this country. With the advent of British in India, reform of the traditional system began and foundation of modern education system in India was laid down. After independence, Government of India improved the status and promoted the system of education to a new culminating point.

National Education Policy (NEP2020) aspires to transform the educational scenario in india. it aims to fulfil the countless aspirations and new hopes of our country. This policy introduces robust features to overcome some of the chronic challenges of our education system. it emphasizes quality education by engaging students in their holistic development through innovative methods like experiential and other student –oriented teaching methodologies. The NEP 2020 focuses on experiential and activity-based education, aligning well with Dale's principles, and aiming to enhance long-term retention and understanding.

Keywords:- Indian knowledge system (IKS), Gurukul pedagogy, Activity based learning (ABL), National Education Policy (NEP) 2020

Introduction :- Development of education in India has a long historical past. The history of education in India can be traced back to the Gurukul system of education during the Ancient times. Since then, it has passed through several centuries of Indian civilization and reached the current stage of technology based education system. Development of education in every period beginning from the Ancient times has its own importance. India has witnessed many ups and downs of

education during different periods, say, the Ancient, the Medieval, and also the Modern which includes both the pre-independence and the post-independence periods. The present research will help you understand and analyse the education system prevailing in India during different periods as mentioned above. This research will also help you understand the present development of education in terms of transformation of quality education at the School and the Higher education levels

Objectives of the study:-

1. To study the Indian Knowledge system.
2. To study the gurukul pedagogy.
3. To study the Activity based learning based on national education policy 2020.
4. To give suggestions to concern on the basis of study.

Importance of the study:- Present study important for Teacher ,students ,educators, Researchers for clear the concept of Gurukul pedagogy and National education policy 2020.

Delimitations of the study:-

Present study delimited only Indian Knowledge System ,Gurukul pedagogy, Activity based learning and National education policy 2020.

Research Methodology:-For the Present study researcher used by verified documentations and survey method for appropriate to achieve the objectives of the study.

Analytical Interpretation :-**Indian Knowledge System :Gurukul Pedagogy**

Education during the Vedic Period:- The Vedas were the original source of the philosophy of life and system of education during ancient India. Education, during ancient India, consisted of teachings of the Vedas. Four Vedas, such as Rig-Veda, Samveda, Atharveda and Yajurveda are the sources of knowledge about the culture, civilization, life and philosophy of the people of Ancient India. They contain the philosophy of life. Rig-Veda is the essence of the basic teachings of the great Indian thinkers, teachers, rishis and munis. Education, during the Vedic period, was based on the text of Rig-Veda. Vedic education thus consisted of teachings of the Vedas.

Gurukul Pedagogy :- Methods of teaching during, the Vedic period, emphasised repetitive recital or variety. Mostly, three methods of teaching were being used by teachers during that period: (i) Sravana (Listening): Students listened to the words or texts uttered by the teacher and memorized them. (ii) Manana (Deliberation): It was an advanced method of teaching through which students were taught how to reflect on the topic taught by the teacher. Intellectual appreciation of truth was the prominent feature of this method. (iii) Nidhidhyasana (Meditation): Through this method realization of truth was to be accomplished. The individual was helped by this method to realise the self

Duties of students (Shishyas) :- The duties of the students who lived in ‘Gurukul’ were : (a) a student had to do the service of the ‘Guru’ and required works of the ‘Gurukul’. He also prepared the necessities for the rituals like, Yajnas. (b) The student had to go out for alms. This developed the spirit of generosity in them. (c) His main duty was to study. He learnt and attended to the instruction of the ‘Guru’ very gently. Thus, it is clear that while living in ‘Gurukul’ he spent the life of an ideal student, which was simple and well regulated.

Relation between Guru and Shishyas :- During the Vedic age, the Shishya considered his Guru as his father. “Guru, very affectionately looked after his taught” (Rai, 2001, p. 11). He never let him suffer in any way and always worked towards his all-round development.

Gurukulas :- “The Gurukul system which necessitated the stay of the student away from his home at the home of the teacher or in boarding house of established reputation, was one of most important features of the Ancient Indian Education”

Qualities of Guru :- Teachers of the Vedic age were of the uppermost calibre in the society in terms of knowledge and spiritual development. Residing in their ‘Gurukulas’, they always emphasised on religious and spiritual development of their thoughts. Thus, every obligation of the Shishyas (learners) was on ‘Gurus’, who continuously tried to improve the qualities of their learners so that they might become better than themselves. The teacher’s responsibility was to show the correct path to learners for realization of ultimate truth.

Curriculum;- Curriculum, during the Vedic period, was chosen to enhance the process of all round development of the learner’s personality. The students were taught to learn the four Vedas by heart and side by side they studied Sanskrit language and six Vedangas Kalpa (ritual), Vyakaran (grammar), Jyotish (astronomy), Chhanda (metrics), Nirukta (etymology) and Shiksha (phonetics). As far as courses of study and literature were concerned, the Vedic education was remarkable. Physical Education was also included in the curriculum. Some professional and technical subjects like Ayurveda or Chikitsavidya (Medicine and surgery), Astronomy, Ethics, Philosophy, Astrology, Military Education, Artha-sashtra, etc. also comprised the Vedic curriculum.

ACTIVITY BASED LEARNING BASED ON National Education Policy 2020

According to the National Education Policy NEP 2020, Activity Based Learning, refers to a pedagogy that strongly emphasizes engaging students through hands on, interactive activities like experiments, projects, games, role playing and group discussion, aiming to foster critical thinking, creativity, collaboration and problem solving skills, rather than relying solely on traditional lecture-based learning methods.

The National Education Policy (NEP) 2020 encourages activity-based learning (ABL) to help students learn through hands-on activities. ABL is a teaching method that helps students

understand concepts through practical application.

How does NEP 2020 encourage ABL?

- **Experiential learning:** NEP 2020 encourages educators to design lessons that involve students in activities that require observation, reflection, and hands-on engagement.
- **Active pedagogy:** NEP 2020 encourages active pedagogy, which involves engaging students in the learning process through interactive and participatory methods.
- **Inquiry-based approaches:** NEP 2020 encourages inquiry-based approaches to learning.
- **Holistic learning:** NEP2020 emphasizes holistic learning approaches instead of traditional learning approach.
- **Competency-based education:** NEP 2020 encourages competency-based education.
- **Flexible learning environments:** NEP 2020 encourages flexible learning environments.

PEDAGOGY

NEP 2020 emphasises the need for a student-centric, ,Activity based ,experiential, and inquiry-based approach to learning. The policy aims to move away from the traditional rote learning method and encourage critical thinking, problem-solving, and creativity. The pedagogy will be supported by the development of new teaching-learning materials, textbooks, and teacher training programs.

The policy also emphasises the need for continuous evaluation and assessment of students' progress. The assessment will focus on evaluating students' conceptual understanding, problem-solving skills, and creativity.

Another significant change in pedagogy is the integration of technology in education. The policy aims to leverage technology to improve the quality of education and make it more accessible and affordable. The policy encourages the use of online learning platforms, digital content, and virtual classrooms.

Role of a Teacher in Activity Based Learning:-

The Teacher will be viewed as a mediator ,facilitator ,coach, mentor and actuator who participates with the learner's co –constructing knowledge. Activity based learning plays an important role in teaching the students to collaborate ,communicate ,interact and work in teams.

Conclusion :-Gurukul-inspired activities under NEP 2020:

Nature Study:

Conducting outdoor explorations to learn about ecology, botany, and environmental issues, followed by discussions and presentations.

Craft-Based Learning:

Creating projects using traditional crafts like pottery, weaving, or carpentry to learn about geometry, design, and cultural heritage.

Storytelling and Debates:

Using traditional stories and debates to develop critical thinking, communication skills, and ethical reasoning.

Skill-Based Workshops:

Organizing workshops on practical skills like gardening, basic mechanics, or coding to promote real-world application.

Yoga and Meditation:

Incorporating mindfulness practices to enhance focus, emotional regulation, and overall wellbeing.

Important considerations when implementing Gurukul pedagogy with NEP 2020:**Adapting to Modern Context:**

While drawing inspiration from the Gurukul system, ensure activities are relevant to contemporary challenges and future needs.

Technology Integration:

Utilize digital tools to enhance learning experiences, access information, and collaborate effectively.

Teacher Training:

Equipping teachers with the necessary skills to facilitate inquiry-based learning, project-based activities, and student-centred pedagogy.

Assessment Strategies:

Move beyond traditional exams and incorporate diverse assessment methods like portfolios, presentations, and performance-based evaluations to capture holistic learning.

Activity-Based Learning (ABL) is a teaching methodology where subject matter is delivered through various activities, making learning interesting and engaging. It contrasts with the traditional monologue education system. This learning encourages students to participate in their own learning experience through practical activities. It also promotes team spirit and social skills. By promoting activity-based and hands-on learning, aims to develop creative thinking, critical skills, problem-solving attitudes, collaborative thought, cooperation, competition, and other life skills among learners. It encourages the four E's among students: engage, experiment, explore, and express.

Recommendations of the study: -

The need of the hour is for teachers, from primary to apex levels, to switch from conventional to modern teaching methods. Learners should not be mere passive participants but active ones. The best teaching principles should be adopted to make teaching student-centred and goal-oriented. Without the proper intervention of teachers, the dream of NEP 2020 is unachievable. Teachers can provide an alternative to the banking model of education. The time has

come to unfold this robust policy and implement this form of teaching among learning communities.

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USE OF MULTIMEDIA BY SECONDARY SCHOOL TEACHERS FOR TEACHING SCIENCE- A STUDY

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Abstract:

“Use of Multimedia by Secondary School Teachers for teaching science- A study”. The purpose of the present study is to look into how secondary school science teachers use multimedia. It investigates the many types of multimedia used, how frequently they are used, and how teachers perceive the efficacy of multimedia in science instruction. The study also looks at the problems that teachers have when employing multimedia and the support they require to effectively integrate it into their teaching practices. The findings shed light on the current state of multimedia use in scientific classrooms and can help drive professional development programs and resource allocation to improve science teaching and learning.

Present research objectives are to identify the components of multimedia used in education, to study the awareness of multimedia for teaching among secondary school teachers, and to give suggestions to the concern on the basis of the study. The researcher identified several Components of multimedia, comprising Text, Images, Audio, Video, and Animation. The data is gathered through surveys with secondary school science teachers. The research methodology involved conducting a survey using a questionnaire. A total of 66 teachers by using lottery sample technique from Madha taluka from Solapur district, of Maharashtra, to gather data on the awareness of multimedia for teaching. The findings indicate that, while teachers acknowledge multimedia's potential to improve science instruction, its adoption is not ubiquitous. Teachers reported limited access to technology, inadequate training, and time constraints as hurdles to multimedia integration. The study concludes with recommendations for professional development and resource allocation to help instructors successfully incorporate multimedia into science lessons. Thus researcher attempted to study here to emphasizing the significance of multimedia for enhancing educational practices.

Keywords: Multimedia, secondary school teachers, components.

Introduction:

Awareness generally refers to the state of being aware of anything, such as one's surroundings, thoughts, feelings, or situations. It can be understood in several circumstances. Technical literacy, which is closely tied to technical awareness, has become an important

educational goal. This time period witnessed an increased emphasis on incorporating technology into education and raising knowledge of its possibilities and limitations. **Dyrenfurth, M.J. (1987)**. Conceptual Beginnings of Multimedia, as a concept, emerged alongside technological breakthroughs that enabled the merging of various types of media. One of the earliest examples of multimedia may be seen in education and the arts, when technology and media began to intersect in presentations or performances. **McCormick, E. J. (1971)**. Multimedia can be described as "any combination of text, graphic art, sound, animation, and video that is delivered by computer or other electronic means. **Vaughan T., (1993)**. The term "multimedia" became more formalized with the advent of personal computing in the 1980s, which allowed digital media such as graphics, video, and audio to be used interactively on a computer system. **Phillips, L. (1987)**.

Multimedia is the combination of several media types, including as text, audio, photos, video, and interactive features, on a single platform or application. This combination results in a more engaging and immersive experience than standard single-medium content. While the idea of merging diverse media has been around for centuries, the introduction of computers and digital technologies in the late twentieth century transformed multimedia, making it more accessible and participatory.

Therefore from present research researcher undertaken efforts to study how much awareness is among secondary school student on A.I. Tool based multimedia, with help of it they can able to enhance student's conceptual clarifications of abstract and complicated concepts during learning process.

Hence researcher undertaken present study under the light of the following objectives.

Objectives:

- 1) To identify the component of multimedia.
- 2) To study the awareness about multimedia for teaching science.
- 3) To give suggestions to the concern on the basis of study.

Research Procedure:

For the present research researcher following research procedure.

Research Method: Survey is undertaken with the help of Questioner to study the use of multimedia for teaching science by secondary school teachers.

Collection of the Data: For present study data is collected through the survey of secondary school teachers for studying use of multimedia for teaching science.

Sample: The study sample is undertaken of Sixty Six Secondary school teachers who are randomly selected by using the lottery method from Madha taluka, Solapur districts (Maharashtra).

Objective wise Procedure of the study:

The first objectives of the research is to identify the component of multimedia and A.I. Tools. Villalobos, J. L., & Blando, J. A. (2018), Khan, M. L. (2015). Hence for fulfilling this

objectives the information is collected by using Literature survey and it those are described in Fig.No.1.

Sr. No.	Component	Function
1	Text	Text is most commonly used to communicate information. Written or typed information, serving as a fundamental component of multimedia presentations.
2	Images	Images/Illustrations are the oldest form of media. Images are visual representations such as images, illustrations, and graphics that help people understand and participate.
3	Audio	The speech, music and sound effects used in multimedia is digital audio. Audio elements include music, speech, and sound effects, which give depth and emotion to multimedia experiences.
4	Video	Video presents moving pictures and typically combines images and sound for a multimedia experience. Moving pictures that draw attention and transmit information in a dynamic manner.
5	Animation	Animation is the process of making a static image to look as if it is moving. It helps in creating, developing, sequencing, and displaying a set of images. Technically known as frames. Animation is the process of creating the illusion of movement using a series of images, which adds visual interest and interactivity.

From Table No.1 it seems that information on the component of the multimedia for teaching (Text, Image, Video, Audio, and animation). Those are

Text is primarily used to convey information effectively in various multimedia applications. These graphics are created using specialized software, allowing for scalable images without loss of quality. Audio elements enhance multimedia applications, enabling the addition of background music or voiceovers in websites and presentations. Image Processing Multimedia elements facilitate the generation, representation, processing, manipulation, and display of images. Frames in Animation the creation and sequencing of images, known as frames, are essential for developing animations. GIFs are small graphic image files that can display a single image or a sequence of images rapidly, creating the illusion of motion. Video combines moving pictures with sound, providing a rich multimedia experience. Animation Tools Adobe Flash is a widely used tool for creating animations, showcasing the importance of software in multimedia production. Multimedia applications utilize two main types of images: bitmaps and vectors, supporting linked content through hypertext.

The second Objective of the study that is, to identify the awareness about multimedia for teaching. For the fulfilment of the second objective of the study survey is undertaken of 66

secondary school teachers from Madha taluka, of Solapur districts (Maharashtra) respondent on use of component of multimedia and multimedia for teaching in secondary school and the responses are analysed and as shown in Fig. No.1.

Fig. No. 2 Analysis of Teachers responses on the use of Multimedia for Teaching Science

Sr. No.	Respondent	Responses on Item	Respondents for 'Yes' Option		Respondents for 'No' Option	
			No. of Respondent	Percentage (%)	No. of Respondent	Percentage (%)
1	66	Teachers response's on use of multimedia for teaching	18	27.27	48	72.70
		Teachers response's on use of multimedia on any science topic	41	62.12	25	37.87

From Fig. No.2 it seems that 18 teachers among 66 are considered means 27.27% secondary school teachers responded that they use of multimedia for teaching, and 48 teachers responses means 72.70% responded that the don't use multimedia for teaching. As per 44 responses out of 66 means 62.12% responded that they use of multimedia on science content and according to 25 response's means 37.87% responded that they don't use of multimedia on science content.

From Fig.No.2 it seems that according to responses of secondary school teachers more number in teachers means more number in percentage are show that they don't use any type of multimedia for teaching as compare to the use of Multimedia for teaching.

Conclusion:

The study successfully identified key components of multimedia and A.I. tools, which are essential for enhancing teaching methods among secondary school teachers. Awareness levels regarding multimedia for teaching were assessed through a survey of 66 secondary school teachers, indicating varying degrees of familiarity and usage. According the 66 responses of the secondary school teachers it conclude that teachers are more in number they don't aware about the multimedia as well as the A.I. Tools. The teachers are more in number respondent that they don't

use any multimedia for teaching as well as they don't have any information about the A.I. Tools based multimedia. According to 66 responses of the school teachers it seems that teachers number is more they don't use any A.I. Tools for teaching physics. The study also emphasized the need for better integration of multimedia applications in teaching, as they support linked content and enhance the learning experience.

Suggestions:

Based on the findings of the study "Use of Multimedia by Secondary School Teachers for teaching science- A study" several suggestions can be made to enhance the awareness and utilization of multimedia and A.I. tools in education:

1. Implement regular training sessions for secondary school teachers focused on the effective use of multimedia and A.I. tools in teaching. This will help improve their understanding and application of these technologies in the classroom.
2. Create and distribute comprehensive resources that outline the components of multimedia and A.I. tools. This could include guides, tutorials, and best practices to facilitate better integration into teaching methods.
3. Foster a collaborative environment among teachers to share experiences and strategies related to multimedia and A.I. tools. This could be achieved through workshops or online forums where teachers can discuss their challenges and successes.
4. Establish a feedback mechanism to assess the effectiveness of multimedia and A.I. tools in enhancing teaching practices. This will help in refining the approaches and ensuring that the tools meet the educational needs of both teachers and students.
5. Conduct awareness campaigns to highlight the benefits of using multimedia and A.I. tools in education. This can motivate teachers to adopt these technologies and improve their teaching methodologies.
6. These suggestions aim to bridge the gap in awareness and utilization of multimedia and A.I. tools among secondary school teachers, ultimately enhancing the educational experience for students.

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**AN ARTICLE ON THE ROLE OF GURUKUL SYSTEMS IN THE
DEVELOPMENT OF KNOWLEDGE MANAGEMENT IN INDIA****Miss. Ananya Bhansali***MBA Student 2nd Year (Marketing), Sem-IV**SSR IMR, Silvassa**Permanently Affiliated to SPPU, Pune*

ABSTRACT:

This article has key focus on the role of the ancient Gurukul system in developing knowledge management in India. The Gurukul system was one of the oldest education methods in our country where students lived with their teacher, learning not only academics but also life skills, values, and traditions. This system focused on the overall growth of a person including physical, emotional, and moral development. Analysis of the historical studies, this paper highlights how traditional practices such as oral tradition, storytelling, hands-on learning, and strong teacher-student relationships helped in preserving and the transfer of knowledge effectively. Many principles of the Gurukul system are still relevant today and are combined with modern technology to create a balanced, practical, and value-based approach to education and knowledge management.

Key Words: Knowledge Management, Gurukul System, Knowledge**INTRODUCTION:**

The Gurukul system is one of the oldest education systems in India, known for its holistic approach to learning. Unlike modern schools, Gurukuls focused on overall development, including intellectual, physical, emotional, and spiritual growth. Students lived with their teachers, creating a close bond that encouraged personalized learning and strong moral values. In today's world, where education is often exam-oriented and competitive, the Gurukul system's emphasis on character building, practical knowledge, and lifelong learning is highly relevant. By studying the role of Gurukul systems in developing knowledge management, we can learn valuable lessons on conserving the cultural heritage, giving rise to critical thinking, and promoting continuous learning.

LITERATURE REVIEW:

Vinod Kumar Shanwal, Gautam Buddha University (2024) The paper highlights the studies that influence of the traditional Gurukul education system on modern Indian schools, highlighting its focus on holistic development, spirituality, moral values, and self-discipline. The aim is to examine its relevance today and how its principles can be integrated into modern education. Using interviews with teachers and school heads from five schools, the study found that

the Gurukul system emphasizes on holistic learning, practical knowledge, and strong student-teacher relationships is still relevant. However, there is a gap in its implementation, and the study suggests combining these traditional values with modern technology for a more effective educational experience.

Raushan Kumar (2024) The paper compares the ancient Indian Gurukul education system with the modern Indian education system. It explains that the Gurukul system focused on holistic development, moral values, and strong teacher-student relationships, without formal exams. In contrast, the modern system emphasizes institutionalized schooling, formal degrees, and competitive exams but is criticized for rote learning and lack of value-based education. The aim is to find the strengths and weaknesses of both systems and suggest reforms by integrating ancient practices. Using secondary data and a comparative method, the study shows that ancient methods encouraged critical thinking and holistic growth, while the modern system focuses more on academics. The gap identified is the lack of moral and value-based education in the current system, and the paper gives insights upon exploring ways to combine the best of both systems for better learning outcomes.

Nishta Rana(2024)The paper looks forward to the relevance of the Indian Knowledge System (IKS) in today's educational system. It explains that IKS includes traditional knowledge from India's cultural heritage, covering philosophy, science, art, literature, and medicine. The aim is to show how integrating IKS into modern education can provide a holistic and culturally grounded learning experience. The paper uses a descriptive method, analyzing historical texts like the Vedas and Upanishads along with modern educational practices. It finds that IKS promotes sustainability, morality, and critical thinking, enhancing the present curriculum. The gap identified is the lack of integration between traditional and modern knowledge systems, suggesting a balanced approach for a more inclusive education.

Ce Dr Sumanta Bhattacharya, Bhavneet Kaur Sachdev(2022)The paper *Gurukul System versus Modern Education in India – A Need for Amalgamation of the Two Systems to Eliminate the Crisis of Illiteracy, Economy, and Social Problems of the Society* compares the ancient Gurukul system with modern education in India. It explains that the Gurukul system focused on holistic learning, character building, discipline, and practical knowledge, while modern education is more exam-oriented and stressful, leading to issues like student suicides and lack of skill development. The aim is to recommend an incorporation of both systems to create a balanced education model. Using historical analysis and comparative study, the paper finds that the Gurukul system promoted overall growth and peace of mind, whereas modern education lacks practical learning and emotional well-being. The gap identified is the absence of value-based education and life skills in today's system, highlighting the need to blend ancient methods with modern practices for better student development.

Dinesh Joshi (2020) The paper titled *Gurukul and Modern Education System in India: Holistic Outlook* compares the ancient Gurukul system with the modern education system in India. It explains that the Gurukul system focused on holistic learning, moral values, and practical life skills, while modern education is more exam-oriented and theoretical. The aim is to analyze both systems and suggest ways to integrate the holistic approach of Gurukuls into today's education. Using secondary data, the paper finds that Gurukuls promoted overall development, whereas modern schools often neglect emotional and moral growth. The gap identified is the lack of value-based education in the current system, and the paper suggests exploring ways to blend ancient principles with modern teaching.

Milan Barman Sourav Sen, Tapash Das (2020) The paper *Holistic Approaches to Learning Inspired by Gurukul System and Its Present Importance* explores how the ancient Gurukul system of education, known for its holistic approach to learning, can be relevant in modern times. It explains that the Gurukul system focused on overall development, including academic, physical, mental, and spiritual growth, unlike modern education which emphasizes standardized testing. The aim is to compare Gurukul practices with modern education and suggest ways to integrate its value-based and experiential learning methods today. Using qualitative research and literature review, the study finds that the Gurukul system's focus on teacher-student relationships, moral education, and harmony with nature can address gaps in modern education, such as lack of emotional intelligence and moral values.

OBJECTIVES OF THE STUDY:

- To gather understanding about the role of Gurukul Systems in the development of Knowledge Management in India
- To analyze the impact of Gurukul Systems in Developing Knowledge Management in India.
- To identify key knowledge management practices in the Gurukul system.

RESEARCH METHODOLOGY

This study employs a varied approach to comprehensively explore the impact of Gurukul Systems in developing Knowledge Management in India. The study on the role of Gurukul systems in the development of knowledge management in India adopts a descriptive design, focusing on understanding the concept of Gurukul system and its role in development of Knowledge Management. The study aims to evaluate the effectiveness of the knowledge management practices in Gurukul system. The study encapsulates the domain of modern relevancy of this concept. The inferences will be indicative in nature.

UNDERSTANDING THE ROLE OF THE GURUKUL SYSTEMS IN KNOWLEDGE MANAGEMENT

Historical Base: The Gurukul system of education dates back to ancient India, where it was the primary method of knowledge dissemination. In this system, students (known as shishyas) lived with their teachers (gurus) in an ashram or Gurukul. This close-knit living arrangement created an environment of discipline, respect, and continuous learning. The knowledge imparted was not limited to academics but included life skills, values, and cultural teachings. The curriculum covered a wide range of subjects such as Vedas, philosophy, mathematics, astronomy, medicine, and even warfare. This holistic approach ensured the development of well-rounded individuals. Historical records and scriptures like the Vedas and Upanishads mention the importance of this system in preserving and transmitting knowledge across generations.

Gurukul as Knowledge Hubs: Gurukuls were more than just educational institutions; they were hubs of knowledge preservation and transfer. Unlike modern schools, Gurukuls maintained knowledge continuity by passing down wisdom orally and through practical experiences. The education was personalized, with the Guru understanding each student's capabilities and guiding them accordingly. The emphasis on oral tradition and memorization helped in preserving vast amounts of knowledge, which was then passed on to the next generation. This system also ensured the preservation of cultural heritage, spiritual teachings, and traditional practices. Gurukuls played a crucial role in maintaining the intellectual and cultural fabric of ancient Indian society.

Holistic Knowledge Approach: The Gurukul system is based on a holistic approach to education, focusing on the overall development of an individual. It aimed at nurturing not only intellectual abilities but also physical, emotional, and spiritual well-being. Students were taught self-discipline, humility, respect for elders, and a sense of social responsibility. The learning process was integrated with nature, emphasizing harmony and balance in life. This experiential learning method promoted critical thinking, problem-solving, and practical application of knowledge. By connecting education with real-life experiences, the Gurukul system ensured that knowledge was relevant and applicable, thus laying the foundation for effective knowledge management.

SIGNIFICANT IMPACT OF THE GURUKUL SYSTEMS ON DEVELOPING KNOWLEDGE MANAGEMENT

In the Gurukul system, oral tradition was the backbone of knowledge transfer. Students were taught to memorize scriptures, verses, and complex concepts through repetition and chanting. Techniques like “Shruti” (listening) and “Smriti” (memorization) were used for effective knowledge preservation. This oral tradition created a culture of strong mental discipline and cognitive development, which are essential for knowledge management. The Guru-Shishya Parampara—the close bond between the Guru and Shishya was a unique feature of the Gurukul

system. The Guru was not just a teacher but also a mentor and role model who guided the student's intellectual, moral, and spiritual growth. This mentorship model is relevant even today, as it enhances knowledge retention, loyalty, trust, and continuous learning. Gurukuls emphasized experiential learning, where students gained knowledge through real-life experiences and practical applications. For example, they learned mathematics by observing nature, astronomy by studying celestial movements, and statecraft by participating in community activities. This hands-on learning approach promoted critical thinking, problem-solving, and creativity. It also ensured that knowledge was not just theoretical but also practical and applicable in daily life. This experiential learning model is highly effective for knowledge management, as it leads to better understanding, retention, and utilization of knowledge. The Gurukul system ensured sustainability and continuity of knowledge through disciplined lifestyles and lifelong learning principles. Students were taught to lead a simple and sustainable life, emphasizing the values of respect, responsibility, and gratitude. This cultural and value-based education to preserve traditional knowledge and practices for future generations. The focus on lifelong learning ensured that knowledge continued to grow and evolve. This sustainability approach is highly relevant in today's rapidly changing world, where continuous learning and adaptability are key to effective knowledge management.

KEY KNOWLEDGE MANAGEMENT PRACTICES IN GURUKUL SYSTEM:

1. **Oral Tradition and Storytelling:**In Gurukuls, knowledge was passed on orally. The Guru would recite sacred texts, share philosophical ideas, and teach practical skills through storytelling. This wasn't just about memorizing words; it helped students understand complex ideas deeply and remember them for life. Today, storytelling is still a powerful tool. For example, companies use stories in training programs to explain difficult concepts simply and effectively. By using data and feedback, organizations can also measure how well stories help in learning and understanding.
 2. **Guru-Shishya Relationship:**The close bond between the Guru and Shishya was the heart of the Gurukul system. This one-on-one mentoring allowed personalized teaching, where the Guru understood each student's strengths and weaknesses. In modern workplaces, mentorship continues to play an important role in employee growth and development. By organizations adopts mentors and mentees, companies analyzes how personalized guidance impacts performance and learning.
 3. **Experiential Learning (Karma Yoga):**In Gurukuls, learning was not just theoretical. Students learned by doing daily chores and practical activities, gaining hands-on experience. This method is similar to modern-day project-based learning and on-the-job training. Companies today use this by assigning real-world projects to employees or students. By tracking progress and measuring skills learned, organizations can see how effective experiential learning is in building problem-solving abilities.
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4. **Observation and Imitation (Anukaran):**Students learned by observing their Guru's actions and behavior. This "learning by doing" method showed the importance of role modeling. In today's world, leaders and mentors set examples for others to follow. A senior employee demonstrating best practices that help new employees learn the right way to perform tasks. Companies look forward to measure how effective role modeling is significantly, by tracking the adoption of these practices and seeing how well tasks are replicated.
5. **Community Learning (Satsang):**In Gurukuls, group discussions and shared experiences were a key part of learning. This collective learning approach is similar to today's communities of practice, where people share knowledge and ideas. Online platforms and discussion forums work in the same way by encouraging collaboration and more of interactions. Organizations analyze the quality of interactions, track how new ideas emerge, and see the information spreads in these communities.
6. **Discipline and Routine (Brahmacharya):****Gurukul students followed strict daily routines, which helped them build discipline, focus, and concentration. This is still very important in today's developing world. Regular routines and mindfulness practices help in better time management and productivity. By analyzing schedules and performance data, educational institutions and companies measure the impact of the disciplined routines on learning and work efficiency.**

MODERN RELEVANCY

The Gurukul system is highly relevant for today's youth, individuals, and organizations because it emphasizes holistic learning, personal mentorship, and practical knowledge. For youth, it promotes overall development, including emotional and social skills, which are essential in today's competitive world. Individuals benefit from personalized learning and moral values, helping them grow both professionally and personally. Organizations can use its principles of experiential learning, collaborative knowledge sharing, and value-based leadership to build strong, ethical, and innovative teams. By adopting these age-old practices, modern workplaces can enhance productivity, creativity, and employee satisfaction.

CONCLUSION:

The Gurukul system of education in ancient India played a vital role in the development and preservation of knowledge. Its holistic approach to learning, which focused not only on academics but also on moral values, life skills, spirituality, and physical well-being, made it a unique and powerful system of knowledge management. By nurturing character, discipline, and respect for teachers, it created a generation of knowledgeable and responsible individuals who

contributed positively to society. As India and the world move towards knowledge-based economies, rediscovering and reimagining the Gurukul system's wisdom can help build a more inclusive, ethical, and knowledgeable society. Thus, the Gurukul system's contribution to knowledge management is not merely historical but also futuristic. It bridges the gap between traditional wisdom and modern innovation, creating a harmonious blend that caters to intellectual, emotional, and social needs.

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कृत्रिम बुद्धिमत्ता आणि सामाजिक कौशल्ये

अनिता सतीश लवांडे

पीएच.डी. संशोधक विद्यार्थिनी

And

डॉ. पारधे शर्मिला भाऊसाहेब

सहयोगी प्राध्यापक (मार्गदर्शक)

संशोधन केंद्र- विद्या प्रतिष्ठानचे शिक्षण शास्त्र महाविद्यालयविद्या प्रतिष्ठान शिक्षण शास्त्र महाविद्यालय
व संशोधन केंद्र, केडगाव देवी रोड अहिल्यानगर, केडगाव देवी अहिल्यानगर.

सारांश

कृत्रिम बुद्धिमत्ता (AI) आणि सामाजिक कौशल्ये (Social Skills) यांचे शैक्षणिक क्षेत्रात महत्त्वपूर्ण योगदान आहे. AI शिक्षण प्रक्रियेला अधिक वैयक्तिक, सुलभ आणि प्रभावी बनवते, तर सामाजिक कौशल्ये विद्यार्थ्यांच्या संवाद, सहकार्य, नेतृत्वगुण आणि समस्या सोडविण्याच्या क्षमतेचा विकास करतात.

AI च्या मदतीने वैयक्तिक शिक्षण, आभासी शिक्षक, स्वयंचलित मूल्यांकन आणि विशेष गरजा असलेल्या विद्यार्थ्यांसाठी सहाय्य यासारखी तंत्रज्ञानाधारित साधने वापरली जातात. त्याच वेळी, सामाजिक कौशल्यांचा विकास करण्यासाठी गटकार्य, संवाद प्रशिक्षण, सहानुभूती वाढविणारे उपक्रम आणि तर्कशक्ती वाढवणाऱ्या क्रियाकलापांचा वापर होतो.

शिक्षण क्षेत्रात AI आणि सामाजिक कौशल्ये यांचा समतोल साधल्यास विद्यार्थ्यांचा सर्वांगीण विकास होऊ शकतो. भविष्यात शिक्षण केवळ तंत्रज्ञानाधारित न राहता, मानवी मूल्ये, सहकार्य आणि नैतिकता यांना समर्पित राहिल, असे सुनिश्चित करणे आवश्यक आहे.

Key Words - कृत्रिम बुद्धिमत्ता (AI), सामाजिक कौशल्ये

प्रस्तावना:

तंत्रज्ञानाच्या झपाट्याने होणाऱ्या प्रगतीमुळे कृत्रिम बुद्धिमत्ता (Artificial Intelligence - AI) ही आधुनिक युगातील एक क्रांतिकारी संकल्पना ठरली आहे. यामुळे मानवी जीवन अधिक सोयीस्कर आणि प्रभावी झाले आहे. मात्र, तंत्रज्ञानाच्या वाढत्या प्रभावामुळे सामाजिक कौशल्ये (Social Skills) विकसित करण्याचे महत्त्व आणखी वाढले आहे.

कृत्रिम बुद्धिमत्ता मोठ्या प्रमाणावर माहितीचे विश्लेषण, संवाद, निर्णय-प्रक्रिया आणि स्वयंचलित यंत्रणा चालवते. तथापि, माणसामध्ये असलेल्या सहानुभूती, भावनिक बुद्धिमत्ता, संवादकौशल्य आणि निर्णय क्षमता या बाबतीत AI अजूनही मर्यादित आहे. त्यामुळे भविष्यात मानवी मूल्ये आणि सामाजिक कौशल्ये जपण्यासोबतच कृत्रिम बुद्धिमत्तेचा योग्य उपयोग करणे गरजेचे आहे.

ही संगती समजून घेण्यासाठी, कृत्रिम बुद्धिमत्ता आणि सामाजिक कौशल्यांमधील परस्परसंबंध, त्यांचे फायदे आणि आव्हाने यावर सखोल चर्चा करणे महत्त्वाचे आहे. AI मुळे कामाच्या स्वरूपात बदल होत असताना, संवाद, सहकार्य, संघटन कौशल्ये, नेतृत्वगुण आणि भावनिक समज यांना अधिक प्राधान्य द्यावे लागेल.

त्यामुळे, मानव आणि AI यांच्यातील समतोल साधून एक समृद्ध आणि सुसंस्कृत समाज घडवण्यासाठी सामाजिक कौशल्यांचा विकास कसा करावा, याचा विचार करणे आवश्यक आहे. कृत्रिम बुद्धिमत्ता (AI) आणि सामाजिक कौशल्ये (Social Skills) यांचे शैक्षणिक क्षेत्रात महत्त्वपूर्ण योगदान आहे. AI शिक्षण प्रक्रियेला अधिक वैयक्तिक, सुलभ आणि प्रभावी बनवते, तर सामाजिक कौशल्ये विद्यार्थ्यांच्या संवाद, सहकार्य, नेतृत्वगुण आणि समस्या सोडविण्याच्या क्षमतेचा विकास करतात. AI च्या मदतीने वैयक्तिक शिक्षण, आभासी शिक्षक, स्वयंचलित मूल्यांकन आणि विशेष गरजा असलेल्या विद्यार्थ्यांसाठी सहाय्य यासारखी तंत्रज्ञानाधारित साधने वापरली जातात. त्याच वेळी, सामाजिक कौशल्यांचा विकास करण्यासाठी गटकार्य, संवाद प्रशिक्षण, सहानुभूती वाढविणारे उपक्रम आणि तर्कशक्ती वाढवणाऱ्या क्रियाकलापांचा वापर होतो. शिक्षण क्षेत्रात AI आणि सामाजिक कौशल्य यांचा समतोल साधल्यास विद्यार्थ्यांचा सर्वांगीण विकास होऊ शकतो. भविष्यात शिक्षण केवळ तंत्रज्ञानाधारित न राहता, मानवी मूल्ये, सहकार्य आणि नैतिकता यांना समर्पित राहिल, असे सुनिश्चित करणे आवश्यक आहे.

कृत्रिम बुद्धिमत्तेच्या व्याख्या-

वेगवेगळ्या तज्ज्ञांनी आणि संस्थांनी कृत्रिम बुद्धिमत्ता (Artificial Intelligence - AI) यासाठी विविध व्याख्या दिल्या आहेत.

1. जॉन मॅकार्थी (John McCarthy, 1956)

"कृत्रिम बुद्धिमत्ता म्हणजे अशा बुद्धिमान यंत्रणा किंवा संगणकीय प्रणालींची निर्मिती, ज्या मानवी मंदूप्रमाणे विचार करू शकतात आणि समस्या सोडवू शकतात."

2. अॅलन ट्यूरिंग (Alan Turing, 1950)

"जर एखादी मशीन मानवी बुद्धिमत्तेच्या आधारावर प्रश्न सोडवू शकते आणि निर्णय घेऊ शकते, तर ती बुद्धिमान आहे."

3. स्टुअर्ट रसेल आणि पीटर नॉर्विग (Stuart Russell & Peter Norvig, 1995)

"कृत्रिम बुद्धिमत्ता म्हणजे अशी प्रणाली जी बुद्धिमान वर्तन दाखवते, पर्यावरणाशी संवाद साधते आणि उद्दिष्ट प्राप्त करण्यासाठी तर्कसंगत निर्णय घेते."

4. ऑक्सफर्ड डिक्शनरी

"कृत्रिम बुद्धिमत्ता म्हणजे संगणक प्रणालीला शिकण्याची (learning) आणि विचार करण्याची (thinking) क्षमता देण्याची प्रक्रिया."

कृत्रिम बुद्धिमत्तेच्या मानसशास्त्रीय व्याख्या

कृत्रिम बुद्धिमत्ता (Artificial Intelligence - AI) ही मानसशास्त्र आणि संगणक विज्ञानाच्या संगमावर उभी असलेली संकल्पना आहे. मानसशास्त्रात कृत्रिम बुद्धिमत्तेची व्याख्या मानवी संज्ञानात्मक (Cognitive) प्रक्रिया, विचारशक्ती, शिकण्याची क्षमता आणि निर्णय घेण्याच्या पद्धतींची संगणकीय अनुकरणे म्हणून केली जाते.

१. हर्बर्ट सायमन (Herbert Simon, 1980)

"कृत्रिम बुद्धिमत्ता म्हणजे अशा प्रणालींची निर्मिती, ज्या मानवी मनासारखे विचार करू शकतात, शिकू शकतात आणि नवीन परिस्थितींमध्ये स्वतःला सामावून घेऊ शकतात."

२. **हावर्ड गार्डनर (Howard Gardner, 1983) - बहु-बुद्धिमत्ता सिद्धांत**

"कृत्रिम बुद्धिमत्ता ही संगणक प्रणालीतील तंत्र आहे, जी भाषिक, तार्किक, दृश्य-स्थानिक आणि आंतर-व्यक्तिगत बुद्धिमत्ता विकसित करण्याचा प्रयत्न करते."

३. **जीन पियाजे (Jean Piaget, 1950) - संज्ञानात्मक विकास सिद्धांत** "AI म्हणजे संगणकीय प्रणालींमध्ये संज्ञानात्मक विकासाच्या टप्प्यांनुसार शिकण्याची आणि समस्यांचे निराकरण करण्याची क्षमता विकसित करणे."४. **डॅनियल गोलमन (Daniel Goleman, 1995) - भावनिक बुद्धिमत्ता (Emotional Intelligence)**

"मानवी भावना आणि सामाजिक संवाद समजून घेणारी AI विकसित करणे हे यंत्रमानवांना अधिक मानवी बनवण्याचे महत्त्वाचे पाऊल आहे."

AI फक्त गणनात्मक (Computational) बुद्धिमत्तेपुरती मर्यादित न राहता, भावनिक आणि सामाजिक बुद्धिमत्तेची समजूत वाढवण्यासाठीही प्रयत्नशील आहे.

कृत्रिम बुद्धिमत्तेची उद्दिष्टे-

- 1) AI प्रणालींना वेगाने आणि अचूक निर्णय घेण्याची क्षमता विकसित करणे.
- 2) शिकण्याची आणि समस्या सोडविण्याची क्षमता विकसित करणे.
- 3) मानवी भाषा समजून घेणे आणि संवाद साधणे.
- 4) कृत्रिम तर्क शक्ती विकसित करणे.
- 5) AI प्रणालींना मानवी भावना समजून घेण्याची आणि प्रतिसाद देण्याची क्षमता विकसित करणे.
- 6) AI प्रणाली आणि मानव यांच्यात समन्वय साधणे.
- 7) सुरक्षित आणि नैतिक AI विकसित करणे.

कृत्रिम बुद्धिमत्तेची गरज आणि महत्त्व-

कृत्रिम बुद्धिमत्ता (Artificial Intelligence - AI) ही आधुनिक युगातील सर्वात प्रभावी तंत्रज्ञानांपैकी एक आहे. वेगाने बदलणाऱ्या जगात स्वयंचलितता (Automation), तर्कशक्ती (Reasoning), शिकण्याची क्षमता (Learning), आणि निर्णय घेण्याची प्रक्रिया (Decision Making) सुधारण्यासाठी कृत्रिम बुद्धिमत्तेची गरज भासते.

१. **कृत्रिम बुद्धिमत्तेची गरज**(१) **स्वयंचलित आणि जलद प्रक्रिया**

माणसाच्या तुलनेत AI प्रणाली अधिक वेगाने आणि अचूकपणे माहिती प्रक्रिया करू शकते.

उदा: बँकिंग क्षेत्रातील स्वयंचलित व्यवहार, डेटा विश्लेषण, आणि ग्राहक सेवा चॅटबॉट्स.

(२) **मोठ्या प्रमाणातील डेटा व्यवस्थापन**

डिजिटल क्रांतीमुळे मोठ्या प्रमाणावर डेटा निर्माण होतो, ज्याचे विश्लेषण AI मदतीने अधिक प्रभावीपणे करता येते.

उदा: Google Search Engine, Social Media A...

(३) **अचूक निर्णयक्षमतेसाठी**

कृत्रिम बुद्धिमत्ता डेटा-आधारित निर्णय घेत असल्याने मानवी चुकांची शक्यता कमी होते.

- उदा: वैद्यकीय निदान प्रणाली (AI-Based Medical Diagnosis).
- (४) **सतत कार्यरत यंत्रणा (24x7 Workability)**
माणूस थकतो, पण AI आधारित यंत्रणा सतत काम करू शकते.
उदा: ग्राहक सेवा, ऑटोमेटेड हेल्पडेस्क.
- (५) **मानवी श्रम आणि वेळ वाचवण्यासाठी**
AI मुळे माणसाला वेळखाऊ आणि पुनरावृत्तीचे (Repetitive) काम करावे लागत नाही
उदा: औद्योगिक रोबोटिक्स, स्वयंचलित वाहने (Self-driving Cars).
२. **कृत्रिम बुद्धिमत्तेचे महत्त्व**
- (१) **आरोग्य सेवा सुधारण्यासाठी**
AI आधारित निदान प्रणाली डॉक्टरांना जलद आणि अचूक निदान करण्यात मदत करते.
उदा: एक्स-रे, MRI स्कॅन विश्लेषण करणारी AI सॉफ्टवेअर.
- (२) **शिक्षण क्षेत्रात क्रांती**
AI आधारित स्मार्ट शिक्षण प्रणाली विद्यार्थी आणि शिक्षकांना मदत करते.
उदा: वैयक्तिकृत शिक्षण प्रणाली (Personalized Learning Platforms).
- (३) **औद्योगिक आणि व्यवसाय क्षेत्रात उपयोग**
AI मुळे उत्पादन प्रक्रिया वेगवान होते आणि कामाचा खर्च कमी होतो.
उदा: उत्पादन स्वयंचलितता (Automation in Manufacturing).
- (४) **वाहतूक आणि स्मार्ट शहरांसाठी योगदान**
AI मुळे ट्रॅफिक मॅनेजमेंट, स्वयंचलित वाहने आणि सार्वजनिक वाहतूक सुधारता येते.
उदा: Google Maps, Self-Driving Cars (Tesla).
- (५) **आर्थिक सेवा आणि सुरक्षा प्रणालींमध्ये सुधारणा**
AI आधारित अल्गोरिदम फसवणूक (Fraud Detection) ओळखण्यासाठी वापरले जातात.
उदा: क्रेडिट कार्ड व्यवहार सुरक्षित करणे, बँकिंग क्षेत्रातील AI आधारित मदत.
- (६) **मानवी जीवन अधिक सोपे करण्यासाठी**
स्मार्टफोनमध्ये AI आधारित सहाय्यक (Google Assistant, Siri, Alexa) आपले जीवन सुलभ करतात.
उदा: घरी स्वयंचलित उपकरणे (Smart Home Systems).

कृत्रिम बुद्धिमत्ता आणि सामाजिक कौशल्य यांचा परस्पर सहसंबंध-

कृत्रिम बुद्धिमत्ता (Artificial Intelligence - AI) आणि सामाजिक कौशल्ये (Social Skills) यांचा परस्पर सहसंबंध हा आधुनिक तंत्रज्ञानाच्या युगात अत्यंत महत्त्वाचा विषय ठरला आहे. जसे की AI मानवी कार्यक्षमता वाढवते, तसेच सामाजिक कौशल्ये ही मानवी परस्परसंवाद आणि नातेसंबंध सुधारण्यास मदत करतात. दोन्ही घटकांचा समतोल साधणे आवश्यक आहे, कारण अत्याधुनिक तंत्रज्ञानाच्या प्रभावामुळे मानवी संवाद आणि भावनिक समजूत बदलत आहेत.

१. कृत्रिम बुद्धिमत्ता आणि सामाजिक कौशल्ये: परस्पर पूरकता
- (१) संवाद कौशल्ये आणि AI आधारित तंत्रज्ञान

AI चॅटबॉट्स, व्हर्च्युअल असिस्टंट (Google Assistant, Siri, Alexa) यामुळे संवाद अधिक सोपा झाला आहे. तथापि, मानवी संवाद कौशल्ये जसे की स्वतःला प्रभावीपणे मांडणे, सहानुभूती दाखवणे आणि भावनिक संवाद राखणे, हे अजूनही AI पूर्णतः आत्मसात करू शकलेले नाही.

(२) AI आणि मानवी सहकार्य

अनेक कंपन्या AI चा वापर करून संवाद साधने (Communication Tools) विकसित करत आहेत. परंतु, नेतृत्वगुण, सहकार्य, संघभावना आणि संघटन कौशल्ये ही केवळ मानवी सामाजिक कौशल्यांवर अवलंबून असतात.

(३) AI चा मानवी नातेसंबंधांवर प्रभाव

सोशल मीडिया आणि डिजिटल संवाद AI द्वारे नियंत्रित होत असल्याने मानवी संवादाची पद्धत बदलत आहे. प्रत्यक्ष मानवी संवाद कमी होत असून, याचा परिणाम भावनिक बंध आणि सामाजिक नातेसंबंधांवर होत आहे.

2. कृत्रिम बुद्धिमत्ता आणि सामाजिक कौशल्ये यांचे भविष्य

भविष्यात AI भावनिक बुद्धिमत्ता (Emotional Intelligence - EI) आत्मसात करण्याचा प्रयत्न करेल. मानवी आणि AI चा समतोल सहजीवन अत्यावश्यक ठरेल, जिथे AI मानवी निर्णय प्रक्रिया सुधारेल आणि माणूस आपली सामाजिक कौशल्ये वृद्धिंगत करेल. शिक्षण, आरोग्य, व्यवसाय आणि मानसिक आरोग्य क्षेत्रांमध्ये AI आणि सामाजिक कौशल्ये एकत्र येऊन नवकल्पना निर्माण करतील.

कृत्रिम बुद्धिमत्ता आणि सामाजिक कौशल्ये यांचा शिक्षण आणि समाजासाठी उपयोग-

कृत्रिम बुद्धिमत्ता (AI) आणि सामाजिक कौशल्ये (Social Skills) यांचा योग्य समतोल साधल्यास शिक्षण आणि समाजाच्या विकासासाठी मोठे योगदान मिळू शकते. AI शिक्षण प्रणाली अधिक प्रभावी बनवते, तर सामाजिक कौशल्ये विद्यार्थ्यांमध्ये परस्परसंवाद आणि सहकार्य वाढवतात. यामुळे शिक्षण आणि समाजजीवन अधिक प्रगत आणि समतोल होऊ शकते.

१. शिक्षण क्षेत्रातील उपयोग

(१) वैयक्तिकृत शिक्षण (Personalized Learning)

AI आधारित स्मार्ट लर्निंग प्लॅटफॉर्म प्रत्येक विद्यार्थ्यांच्या गतीनुसार शिकवू शकतो.

उदा: BYJU's, Coursera, Duolingo सारख्या AI-आधारित शिक्षण ॲप्स.

(२) भाषा आणि संप्रेषण कौशल्ये सुधारण्यासाठी

नैसर्गिक भाषा प्रक्रिया (NLP) तंत्रज्ञानाद्वारे विद्यार्थी विविध भाषा शिकू शकतात.

उदा: Google Translate, AI-आधारित स्पीकिंग असिस्टंट्स.

(३) शिक्षकांना सहाय्य आणि तंत्रज्ञान-आधारित अध्यापन

AI शिक्षकांना वेगवेगळ्या विद्यार्थ्यांच्या प्रगतीवर नजर ठेवण्यास मदत करते.

व्हर्च्युअल क्लासरूम, स्मार्ट बोर्ड आणि AI असिस्टंट्सद्वारे शिक्षण अधिक संवादात्मक बनते.

(४) समुपदेशन आणि मानसिक आरोग्य सहाय्यक (AI Counseling & Mental Health Support)

विद्यार्थी मानसिक तणावाखाली असतील, तर AI-आधारित समुपदेशन प्रणाली त्यांना मदत करू शकते.

उदा: Woebot, Replika – AI आधारित मानसिक आरोग्य सहाय्यक.

(५) सामाजिक कौशल्यांचे मूल्यांकन आणि प्रशिक्षण

AI आधारित सिम्युलेशन आणि रोल-प्ले मॉडेल्स विद्यार्थ्यांना टीमवर्क, संवाद कौशल्ये आणि सहानुभूती शिकवतात.

उदा: VR (Virtual Reality) आधारित संवाद प्रशिक्षण तंत्रज्ञान

२. समाजासाठी उपयोग

(१) रोजगार आणि कौशल्य विकास (Employment & Skill Development)

AI डेटा विश्लेषणाद्वारे समाजातील रोजगाराच्या संधी ओळखण्यास मदत करू शकते.

AI-आधारित ऑनलाइन कोर्सेस नवीन कौशल्ये शिकण्यास मदत करतात.

उदा: LinkedIn Learning, Udemy, AI Career Advisors.

(२) समाजात समावेशन (Social Inclusion) आणि अडथळे दूर करणे

दिव्यांग व्यक्तींना AI आधारित सहाय्यक तंत्रज्ञान मोठी मदत करू शकते.

उदा: AI आधारित वाचक प्रणाली (Screen Readers for Visually Impaired).

(३) आरोग्य आणि सामाजिक सेवा (Healthcare & Social Services)

AI डॉक्टरांना रुग्णांच्या निदान आणि उपचारांमध्ये मदत करू शकते.

ग्रामीण भागात आरोग्यसेवा सुधारण्यासाठी AI आधारित टेलिमेडिसिन सेवा उपयुक्त ठरतात.

उदा: IBM Watson, AI-Healthcare Assistants.

(४) गुन्हेगारी आणि सुरक्षाव्यवस्था (Crime Prevention & Security)

AI आधारित CCTV आणि Facial Recognition प्रणाली सुरक्षेसाठी वापरली जाऊ शकते.

सायबर गुन्ह्यांवर नियंत्रण ठेवण्यासाठी AI वापरला जातो.

(५) स्मार्ट सिटी आणि वाहतूक व्यवस्थापन

ट्रॅफिक कंट्रोल, पाणी आणि वीज व्यवस्थापन, कचरा व्यवस्थापन यासाठी AI आधारित तंत्रज्ञान उपयोगी आहे.

उदा: Smart Traffic Systems, AI-Based Waste Management.

कृत्रिम बुद्धिमत्ता आणि सामाजिक कौशल्य यांचे शैक्षणिक उपयोजन-

कृत्रिम बुद्धिमत्ता (AI) आणि सामाजिक कौशल्य (Social Skills) यांचे शैक्षणिक क्षेत्रात महत्त्वपूर्ण उपयोजन आहे. शिक्षणाच्या विविध स्तरांवर, दोन्ही घटक एकत्रितपणे विद्यार्थ्यांच्या सर्वांगीण विकासास मदत करू शकतात.

१. कृत्रिम बुद्धिमत्तेचे शैक्षणिक उपयोजन

AI च्या मदतीने शिक्षण अधिक प्रभावी, सुलभ आणि व्यक्तिगत केले जाऊ शकते. त्याचे काही महत्त्वाचे उपयोग पुढीलप्रमाणे आहेत:

(अ) वैयक्तिक शिक्षण (Personalized Learning)

AI विद्यार्थ्यांच्या शिकण्याच्या पद्धतीचा अभ्यास करून त्यांना त्यांच्या गरजेनुसार शिकवते.

बुद्धिमत्तेच्या वेगानुसार (Adaptive Learning) अभ्यासक्रम सादर केला जातो

- (ब) आभासी शिक्षक आणि ट्यूटर (Virtual Teachers & Tutors)
AI-आधारित चॅटबॉट्स आणि ट्यूटर विद्यार्थ्यांना तत्काळ शंका निरसन करण्यास मदत करतात. उदाहरणार्थ, Google Assistant, ChatGPT, Duolingo Bots इत्यादी.
- (क) मूल्यांकन आणि प्रगती मापन (Assessment & Progress Tracking)
AI स्वयंचलित चाचण्या, उत्तर पत्रिकेचे मूल्यमापन आणि विद्यार्थ्यांच्या प्रगतीचा अंदाज लावते. यामुळे शिक्षकांना विद्यार्थ्यांच्या कमजोरी आणि ताकदी समजण्यास मदत होते.
- (ड) विशेष गरजा असलेल्या विद्यार्थ्यांसाठी सहाय्य (Assistive Learning for Special Needs Students)
AI आधारित तंत्रज्ञान Text-to-Speech, Speech-to-Text, Braille Translators यासारख्या सुविधा प्रदान करून दिव्यांग विद्यार्थ्यांसाठी शिक्षण सुलभ बनवते.
२. सामाजिक कौशल्यांचे शैक्षणिक उपयोजन
सामाजिक कौशल्य म्हणजे संवाद, सहकार्य, समस्या सोडविण्याची क्षमता, सहानुभूती इत्यादी. या कौशल्यांचा विकास शिक्षण प्रक्रियेत अत्यंत महत्त्वाचा आहे.
- (अ) समूह कार्य (Collaborative Learning)
गटचर्चा, प्रकल्प, खेळ यांद्वारे विद्यार्थ्यांना टीमवर्क शिकवले जाते. हे त्यांना भविष्याच्या व्यावसायिक आणि वैयक्तिक जीवनात मदत करते.
- (ब) संवाद कौशल्ये (Communication Skills)
प्रभावी संभाषण, लेखन, श्रवण आणि सार्वजनिक भाषण यांचा विकास करून आत्मविश्वास वाढवला जातो. यासाठी डिबेट, रोल-प्ले, सादरीकरणे वापरण्यात येतात.
- (क) सहानुभूती आणि नेतृत्वगुण (Empathy & Leadership Skills)
विद्यार्थ्यांना सामाजिक भान, समजूतदारपणा आणि जबाबदारीची जाणीव करून देण्यासाठी विविध सामाजिक उपक्रम राबवले जातात.
- (ड) समस्या सोडविण्याची क्षमता (Problem-Solving Skills)
तर्कशक्ती, निर्णयक्षमता आणि सर्जनशीलता विकसित करण्यासाठी विद्यार्थ्यांना विविध समस्या सोडविण्याचे प्रयोग दिले जातात.
३. AI आणि सामाजिक कौशल्य यांचे एकत्रित उपयोजन
AI च्या मदतीने संवाद प्रशिक्षण: AI-आधारित व्हर्च्युअल असिस्टंट्स आणि सिम्युलेशनस विद्यार्थ्यांना प्रभावी संवाद शिकवू शकतात.
भावनिक बुद्धिमत्तेच्या विकासासाठी AI: AI भावनिक ओळखणारी यंत्रणा तयार करून विद्यार्थ्यांच्या सामाजिक आणि भावनिक बुद्धिमत्तेचा अभ्यास करते.
शिक्षकांना सहाय्य: AI सामाजिक कौशल्यांच्या प्रशिक्षणासाठी वैयक्तिक आणि इंटरएक्टिव्ह अनुभव देऊ शकते.
- समारोप** - कृत्रिम बुद्धिमत्ता (AI) आणि सामाजिक कौशल्ये (Social Skills) या दोन्ही घटकांचे शैक्षणिक क्षेत्रात महत्त्वपूर्ण योगदान आहे. AI शिक्षण प्रक्रियेला अधिक प्रभावी, वैयक्तिक आणि सुलभ बनवते, तर सामाजिक कौशल्य विद्यार्थ्यांच्या व्यक्तिमत्त्व विकासासाठी आवश्यक असतात.

AI आधारित शिक्षण वैयक्तिक शिकण्याची गती वाढवते, विशेष गरजा असलेल्या विद्यार्थ्यांना मदत करते आणि मूल्यांकन प्रक्रियेत सुसूत्रता आणते. त्याचवेळी, सामाजिक कौशल्य विद्यार्थ्यांना प्रभावी संवाद, सहकार्य, सहानुभूती आणि समस्या सोडविण्याची क्षमता विकसित करण्यास मदत करतात. भविष्यात शिक्षण अधिक तंत्रज्ञान-संचालित होत असताना, AI आणि सामाजिक कौशल्य यांचे संतुलित एकत्रीकरण आवश्यक आहे. केवळ तांत्रिक प्रगती पुरेशी नाही, तर त्यासोबतच मानवी परस्परसंवाद, नैतिक मूल्ये आणि सर्जनशील विचारसरणीचा विकास होणेही महत्त्वाचे आहे. म्हणून, शिक्षण प्रणालीने या दोन्ही घटकांचा योग्य प्रकारे समावेश करून सर्वांगीण शिक्षणाच्या दिशेने वाटचाल करावी.

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**INDIAN KNOWLEDGE SYSTEMS AND ENVIRONMENTAL SUSTAINABILITY:
LESSONS FOR CLIMATE RESILIENCE****Asst. Prof. Kumavat Shaila Vitthal***Researcher***M.V.P. Samaj's Adv. Vitthalrao Hande***College of Education, Nashik.*

Abstract

This conceptual research paper explores the intersection of Indian knowledge systems and environmental sustainability, focusing on their potential to provide valuable lessons for climate resilience. By examining traditional Indian agricultural practices, philosophical concepts, and their modern scientific validation, this study aims to demonstrate how ancient wisdom can be integrated with contemporary approaches to address the pressing challenges of climate change. The paper investigates the historical documentation of Indian environmental knowledge systems, analyzes case studies of successful implementation of traditional practices in modern contexts, and examines current policies that integrate traditional knowledge with modern climate resilience strategies. Through this comprehensive analysis, the research highlights the significance of Indian knowledge systems in fostering sustainable development and enhancing climate resilience.

1. Introduction

As the global community grapples with the escalating challenges of climate change, there is a growing recognition of the value of traditional knowledge systems in developing sustainable solutions. India, with its rich cultural heritage and diverse ecological landscapes, offers a wealth of traditional wisdom that has evolved over millennia to maintain harmony between human activities and the natural environment. This paper aims to explore how Indian knowledge systems, particularly in the realm of environmental sustainability, can provide crucial lessons for enhancing climate resilience in the modern world. The concept of climate resilience refers to the capacity of social, economic, and environmental systems to cope with hazardous events or trends, responding in ways that maintain their essential function, identity, and structure while also maintaining the capacity for adaptation, learning, and transformation.

In the context of Indian knowledge systems, this resilience is deeply rooted in philosophical concepts, traditional agricultural practices, and a holistic understanding of the environment. This research paper will delve into various aspects of Indian knowledge systems, including Vedic agriculture, traditional ecological knowledge (TEK), and philosophical concepts that emphasize the interconnectedness of all life forms. By examining these systems through the lens of modern scientific validation and contemporary environmental challenges, we aim to bridge the gap between ancient wisdom and current sustainability efforts. The significance of this research

lies in its potential to inform policy-making, agricultural practices, and environmental conservation strategies.

2. Methodology

This conceptual research paper employs a comprehensive literature review and analysis of various sources, including historical documentation, academic studies, case studies, and current policy initiatives. The methodology involves the following steps:

1. Examination of historical documentation and academic studies on Indian environmental knowledge systems.
2. Analysis of the connection between Indian philosophical concepts and environmental sustainability.
3. Investigation of case studies demonstrating successful implementation of traditional agricultural practices in modern contexts.
4. Study of modern scientific validation of traditional Indian agricultural practices.

By synthesizing information from these diverse sources, this paper aims to provide a holistic understanding of the role of Indian knowledge systems in promoting environmental sustainability and climate resilience.

3. Indian Philosophical Concepts and Environmental Sustainability

Indian philosophy offers a unique perspective on environmental ethics and sustainability, deeply rooted in spiritual and ethical traditions. The core concepts that underpin this philosophical approach to the environment include:

3.1 Interconnectedness and Reverence for Nature

Indian philosophy views nature as a living system where humans are an integral part, not separate entities. This perspective is evident in the Vedic texts, which highlight the importance of nature for human existence and emphasize the interconnectedness of all life forms. The concept of interconnectedness is central to Indian philosophical thought, where the environment is seen as an extension of human life. This understanding of interconnectedness fosters a deep reverence for nature, encouraging sustainable practices and ethical treatment of the environment. It promotes a holistic approach to environmental management, recognizing that actions affecting one part of the ecosystem have ripple effects throughout the entire system.

3.2 Sacredness of Nature

In Indian philosophy, nature is often considered sacred, with the Earth frequently personified as a mother figure. This reverence for nature is reflected in the Vedas, which emphasize the importance of trees and wildlife, and in the teachings of influential figures like Mahatma Gandhi, who advocated for harmony with nature.

The concept of sacredness attributed to nature fosters a sense of responsibility and stewardship towards the environment, encouraging conservation and sustainable use of natural resources.

3.3 Non-Violence and Ethical Treatment

Non-violence (Ahimsa) is a fundamental principle in Indian philosophy, particularly in

Hinduism and Jainism. This principle extends to the treatment of nature, advocating for minimal harm and ethical interaction with the environment. The ethical treatment of nature is also supported by the concept of Dharma, which in ancient India was likely used as a tool to protect the environment and natural resources. The principle of non-violence, when applied to environmental management, promotes sustainable practices that minimize harm to ecosystems and biodiversity. It encourages the development of technologies and practices that work in harmony with nature rather than exploiting it.

3.4 Spirituality and Sustainable Practices

The spiritual culture of ancient India, which viewed the creator and creation as one, has shaped sustainable practices and a circular economy. This spiritual perspective encourages a lifestyle that is in harmony with nature, promoting sustainability and ecological balance. It emphasizes the importance of taking only what is needed from nature and giving back to maintain the balance. These philosophical concepts provide a strong foundation for environmental sustainability and offer valuable insights for developing climate-resilient strategies. By emphasizing the interconnectedness of all life forms, the sacredness of nature, and the importance of ethical treatment of the environment.

4. Traditional Indian Agricultural Practices and Systems

Traditional Indian agricultural practices have evolved over centuries, adapting to diverse ecological conditions and cultural contexts. These practices offer valuable insights into sustainable agriculture and environmental stewardship, particularly relevant in the face of climate change challenges.

4.1 Vedic Agriculture

Vedic agriculture refers to the farming practices mentioned in ancient Indian texts, such as the Vedas, which date back to 1500–600 BCE. These texts highlight the importance of agriculture in ancient Indian society and provide guidelines on various farming techniques. Vedic agriculture emphasizes harmony with nature, the use of natural resources, and the importance of maintaining soil fertility and biodiversity. Key principles of Vedic agriculture include:

- Use of natural fertilizers and pest control methods
- Emphasis on soil health and biodiversity
- Integration of spiritual practices with agricultural activities
- Recognition of the interconnectedness between agriculture and the broader ecosystem

4.2 Crop Rotation

Crop rotation is a traditional practice that involves growing different types of crops sequentially on the same plot of land. This method helps in maintaining soil health, optimizing nutrient use, and controlling pests and diseases. Crop rotation has been practiced in India since the Vedic period and continues to be a vital component of sustainable agriculture.

- Enhanced soil fertility through alternating nutrient-depleting and nutrient-replenishing crops

- Reduced pest and disease cycles
- Improved soil structure and water retention
- Increased biodiversity in agricultural landscapes

4.3 Mixed Cropping

Mixed cropping, also known as intercropping, involves planting two or more crops simultaneously in the same field. This practice increases land use efficiency, reduces the risk of crop failure, and enhances biodiversity. Mixed cropping is prevalent in various agro-ecological zones of India and is particularly beneficial in rain-fed regions where it helps in managing climatic variability. Advantages of mixed cropping include:

- Efficient use of land and resources
- Enhanced resilience to pests, diseases, and climatic variations
- Improved soil health through diverse root systems and nutrient cycling
- Increased overall productivity and income stability for farmers

4.4 Agroforestry

Agroforestry integrates trees and shrubs with crops and livestock on the same land. This system promotes biodiversity, soil conservation, and livelihood diversification. It is widely practiced in different regions of India, including the dry areas of Rajasthan and the rain-fed regions of Madhya Pradesh and Chhattisgarh.

- Enhanced biodiversity and ecosystem services
- Improved soil fertility and reduced erosion
- Carbon sequestration, contributing to climate change mitigation
- Diversified income sources for farmers, enhancing economic resilience

4.5 Traditional Water Management Techniques

India has a rich history of traditional water management techniques that have evolved to address water scarcity and variability. These include:

- Rainwater harvesting systems like step wells and tanks
- Check dams and small-scale irrigation systems
- Community-based water management practices

5. Scientific Validation of Traditional Indian Agricultural Practices

The integration of traditional Indian agricultural practices with modern scientific approaches has gained significant attention in recent years. This section explores how these age-old methods are being validated and integrated with contemporary scientific advancements to address current agricultural challenges, particularly in the context of sustainability and climate resilience.

5.1 Crop Rotation and Soil Fertility

Modern scientific studies have confirmed the benefits of crop rotation in maintaining soil fertility and reducing pest and disease cycles. Research has shown that rotating crops, especially cereals with legumes, can naturally enhance soil nitrogen levels, reducing the need for chemical

fertilizers.

5.2 Polyculture and Biodiversity

The practice of polyculture, or growing multiple crop species in the same space, has been scientifically validated for its role in increasing biodiversity and resource efficiency. Studies have demonstrated that such systems can lead to more resilient agricultural ecosystems, capable of withstanding environmental stresses.

5.3 Organic Manures and Soil Health

The use of organic manures, such as compost and cattle dung, is a cornerstone of traditional Indian agriculture. Modern research supports the use of these natural fertilizers for maintaining soil structure and moisture-holding capacity, which are critical for sustainable agriculture. Scientific studies have shown that organic manures improve soil microbial activity, enhance nutrient cycling, and contribute to long-term soil health.

5.4 Agroforestry and Climate Resilience

Scientific research has validated the multiple benefits of agroforestry systems, including their role in carbon sequestration, biodiversity conservation, and soil improvement. Studies have shown that agroforestry can enhance the resilience of agricultural systems to climate change by providing multiple ecosystem services and diversifying income sources for farmers.

5.5 Water Conservation Techniques

Traditional water harvesting and conservation techniques have been scientifically validated for their effectiveness in managing water resources sustainably. Research has shown that these practices can significantly improve water availability for agriculture, particularly in rain-fed regions, and contribute to groundwater recharge.

5.6 Challenges and Opportunities

While scientific validation supports many traditional practices, there are challenges in integrating them with modern agriculture.

Socio-cultural barriers and resistance to change

- Economic constraints in implementing traditional practices at scale
- Need for policy support and incentives for sustainable agriculture

6. Climate Change Impacts on Indian Agriculture and Traditional Adaptation Methods

Indian agriculture is facing significant challenges due to climate change, characterized by rising temperatures, erratic rainfall patterns, and an increase in extreme weather events. This section examines these impacts and explores how traditional methods are being used to address these challenges.

6.1 Climate Change Impacts

1. **Temperature Changes:** Rising temperatures are affecting crop growth and productivity. Some crops may become unsuitable for cultivation in certain regions as temperatures rise beyond their optimal range. Higher temperatures can also lead to accelerated soil moisture depletion, causing water stress and reduced yields.

2. **Precipitation Changes:** Climate change is altering precipitation patterns, leading to more frequent and intense droughts or floods. This variability disrupts the agricultural calendar and exacerbates water scarcity in many regions.
3. **Extreme Weather Events:** The frequency and intensity of extreme weather events, such as heat waves and cyclones, are increasing. These events can cause physical damage to crops, disrupt pollination, and lead to significant crop losses.
4. **Pest and Disease Dynamics:** Changes in temperature and precipitation patterns are influencing the distribution and severity of pests and plant diseases, posing additional challenges for crop protection and management.
5. **Water Availability:** Climate change is altering the availability and distribution of water resources, leading to water scarcity in some regions and affecting irrigation-dependent agriculture.

6.2 Traditional Adaptation Methods

Traditional agricultural practices in India offer valuable strategies for adapting to climate change:

1. **Crop Diversification:** Traditional mixed cropping and crop rotation practices enhance resilience by spreading risk across different crops with varying climate tolerances.
2. **Water Management:** Traditional water harvesting techniques, such as the construction of ponds and tanks, help in managing water resources more effectively, ensuring water availability during dry spells.
3. **Use of Indigenous Crop Varieties:** Indigenous varieties are often more resilient to local climatic conditions and can be crucial in maintaining food security under climate stress.
4. **Soil Conservation Practices:** Traditional methods of soil conservation, such as terracing and mulching, help in maintaining soil health and moisture retention, crucial for adapting to changing rainfall patterns.
5. **Community-Based Resource Management:** Traditional systems often involve community management of resources, which can enhance collective resilience to climate impacts through shared knowledge and resources.

6.3 Integration of Traditional and Modern Approaches

The integration of traditional agricultural practices with modern scientific approaches can enhance the resilience of Indian agriculture to climate change. This integration requires:

- Collaborative research involving farmers, scientists, and policymakers
- Documentation and validation of traditional knowledge
- Development of policies that support the integration of traditional and modern practices
- Capacity building and awareness programs for farmers and agricultural extension workers

7. Current Policies and Initiatives Integrating Traditional Knowledge with Modern Climate Resilience Strategies

The recognition of the value of traditional knowledge in addressing climate change has led to the development of policies and initiatives that aim to integrate this wisdom with modern

climate resilience strategies. This section examines some of these efforts at global, national, and local levels.

7.1 Global Recognition and Frameworks

There is growing recognition at the international level of the need to integrate Indigenous Knowledge Systems (IKS) into global climate adaptation policies. The United Nations Framework Convention on Climate Change (UNFCCC) and the Sustainable Development Goals (SDGs) emphasize the importance of inclusivity and sustainable development in climate action. Key initiatives include:

- The Local Communities and Indigenous Peoples Platform under the UNFCCC, which aims to ensure the integration of Indigenous knowledge into international and national programs and policies
- The Intergovernmental Panel on Climate Change (IPCC) recognition of the value of indigenous and local knowledge in understanding climate change impacts and adaptation strategies.

7.2 National Efforts in India

India has taken several steps to integrate traditional knowledge into its climate resilience strategies:

1. **National Action Plan on Climate Change (NAPCC):** This plan recognizes the role of traditional knowledge in developing sustainable adaptation strategies.
2. **National Innovation on Climate Resilient Agriculture (NICRA):** This project aims to enhance the resilience of Indian agriculture to climate change by integrating traditional practices with modern technologies.
3. **Biodiversity Conservation:** India's efforts in biodiversity conservation, as outlined in its National Biodiversity Action Plan, incorporate traditional knowledge in conservation strategies.
4. **National Education Policy (NEP) 2020:** The policy emphasizes the integration of Indian Knowledge Systems (IKS) into educational curricula, including courses on traditional agricultural practices and natural farming

7.3 State-Level Initiatives

Several Indian states have initiated programs that leverage traditional knowledge for climate resilience:

- Sikkim's transition to organic farming, which draws heavily on traditional agricultural practices.
- Kerala's promotion of traditional organic farming practices integrated with modern organic certification processes.
- Rajasthan's water conservation efforts that revive traditional rainwater harvesting techniques.

7.4 Collaborative Approaches

Collaborative strategies are being developed to integrate traditional knowledge with

modern scientific approaches.

- Participatory research programs that involve local communities in climate adaptation planning.
- Partnerships between academic institutions and indigenous communities to document and validate traditional knowledge.

7.5 Challenges and Future Directions

Despite progress, several challenges remain in effectively integrating traditional knowledge into mainstream climate resilience strategies:

- Overcoming systemic biases that favor Western scientific knowledge over traditional wisdom.
- Addressing power imbalances and ensuring equitable participation of indigenous communities in decision-making processes.
- Developing mechanisms for fair and equitable sharing of benefits arising from the use of traditional knowledge.
- Strengthening legal frameworks to protect traditional knowledge and ensure its ethical use.
- Developing interdisciplinary research programs that bridge traditional and modern knowledge systems.
- Enhancing funding and support for community-led climate resilience initiatives that incorporate traditional practices.

8. Conclusion

The interconnectedness and reverence for nature embedded in Indian philosophy provide a strong ethical foundation for sustainable environmental management. Traditional agricultural practices such as crop rotation, mixed cropping, and agroforestry offer practical solutions for enhancing biodiversity, improving soil health, and building resilience to climate variability. The scientific validation of these traditional practices underscores their effectiveness and potential for integration with modern agricultural techniques. This integration is crucial for developing sustainable and adaptive strategies that ensure food security and protect the livelihoods of farmers in the face of climate change. Current policies and initiatives at global, national, and local levels are increasingly recognizing the value of traditional knowledge in climate resilience strategies. However, challenges remain in fully integrating this wisdom into mainstream approaches, necessitating continued efforts in research, policy development, and community engagement. As we confront the escalating challenges of climate change, the lessons from Indian knowledge systems offer a pathway towards more sustainable and resilient environmental practices. By bridging ancient wisdom with modern science, we can develop holistic approaches that not only mitigate environmental degradation but also foster a more harmonious relationship between humanity and nature. The integration of traditional knowledge with modern climate resilience strategies represents a promising avenue for addressing global environmental challenges. It offers an opportunity to develop more inclusive, sustainable, and effective solutions that respect cultural heritage while

embracing scientific innovation. As we move forward, it is crucial to continue exploring and implementing these integrated approaches, ensuring that the wisdom of the past informs and enhances our strategies for a sustainable future.

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**A STUDY OF INDIAN KNOWLEDGE SYSTEM (IKS) AND TECHNOLOGY IN
TEACHER EDUCATION: CHALLENGES AND OPPORTUNITIES FOR 21ST
CENTURY LEARNING**

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Abstract:

There are potential and challenges for 21st century learning when the Indian Knowledge System (IKS) and contemporary technologies are incorporated into teacher education. IKS offers a comprehensive, interdisciplinary approach to education with roots in antiquated customs like the Gurukula system, Ayurveda, and Vedic mathematics (Rao, 2021). However, obstacles such as a lack of digital literacy, institutional frameworks, and shift from traditional pedagogies to technology-driven education (Singh & Sharma, 2020).

Notwithstanding these obstacles, technology presents previously unheard-of chances to close the gap between IKS and modern educational paradigms. Immersion learning experiences that combine indigenous knowledge with contemporary curricula can be produced by utilising digital platforms, learning tools, and virtual reality (Kumar et al., 2022). Furthermore, the National Education Policy (NEP) 2020 promotes the resuscitation of IKS via curricular reform and digital repositories (Government of India, 2020).

IKS must be integrated with developing technologies in teacher education programs to take advantage of these opportunities, which promote critical thinking, interdisciplinary learning, and cultural preservation. In order to provide insights into how teacher education might successfully incorporate IKS with technological advancements for a sustainable and inclusive future, this study examines these potentials and obstacles.

Hence, present study is undertaken with five objectives: these are to study the integration of the Indian Knowledge System (IKS) in teacher education, to study the awareness of IKS among teacher educators, to study the integration of technology in teacher education, to identify the challenges faced by teacher educators in integrating IKS and technology, and to give suggestions to the concerned on the basis of the study. Researchers reviewed relevant literature on teaching methods, approaches, value instillation, and knowledge imparting and then evaluated qualitative data and came to findings with the help of the questionnaire as a tool to collect the data in order to achieve these goals.

Keywords: Indian Knowledge System, Teacher Education, 21st-Century Learning, Technology Integration, NEP 2020.

Introduction:

Integrating Indian Knowledge Systems (IKS) with contemporary technology in teacher education offers both opportunities and problems in the quickly changing field of 21st century education. Knowing how IKS works with technology is crucial as educators work to develop inclusive and culturally sensitive teaching strategies. Using technical innovations, this study investigates how IKS might be integrated into teacher education programs, highlighting integration challenges as well as possible advantages for both teachers and students.

In the rapidly evolving landscape of 21st century education, integrating Indian Knowledge Systems (IKS) with modern technology in teacher education presents both challenges and opportunities. As educators strive to create inclusive and culturally responsive teaching methods, understanding the role of IKS in conjunction with technology becomes essential. This study explores how IKS can be incorporated into teacher education programs using technological advancements, identifying the barriers to integration and the potential benefits for both educators and students.

The incorporation of Indian Knowledge Systems (IKS) and technology into teacher education creates both obstacles and opportunities for 21st century learning. Integration challenges include limited access to technology in educational institutions, which might restrict the efficient use of ICT in classrooms. Continuous training can improve instructors' ICT competencies, resulting in higher instructional quality (Baldon & Codilla, 2024). While the incorporation of IKS and technology into teacher education presents great opportunities for enriching learning experiences, it is critical to overcome the existing hurdles in order to fully realise its potential.

However, an opportunity and challenges for 21st century learning, the Indian Knowledge System (IKS), and technology integration for teacher education is focused in the present study and undertaken with four objectives. These are:

Objectives:

1. To study the integration of Indian Knowledge System (IKS) in teacher education.
2. To study the awareness of IKS among Teacher Educators.
3. To study the integration of Technology in teacher education.
4. To identify the Challenges faced by teacher educators in integrating IKS and Technology.
5. To give Suggestions to the concerned on the basis of the study.

Thus, for fulfilling these objectives following research procedure is followed.

Research Procedure:**Research Method:**

1. Survey method adopted and through it review of related literature and Secondary Sources are reviewed to explore the potential of integrating IKS and technology into teacher education programs.
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2. Survey is undertaken with the help of Questionnaire to identify the Challenges faced by teacher educators in integrating IKS and Technology.

Collection of the Data:

For present study data is collected through Secondary sources through documents, articles, research papers, etc. Also, for present study data is collected through the survey of Teacher Educators for studying and identifying the Challenges faced by teacher educators in integrating IKS and Technology.

Objective-Wise Procedure of the Study:

First objective of the research is to study the integration of Indian Knowledge System (IKS) in teacher education; hence, to fulfil this objective, the review of related literature is undertaken as follows:

Agrawal,A.(2002)., Kumar, S. (2020)., Sharma,R. & Mishra, P.(2018)., Srivastava, R. (2019). This review of related literature discussed the ways of integration of Indian Knowledge System (IKS) in teacher education; those are in brief described in Figure No.1.

Sr. no.	Area of Integration	Description	Ways of Integration
1.	Philosophical Foundations	Incorporating ancient Indian educational philosophies such as those of Nalanda and Takshashila into modern teacher training.	Curriculum redesign to include texts from Vedic, Buddhist, and Jain traditions.
2.	Pedagogical Approaches	Adopting traditional teaching methods like storytelling (Katha), experiential learning (Anubhava), and dialogue (Samvada).	Training teachers in indigenous pedagogies and blending them with modern methodologies
3.	Language and Literature	Promoting Sanskrit and other classical Indian languages as mediums for exploring knowledge	Encouraging multilingual education and the use of ancient texts in learning.
4.	Ethics and Value Education	Integrating ethical teachings from the Bhagavad Gita, Upanishads, and other Indian texts.	Designing courses that emphasize values like self-discipline, respect, and social harmony.
5.	Science and Mathematics	Drawing from Indian contributions in mathematics (e.g., zero, algebra) and science (e.g., Ayurveda, astronomy).	Including historical Indian contributions in STEM education and teacher training.
6.	Arts and Aesthetics	Incorporating Indian music, dance, and fine arts in holistic education.	Teachertraining programs including practical exposure to Indian classical arts.

7.	Environmental Education	Teaching traditional ecological knowledge, such as Ayurveda and Vrikshayurveda.	Encouraging sustainable practices based on indigenous environmental wisdom.
8.	Yoga and Well-being	Integrating yoga and meditation for student and teacher well-being	Mandatory yoga training in teacher education curricula.
9.	Technology and IKS	Using digital tools to disseminate IKS and make traditional knowledge accessible.	Developing online resources and digital platforms for IKS-based learning.

Figure No.1. The integration of Indian Knowledge System (IKS) in teacher education

Figure no. 1 presents a framework for integrating the Indian Knowledge System (IKS) into teacher education by incorporating traditional Indian philosophies, teaching methods, ethics, sciences, arts, and well-being practices. It emphasizes blending ancient wisdom, such as Vedic and Buddhist teachings, storytelling, Sanskrit, Ayurveda, and yoga, with modern educational approaches. The implementation strategies focus on curriculum redesign, teacher training, and digital tools to preserve and promote traditional knowledge. The approach aims to create a holistic education system that fosters ethical values, sustainability, and well-being while enhancing learning through indigenous wisdom.

After studying the area of integration of IKS in teacher education, the researcher studies how much teacher educators are aware of IKS and its relevance to education.

Second objective of the research is to study the awareness of IKS among Teacher Educators. Hence, to fulfil this objective, the researcher opted for the survey method and with the help of the researcher prepared questionnaire, data was collected from teacher educators of different districts of Maharashtra state.

Analysis of Teacher Educators Responses on Awareness of Indian Knowledge System and its relevance to education.

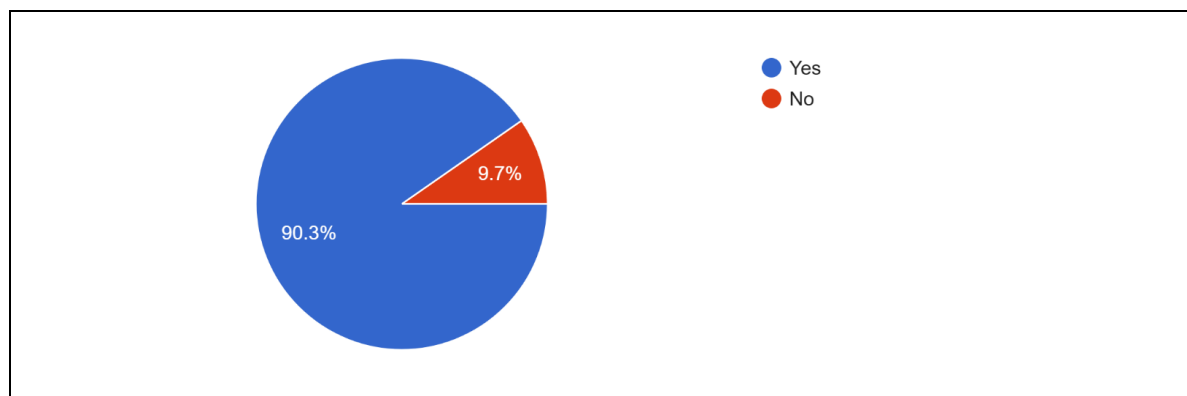


Figure no.2.: Awareness of Indian Knowledge System and its Relevance to Education.

Figure no. 2 represents the responses of 31 participants regarding their familiarity with the Indian Knowledge System (IKS) and its relevance to education. The majority, 90.3%, indicated they are familiar with IKS (represented in blue), while a small percentage, 9.7%, stated that they are not familiar (represented in red). This suggests that most respondents have some awareness of IKS and its role in education, highlighting a strong existing knowledge base that can be further explored and integrated into learning systems.

Third objective of the study is to study the integration of Technology in teacher education; hence, to fulfil this objective, the review of related literature is undertaken as follows:

Bates,A.W.(2019).,Mishra,P.,& Koehler,M.J.(2006)., Redecker.C., &Punie.Y.(2017). This review of related literature discussed the integration of Technology in teacher education; those are in brief described in Figure No.3.

Sr. no.	Technology	Application in Teacher Education
1.	Learning Management System (LMS) (e.g,Moodle, Blackboard, Google Classroom)	Provides a platform for online courses, resource sharing, assessments, and communication
2.	Virtual Reality (VR) & Augmented Reality (AR)	Simulates real-life classroom experiences for teacher trainees.
3.	Artificial Intelligence (AI) Tools (e.g., Chatbots, AI-driven assessments)	Supports personalized learning, automated grading, and feedback
4.	Video Conferencing Tools(e.g., Zoom, Microsoft Teams,Google Meet)	Facilitates remote teaching, virtual collaboration, and online workshops.
5.	Gamification & EdTech Apps(e.g., Kahoot! Duolingo,Quizlet)	Engages students through interactive and game-based learning
6.	Open Educational Resources (OERs) (e.g., Open textbooks, online research databases)	Provides free and quality educational content
7.	Blended LearningModels(e.g., Flipped Classroom)	Combines traditional and digital teaching methods

FigureNo.3. The integration of Technology in teacher education

Figure no. 3highlights the integration of technology in teacher education, outlining various tools and their applications. It covers LMS for online courses, VR and AR for immersive learning, and AI tools for personalized education. Video conferencing platforms support remote teaching, while gamification and EdTech apps make learning interactive.OERs provide free access to quality content, and blended learning models combine traditional and digital teaching methods. These technologies enhance teacher training, improve accessibility, and create engaging and efficient learning environments.

After studying the area of integration of Technology in teacher education, the researcher studies the challenges faced by teacher education while integrating IKS and Technology in Teacher Education.

Fourth objective of the study is to identify the challenges of teacher education; hence, to fulfil this objective, the researcher opted for the survey method and with the help of the researcher prepared questionnaire, data was collected from teacher educators of different districts of Maharashtra state. The Challenges in integrating IKS into teacher education Programs are represented in Figure no.4

Analysis of Teacher Educators Responses on the challenges foresee in integrating IKS into teacher education programs.

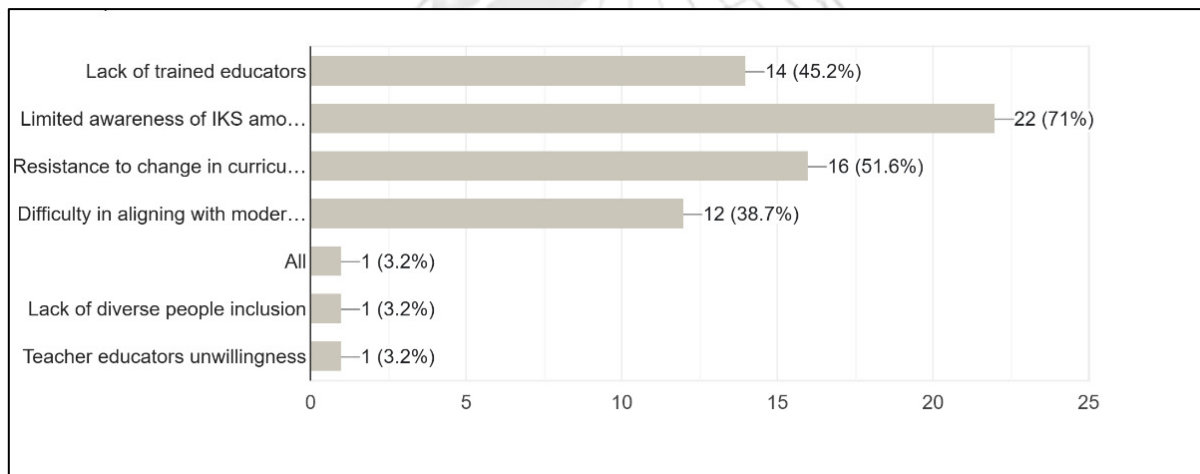


Figure no. 4.: The challenges foresee in integrating IKS into teacher education programs

Figure no. 4 presents the challenges anticipated in integrating Indian Knowledge Systems (IKS) into teacher education programs, based on 31 respondents from different teacher education institutes of Maharashtra state. The most significant challenge identified is limited awareness of IKS among educators (71%), followed by resistance to curriculum changes (51.6%) and a lack of trained educators (45.2%). Additionally, difficulty in aligning IKS with modern education (38.7%) is another concern. A small percentage of respondents (3.2%) highlighted issues such as a lack of diverse inclusion and teacher educators' unwillingness. The results indicate that raising awareness, training educators, and ensuring curriculum flexibility are crucial for effectively integrating IKS into teacher education.

Researcher studies the opportunities for the in-service teacher by receiving regular training. Analysis of Teacher Educators Responses on in-service teachers receive regular training and development opportunities.

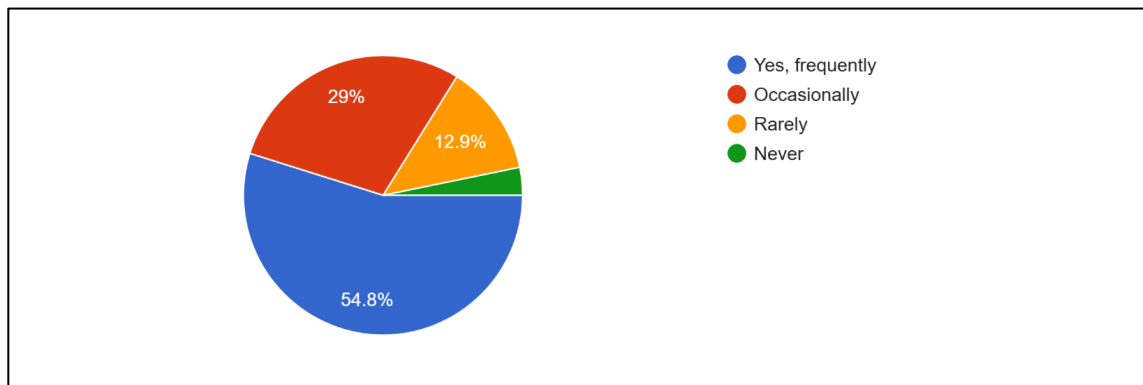


Figure no. 5.: In-service teachers receive regular training and development opportunities.

Figure no. 5 illustrates the frequency of regular training and development opportunities for in-service teachers. The majority, 54.8%, reported receiving frequent training, while 29% indicated they only received training occasionally. A smaller portion, 12.9%, stated that training opportunities were rare, and a minimal 3.2% reported never receiving any training. These results suggest that while many teachers have access to continuous professional development, a significant portion still faces limited training opportunities, which may impact their growth and effectiveness in the classroom.

Suggestions:

Based on the findings of the study ‘A Study of Indian Knowledge System (IKS) and Technology in Teacher Education: Challenges and Opportunities for 21st Century Learning’ several suggestions can be made to integrate the IKS and Technology in Teacher Education.

Fifth objectives of the research are to give suggestions to the concerned on the basis of the study, those are described below for the institution in figure no. 6

Sr.No.	Category	Suggestions
1.	Curriculum Reform	<ul style="list-style-type: none"> Curriculum should align with modern needs and global standards. Integration of digital skills and technology in pedagogy. Reflect contemporary global issues and the Indian Knowledge System (IKS). Include practical training and real-life classroom situations.
2.	Pedagogical Improvement	<ul style="list-style-type: none"> Emphasis on conceptual clarity over excessive writing work. Improvement in pedagogy through innovative teaching methods. Align programs with current educational research and best practices.
3.	Teacher Training & Development	<ul style="list-style-type: none"> Structured internships with mentorship from experienced teachers. Continuous professional development for educators. Strengthen soft skills and professional practices for trainee teachers.

4.	Practical Exposure	<ul style="list-style-type: none"> • Longer and structured internships. • Practical-based learning with value-based education. • Microteaching and lesson planning should be emphasized.
5.	Institutional Strengthening	<ul style="list-style-type: none"> • Adequate faculty in teacher training institutions. • Public-Private Partnerships for better infrastructure and resource sharing.
6.	Technology Integration	<ul style="list-style-type: none"> • Integration of technology to enhance student engagement. • Training teachers on modern tools and resources.
8.	Indian Knowledge System (IKS)	<ul style="list-style-type: none"> • Incorporate IKS through value-added courses. • Blend IKS philosophy with modern education. • Include theory and practical awareness of IKS teaching methods.

Figure no.6.: Suggestions to Institutions and Teacher Educators.

Conclusion and Discussion:

The study focusses on the enormous potential and challenges of incorporating the Indian Knowledge System (IKS) and modern technology into teacher education. The findings indicate that, while IKS provides a holistic, culturally rooted approach to learning, its incorporation into modern educational systems confronts numerous challenges. These problems include educators' lack of digital literacy, resistance to curriculum changes, little knowledge of IKS, and insufficient institutional support. However, the study emphasizes the huge opportunity that technology provides for bridging the gap between conventional knowledge and current education. Digital tools, virtual reality, and artificial intelligence can improve the accessibility and effectiveness of IKS-based instruction, promoting a diverse, interdisciplinary learning community.

Despite these limitations, the National Education Policy (NEP) 2020 establishes a solid platform for advancing IKS through curriculum reforms and technological developments. Furthermore, technological improvements have substantially improved teaching approaches, but the efficiency of technology integration in teacher training programs is still moderate, indicating space for improvement. To achieve the successful integration of IKS and technology into teacher education, various strategic steps must be implemented. Curriculum revisions to match traditional knowledge with modern educational standards, improved teacher training programs focusing on digital literacy and pedagogical innovation, and stronger institutional support for faculty growth are among the measures proposed.

In brief, incorporating IKS and technology into teacher education brings both obstacles and opportunity. Addressing challenges such as a lack of expertise, limited resources, and opposition to change necessitates a coordinated effort among educators, legislators, and institutions. Teacher education can become a more holistic and successful system by utilizing digital resources while

retaining indigenous knowledge, encouraging critical thinking, cultural awareness, and lifelong learning in future educators.

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STATUS OF IMPLEMENTATION OF CURRICULUM IN NURTURING NATURALISTIC
INTELLIGENCE AMONG MIDDLE STAGE STUDENTS

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ABSTRACT

Education plays an important role in nurturing human beings at cognitive, psychomotor and emotional levels. This paper focuses on cognitive development. Howard Gardner in his theory of Multiple Intelligence, introduced eight types of intelligence which speak about holistic development. Curriculum designing is an effective way to create a nurturing environment. Specific subjects are allotted for developing intelligence. The paper signifies the importance of developing naturalistic intelligence through school textbooks, as, for an average or representative student, school textbooks are the only available resource to get naturalistic literacy.

As skills, values related to naturalistic intelligence get delivered through subjects like languages, science, social science; the researchers studied the content of these subjects for middle stage students i.e. 6th to 8th standards as labelled by NEP2020. The research aims at finding out the present status of the role of curriculum in implementing naturalistic intelligence among middle stage students.

A questionnaire based on content of the specific subjects was designed for students, teachers and validated. The data was analyzed quantitatively and qualitatively. The students' records highlights, teachers for science provided more opportunities to get connected to nature at experiential learning level than teachers of other subjects who mostly follow traditional means. Though students get acquainted with natural sites through texts, they receive experiential learning largely through visits accompanied by their parents. Hence parents' orientation by schools is a key need at this point of time. Students are familiar with the terms 'wet garbage' and 'dry garbage'; but they are incapable of classifying them at sublevels. Only one fourth of the total students participated in activities related to plantation and cleanliness which were suggested in texts.

Teachers strongly emphasized the importance of allowing students to explore natural phenomena with reference to their textbooks, as it nurtures a sense of responsibility toward the environment. Engaging in activities like tree planting, plastic waste collection, and resource conservation helps instill sustainable habits that last a lifetime. They highlighted that such experiences enable students to grasp the interconnectedness of nature and recognize the vital

role of a healthy environment in supporting all living beings, fostering both responsibility and environmental awareness.

Keyword- Curriculum, Naturalistic Intelligence, Middle stage students, Healthy environment.

Introduction

‘To educate’ means to draw out knowledge, understanding, skills and values among students to meet the needs of the current society. Various policies establish norms for designing and development of the curriculum. Through formal and informal methods, children progress from basic literacy to intellectual proficiency, gaining the ability to think critically and contribute meaningfully to their fields.

As per the widely accepted Gardner’s Multiple Intelligence theory, curriculum explores different subjects widely and in depth at each educational level. A well-educated human contributes his intelligence not only for self-development but also for the development of society, nation and world at large.

Sustainable development, which focuses on the need to protect and conserve nature is a key demand of the 21st century. Before utilizing natural resources for the wellbeing of the human race, it is essential to inculcate knowledge, skills, values through the curriculum to nurture the nature literacy, to foster nature smart generation and fulfill the demand for naturalistically intelligent thinkers.

The paper signifies the implementation of curriculum in nurturing naturalistic intelligence (NI) in middle stage students i.e. 6th to 8th standard as per NEP2020 in Pune districts. A survey was conducted among students and teachers to understand about the content, pedagogy and awareness regarding NI among students and teachers.

Review of Related Literature

The book Environmental Education- Problems and Prospects edited by Ramesh Ghanta and Digumarti Rao, highlights the importance of Environmental education (EE) in curricula. EE gained worldwide acceptance around 1972.

In 1970, in Paris, the international working meeting under UNESCO, the IUCN defined EE as ‘the process of recognizing values and classifying concepts to appreciate interrelation between human, culture and environment’. The definition influenced global policies and in India, in 1975 the NCERT introduced textbooks of science and social science with good coverage of environment oriented topics.

Ningrum, Z. B., et al (2018) analyzed strong and significant correlation (0.754) between the NI and environmental awareness among Indonesian graduate students. The enlisted characteristic features of NI helped design the questionnaire.

Fatonah, S., & Prasetyo, Z. K. (2017) emphasized that science learning model improves NI

in early childhood by helping children closely react with nature. Their work inspired researcher on a role of curricula in nurturing NI in middle stage students and significance of teachers in creating a supportive environment.

A survey by Hasan K. et al provided valuable insights into assessing NI among secondary and higher secondary students. Findings from the comparative study helped refine research objectives and scope.

Statement of the Problem:

To study status of implementation of curriculum in nurturing naturalistic intelligence among middle stage students in Pune district.

Objectives:

1. To study status of knowledge-based curriculum content developing naturalistic literacy among middle stage students.
2. To understand skills-based components of curriculum related to naturalistic literacy among middle stage students.
3. To investigate pedagogical approaches of teachers to deliver nature-oriented content among middle stage students.
4. To study teachers' awareness and perspectives on naturalistic intelligence in school curriculum.

Research question:

1. How do middle stage students acquire knowledge, skills, values fostering NI through their school curriculum?
2. What is the approach used by a teacher to deliver nature oriented content to nurture NI?

Methodology:

The study is conducted using the Survey method. The data was collected through self-constructed and validated questionnaires separately designed for students and teachers.

Samples:

For the current study, the sample includes 153 students of standard seven (Maharashtra SSC board) and 42 teachers from schools in Pune district.

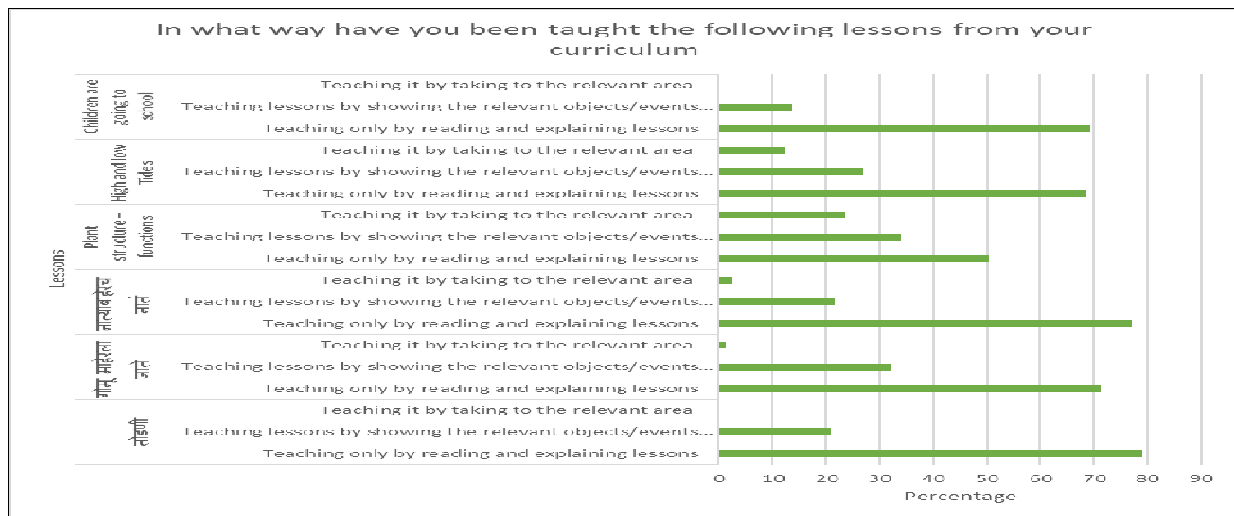
Analysis and Results:

Data was analyzed qualitatively by thematic analysis and quantitatively with percentages.

Curriculum Overview (NI) by Students

Q1. In what way have you been taught the following lessons from your curriculum?

The table shows that teaching through reading and explaining lessons has the highest percentages, indicating a preference for traditional instruction by the teachers. While audio-visual aids and practical experiments offer benefits, students noted that teachers prefer all three methods for the science lessons.



Q2. How often would you like to do the following activities from your textbook?

Activities	Always	Sometimes	Never
To collect and read stories	33.99	49.67	15.03
Listing words in rural languages.	29.41	51.63	17.65
Solving word puzzles.	50.33	35.95	12.42
Collecting and reading nature poetry	32.03	47.06	18.3
To observe different flowers in area and record similarities and differences between them.	28.1	47.06	22.22
To collect clippings to get information about cyclones on the east coast of India.	28.1	44.44	26.14
Participating in competition to create slogans under Swachh Bharat Abhiyan	44.44	33.33	20.92
Drawing pictures of ancient objects.	49.02	36.6	13.07
Producing book marks of famous gospels.	30.72	42.48	25.49
Performing hymns in Sufi musical tradition.	24.18	34.64	37.25
Dramatizing and presenting favorite lessons.	33.33	39.22	25.49
Visit banks and get information about work.	18.95	43.79	32.68
To determine the area of a given item/place.	19.61	49.02	30.07
Drawing diagrams of symmetric-asymmetric objects.	28.76	47.71	22.22
Generating frequency tables from t given information.	18.3	47.71	30.07

Students showed a strong preference for activities like solving word puzzles (50.33%), slogans for the Swachh Bharat Abhiyan (44.44%), illustrating ancient artifacts (49.02%). Activities related to nurturing NI were sometimes preferred by nearly 45% students.

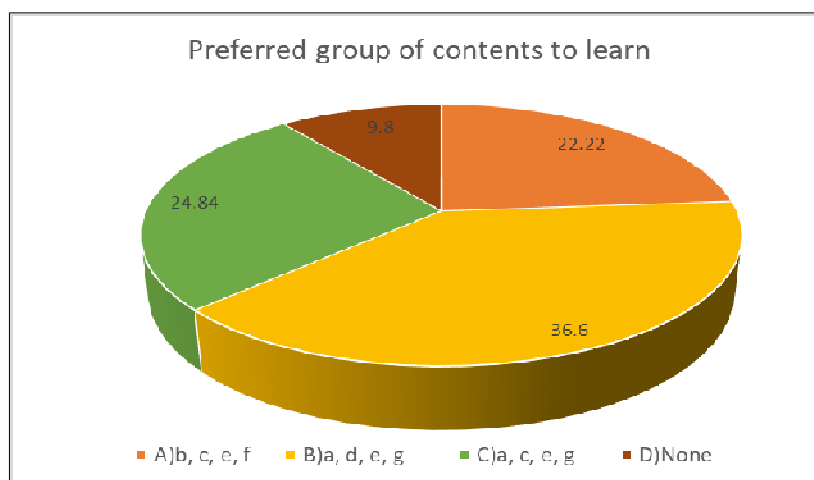
Q3 If you visited any scenic areas, record with whom you have made these visits.

Area	With Schools	Family-Friends	None
Seashore	11.11	54.25	43.79
Riverside, lake	38.56	73.86	20.26
Mountains, valleys	37.91	58.82	30.72
Botanical Garden	21.57	35.95	49.67
Zoos	16.34	74.51	22.22
Sanctuaries, national parks	20.92	32.03	54.9
Garden	27.45	81.05	13.07
Agricultural territory	30.07	77.78	12.42

Result shows most students visited specified locations with family and friends, but over 40% have never been to the Botanical Garden, Sanctuary, National Parks, or Seashore. This suggests schools may not be providing sufficient experiential learning opportunities at these sites.

Q4. Some contents are given in a to g. Those contents are grouped. Choose which of these groups you would like to study.

- | | |
|--------------------------------------|---|
| a) Information about great people | b) Descriptions, stories, poems related to nature |
| c) Scientific discoveries | d) Information on historical wars |
| e) Information on historic sites | f) Correlations between natural elements |
| g) Culture, tradition of social life | |

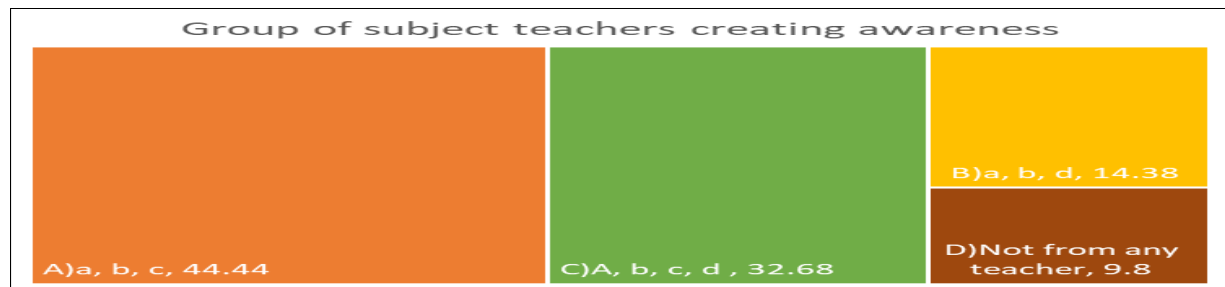


The alternatives included nature, history, and one unrelated option. Given the focus on NI, group A) was the expected choice. However, students preferred the history-related group, suggesting that

nature-related materials may not engage them as expected. This highlights the need to guide educators and learners towards a nature-focused understanding.

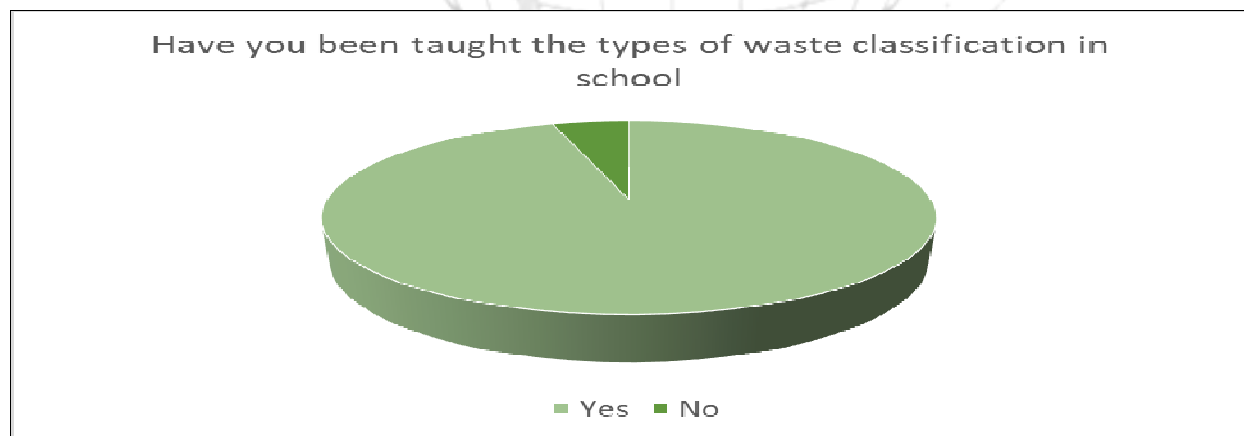
Q5. From which subject teachers have you heard about taking care of the environment?

- a) Language Teacher b) Science Teacher
b) Sociology Teacher d) Mathematics Teacher



44.44% students accepted teachers of language, science and social science orient them on caring environment, it shows the subject content provides opportunity to teachers to discuss nature related values with students.

Q6. Have you been taught the types of waste classification in school?



90.85% students admitted the subject curriculum teaches students about classification of garbage.

Q7. From a list of 18 items, classify them into columns according to the type of waste.

1 mark for each correct classification.

Total no of items	Average	Minimum	Maximum
18	10.69	0	18

Students understood waste classification, but unable to apply atractical situations, scoring just over 50%.

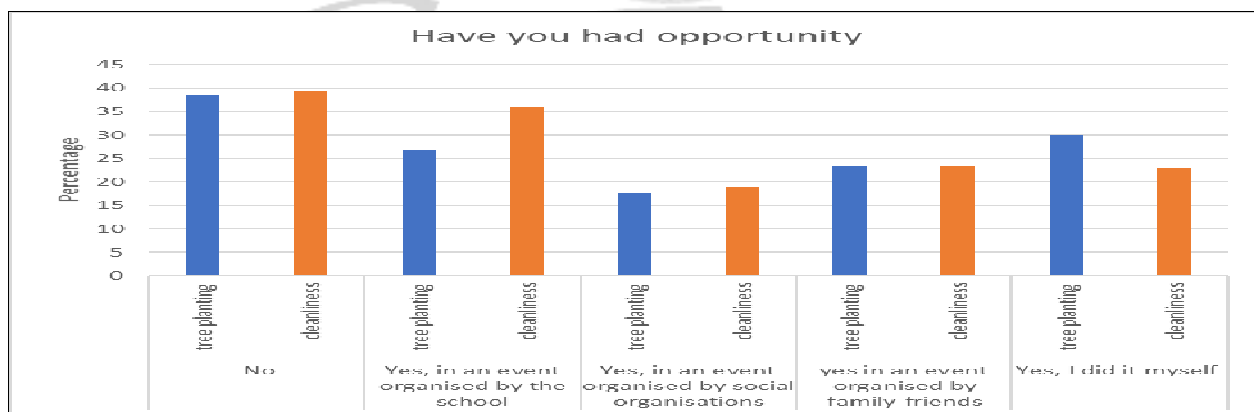
Q8. How is the following waste disposed of in your home?

Waste	Disposing at home	Dumping in garbage bin	Depositing with garbage collection vehicle/sanitation workers	Giving to recycling organization
Wet Waste	10.46	11.76	71.24	9.15
Dry Waste	7.19	16.34	68.63	9.8
Plastic	11.11	10.46	47.06	44.44
E-Waste	8.5	10.46	45.75	31.37

The table shows that giving waste to garbage collection vehicles is common. While this practice isn't harmful, it's essential to educate students on proper wet waste disposal at home and raise awareness about the risks of improper electronic waste disposal, emphasizing the importance of recycling these items.

Q9. Have you had the opportunity to participate in a tree planting program?

Q10. Have you had the opportunity to create awareness about neighborhood cleanliness in your community?



30.07% of students reported active involvement in tree planting initiatives, but 38.56% have never participated. This lack of engagement may be due to insufficient awareness, apathy, or a need for more motivation from educators. However, it's encouraging that schools, social organizations, and families are helping to boost student participation in these programs.

Only 22.88% of students reported active involvement in cleanliness initiatives, while 39.22% have never participated. This low engagement may be due to a lack of awareness, indifference, or a need

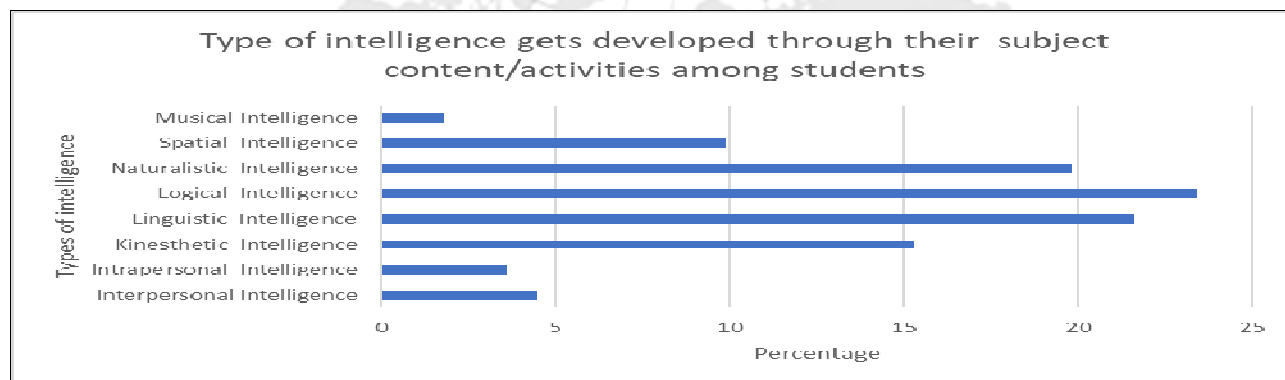
for educators to encourage participation. The data indicates that schools, community organizations, and families play a crucial role in promoting student involvement.

Q11. What lessons in your textbook do you think inspire you to study the elements of nature and to take care of nature? Write down the names of such lessons.

Students enlisted various topics from their different subjects. Repetitive topics highlight its content is nature related. And while learning those topics students have a good connection with natural elements.

Curriculum Overview (NI) by Teachers

42 Teachers from 25 different schools participated in the study and were found to be well educated. 66.67% teachers who participated in study have more than 15 years of experience. While responding type of intelligences through their subjects; among 111 responses from 42 teachers, 19.82% indicated that their subject content/activities fostered NI.



Regarding effective teaching methods, out of 202 responses, 15.35% preferred field visits for delivering nature-related topics, followed by group discussions and learning-by-doing, which encourage active participation and critical thinking.

Methods used to deliver content to students effectively	No of responses	Percentage of responses
Discussion Method	25	12.38
Experimental method	15	7.43
Question Answer Method	21	10.4
Group Discussion Method	28	13.86
Field Visits	31	15.35
Lecture Method	10	4.95
Learning By Doing Method	26	12.87
Explanation Method	13	6.44
Audio Visual Method	19	9.41
Drama method	10	4.95
Flipped Classroom Method	2	0.99
Collection and Observation	1	0.5
Object Method	1	0.5
Total	202	100

Out of 255 responses on indoor activities for developing NI in middle school students, 12.55% favored group discussions, along with reading travel stories and nature descriptions. Virtual field visits were seen as the most effective but needed broader implementation.

For outdoor activities, most responses were linked to science content. Among 307 responses, 36 highlighted plant observation, easily conducted on school premises. Gardening and plantation were the most preferred methods, allowing hands-on engagement both at school and home.

Moreover, teachers were aware about lessons or subtopics which helped to develop NI.

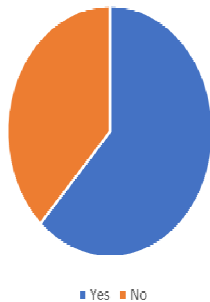
Teachers believe that if students explore natural phenomena during school, they will become aware of nature and ensure the natural cycle is not disrupted. They will avoid harming nature, understand our dependence on it, and work to preserve it. Students will also educate others, adopt eco-friendly technology, and develop a sense of responsibility. They will recognize that the survival of all species depends on nature and take steps to protect it.

Students will engage in activities like seed banks, tree plantations, plastic collection, waste segregation, and proper disposal. They will develop eco-friendly concepts like eco-break and avoid littering, spitting, burning trash, or wasting water. They will plan for freshwater conservation and conduct experiments like composting, resource conservation, cleanliness drives, organic farming, vertical gardens, and ayurvedic plant studies. Proper waste management will prevent drain blockages during the rainy season. Each student's interests are different, but small habits can become a way of life. Attitude towards nature, current situation, and future problems often awaken students.

When asked about their experiences where they had noticed students' responsible behavior towards nature teachers shared some aspects as follows.

- After learning about waste management during trips, students collected waste in bags instead of littering.
- They gathered plastic for recycling and avoided plastic use, encouraging parents to use cloth bags.
- In plantation activities, students cared for trees, used leftover water for them, and started vegetable cultivation.
- A school seed bank and a nursery of 5,000 saplings were established.
- They also produced compost and vermicompost.
- Students used water carefully, turned off taps, and saved notebook paper.
- They kept food and water for birds in summer and learned to make eco-bricks.

Have you practiced assessment method to notice students affection and involvement with nature?



When asked whether they use any assessment method to gauge students' affection and involvement with nature by teachers, 61.90% of teachers stated that they use it. But still 38.10% of teachers failed to do so.

Teachers who assessed the student's affection and involvement with nature use Observation Method, Demonstration Method, Group Discussion Method, Nature picture competitions most of the times, but

very few use interview, questionnaires based on direct participation

When teachers were asked about the meanings of NI, they shared their detailed views based on their understanding. The qualitative analysis highlighted common perspectives among them.

- To develop a love, affection, vigilance, and awareness for nature
- To understand nature strength, adapt to it.
- To know strong correlation between all biological, abiotic factors, both human and non-human.
- To be aware that we depend on nature to meet our needs - food and clothing shelter. Therefore, to protect nature and the environment.
- To recognize, identify, understand, observe, classify and work with the natural world.
- To study how the smallest thing in nature affects human life and take appropriate action that does not harm nature.
- To maintain proximity to nature, understanding the phenomena of nature, curiosity about seasonal changes in nature and to act complementary to nature.
- To create the attitude that nature is ours and to protect and preserve it, to fulfill it is our responsibility.
- Taking care of the environment, weather, surroundings and living things.

Findings and Conclusion:

1. Instead of a dedicated Environmental Education subject at the middle stage, a nature-oriented curriculum is integrated into subjects like Science, Social Science, and languages.
2. Observation and active participation are essential for nurturing Nature Intelligence (NI) among students, but large-scale implementation is necessary.
3. Students primarily connect with nature during family trips, hence making parental orientation by schools a crucial need.
4. While students are aware of environmental protection, their participation in related school activities remains limited.

5. Teachers recognize the nature-oriented aspects of their subjects, yet effective pedagogical approaches for delivering this content are not widely practiced.
6. The most commonly accepted method for assessing NI is incidental observation of a child's engagement with nature.
7. Teachers associate NI with key components such as affection and care for nature, understanding interactions within the environment, and demonstrating responsibility for its protection and preservation.

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MULTILINGUAL EDUCATION IN CONTEXT OF NEP 2020 AND NCF 2023**Mr. Kamble Ketan Laxman Aruna***Ph.D. Scholar,**Smt. Surajba College of Education,**Mumbai.***Dr. Sunayana Kadle***Research Guide,**Smt. Surajba College of Education**Mumbai.*

Abstract

The National Education Policy (NEP) 2020 and the National Curriculum Framework (NCF) 2023 signify a major shift in India's educational system, underscoring the significance of multilingual education for cognitive development and cultural preservation. This study examines the key aspects of NEP 2020 and NCF 2023 concerning multilingual education, focusing on their foundational principles, recommended implementation strategies, and potential challenges. It investigates the policy documents' perspectives on the three-language formula, the use of the mother tongue or local language as the medium of instruction, and the incorporation of multilingual resources into the curriculum. Furthermore, the paper discusses the implications for teacher training, curriculum development, and assessment practices, ultimately highlighting the crucial role of multilingualism in creating a more inclusive, equitable, and culturally enriched educational framework in India.

Keywords: Multilingual Education, National Education Policy 2020, National Curriculum Framework 2023.

Introduction

India is characterized by an extraordinary array of linguistic diversity, with numerous languages spoken across its various regions. Navigating the educational landscape in this context necessitates a sophisticated comprehension of the interplay between language, culture, and cognitive growth. In acknowledgment of this complexity, the National Education Policy (NEP) 2020 (Ministry of Education [MoE], 2020) and the National Curriculum Framework (NCF) for School Education 2023 (MoE, 2023) propose a significant transition towards endorsing multilingualism as a fundamental component of the Indian educational framework.

Previous discussions surrounding language in education frequently cantered on the perceived tension between national cohesion and linguistic plurality. However, NEP 2020 and NCF 2023 transcend this dichotomy, positioning multilingualism as a national asset and an essential facilitator of cognitive advancement and cultural continuity. These policy frameworks envision a future in which children are encouraged to learn in their native or local languages while also achieving proficiency in other Indian languages and at least one foreign language, thus preparing them to be global citizens rooted in their local environments.

This paper seeks to analyse the specific provisions and foundational justifications of NEP 2020 and NCF 2023 concerning multilingual education. It will investigate the implications of these policy documents for the implementation of the three-language formula, the emphasis on mother tongue instruction, and the creation of a multilingual curriculum. Additionally, the paper will consider the potential challenges and opportunities associated with actualizing the vision of a genuinely multilingual education system in India.

NEP 2020 and Multilingual Education

The National Education Policy (NEP) 2020 clearly recognizes the cognitive and educational benefits of multilingualism. It states that “young children learn concepts more quickly and effectively in their home language/mother tongue” (MoE, 2020, p. 11). This recognition is backed by studies showing that children who are proficient in multiple languages display greater cognitive flexibility, better problem-solving abilities, and increased creativity (Bialystok, 2001; Cummins, 1979).

The policy document outlines several key strategies to encourage multilingualism:

- **Mother Tongue/Local Language as Medium of Instruction:** NEP 2020 advocates for the utilization of the mother tongue or local language as the primary medium of instruction at least through Grade 5, with a preference for extending this practice to Grade 8 and beyond. This initiative is designed to facilitate a robust understanding of fundamental concepts among children, alleviating the additional challenge of acquiring knowledge in a foreign language.
- **The Re-examination of the Three-Language Formula:** The National Education Policy (NEP) 2020 reaffirms the significance of the three-language formula while enhancing its practical application. It stipulates that at least two of the three languages must be indigenous to India, allowing students the flexibility to alter one of the languages starting in Grade 6, provided they demonstrate proficiency in all three languages (Ministry of Education, 2020).
- **Emphasizing Sanskrit and Other Indian Languages:** The policy advocates for the study of Sanskrit, recognizing it as a language with a profound literary, scientific, and philosophical legacy. Furthermore, it underscores the importance of preserving and promoting all Indian languages, which encompasses classical languages, tribal languages, and sign languages.
- **Integration of Languages in the Curriculum:** The National Education Policy (NEP) 2020 advocates for the integration of languages throughout the educational curriculum, encouraging multilingual engagement in various subjects and cultivating an appreciation for the richness of linguistic and cultural diversity

NCF 2023 and Multilingual Education

The National Curriculum Framework (NCF) 2023 for School Education builds upon the groundwork established by the National Education Policy (NEP) 2020, offering a clear and actionable plan for its execution. It presents comprehensive guidelines concerning curriculum development, teaching methodologies, and evaluation processes, with a pronounced emphasis on multilingualism.

Significant elements of NCF 2023 pertaining to multilingual education encompass:

- **Designated Curriculum Areas for Languages:** NCF 2023 establishes specific curriculum segments dedicated to languages, which include language acquisition, literature, and communication skills based on language. This structure guarantees that students receive systematic and thorough language education (MoE, 2023).
- **Multilingual Textbooks and Educational Resources:** The framework promotes the creation of multilingual textbooks and educational resources that integrate content across various languages, enabling students to engage with information and articulate their understanding in the languages they are most proficient in.
- **Pedagogical Strategies for Multilingual Environments:** NCF 2023 underscores the importance of employing teaching strategies that capitalize on the linguistic diversity present in classrooms, such as translanguaging, which encourages students to utilize all their linguistic capabilities for effective communication and learning (García, 2009).
- **Professional Development for Teachers:** Acknowledging the vital role of educators in the successful implementation of multilingual education, NCF 2023 stresses the necessity for comprehensive teacher training programs. These programs should equip teachers with the expertise and knowledge required to teach effectively in multilingual settings, including training in language pedagogy, assessment of multilingual learners, and culturally responsive teaching methodologies.
- **Assessment Strategies for Multilingual Learners:** NCF 2023 advocates for the formulation of assessment techniques that are attuned to the linguistic backgrounds of students, focusing on their comprehension of concepts rather than their language skills. This approach includes the use of diverse assessment formats, allowing students to respond in their preferred language, and providing necessary accommodations for language differences.

Challenges and Opportunities

The National Education Policy (NEP) 2020 and the National Curriculum Framework (NCF) 2023 present an optimistic framework for advancing multilingual education in India; however, several obstacles must be navigated to ensure effective execution:

- **Resources Limitations:** The scarcity of qualified educators, suitable educational materials, and sufficient infrastructure across various languages poses a significant hurdle, especially in marginalized communities.
- **Professional Development for teachers:** Equipping teachers to proficiently instruct in multilingual settings necessitates considerable investment in professional development and the establishment of training programs specifically designed to meet the diverse needs of multilingual students.
- **Cultural Perceptions:** Addressing societal biases and negative attitudes towards specific languages and dialects is essential for cultivating an inclusive and supportive educational atmosphere for all learners.
- **State-Level Implementation:** Given that education is a concurrent subject in India, both the central and state governments possess legislative authority over educational issues. Achieving uniform implementation of NEP 2020 and NCF 2023 across all states demands effective collaboration and coordination between these governmental bodies.

The challenges associated with implementing multilingual education are significant; however, the potential advantages are substantial. By adopting a multilingual approach, India stands to achieve the following:

- **Enhancement of Learning Outcomes:** Instruction delivered in students' native or local languages can markedly improve educational results, especially for those from underrepresented communities.
- **Promotion of Cognitive Development:** Research indicates that multilingualism can boost cognitive flexibility, enhance problem-solving skills, and foster creativity.
- **Preservation of Cultural Heritage:** Encouraging the use and growth of all Indian languages plays a crucial role in safeguarding the nation's diverse cultural heritage.
- **Advancement of Social Inclusion:** A multilingual educational framework can facilitate social inclusion by recognizing and valuing the linguistic diversity present within the population, thereby fostering a more equitable learning environment for every student.
- **Improvement of Global Competitiveness:** In a world that is increasingly interconnected, multilingualism serves as a significant asset that can bolster India's position in the global economy.

Conclusion

The National Education Policy (NEP) 2020 and the National Curriculum Framework (NCF) 2023 signify a pivotal advancement in acknowledging the role of multilingualism within the educational landscape. By endorsing the use of the mother tongue or local language as the primary medium of instruction, advocating for a flexible three-language policy, and highlighting the integration of various languages within the curriculum, these policy frameworks pave the way for a

more inclusive, equitable, and culturally enriched educational system in India.

Nonetheless, the effective realization of these policies necessitates a persistent dedication to overcoming resource limitations, enhancing teacher training, and shifting societal attitudes that hinder the progress of multilingual education. Through collaborative efforts among policymakers, educators, and local communities, India has the potential to leverage the advantages of multilingualism, thereby maximizing the capabilities of its students and fostering a more promising future for the country.

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REDEFINING TEACHER EDUCATION: EXPLORING THE ROLE OF AI IN PRE-SERVICE TEACHER TRAINING

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Abstract

Artificial intelligence (AI) offers transformative possibilities for pre-service teacher training, promising to reshape how educators are prepared. This conceptual paper investigates AI's role in this preparation, analysing the existing landscape of teacher education, exploring AI's potential applications, and considering the ramifications of its integration into training programs. We contend that AI can enrich teacher education through personalized learning, enhanced feedback and assessment, and the development of more robust evaluation systems. However, we also underscore the critical importance of addressing the ethical considerations surrounding AI's use, particularly concerning bias, transparency, and accountability. The overarching goal of this paper is to foster the creation of more effective and forward-thinking teacher education programs, equipping teachers to thrive in today's classrooms.

Key Words :- Artificial Intelligence (AI), Pre-service teacher training, Ethics and accountability

Introduction

Teacher education is being reshaped by technological advancements and the growing need for innovative teaching methods. Integrating Artificial Intelligence (AI) into pre-service training offers a new avenue for preparing teachers. Traditional programs have been criticized for lacking relevance to modern classrooms, leaving teachers feeling unprepared for diverse student needs. The COVID-19 pandemic underscored the necessity for adaptable, tech-savvy, and resilient educators. AI promises to revolutionize teacher education through personalized learning, improved feedback and assessment, and enhanced evaluation systems. Furthermore, AI can equip teachers with the skills to effectively integrate technology, boosting student learning outcomes. This paper investigates AI's role in pre-service training, aiming to redefine teacher education for 21st-century students. It examines the current state of teacher education, AI's potential applications, and the implications of AI integration. By exploring this intersection, the paper seeks to contribute to the development of more effective and innovative programs that prepare teachers for success in today's classrooms, specifically through personalized learning experiences. AI can personalize teacher education programs to cater to the unique needs and learning styles of individual pre-service teachers.

The Potential Applications of AI in Pre-Service Teacher Training

- 1. Adaptive learning systems:** AI-powered adaptive learning systems can adjust the difficulty level and content of teacher education programs based on pre-service teachers' performance and learning needs.
- 2. Learning analytics:** AI-powered learning analytics can provide insights into pre-service teachers' learning behaviours and outcomes, helping teacher educators identify areas where they need additional support.
- 3. Personalized feedback:** AI-powered systems can provide personalized feedback to pre-service teachers on their teaching practices, helping them refine their skills and identify areas for improvement.

Enhanced Teacher Feedback and Assessment

AI can provide immediate feedback and assessment on teacher performance, helping pre-service teachers refine their skills and identify areas for improvement. For example:

- 1. Automated grading:** AI-powered systems can automate the grading process, freeing up instructor time and providing immediate feedback to pre-service teachers.
- 2. Peer review:** AI-powered systems can facilitate peer review, allowing pre-service teachers to receive feedback from their peers and develop their critical thinking skills.
- 3. Self-assessment:** AI-powered systems can provide pre-service teachers with tools for self-assessment, helping them develop their reflective practice skills and identify areas for improvement.

Development of Effective Teacher Evaluation Systems

AI can help develop more effective teacher evaluation systems, taking into account multiple factors such as teacher performance, student outcomes, and school context. For example:

- 1. Machine learning algorithms:** AI-powered machine learning algorithms can analyse large datasets and identify patterns and correlations that can inform teacher evaluation systems.
- 2. Natural language processing:** AI-powered natural language processing can analyse teacher feedback and evaluation reports, providing insights into teacher performance and areas for improvement.
- 3. Predictive analytics:** AI-powered predictive analytics can forecast teacher performance and student outcomes, helping school administrators identify areas where teachers need additional support.

Simulation-Based Teacher Training

AI-powered simulations can provide pre-service teachers with realistic and immersive teaching experiences, helping them develop their teaching skills in a low-stakes environment. For example:

1. **Virtual reality simulations:** AI-powered virtual reality simulations can provide pre-service teachers with immersive teaching experiences, helping them develop their teaching skills and build confidence.
2. **Avatar-based simulations:** AI-powered avatar-based simulations can provide pre-service teachers with realistic teaching experiences, helping them develop their teaching skills and build confidence.
3. **Game-based simulations:** AI-powered game-based simulations can provide pre-service teachers with engaging and interactive teaching experiences, helping them develop their teaching skills and build confidence.

Intelligent Tutoring Systems

AI-powered intelligent tutoring systems can provide pre-service teachers with personalized guidance and support, helping them develop their teaching skills and knowledge. For example:

1. **AI-powered chatbots:** AI-powered chatbots can provide pre-service teachers with personalized guidance and support, helping them develop their teaching skills and knowledge.
2. **AI-powered virtual mentors:** AI-powered virtual mentors can provide pre-service teachers with personalized guidance and support, helping them develop their teaching skills and knowledge.
3. **AI-powered learning platforms:** AI-powered learning platforms can provide pre-service teachers with personalized guidance and support, helping them develop their teaching skills and knowledge.

Rethinking Teacher Education Curriculum

Implications of AI Integration for Teacher Education Programs

The Transformative Potential of AI in Pre-Service Teacher Training

1. Personalized Learning Experiences:

- **Adaptive Learning Systems:** AI can create personalized educational pathways by tailoring the difficulty and content of teacher training programs to individual pre-service teachers' abilities and learning styles.
- **Learning Analytics:** AI-driven analysis of learning data provides valuable insights into pre-service teachers' learning behaviours and outcomes, enabling educators to provide targeted support where it's most needed.
- **Customized Feedback:** AI systems can deliver specific feedback on teaching practices, assisting pre-service teachers in refining their skills and identifying areas for growth.

2. Revolutionizing Teacher Feedback and Assessment:

AI offers opportunities for more efficient and insightful teacher evaluation, promoting skill development and identifying areas for improvement:

- **Automated Grading:** AI-powered grading systems can automate assessment tasks, saving instructors time and delivering immediate feedback to pre-service teachers.
- **Facilitated Peer Review:** AI can streamline peer review processes, allowing pre-service teachers to learn from their peers' experiences and develop their critical thinking skills.
- **Enhanced Self-Assessment:** AI tools can empower pre-service teachers to evaluate their own strengths and weaknesses, fostering reflective practice and continuous improvement.

3. Developing Advanced Teacher Evaluation Systems:

AI can contribute to creating more comprehensive and effective teacher evaluation systems by considering various relevant factors:

- **Machine Learning Insights:** AI algorithms can analyse extensive datasets to uncover patterns and correlations that inform teacher evaluation systems.
- **Natural Language Processing:** AI can analyse feedback and evaluation reports to gain insights into teaching performance and identify areas for development.
- **Predictive Analytics:** AI can forecast teacher performance and student outcomes, enabling school administrators to proactively provide support where needed.

4. Immersive Simulation-Based Training:

AI-driven simulations offer realistic and engaging teaching experiences in a safe and controlled environment:

- **Virtual Reality Simulations:** AI-powered virtual reality can immerse pre-service teachers in realistic classroom scenarios, enhancing their skills and building confidence.
- **Avatar-Based Simulations:** Simulated classrooms with AI-controlled avatars allow pre-service teachers to practice their teaching skills in a lifelike environment.
- **Gamified Simulations:** AI-driven game-based simulations can create engaging and interactive learning experiences, promoting skill development and confidence.

5. Intelligent Tutoring and Mentorship:

AI-powered tutoring systems can provide personalized guidance and support to pre-service teachers, facilitating their knowledge acquisition and skill development:

- **AI Chatbots:** Chatbots can provide on-demand support and answer questions, offering personalized guidance to pre-service teachers.
- **Virtual AI Mentors:** AI can provide personalized guidance and support, helping them develop their teaching skills and knowledge.
- **AI Learning Platforms:** AI-driven learning platforms can provide personalized guidance and support, helping them develop their teaching skills and knowledge.

Conclusion

The integration of AI in pre-service teacher training has the potential to revolutionize the way teachers are prepared for the classroom. By exploring the potential applications of AI and the

implications of AI integration for teacher education programs, we can develop more effective and innovative teacher education programs that prepare teachers for success in the modern classroom.

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THE VOW OF ARTIFICIAL INTELLIGENCE IN ECONOMIC EVOLUTION

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ABSTRACT

This paper examines the viable impact of artificial intelligence (A.I.) on economic growth. The relationship between artificial intelligence and the economy has become increasingly significant in shaping the future, while also providing assistance to numerous individuals and sectors. AI technologies are driving innovation, enhancing productivity, and creating new opportunities for growth and sustainability. We stand at the cusp of a technological transformation that has the potential to ignite productivity, stimulate worldwide economic expansion, and elevate incomes globally. However, this same revolution might also eliminate jobs and exacerbate social disparities. This research paper examines the multifaceted impact of AI on economic growth, productivity enhancement, and innovation acceleration. The research also investigates AI's impact on service industries, examining how personalized recommendations and chatbots are enhancing customer experiences and driving sales. In healthcare, AI's contributions to drug discovery, diagnostic accuracy, and personalized treatment plans are assessed for their economic implications. The paper further explores AI's role in advancing scientific research and accelerating innovation across disciplines. While highlighting the economic opportunities, the study also addresses challenges associated with AI adoption, including data privacy concerns, algorithmic bias, and the potential exacerbation of economic inequalities. The importance of developing robust regulatory frameworks and ethical guidelines to ensure responsible AI deployment is emphasized. The paper concludes by proposing strategies for policymakers, businesses, and educational institutions to harness AI's potential for inclusive economic growth. It underscores the need for collaborative efforts in AI research and development, as well as the importance of international cooperation to address global challenges and ensure equitable distribution of AI's economic benefits. By critically examining both the promises and pitfalls of AI in economic development, this research aims to provide a comprehensive understanding of AI's role in shaping the future global economy.

Keywords: Artificial intelligence, economic growth, Innovation, healthcare, Productivity.

Introduction

Artificial intelligence (AI) presents significant potential for facilitating economic development on a global scale. As a transformative technology, AI possesses the capacity to revolutionize industries, enhance productivity, and generate novel opportunities for growth. Through the automation of routine tasks, optimization of processes, and provision of data-driven insights, AI can substantially augment efficiency and innovation across various sectors of the economy. From manufacturing and healthcare to finance and agriculture, the implementation of AI technologies can result in increased output, reduced costs, and enhanced decision-making processes. Moreover, AI demonstrates the capability to address complex societal challenges, such as resource allocation, urban planning, and environmental sustainability, which are critical for sustainable economic development. As nations and enterprises increasingly adopt AI solutions, it is anticipated to become a key driver of economic progress, potentially reshaping labour markets, fostering new industries, and contributing to overall economic expansion.

The objectives of this paper are threefold: First, to provide a comprehensive review of the major ways in which AI contributes to economic development; second, to identify the key research areas where AI has made the most significant impact; and third, to discuss the existing challenges and potential future research directions in this domain.

LITERATURE REVIEW

AI CONTRIBUTION IN ECONOMIC PROGRESS

AI represents a driver of output and economic growth as well as it has become a remedy for numerous economic sectors. Artificial intelligence-powered tools enable organizations and governmental entities to make more informed decisions based on data-driven insights. This capability can facilitate improved resource allocation, enhanced risk management, and optimized strategic planning, thereby contributing to economic growth and competitive advantage. Primarily, a fundamental question arises in the minds of individuals regarding how artificial intelligence (AI) can contribute to economic growth. Research indicates that AI has the potential to enhance the productivity of less experienced workers more rapidly. Younger employees may find it easier to capitalize on opportunities, while older workers might face challenges in adaptation. The impact on labour income will largely depend on the extent to which AI complements high-income workers. Artificial intelligence is being integrated into businesses globally at a remarkable rate, underscoring the necessity for policymakers to take action.

To assist nations in formulating appropriate policies, the International Monetary Fund (IMF) has developed an AI Preparedness Index that assesses readiness in domains such as digital infrastructure, human-capital and labour-market policies, innovation and economic integration, and regulation and ethics.

Furthermore, the contributions of AI may be specific to the sectors in which it is applied, such as manufacturing, health, finance, energy, and transport. For instance, AI supports healthcare

services through early detection and diagnosis of illnesses, identification of "potential pandemics and tracking incidence," and "imaging diagnostics" in radiology and pathology. In the financial sector, AI contributions include applications for fraud detection and anti-money laundering. Moreover, AI developments such as "robo-advice" facilitate "customized investment solutions" in managing financial goals and optimizing clients' funds. Additionally, AI enables "autonomous trucking and delivery," traffic control systems, and enhanced security in the transport sector. Recently, researchers have developed a novel artificial intelligence algorithm, termed Torque Clustering, which demonstrates significantly enhanced similarity to natural intelligence compared to existing methodologies. This algorithm substantially improves the capacity of AI systems to autonomously learn and identify patterns in data without human intervention.

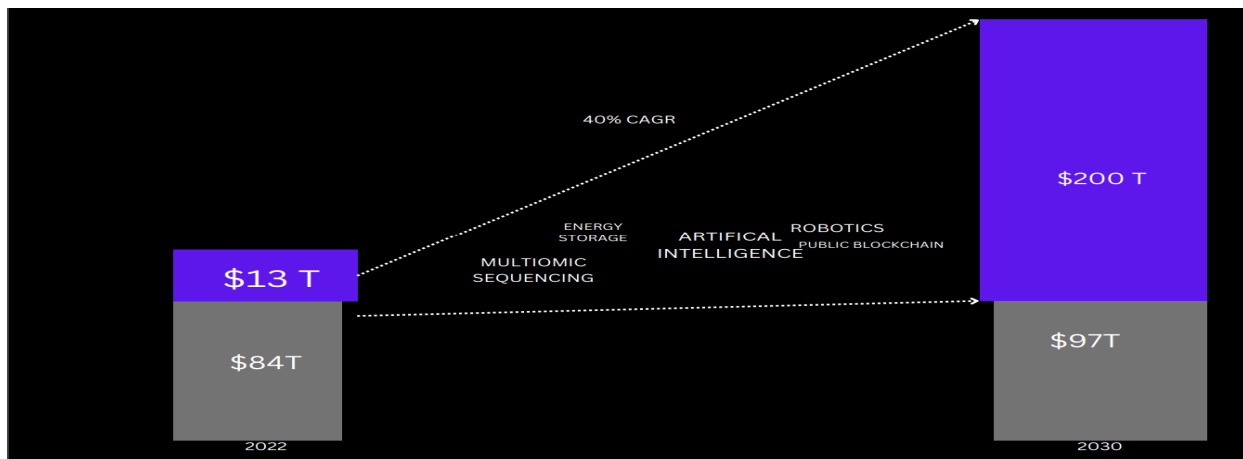
Torque Clustering exhibits the capability to efficiently and independently analyze extensive datasets across diverse fields, including biology, chemistry, astronomy, psychology, finance, and medicine. This analysis has the potential to yield new insights, such as identifying disease patterns, detecting fraudulent activities, or elucidating behavioral phenomena.

A recent investigation led by Jonathan .H, a medicine assistant professor, and his research team is exploring the capabilities of chatbots, a type of large language model (LLM), in addressing complex medical inquiries. Additionally, they are assessing whether these AI tools can enhance physician performance.

The study's results are promising on both aspects. The team evaluated a chatbot's effectiveness across various clinical situations. Notably, the chatbot by itself surpassed the performance of doctors who relied solely on internet searches and medical resources. However, when physicians from different regions and institutions throughout the United States were provided with their own LLM, they were able to achieve comparable results to the chatbots.

This demonstrates how artificial intelligence is making significant contributions to multiple economic sectors, improving their usefulness, productivity, and long-term value for upcoming generations.

In a TEDTALKS SHOW presentation, Cathie Wood addressed the issue of inflation, a widespread concern for nations globally. She expressed anticipation for significant future developments and suggested that the Federal Reserve is making a major mistake. While initially considering the March regional bank crisis as a potential trigger, Wood now believes an unknown factor will reveal to the Federal Reserve that inflation is not the primary issue. She argued that genuine economic growth, particularly when driven by productivity, isn't inherently inflationary and may even be disinflationary or deflationary. This perspective contributes to her optimistic outlook for the coming decade.



The key message conveying optimism about overcoming current economic challenges stems from Wood's presentation of five interconnected categories, with Artificial Intelligence at the center. This core technology links to robotics, energy storage, public blockchains, and multiatomic sequencing. A chart illustrated AI's potential impact in the near future, showing disruptive or transformative innovation, represented by the blue section, currently valued at approximately \$13 trillion in global equity markets (both public and private). This figure represents slightly over 10% of total global equity market valuation. Wood's team projects this to grow to over \$200 trillion, implying a 40% compound annual growth rate. While this projection may seem implausible to some, their confidence is rooted in research on these technological platforms. The 40% annual growth aligns with a world of accelerated GDP, very low inflation, and high productivity. Wood cited autonomous taxi platforms alone as potentially representing \$20 to \$50 trillion of the projected \$200 trillion.

The chart also conveyed that alongside being a promising investment area, disruptive innovation leads to creative destruction. Wood described how autonomous taxi platforms will revolutionize transportation and mobility. The convergence of artificial intelligence, multitopic sequencing, and CRISPR gene editing technologies is expected to transform healthcare. Additionally, blockchain technology and artificial intelligence are anticipated to not only reshape the entire financial sector but also usher in a new era of digital property rights.

In a recent discussion, Sundar Pichai, the CEO of Google and Alphabet, highlighted the significant impact of Agentic AI in the coming 2-4 years. Agentic AI, a form of artificial intelligence capable of executing tasks with minimal human oversight, integrates various AI technologies such as large language models (LLMs) and machine learning. This advanced AI is expected to find applications in sectors like finance, healthcare, manufacturing, smart homes, and supply chain management.

The advantages of Agentic AI include streamlining workflows and business operations, enhancing efficiency and scalability, cutting operational expenses, and tackling complex issues. Many

individuals were previously unaware that AI could potentially overcome seemingly insurmountable economic challenges, paving the way for improved growth.

ECONOMIC SECTORS ARE MOST INFLUENCED BY AI AND THE BROADER MACROECONOMIC IMPLICATIONS.

Several sectors are expected to face significant risks from the increasing prevalence of AI. These include customer service, manufacturing, transportation, administrative work, and financial services. Additional vulnerable areas encompass sales, legal services, hospitality, retail, insurance, entertainment, and certain government bureaucracy segments. In customer service, AI is anticipated to reduce costs and enhance efficiency, resulting in shorter wait times and round-the-clock automated support. However, this may lead to widespread elimination of call center and online chat positions.

The manufacturing sector is likely to experience lower production expenses and faster operations, along with improved precision and quality control. Nevertheless, this could result in the loss of over 50% of manufacturing and assembly jobs, potentially impacting factory-dependent communities.

For transportation, AI is expected to decrease transport and logistics costs while theoretically improving road safety.

Administrative work is particularly susceptible to AI automation due to its high-volume but repetitive nature, especially in tasks involving data entry, processing, and rule-based analysis. By 2034, AI is projected to replace 30-50% of roles such as data analysts, administrative assistants, and bookkeepers across various sectors including finance, healthcare, and public service.

The finance industry's vulnerability stems from its generation of extensive datasets suitable for predictive analytics, established use cases in risk modeling and process automation, and cyclical nature allowing for pattern recognition. While AI in finance can promote transparency and efficiency if applied judiciously, it may also destabilize markets, limit capital access for certain groups, and eliminate entry-level positions.

In the hospitality and food services sector, AI is expected to lead to better-managed margins and significantly reduced labor costs, as well as operational consistency through coordinated teams. Government bureaucracies may become more streamlined, offering potential cost savings. HR and recruiting functions could see automation in resume review and retention modeling, while accounting may experience displacement of clerks and bookkeepers due to transaction processing automation.

The broader macroeconomic implications of AI adoption refer to its wide-ranging effects on the overall economy, influencing factors such as inflation, unemployment, economic growth, and consumer

confidence. These implications can impact entire nations or regions, extending beyond individual industries or sectors.

Key aspects of macroeconomic implications include:

1. Impact on aggregate demand: Changes in one area can affect consumer spending, business investment, and government expenditure, influencing overall demand levels.
2. Influence on price levels: Macroeconomic shifts can trigger inflation or deflation, affecting the cost of goods and services.
3. Employment effects: Economic fluctuations may lead to changes in unemployment rates, impacting the labor market.
4. International trade considerations: Macroeconomic changes can affect a country's exchange rates and its competitiveness in global markets.

Illustrations of macroeconomic consequences:

- Shifts in interest rates:
Elevating interest rates to manage inflation can affect the cost of borrowing for both companies and individuals, potentially dampening economic expansion.
- Fiscal policy decisions:
Amplified government expenditure can boost economic growth during economic downturns but might result in heightened inflation over time.
- Variations in oil prices:
An abrupt increase in oil prices can elevate production expenses for businesses, influencing inflation and possibly decelerating economic activity.
- Devaluation of currency:
A weakening currency can render exports more affordable, potentially stimulating economic growth but also leading to increased costs for imports and inflation.

POTENTIAL AVENUES FOR UPCOMING STUDIES THAT COULD ADDRESS CURRENT GAPS IN UNDERSTANDING.

To address existing knowledge gaps, upcoming research should emphasize cross-disciplinary teamwork, studies of real-world applications, and the inclusion of varied viewpoints. It should also leverage advanced data analysis techniques and actively involve stakeholders to convert research outcomes into practical solutions. This approach is particularly crucial in domains where practical implementation is currently insufficient, such as intricate societal challenges or cutting-edge technologies.

CONCLUSION

This study sought to examine artificial intelligence's role in economic growth and offer a comprehensive review of current research focusing on AI's applications in economics and related

domains. The findings suggest that while AI will continue to significantly impact our daily lives, it has not yet reached the point of replacing human capabilities entirely.

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HUMAN RECOURSE IN GRAM PANCHAYATS FOR SUSTAINABLE DEVELOPMENT

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Abstract

In Maharashtra Gram Panchayat plays an important role in the overall development of villages. The gram panchayats are governed by section 5 of the Bombay Gram Panchayat Act, 1958. Population is the main criteria used for establishing Gram Panchayats in the state, it is the lowest but most important part of Panchayat Raj. Capacity development, particularly through training, has been a key focus area over the years. Efforts have been made towards institutional and financial resource development to support the functioning of Panchayats. However, the strengthening of human resources within Panchayats has been neglected and not approached from a long-term sustainable perspective. Hence an effort has been made in the present article to draw some general observations about human resource available in Gram Panchayats in Nashik district of Maharashtra.

Key Words: Human Recourse, Gram Panchayats, Sustainable, Development

Introduction

Panchayats play a significant role in the overall development of the country within the Panchayati Raj system. The United Nations adopted the 17 Sustainable Development Goals (SDGs) and their 169 targets in September 2015. Local governments are essential in achieving these SDGs, as the goals are universal but the implications and interventions are local. The Indian Constitution envisions the twin objectives of the Panchayati Raj system as ensuring local economic development and social justice. With approximately 2,60,000 rural local bodies (Panchayats), India has vast opportunities to localize the SDGs and meet the goals. Panchayats are expected to effectively plan and implement functions related to the 29 subjects listed in the Eleventh Schedule of the Constitution, most of which align with the SDG targets.

As part of the 73rd constitutional amendment, 29 subjects were transferred to the Panchayats, covering various development sectors such as agriculture, irrigation, health, and

education. The aim was to achieve rural development through decentralized planning and initiatives at the District, Block, and Village levels (Chakrabarti, Chattopadhyay, Nath 2011).

Capacity development, particularly through training, has been a key focus area over the years. Efforts have been made towards institutional and financial resource development to support the functioning of Panchayats. However, the strengthening of human resources within Panchayats has been neglected and not approached from a long-term sustainable perspective. Hence an effort has been made in the present article to draw some general observations about human resource available in Gram Panchayats in Nashik district of Maharashtra. Because effective and timely service delivery should be treated as an important criteria for the development of Gram Panchayats. Nashik district is the third largest district in Maharashtra in terms of Population of 61,09,052 (census, 2011) and area occupying an area of 15,582 square kilometres in the north Maharashtra region. It is bounded by Dhule district to the north, Jalgaon district to the east, Aurangabad district to the southeast, Ahmadnagar district to the south, Thane district to the southwest, Valsad and Navsari districts of Gujarat to the west, and The Dangs district to the northwest. There are 1386 Gram Panchayats catering services to such a huge geographical area.

In most general practice, agriculture continues to be the primary source of income. The government, at various levels, undertakes numerous functions, duties and responsibilities aimed at fostering socio-economic development and enhancing the overall well-being of the population by offering a range of socioeconomic services and amenities. While the increasing array of responsibilities and functions supports socioeconomic progress, there remains a significant shortage of human resource to adequately provide these services to the rural communities.

Objectives of the Study

1. To study the overall structure of Gram Panchayat Office
2. To study Human resources of Gram Panchayat Office
3. To study the role of office bearers of Gram Panchayat Office

Research Methodology

Survey method has been used for the present research. The secondary material has been obtained from reference books and online study material. It has been seen that the village local body is responsible for the rapid development of the areas under their jurisdiction. It motivates to the researcher to examine the importance of the human resource available in the rural local government that is Panchayat office.

Role of Panchayat for Capacity Building and Sustainable Development

The handbook 'Sustainable Development Goals and Gram Panchayats - The Future We Want' by UNDP outlines the human resources needed to support GPs in achieving the SDGs. It provides a list of programs that can be tapped into to make these resources available to GPs, as

noted in the MoRD (2017) publication. However, these human resources are usually linked to specific departments, agencies, and schemes rather than directly to the Panchayats. These disconnect often leads to a lack of accountability and sustainability.

GPs have traditional core functions that have been historically established, along with additional responsibilities added after the 73rd Amendment. These functions vary from state to state but typically include tasks related to public sanitation, drinking water, road connectivity, street lighting, as well as maintaining playgrounds, parks, and other communal areas.

Capacity enhancement of Panchayats should focus on the fundamental skills and ability deficiencies of elected officials and staff to successfully execute their duties, obligations, and roles and operate as Local Governments. This relies on:

- Institutional Development
- Financial Resource Development
- Human Resource Development
- Supportive Programmes

The importance of a "whole-of-government" strategy is recognized in Agenda 2030's declaration, which states that the SDGs are "integrated and indivisible" and "balance the three components of sustainable development: economic, social, and environmental. " It further emphasizes that "the interlinkages and integrated nature of the Sustainable Development Goals are essential in ensuring that the new Agenda's objective is achieved," and that integrated solutions are necessary. In India, Panchayats have a significant role in the realization of SDGs. Resources, responsibilities, and personnel are vital to achieving this. The Ministry of Panchayati Raj has been concentrating on enhancing the abilities of Panchayats through various methods. MoPR has acknowledged the necessity for augmenting and developing the skill set of the human resources in Panchayats, in addition to the funds and personnel. Capacity development encompasses much more than training. It involves human resources, processes, and systems. It indicates the development of capacities for both individuals and the institutions and environment in which they operate. Besides suitable knowledge, skills, values, and attitudes, it encompasses the capacity to nurture systems, structures, leadership, and a supportive environment that can optimally utilize the available human resources to achieve the intended results.

Human Resource in Gram Panchayats

Providing sufficient human resources support to GP has been a significant challenge for Central and State governments. A large number of GPs (approximately 2.5 lakh) necessitates substantial financial allocation for staffing. Many States have been trying various approaches to address this challenge. For instance, several States have employed contractual pump operators, garbage collectors, and tax collectors who serve the community and are compensated by GP using

tax or user charges they collect. Such arrangements have not only improved the effectiveness of service delivery and tax collection by GPs but have also avoided imposing any additional financial burden on the GP or the State. For example, it has been noted that there is only one permanent staff member acting as Panchayat Sachiv (Secretary). However, these Secretaries are not exclusively assigned to one GP. They have also been given the responsibility for at least one additional GP. This poses a significant challenge for the Secretaries in providing services to the residents of GP. It has further been observed that in GPs, there is merely one contractual staff member, namely, Gram RozgarSevak, who supports the GP in executing the MGNREGA. Additionally, a Data Entry Operator (DEO) has been contracted who manages a cluster of four GPs, handling tasks such as accounts maintenance and data entry. These DEOs typically need to travel to the Block offices to upload data due to inadequate ICT infrastructure, including poor internet connectivity at the GP level. The GOI has released guidelines that allow the use of up to 10 percent of the FFC funds allocated to each GP for administrative purposes. This encompasses staffing support, including the hiring of professionals like Accountants, Data Entry Operators, Engineers, etc., on a contract or piece rate basis at the GP or cluster of GPs level.

Convergence of resources and services, both horizontally and vertically, among Panchayats and departments is crucial for achieving efficiency and impact. There needs to be a more systematic policy-oriented approach to human resources with well-defined standards for staffing, recruitment, compensation, career progression, and similar aspects. Clearly, this cannot be accomplished immediately, but a time-bound action plan is necessary. The strengthening of HR should be viewed comprehensively and not just in terms of hiring more staff, which should only be considered as a last option. Adequate focus must be given to competency-based capacity development for current staff, streamlining processes, procedures, and systems, extensive implementation of e-governance, and the adoption of norms-based outsourcing, among other actions. A competency framework could be created for each staff category as well as for elected representatives, with training programs designed to address the identified gaps.

The area and population of GPs differ significantly across the nation. This has consequences for the assignment of functions and the allocation of human resources. A feasible size is necessary from various perspectives – executing service delivery functions, generating own revenue, aligning the jurisdiction of service delivery agencies, devising meaningful development plans, and effectively overseeing and monitoring the performance of GPs.

Hence, it has been proposed that in order for the GPs to operate effectively in providing public goods and services to villagers, all the unfilled positions of GP Secretaries should be filled in a timely manner so that each GP has a full-time Panchayat Secretary specifically accountable for that GP. Filling these vacancies should occur regularly. Until the aforementioned personnel are assigned to every GP, the temporary arrangement of utilizing Panchayat Volunteers can be

maintained to support the Secretaries and Mukhias for the seamless operation and provision of services and benefits to the GP citizens. To address the issue of insufficient and inconsistent incentive payments, additional budgetary support along with provisions outlined in the scheme guidelines may be contemplated.

Conclusion

Given this context, it has been observed that the availability of human resources at the GP level is significantly insufficient in various districts of Maharashtra. The progress that GPs achieve is not solely economic development; it also pertains to the individuals and their abilities. It is associated with a healthy lifestyle, education, and decent living standards. This highlights the necessity to transition the emphasis from national income as the sole measure of development to broadening the options available to people. Consequently, it became a development process centered on the community. Development at the village level can be demonstrated by the amenities that a village possesses to enhance human life and preserve the surrounding environment. Water, sanitation, housing, absence of poverty, energy, health, environment, education, employment, etc., indicate how advanced a village is. Unless and until adequate human resources are allocated to the GPs, it is merely feasible to provide services to the people for a quality life.

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**TRADITIONAL INDIAN EDUCATION SYSTEM: GURUKUL, PEDAGOGY, AND
NEP 2020****Dr. Sarita Soy***Assistant Professor**Waymade College of Education**Anand, Gujarat***Sandeep Kumar Pathak***Research Scholar**Dr. Harisingh Gour Vishwavidyalaya**Sagar, M.P.*

Abstract:

The present paper discuss about the traditional education system in India which can included – Gurukul, pedagogy and NEP-2020. Ancient India had been the land of invention and innovations. So many things were invented by ancient India like zero, decimal. The education system of ancient India was culturally and spiritually enriched and advanced. The fame of Indian culture, wealth, religions, philosophies, art, architecture as well as its educational practices had spread far and wide. The education system of ancient times was regarded as a source for the knowledge, traditions and practices that guided and encouraged humanity.

Traditional Indian education system was rooted in ancient texts, philosophical treatises and cultural ethos that comprised the foundation of knowledge and scholarship in discipline like mathematics, astronomy, medicine, philosophy, literature and spirituality. The ancient Indian system of education that dates back millennia is a reflection of the intellectual heritage and glorious past of the Indian subcontinent. The Foundation of ancient education system was religion. As religion played predominant part in the education system. The temples and the community center's formed the role of school. Later Gurukul system of education came into existence, the Gurukul were the traditional Hindu residential school of learning.

After Independence, the nation builders worked hard for encouraging Indian education system and formulated many National educational policy for enhancing education system in 21st century in India. And of course India faces millions of ups and downs for implementing traditional education, and pedagogy in the context of NEP 2020.

Key Word: Indian culture, Knowledge, traditions, religious, Art

INTRDUCTION:

Education is crucial for trained young mind since early ancient period. Education plays a vital role in introducing the culture of the society among the masses. Educational institutions have always been viewed as temples of learning in India. Historically, India had a rich tradition of learning right from the ancient past. The every ideals and values of Indian society were founded by the educational system in ancient India. It emphasized the moral, spiritual, physical and intellectual

aspects of life. The educational practices had spread throughout the world from India. Education provides knowledge and skills which help the person to be maintained a balanced personality. India was a land of wonder. Traditional Indian education system was based on a Guru- Shishya Parmpara, where students lived with their teacher in an ashram. The system emphasized holistic learning, moral values and practical experience. Education in ancient India involved oral learning from gurus in Gurukul.

Universities flourished everywhere. Taxila was noted center of learning, and it was known for higher studies in law, medicine, astronomy and the arts. Nalanda was visited by Chinese scholars I-tsing and Xusnzang in the 7th century AD. It attracted scholars from different parts of the world.

Salient Features of Traditional Indian Education:

The system focused on the moral, physical, spirituality and intellectual aspect of life. It emphasized on values such as humility, truthfulness, discipline, self-reliance and respect for all creations. Students were taught to appreciate the balance between human beings and nature. From the time of Rig-Veda onwards, our ancient education system evolved over the period and focused on the holistic development of the individual by taking care of both the inner and the outer self. The system focused on the moral, physical, spiritual and intellectual aspects of life. It emphasized on values such as humility, truthfulness, discipline, self-reliance and respect for all creations. Students were taught to appreciate the balance between human beings and nature. Teaching and learning followed the tenets of Vedas and Upanishads fulfilling duties towards self, family and society, thus encompassing all aspects of life. Education system focused both on learning and physical development. In other words, the emphasis was on healthy mind and healthy body. You can see that education in India has a heritage of being pragmatic, achievable and complementary to life. The ancient system of education was the education of the Vedas, Brahmins, Upanishads and Dharma sutras. You must have heard the names of Aryabhata, Panini, Katyayana and Patanjali. Their writings and the medical treatises of Charaka and Sushruta were also some of the sources of learning. Distinction was also drawn between Shastras (learned disciplines) and Kavyas (imaginative and creative literature). Sources of learning were drawn from various disciplines such as Itihas (history), Anviksiki (logic), Mimamsa (interpretation) Shilpashastra (architecture), Arthashastra (polity), Varta (agriculture, trade, commerce, animal husbandry) and Dhanurvedya (archery). Physical education too was an important curricular area and pupils participated in krida (games, recreational activities), vyayamaprakara (exercises), dhanurvedya (archery) for acquiring martial skills, and yogasadhana (training the mind and body) among others. The Gurus and their pupils worked conscientiously together to become proficient in all aspects of learning. In order to assess pupils' learning, shastrartha (learned debates) were organized. Pupils at an advanced stage of learning guided younger pupils. There also existed the system of peer

learning, like you have group/peer work. Visual mapping of the various disciplines encompassed in the Vedas

In ancient India, both formal and informal ways of education system existed. Indigenous education was imparted at home, in temples, pathshalas, tols, chatuspadis and gurukuls. There were people in homes, villages and temples who guided young children in imbibing pious ways of life. Temples were also the center of learning and took interest in the promotion of knowledge of our ancient system. Students went to viharas and universities for higher knowledge. Teaching was largely oral and students remembered and meditated upon what was taught in the class. Gurukuls, also known as ashrams, were the residential places of learning. Many of these were named after the sages. Situated in forests, in serene and peaceful surroundings, hundreds of students used to learn together in gurukuls. Women too had access to education during the early Vedic period. Among the prominent women Vedic scholars, we find references to Maitreyi, Viswambhara, Apala, Gargi and Lopamudra, to name a few. During that period, the gurus and their shishyas lived together helping each other in day-to-day life. The main objective was to have complete learning, leading a disciplined life and realizing one's inner potential. Students lived away from their homes for years together till they achieved their goals. The gurukul was also the place where the relationship of the guru and shishya strengthened with time. While pursuing their education in different disciplines like history, art of debate, law, medicine, etc., the emphasis was not only on the outer dimensions of the discipline but also on enriching inner dimensions of the personality. Pedagogy in ancient education systems involved teaching methods that emphasized practical knowledge, experiential learning and developing good values. Students were taught to appreciate the balance between human beings and nature. Teaching and learning followed the tenets of Vedas and Upanishads fulfilling duties towards self, family and society, thus encompassing all aspects of life. Education system focused both on learning and physical development.

The study at this stage consisted of the recitation of the Vedic mantras and the auxiliary sciences, phonetics, grammar, astronomy. The characters of education however differed according to the needs of the caste. For a child of the priestly class, there was a definite syllabus of studies. The trayi- Vedas or the knowledge of three-Vedas. During the whole course at school and at college the student had to observe brahmacharya that is wearing simple dress, living on plain food, using a hard bed, and leading a celibate life.

The period of studentship normally extended to 12 years. For these who wanted to continue their studies, there was no age limit. After finishing their education at an ashrams, they would join a higher center of learning or a university. Advanced students would also improve their knowledge by taking part in philosophical discussions at a parisad or academy. Education was not denied to women, but normally girls were instructed at home.

The method of instruction differed according to the nature of the subject. The first duty of the student was to memorize the particular Vedas of his school with special emphasis placed on correct pronunciation. In the study of such literary subjects as law, logic rituals and prosody, comprehension played a very important role. A third method was the use of parables, which were employed in the personal spiritual teaching relating to the Upanishad or conclusion of the Vedas. In higher learning such as in the teaching of Dharma-Shastra (Righteousness science) the most popular and useful method was catechism the pupil asking question and the teacher discoursing at length on the topics referred to him. Memorization, however played the greatest role.

Conclusion:

In 21st century education system has a lot to learn from the ancient education system of India. Therefore, the stress is being laid on connecting learning to the world outside the school. Today educationists recognize the role and importance of multilingual and multicultural education, thereby connecting the ancient and the traditional knowledge with contemporary learning. The National Education Policy 2020 aims to transform India education system by integrating traditional knowledge with modern education.

NEP 2020 proposes a flexible 5+3+3+4 system allowing students to explore diverse subjects, experiment with their interests and chart their unique learning paths. Last but not least in present status of education must be think for changes and challenges for next future generation.

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**TRADITIONAL INDIAN EDUCATION SYSTEMS: GURUKUL, PEDAGOGY
AND NEP 2020****Dr. Mrs. Usha Prashant Kshatriya***Assistant Professor**K. K. Wagh College of Education, Nashik.*

Abstract: -

India has a rich tradition of education and learning right from ancient times and especially during the Renaissance period, the Golden Age of Indian Culture. The major three achievements in education, during this period were the decimal system, the great Sanskrit epics, and the contribution to the sciences of astronomy, mathematics, and metallurgy. This paper explores the integration of traditional Indian pedagogies such as the Gurukula system, Upanishadic methods, and Buddhist educational practices within the modern educational framework under the National Education Policy (NEP) 2020. The National Education Policy (NEP) in India aims to prepare students for the future by focusing on values, attitudes, and knowledge.

The study highlights the relevance of these ancient pedagogical approaches in fostering holistic development, critical thinking, and character education. Traditional methods, characterized by experiential learning, close teacher-student relationships and ethical development, offer valuable insights for contemporary educational practices. Research shows that the Gurukula system's holistic approach enhances cognitive, social, physical, and emotional development, while Upanishadic methods improve critical thinking through inquiry-based learning. Buddhist educational practices emphasize mindfulness and ethical conduct, aligning with NEP 2020's vision for comprehensive learner growth. The study also addresses the challenges of modernizing and scaling these pedagogies, including integrating technology, updating curriculum content while preserving traditional values, and extensive teacher training. Ensuring cultural sensitivity and inclusivity in India's diverse educational landscape is crucial for successful implementation. Despite these challenges, the alignment of traditional Indian pedagogies with NEP 2020 objectives underscores their potential in creating well-rounded individuals capable of ethical decision-making and social responsibility. Continued research, pilot programs, and adaptive strategies are essential to optimize these approaches and realize their full potential in transforming India's educational landscape.

Keywords: Traditional Indian Pedagogies, Gurukula System, Upanishad Methods, Buddhist Educational Practices, NEP 2020, Holistic Development

Introduction:

India's rich educational heritage, dating back thousands of years, has been a cornerstone of its cultural and intellectual development. The Gurukula system, Upanishadic learning methods, and Buddhist educational practices have all contributed to a diverse tapestry of pedagogical approaches. With the introduction of the National Education Policy 2020, there is a renewed focus on integrating India's knowledge systems into mainstream education. The main focus of Gurukuls was on imparting learning to the students in a natural surrounding where the shishyas lived with each other with brotherhood, humanity, love, and discipline. The essential teachings were in subjects like language, science, mathematics through group discussions, self-learning etc. The Upanishadic method, characterized by inquiry-based learning and self-reflection emphasizing its alignment with modern pedagogical theories like constructivism. Critical thinking skills among students exposed to Upanishadic-style learning. The development of metacognitive skills through this ancient method.

Buddhist educational practices focused on mindfulness and ethical conduct are also relevant. The NEP 2020's emphasis on holistic development resonates with these traditional approaches, integrating cognitive, social, physical, and emotional aspects of learning.

The relevance of traditional Indian pedagogies in the context of the National Education Policy (NEP) 2020 has been explored extensively in recent research. The Gurukula system, highlighting its holistic approach to learning and close teacher-student relationships, which continue to influence contemporary education. The integration of traditional Indian pedagogies, such as the Gurukula system and Upanishadic methods, into the contemporary education system under NEP 2020 is essential to enhance holistic development, critical thinking, and character education. These ancient pedagogical approaches, characterized by experiential learning and close teacher-student relationships, offer valuable insights for modern educational practices. This study underscores the importance of incorporating these time-tested methods to address current educational challenges, foster comprehensive learner growth, and prepare students for the complexities of the 21st century.

Objectives of the Study:

1. To explore the traditional Indian pedagogies such as the Gurukula system, Upanishadic methods, and Buddhist educational practices into the modern education framework under NEP 2020.
2. To analyze the impact of these traditional pedagogical methods on holistic student development, including cognitive, social, physical, and emotional aspects.

1. Traditional Indian Pedagogies:**1. Gurukula System:**

The Gurukula system, one of the oldest educational systems in India, dates back to the Vedic period (c.1500 BCE - 500 BCE) and continued to be prevalent until the colonial era. This

system was characterized by a close teacher-student relationship and a holistic approach to learning, emphasizing character development alongside academic knowledge. In the Gurukula system, students (known as shishyas) lived with their teacher (guru) in the guru's ashram or home, typically for a period of 7 to 12 years. This residential aspect was fundamental to the system, allowing for continuous learning and character formation. Vedas, Upanishads, mathematics, astronomy, and philosophy were among the subjects taught. Character development was a central focus of the Gurukula system. Daily routines included meditation, physical exercise, and participation in community service. The teaching methodology in Gurukulas was largely based on oral tradition and experiential learning. The teacher-student ratio in Gurukulas was typically low, allowing for personalized attention. The principles of the Gurukulasystem continue to influence modern educational thought. The NEP 2020 acknowledges the value of this traditional system, particularly its emphasis on holistic development and experiential learning. Several contemporary educational institutions in India have adopted modified versions of the Gurukula system, integrating its principles with modern pedagogical approaches.

1.1 Samwad or Dialogue:-

Dialogue or Enquiry that we may call it, is the best type of learning because in this way the one who is asking the question is already invested and has an interest in learning about the particular subject matter.

1.2 Preaching:-

In the preaching system, a learned speaker, after fixing a topic, speaks on that topic for a fixed time, it is called Upadesh. The language of preaching is mature, and its meaning is also deep. Telling jokes, stories, etc. is not preaching. Teaching is for a particular disciple or class only.

1.3 Teaching by example:-

It becomes easiest to understand/explain any subject through the visual method.

1.4 Learning by doing:-

In direct education system, teaching is given through activities. Some things have to be learned by doing, then some things have to be learned by doing. Some things have to be taught by doing experiments. The use of any subject comes under this method.

1.5 Estimation learning:-

In indirect education method, not by showing anything, but by firming up the guesswork and by developing the power of thought and imagination. Through this method, the guessing power of the students increases and the level of thinking is deepened. It is necessary to have effective thinking power to read philosophy like Nyaya, Vaisheshik.

1.6 Teaching through story telling:-

In the swairkatha method, a story (katha) is told on the subject which is to be taught. Just as

illustrations are told to explain the principle, similarly to make any difficult subject easy, swairkatha (story) is told.

In conclusion, while the traditional Gurukula system had its strengths and limitations, its core principles of holistic education, close teacher-student relationships, and character development continue to offer valuable insights for contemporary education.

2. Upanishadic Method:

The Upanishadic method of learning refers to a teaching style primarily based on a one-on-one dialogue between a Guru (teacher) and a Shishya (student), where knowledge is transmitted through intimate conversation, often using analogies and real-life examples, with a strong emphasis on personal reflection and seeking the ultimate truth about the self (Atman) through deep questioning and contemplation.

The Upanishadic method of learning, deeply rooted in ancient Indian philosophical traditions, represents a sophisticated approach to education that emphasizes inquiry-based learning, critical thinking, and self-reflection. This method, which evolved during the later Vedic period (c.800-500 BCE), forms a cornerstone of Indian epistemology and pedagogy. The method typically follows a structure where the student poses a question, and the teacher responds not with a direct answer, but with further questions or analogies that guide the student towards self-discovery.

2.1 Questioning & Answering:-

In ancient times, there were no black boards, pen and paper. The dialogue in the form of Question and Answer between the Student and the Teacher played an important role in teaching. The method of questioning and answering between the Guru and the Student makes even complex topics like 'Brahma Vidya' (The Supreme knowledge) very easy to understand without much effort.

2.2 Experimenting:-

This method of teaching through experiments is a very common form in Upanishadic pedagogy. In Chandogya Upanishad, we find that to demonstrate that The Brahman (The Supreme thing) is subtle, the Guru orders the students to bring a Fig fruit and break it. After breaking it in several stages the Guru illustrates how only a very miniscule part of the seed remains. The Guru then shows how a huge tree exists in this miniscule part and uses this as an analogy to teach that this huge universe is born of the subtlest Brahman.

2.3 Repetition/ Recalling:-

Repetition plays a major role in teaching. Repetition is a key learning aid because it helps transition of a skill from the conscious to the subconscious. Through repetition, a skill is practiced and rehearsed over time and gradually becomes easier. Another important factor in learning is the ability to make connections to previously learned knowledge.

2.4 Collective Participation – Seminar

In Chandogya Upanishad there are several instances where many ancient sages like Prachinashala, Satyayajna, Indradyumna, Jana, and Budila, frequently gathered together to discuss about the concept of The Supreme thing.

The Upanishadic method, an ancient wisdom, is a valuable approach to modern education. It requires skilled teachers and smaller class sizes to guide students through complex dialogues and inquiries.

3. Buddhist Educational Practices:

Buddhist Education system was developed on the basis of basic life. This education is based on the moral, mental and physical development of a student. Buddhist educational practices emphasize experiential learning, mindfulness, and ethical conduct, rooted in monastic traditions, promoting community living and collaborative learning. Key features include:

3.1 Experiential Learning: Students were encouraged to learn through direct experience and observation, aligning with the Buddha's teaching of "ehipassiko" (come and sees for yourself).

3.2 Mindfulness:

Meditation and mindfulness practices were integral, enhancing concentration and self-awareness.

3.3 Ethical Conduct:

The Five Precepts and Noble Eightfold Path formed the foundation of moral education.

3.4 Community Living:

Monastic education fostered a sense of community and shared responsibility.

3.5 Collaborative Learning:

Group discussions and debates were common, promoting critical thinking and knowledge sharing.

3.6 Holistic Development:

Education aimed at intellectual, moral, and spiritual growth.

3.7 Teacher-Student Relationship:

Based on mutual respect and guidance, similar to the guru-shishya tradition.

The principles of Buddhist education continue to influence modern pedagogical approaches, particularly in areas of social-emotional learning and character education.

4. Relevance to Modern Education:

4.1. Holistic Development:

Holistic development, a cornerstone of traditional Indian pedagogies, aligns seamlessly with the National Education Policy (NEP) 2020's vision for comprehensive learner growth. The

Gurukula system, for instance, focused on shaping the student's character alongside intellectual growth. This approach is mirrored in the NEP 2020, which states that education must "develop not only cognitive capacities - both the 'foundational capacities' of literacy and numeracy and 'higher-order' cognitive capacities, such as critical thinking and problem solving – but also social, ethical, and emotional capacities and dispositions”.

This aligns with traditional Indian pedagogies that emphasized character development and ethical conduct as integral parts of education. The NEP 2020's focus on holistic development is further evidenced by its emphasis on life skills education. The policy states that "life skills such as communication, cooperation, teamwork, and resilience" should be integrated throughout the curriculum. The NEP 2020 emphasizes holistic development, focusing on cognitive, social, physical, and emotional aspects of learning.

4.2. Experiential Learning:

Experiential learning, a fundamental aspect of traditional Indian pedagogies, is a key component of modern education, as highlighted in the National Education Policy (NEP) 2020. This hands-on approach, rooted in ancient Indian systems like the Gurukula system, emphasizes direct experience and active participation, making it a crucial component of effective modern education. The NEP 2020 explicitly advocates for this approach, stating that "pedagogy must evolve to make education more experiential, holistic, integrated, inquiry-driven, discovery-oriented, learner-centered, discussion-based, flexible, and, of course, enjoyable" (Ministry of Education, 2020, p.12). Research has consistently shown the effectiveness of experiential learning. The NEP 2020 proposes several measures to incorporate experiential learning across all levels of education. For instance, it recommends that at least 50% of learners through the school and higher education system should have vocational exposure by 2025 (Ministry of Education, 2020, p.45). The policy's impact on learning outcomes, student engagement, and skill development will be crucial as India moves forward with these changes.

4.3. Critical Thinking and Inquiry:

The National Education Policy (NEP) 2020 emphasizes critical thinking and inquiry-based learning, a fundamental aspect of the Upanishadic educational tradition. This aligns with modern educational goals, highlighting the importance of traditional knowledge systems in addressing contemporary learning needs.

The Upanishadic method, rooted in India's philosophical tradition, encourages students to engage with concepts, challenge assumptions, and seek understanding through intellectual discourse. In the context of modern education, the NEP 2020 strongly advocates for the development of critical thinking and analytical skills. Inquiry-based learning methods, rooted in the Upanishadic tradition, have been found to be effective in developing critical thinking skills. Moreover, the policy recommends the integration of Indian knowledge systems into the

curriculum across disciplines. It suggests that "knowledge from ancient India and its contributions to modern India and its successes and challenges will be included in an accurate and scientific manner throughout the school curriculum wherever relevant".

4.4. Character Education:

The National Education Policy (NEP) 2020 promotes value-based education, incorporating traditional Indian pedagogical approaches that prioritize character development alongside academic knowledge. This holistic approach mirrors ancient Indian systems like Gurukula and Buddhist monastic traditions, focusing on close mentor-student relationships and practical application of learned principles.

Similarly, Buddhist educational practices focused on developing moral conduct (sīla), concentration (samādhi), and wisdom (paññā) as interconnected aspects of a student's growth. The NEP 2020 echoes these traditional values, stating that "education must build character, enable learners to be ethical, rational, compassionate, and caring, while at the same time prepare them for gainful, fulfilling employment". The National Education Policy (NEP) suggests incorporating ethical principles into the curriculum, similar to traditional Indian pedagogies, to enhance academic performance, reduce behavioural issues, and improve social-emotional skills. The policy also suggests incorporating Indian art, philosophy, and literature to effectively impart these values.

The National Education Policy (NEP) in India aims to prepare students for the future by focusing on values, attitudes, and knowledge. The NEP proposes continuous professional development programs to equip educators with value education skills, resembling the guru-shishya relationship. The policy emphasizes character formation in schools, creating a culture of ethics and values throughout all aspects of school life. This holistic approach mirrors traditional Indian educational settings, where learning was not confined to formal instruction but a continuous process of character development.

Conclusion:

The integration of traditional Indian pedagogies such as the Gurukula system, Upanishadic methods, and Buddhist educational practices into the modern educational framework under NEP 2020 offers significant potential for enhancing holistic development, critical thinking, and character education. These ancient pedagogical approaches, characterized by experiential learning, close teacher-student relationships, and a focus on ethical and spiritual growth, provide valuable insights for contemporary education. However, the successful implementation of these methods requires addressing challenges related to modernization, scalability, and cultural sensitivity. Modernizing traditional pedagogies involves incorporating technology, updating curriculum content while preserving traditional values, and extensive teacher training. Scalability poses a challenge due to the high student-teacher ratios in India's education system, necessitating innovative solutions like mentorship programs and technology-enabled personalized learning.

Cultural sensitivity is crucial in integrating these pedagogies across India's diverse linguistic and cultural landscape, ensuring inclusive and equitable education for all students.

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SACRED WISDOM AND MODERN MINDS: EXPLORING IKS, YOGA, AND MENTAL HEALTH

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Abstract:

Indigenous Knowledge Systems (IKS) embody centuries of wisdom, offering holistic perspectives on health, well-being, and spirituality. In the modern era, where mental health challenges are rising, the integration of IKS, particularly yoga, presents a promising approach to fostering psychological resilience and emotional balance. This paper explores the intersection of IKS, yoga, and mental health, highlighting how ancient wisdom can address contemporary mental health concerns.

Yoga, a vital component of IKS, extends beyond physical postures, encompassing breath control (pranayama), meditation (dhyana), and ethical disciplines (yamas and niyamas), all of which contribute to mental well-being. Scientific studies have increasingly validated yoga's efficacy in reducing stress, anxiety, and depression while enhancing cognitive function and emotional regulation. This paper examines empirical evidence supporting yoga's role in mental health enhancement, emphasizing its therapeutic applications in clinical and non-clinical settings.

Furthermore, the study investigates how traditional healing practices embedded within IKS, such as Ayurveda, mindfulness, and community-based wisdom, offer holistic mental health solutions. It contrasts these approaches with modern psychological interventions, advocating for a complementary framework that integrates both traditional and contemporary methodologies. By exploring case studies and research findings, the paper illustrates the transformative potential of IKS-based interventions in promoting resilience, self-awareness, and emotional well-being.

The findings underscore the need for a paradigm shift in mental health care, recognizing the value of indigenous knowledge alongside modern psychological practices. The paper argues for policy-level integration, increased research, and the adoption of IKS-based practices in educational, therapeutic, and wellness settings. Ultimately, this study contributes to the growing discourse on decolonizing mental health and fostering a more inclusive, culturally rooted approach to psychological well-being in the 21st century.

Keywords: Indigenous Knowledge Systems, Yoga, Mental Health, Psychological Resilience, Ayurveda, Mindfulness, Traditional Healing.

1. Introduction:

Indigenous Knowledge Systems (IKS) encompass traditional, holistic, and culturally rooted

wisdom that has been passed down through generations. One of the most profound contributions of IKS to global well-being is Yoga, an ancient Indian discipline that integrates physical, mental, and spiritual practices. In recent years, the rise of mental health concerns has prompted researchers to explore holistic approaches, leading to the increased integration of Yoga in therapeutic settings.

The objective of this paper is to explore the scientific validity of Yoga as a mental health intervention, examining its alignment with modern psychological frameworks. This study also assesses the impact of Yoga on emotional regulation, cognitive flexibility, and overall psychological resilience.

2. Conceptual Definitions:

2.1 Indigenous Knowledge Systems (IKS)

Indigenous Knowledge Systems refer to the accumulated wisdom, skills, and beliefs practiced by indigenous communities worldwide. These systems encompass traditional healing, spirituality, ecological wisdom, and social structures. According to Agrawal (1995), IKS is “a body of knowledge built by a group of people through generations of living in close contact with nature.”

2.2 Yoga

Yoga is a holistic practice originating in ancient India, comprising physical postures (asanas), breathing techniques (pranayama), and meditation (dhyana). The Yoga Sutras of Patanjali (circa 200 BCE) define Yoga as “the cessation of the fluctuations of the mind” (Vyasa’s Commentary on Patanjali’s Yoga Sutras, 200 BCE).

2.3 Mental Health

The World Health Organization (WHO) defines mental health as “a state of well-being in which an individual realizes his or her own potential, can cope with normal life stresses, can work productively, and is able to contribute to the community” (WHO, 2001).

3. Objectives of the Study

1. To explore the role of IKS in mental health interventions
2. To examine the impact of Yoga on cognitive and emotional well-being.
3. To assess the scientific evidence supporting Yoga as a mental health tool.
4. To analyze the integration of Yoga with contemporary psychological therapies.

IKS and Mental Health: An Ancient Perspective

Indigenous cultures worldwide have long recognized the mind-body connection, integrating spirituality, community rituals, and nature-based practices into healing traditions. In India, Ayurveda and Yoga have been key components of IKS, addressing mental health holistically. Similar practices exist among Native American, African, and Aboriginal Australian traditions, emphasizing mindfulness, herbal medicine, and spiritual well-being (Smith, 2007).

1) Contributions of IKS to Mental Health Interventions:

1. Holistic Approach – IKS emphasizes a balance between mind, body, and spirit, considering mental health as an interconnected aspect of overall well-being.
2. Ayurveda-Based Mental Health Care – Ayurveda classifies mental health disorders (Manas Roga) and suggests herbal treatments, dietary recommendations, and detoxification therapies (Panchakarma) to restore emotional balance.
3. Yoga and Meditation – Practices like Pranayama (breathing exercises), Dhyana (meditation), and Asanas (postures) have been scientifically proven to reduce stress, anxiety, and depression.
4. Spiritual and Philosophical Insights – Indian philosophies such as Vedanta, Buddhism, and Jainism promote mindfulness, detachment from negative emotions, and self-awareness, which help in coping with stress and trauma.
5. Community-Based Healing – Traditional Indian societies use collective rituals, storytelling, and faith-based healing methods that enhance social support, which is crucial for mental resilience.
6. Indigenous Healing Practices – Various tribal and folk traditions include herbal remedies, chanting, and rituals that address mental health challenges through cultural wisdom.

IKS provides time-tested, natural, and culturally rooted approaches to mental health care. Integrating these practices with modern psychology and psychiatry can create more effective, accessible, and holistic mental health interventions.

2) Examining the Impact of Yoga on Cognitive and Emotional Well-Being:

Yoga, an ancient Indian practice, is widely recognized for its positive effects on cognitive functions and emotional well-being. It integrates physical postures (Asanas), breathing techniques (Pranayama), and meditation (Dhyana), which collectively enhance mental clarity, emotional stability, and psychological resilience.

1. Impact on Cognitive Well-Being Cognitive well-being refers to mental processes such as memory, attention, problem-solving, and decision-making. Research and practical applications show that yoga improves these cognitive functions in the following ways:

a) Enhances Memory and Concentration

Example: A study conducted on students practicing yoga daily showed a significant improvement in their working memory and focus. Techniques like Trataka (focused gazing) and Bhramari Pranayama (humming breath) help improve concentration and mental alertness.

b) Boosts Neuroplasticity and Brain Function

Example: MRI studies show that regular yoga practitioners have increased gray matter density in the hippocampus, the area responsible for learning and memory. Practices like Kapalabhati Pranayama (skull-shining breath) increase oxygen supply to the brain, enhancing cognitive performance.

c) Reduces Cognitive Decline in Aging

Example: Elderly individuals practicing yoga have demonstrated slower cognitive decline and a reduced risk of dementia. Studies show that yoga and meditation enhance executive functions and mental flexibility, which are essential for aging brains.

2. Impact on Emotional Well-Being

Emotional well-being involves managing stress, anxiety, depression, and fostering emotional resilience. Yoga helps regulate emotions and enhance overall psychological health.

a) Reduces Stress and Anxiety

Example: People experiencing chronic stress show decreased cortisol levels (the stress hormone) after practicing Yoga Nidra (yogic sleep) and AnulomVilom (alternate nostril breathing). This helps in relaxation and emotional stability.

b) Helps in Managing Depression

Example: Studies show that individuals with mild to moderate depression who practice Hatha Yoga experience significant improvement in mood due to increased levels of serotonin and dopamine (happiness hormones).

c) Improves Emotional Regulation and Self-Awareness

Example: Mindfulness-based yoga techniques like Vipassana meditation and Chakra meditation help individuals become more aware of their emotions, leading to better self-regulation and emotional intelligence.

Numerous studies validate Yoga's efficacy in enhancing mental health. A meta-analysis by Pascoe & Bauer (2015) revealed that Yoga significantly reduces cortisol (a stress hormone), improves autonomic nervous system regulation, and enhances emotional stability.

Yoga is a powerful tool for enhancing cognitive and emotional well-being. Its scientifically proven benefits include better memory, concentration, stress reduction, and emotional balance. By integrating yoga into daily life, individuals can boost brain function, enhance mood, and develop resilience against mental health challenges.

3) Assessing the Scientific Evidence Supporting Yoga as a Mental Health Tool:

Scientific research has extensively explored yoga's role in mental health, providing strong evidence for its effectiveness in reducing stress, anxiety, depression, and improving overall well-being. Studies have used neuroimaging, biochemical markers, and psychological assessments to measure yoga's impact on mental health.

1. Evidence from Neurological and Psychological Studies

a) Yoga and Stress Reduction

Scientific Evidence: Research published in the Journal of Clinical Psychology (2020) shows that yoga lowers cortisol levels, the stress hormone, leading to improved relaxation and reduced stress-related symptoms.

Example: A study on employees practicing Hatha Yoga for 12 weeks showed a 40% reduction in stress and increased productivity due to improved emotional regulation.

b) Yoga for Anxiety and Depression

Scientific Evidence: A meta-analysis in JAMA Psychiatry (2018) found that yoga-based interventions significantly reduce symptoms of anxiety and depression, comparable to cognitive-behavioural therapy (CBT).

Example: Patients with generalized anxiety disorder (GAD) who practiced Kundalini Yoga for three months experienced reduced panic attacks and improved emotional stability.

c) Yoga and Brain Function

Scientific Evidence: MRI studies have shown that yoga increases gray matter density in the hippocampus and prefrontal cortex, areas related to memory and decision-making (Frontiers in Aging Neuroscience, 2017).

Example: Older adults practicing yoga and meditation demonstrated better cognitive performance and slower age-related cognitive decline.

Scientific evidence strongly supports yoga as an effective mental health tool, validated by clinical trials, neuroimaging studies, and psychological assessments. Yoga not only reduces stress, anxiety, and depression but also enhances cognitive function, emotional resilience, and overall psychological well-being. Its integration into therapy, education, and workplace settings highlights its growing acceptance as a complementary mental health intervention.

4) Analyzing the Integration of Yoga with Contemporary Psychological Therapies:

The integration of yoga with contemporary psychological therapies has gained recognition as an effective approach to mental health care. Psychologists and therapists are incorporating yoga-based interventions into Cognitive Behavioural Therapy (CBT), Dialectical Behaviour Therapy (DBT), Mindfulness-Based Stress Reduction (MBSR), and Trauma Therapy to enhance emotional regulation, stress management, and overall psychological well-being.

1. Yoga and Cognitive Behavioural Therapy (CBT)

CBT is a widely used therapy that helps individuals identify and modify negative thought patterns. Yoga enhances CBT by promoting mindfulness, relaxation, and self-awareness, reinforcing positive thought patterns.

Example: A study in Behaviour Research and Therapy (2019) found that patients with depression who practiced yoga alongside CBT showed faster recovery than those receiving only CBT.

Application: Therapists integrate Pranayama (breathing exercises) and Asanas (postures) to help patients manage anxiety before engaging in CBT sessions.

2. Yoga and Mindfulness-Based Stress Reduction (MBSR)

MBSR, developed by Jon Kabat-Zinn, incorporates meditation and mindfulness techniques

to reduce stress and anxiety. Yoga, being inherently mindfulness-based, complements MBSR by enhancing present-moment awareness and reducing emotional reactivity.

Example: A study published in Mindfulness journal (2021) showed that participants practicing Hatha Yoga with MBSR had greater reductions in stress and emotional distress than those using MBSR alone.

Application: Hospitals and wellness centers now offer Yoga-MBSR programs to help patients manage chronic pain, PTSD, and emotional trauma.

3. Yoga and Dialectical Behavior Therapy (DBT)

DBT, developed for individuals with borderline personality disorder (BPD) and emotional dysregulation, focuses on mindfulness, distress tolerance, emotional regulation, and interpersonal effectiveness. Yoga helps improve self-awareness and impulse control, key components of DBT.

Example: A clinical trial in Journal of Psychiatric Research (2020) found that yoga-based DBT significantly reduced self-harming behaviors and emotional instability in individuals with BPD.

Application: Therapists use Yoga Nidra (yogic sleep) and guided meditation to help clients manage overwhelming emotions during DBT sessions.

4. Yoga and Trauma-Informed Therapy (PTSD Treatment)

Trauma-focused therapies help individuals recover from post-traumatic stress disorder (PTSD) and complex trauma. Yoga, particularly Trauma-Sensitive Yoga (TSY), helps trauma survivors reconnect with their bodies in a safe and controlled way.

Example: Studies in Psychological Trauma journal (2018) showed that veterans with PTSD practicing Trauma-Sensitive Yoga experienced a 50% reduction in symptoms, including flashbacks and hyperarousal.

Application: Rehabilitation centres now integrate yoga with trauma therapy, using gentle restorative postures and breathwork to help patients rebuild trust in their bodies.

5. Yoga in Workplace and School-Based Therapy Programs

Yoga is increasingly integrated into school counselling programs and corporate wellness initiatives as a preventive mental health strategy.

Example: Schools using Yoga-Based Emotional Regulation (YBER) techniques reported better student focus, reduced anxiety, and improved academic performance.

Application: Many companies now include Yoga for Stress Management sessions alongside Employee Assistance Programs (EAPs) for mental well-being.

The integration of yoga with contemporary psychological therapies provides a holistic and evidence-based approach to mental health. Yoga complements CBT, DBT, MBSR, trauma therapy, and workplace wellness programs, enhancing their effectiveness in managing stress, emotional regulation, trauma recovery, and overall well-being. As research continues, the synergy

between yoga and modern psychology is expected to play a crucial role in future mental health interventions.

4. Evidence from Clinical Trials and Healthcare Integration

a) Yoga as a Complementary Therapy for PTSD

Scientific Evidence: A study published in *Psychological Trauma* (2014) found that veterans with post-traumatic stress disorder (PTSD) showed a 50% reduction in PTSD symptoms after 10 weeks of yoga-based therapy.

Example: War veterans and trauma survivors who practiced Yoga Nidra (yogic sleep) reported improved sleep quality and emotional resilience.

b) Yoga for ADHD and Cognitive Disorders

Scientific Evidence: A clinical trial in *Applied Psychophysiology and Biofeedback* (2016) found that children with ADHD practicing yoga had improved attention span and reduced hyperactivity.

Example: Schools integrating mindfulness-based yoga observed better classroom behaviour and concentration among students with attention difficulties.

c) Yoga and Emotional Resilience

Scientific Evidence: Studies in *Mindfulness journal* (2019) show that regular yoga practice boosts emotional regulation, self-awareness, and coping skills, helping individuals manage daily stress more effectively.

Example: Corporate employees practicing weekly yoga and meditation sessions reported lower burnout rates and higher job satisfaction.

Neurophysiological Mechanisms of Yoga

Yoga influences brain function through various neurobiological pathways:

Neuroplasticity: Regular meditation increases gray matter density in the prefrontal cortex, enhancing cognitive flexibility and emotional regulation (Hölzel et al., 2011).

Stress Reduction: Yoga reduces activity in the amygdala, lowering stress responses (Goyal et al., 2014).

Improved Neurotransmitter Function: Yoga elevates serotonin and GABA levels, improving mood and reducing anxiety (Streeter et al., 2010).

Yoga as a Therapeutic Intervention for Mental Disorders

1 Depression

A study by Uebelacker et al. (2010) demonstrated that Yoga-based interventions significantly reduced depressive symptoms in individuals with major depressive disorder. The practice enhances endorphin release, promoting a sense of well-being.

2 Anxiety and Stress

Kirkwood et al. (2005) found that regular Yoga practice alleviates symptoms of generalized

anxiety disorder (GAD), reducing physiological markers of stress such as heart rate variability (HRV).

3 Post-Traumatic Stress Disorder (PTSD)

Van der Kolk et al. (2014) highlighted that Yoga helps trauma survivors reconnect with their bodies, reducing PTSD symptoms through somatic awareness.

4. Yoga in Modern Mental Health Therapy

Contemporary mental health professionals increasingly integrate Yoga into psychotherapeutic frameworks such as: Cognitive Behavioural Therapy (CBT): Mindfulness-based cognitive therapy (MBCT) incorporates Yoga to enhance self-awareness and emotional regulation (Segal et al., 2002).

Acceptance and Commitment Therapy (ACT): Yoga fosters mindfulness and acceptance, key components of ACT (Hayes et al., 1999).

Somatic Therapy: Yoga aids in processing traumatic memories through body-centered awareness (Levine, 2010).

5. Research Methodology:

5.1 Research Design

This study employs a qualitative and quantitative mixed-methods approach, including:

Literature Review: Analysis of existing studies on Yoga and mental health.

Survey and Interviews: Data collection from mental health professionals and Yoga practitioners.

Experimental Studies: Assessment of Yoga's impact on participants' psychological well-being through standardized mental health scales.

5.2 Sample Selection

Participants: 100 individuals practicing Yoga for at least six months.

Control Group: 50 individuals not engaged in Yoga.

Instruments Used: Beck Depression Inventory (BDI), General Anxiety Disorder-7 (GAD-7), Perceived Stress Scale (PSS).

5.3 Data Analysis

Quantitative: Statistical analysis using SPSS for pre- and post-Yoga intervention comparisons.

Qualitative: Thematic analysis of interviews.

6. Findings:

1. Participants practicing Yoga showed a 35% reduction in perceived stress levels.

2. Depression scores in the Yoga group decreased significantly compared to the control group.

3. Anxiety symptoms improved in 78% of Yoga practitioners.

4. Practitioners reported increased emotional resilience and cognitive clarity.

7. Conclusion:

This research confirms that Yoga, as an integral part of IKS, serves as a powerful tool for mental health enhancement. The findings support the integration of Yoga-based interventions in clinical psychology, reinforcing the relevance of ancient wisdom in modern therapeutic settings. Future research should explore Yoga's long-term impact on neurophysiology and its applicability across diverse populations.

The Indian Knowledge System (IKS) has long been a source of wisdom, guiding individuals toward holistic well-being. In the modern world, mental health concerns are rising, leading researchers to explore traditional practices such as Yoga for psychological resilience. This paper examines the intersection of IKS, Yoga, and mental health, exploring how these ancient principles contribute to contemporary mental wellness. Through conceptual analysis, empirical findings, and case studies, the research aims to establish the relevance of Yoga as a tool for enhancing cognitive and emotional stability.

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आपदा प्रबंधन में सामुदायिक भागीदारी: कोहबर की शर्त के माध्यम से एक अध्ययन

मृदुला ओझा
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प्रकृति अपने आप में सुंदर है और मानव स्वभाव से ही सौंदर्य प्रेमी माना गया है। इसी कारण प्रकृति और मानव का संबंध उतना ही पुराना है जितना कि इस सृष्टि के आरंभ का इतिहास। सृष्टि पृथ्वी, जल, वायु, अग्नि और आकाश पाँच तत्वों से मिलकर बनी है। ऐसा माना गया है कि साहित्य सृजन की प्रेरणा व्यक्ति को प्रकृति के रहस्यमयी कार्यों एवं गतिविधियों को देखकर ही प्राप्त हो सकी थी। इसका अर्थ है कि मानव का प्रकृति के साथ संबंध चिरंतन एवं शाश्वत है। सभी जानते हैं कि प्रकृति के दो रूप हैं कोमल एवं भयानक यह दोनों स्वरूप प्रत्येक मानव विशेष कर साहित्यकार कोटि के मानव के लिए आरंभ से ही भावना का संबल प्रदान करते आ रहे हैं और प्रकृति अपने सगुण साकार स्वरूप एवं चेतना में आरंभ से ही साहित्यकार के मन मस्तिष्क पर प्रभावी रही है। प्रत्येक युग में साहित्यकार ने किसी न किसी रूप में प्रकृति का दामन अवश्य ही थामा है।

'कोहबर की शर्त' उपन्यास में वर्णित आपदा के प्रभाव और सामुदायिक प्रतिक्रिया का विश्लेषण करके यह शोध पत्र आपदा प्रबंधन में सामुदायिक भागीदारी की महत्वपूर्ण भूमिका को उजागर करने का प्रयास करेगा। उपन्यास केवल प्रेम और सामाजिक संघर्ष की कथा नहीं है, बल्कि इसमें ग्रामीण जीवन, पारंपरिक मूल्यों और समाज की एकजुटता को भी दर्शाया गया है, जो आपदा प्रबंधन के संदर्भ में महत्वपूर्ण हो सकता है।

बीज शब्द- सामुदायिक प्रतिक्रिया, दामन, प्रवण, भूविज्ञान, दौआब

समुदाय के सदस्य किसी भी आपदा के प्रभाव को कम करने में एक महत्वपूर्ण भूमिका निभाते हैं। किसी भी आपदा से प्रायः समुदाय के आम लोग ही ज्यादा प्रभावित होते हैं। अभी तक स्थानीय लोग कभी भी निष्क्रिय नहीं रहे बल्कि किसी भी आपदा में उन्होंने तत्परता से सामना किया है।

'कोहबर की शर्त' जैसे उपन्यास के द्वारा आपदा प्रबंधन में समुदाय की भूमिका का विश्लेषण किया गया है। उपन्यास के सामाजिक और सांस्कृतिक ताने-बाने के माध्यम से यह समझाने का प्रयास किया गया है कि परंपरागत मान्यताएँ, रीति-रिवाज और लोककथाएँ किस प्रकार आपदा से निपटने में समुदाय को एकजुट कर सकती हैं।

भारत एक आपदा-प्रवण देश है, जहाँ बाढ़, सूखा, भूकंप, चक्रवात और महामारी जैसी आपदाएँ अक्सर आती रहती हैं। 'कोहबर की शर्त', केशव प्रसाद मिश्र द्वारा लिखित एक ऐसा ही उपन्यास है जिसकी पृष्ठभूमि एक गाँव बलियार है जो उत्तर प्रदेश के बलिया जिले में स्थित नदी किनारे बसा हुआ है। यह एक प्रसिद्ध आंचलिक उपन्यास है। उपन्यासकार ने भी उपन्यास में बताया है कि "उत्तर प्रदेश में बलिया से

पूरब, तीसरा स्टेशन रेवती उतरकर चलने पर, लगभग तीन मील पूरब और दक्षिण के कोने पर एक गाँव है बलिहार ।”1

पश्चिम-दक्षिण में गंगा-सरजू की जल धाराएँ हैं । दौआब में बसे हुए दो गाँव, बलिहार और चौबेछपरा ही इस उपन्यास की कथा भूमि ।”काका रामअँजोर तिवारी अपने अपने मुकदमे की पेशी के लिए बलिया गए थे । सोमवार को सुनवाई हुई तब शाम को अपने गाँव लौट रहे थे तब बलिया में चारों ओर पानी ही पानी भर चुका था । बाढ़ से गाँव के गाँव डूब चुके थे । काका रामअँजोर को आश्चर्य होता है कि तीन ही दिनों में इतना पानी बढ़ गया । डोंगी में बैठकर काका और आठ-दस लोगों को जाते देखते हैं तो मन में ही सोचते हैं, तीन दिन में सरेह अगर डूब गई तो भगवान जाने अब क्या होगा ।”2

चौबेपुर, पियरौंटा, रामपुर, अचलगढ़, छेड़ी और अपने गाँव बलिहार के चारों ओर जल ही जल दिखाई पड़ता है । यह वह समय था जब बाढ़ के कारण सरेह के सरेह और लहलहाती फसलें चंद क्षणों में नदी के जलस्तर के बढ़ने से तहस-नहस हो जाया करती थी । लेकिन लोग अपना हौसला नहीं छोड़ते थे यानि कि प्रकृति के मार को बर्दाश्त कर यथार्थ को स्वीकार कर लेते थे । फिर चाहे नदी के प्रवाह हो या बाढ़ की त्रासदी । जैसे छारा के रूप में डोंगी की सवारी जो उन्हें एक किनारे से दूसरे किनारे या दूसरे गाँव तक जुड़ने का साधन बनती थी ।

काका रामअँजोर तिवारी गाँव के एक सामान्य किसान थे जिनके दो भतीजे थे आँकार और चंदन जो बिन माँ-बाप के अनाथ थे । काका ने अपने भाई-भौजाई के देहांत के बाद स्वयं विवाह ना कर भतीजों का पालन-पोषण किया । अब सोलह बरस का आँकार जवान हो चला था और खेत-खलिहान की सारी जिम्मेदारियों को सँभालने लगा था । चंदन आँकार से छोटा था उसमें अभी जिम्मेदारियों का अहसास नहीं हुआ था । काका भी अब अधिकतर बीमार रहने लगे थे इस कारण आँकार को ज्यादा बोझ पड़ता । यही वजह थी कि काका अब आँकार का ब्याह कर देना चाहते थे ताकि खेत-खलिहान के अलावा आँकार को घर की जिम्मेदारी से मुक्ति मिल जाती ।

बाढ़ के दिनों में बलिहार गाँव के चारों ओर तीन-चार कोस तक में पानी फैल जाता है और इस हद के सारे गाँव के बीच में जैसे द्वीप बन जाते । सारी फसलें पानी में बह जाती, मवेशी चारा के लिए तड़प जाते, लोगों में त्राहि-त्राहि मच जाती । इतने दिनों से जल जमाव के बाद लोग महीनों इंतजार करके चुपचाप तो नहीं बैठते बल्कि उन सभी से उबरने का रास्ता निकाल लेते थे । इसीलिए दिन में लोग छोटी-छोटी डोंगियों में इधर-उधर आते-जाते, क्योंकि आने-जाने का साधन सिर्फ़ ये डोंगिया ही रह जातीं । जहाँ इस बाढ़ के कारण आस-पास के लोगों से, गाँवों से संबंध टूट जाता, ऐसे में लोगों में घिरे हुए बाढ़ से डर एक जगह होता लेकिन डोंगियों का सहारा उनके कई कामों में सहायक होता था ।

इसी बाढ़ के बीच काका की बीमारी का इलाज कर रहे चौबे छपरा के वैद्य जी की बड़ी बेटी रुपा से काका के बड़े भतीजे आँकार से हो जाता है । बाढ़ का जलस्तर कम होने पर धीरे-धीरे कार्तिक माह में बोआई शुरू हो जाती है । इस विवाह के बीच एक प्रेम कहानी पनपती है - चंदन और रुपा की छोटी बहन गुंजा की । स्वयं दोनों को भी पता नहीं चलता कि दोनों की जो तकरार विवाह के कोहबर से शुरू होती है वह एक अनोखी, त्याग और बलिदानी प्रेम कहानी में परिवर्तित हो जाएगी ।

यहीं शुरू होती है 'कोहबर के शर्त' की कहानी जिसे केशव प्रसाद मिश्र के साहित्यिक जीवन को अद्वितीय बना डाला। इस उपन्यास के रैपर पर लिखा है - 'कोहबर की शर्त' एक तरह से निराश और बर्बाद जिंदगी में एक नई प्रेरणा, नई स्फूर्ति और नया उत्साह फूंकने की ही शर्त है, जिसका विस्तार इस मर्मस्पर्शी उपन्यास में सहज ही देखा जा सकता है।

रूपा के बलिहार ब्याह कर आने के बाद काका के घर के अंदर-बाहर दोनों के हालत सुधरते हैं। ओंकार पूरी तरह से खेती पर ध्यान देता है। खेती में अब चंदन भी ओंकार की मदद करने लगता है जिससे अनाज से घर में भंडारा भर गमक उठता है। काका हर्ष से गदगद कि अनाज बिक भी गया अब नए फसल की बोआई हो जाएगी। संयोग से इस वर्ष सोन नदी के पानी में उभार नहीं आता। रूपा भी गर्भवती हो जाती है एवं घर-खेती के काम का बोझ उठाने में थकने लगती है तो अपनी बहन गुंजा को बलिहार बुलवा लेती है।

जिस जमीन के मुकदमे को काका लड़ रहे थे उसे अचलगढ़ के ठाकुर द्वारा धोखे से अचानक हथियाया और हल चलाया देख काका ठाकुर से लड़ने आतुर हो उठे। आमतौर पर जमीन के मुद्दे कोर्ट के मुकदमे और सुनवाई का नतीजे से पहले स्वयं ही मसला हल करने की बेचैनी किसानों में ज्यादा हो जाती है। काका ताव में आ लड़ गए ठाकुर से इसी मार-पीट में बैल के हल से टकरा कर काका हमेशा के लिए शांत हो गए। काका की अर्थी उठी, तो लगा जैसे कोई बयार गाँव के बाँस, जामुन, आम के पत्तों तक को सुखाकर झनझना गई। गाँव भर चारों ओर एक बेहद डरावना सूनापन बिखर गया। जहाँ पूरा बलिहार काका से हँसी ठिठोली कर खेती के विचार-परख जानता था, आज वह जगह सुनी हो गई थी। पूरा समुदाय मातम में छाया हुआ ओंकार और चंदन को सांत्वना देते और ब्रह्मभोज में घर-घर से आटा, चीनी, घी, दही, तरकारी और कपड़े से भंडार को भर अपना सहयोग किया। ओंकार के मनाही के बावजूद ब्रह्मभोज और श्राद्ध बहुत ही अच्छे से संपूर्ण हुआ।

इधर रूपा गर्भावस्था के दौरान बीमार रहने लगती है, पिता वैद्य जी इलाज करते तो है लेकिन कुछ ज्यादा असर नहीं होता। ओंकार पूरा समय रूपा के पास बैठा रहता। जिसके कारण चंदन पर खेती का सारा भार आन पड़ता है। बीमार रूपा एक बार पास बैठे ओंकार को को बनावटी स्वर में बोली, "मैं मर जाऊँगी तो तुम दूसरा ब्याह कर लोगे। बीतेगा तो मेरे बेटे पर।" 3

इधर वैद्यजी के इलाज से रूपा की हालत में सुधार हुआ। लेकिन रूपा की आँखों से चंदन-गुंजा का अनछुआ प्रेम छुपा नहीं रहा। कहीं न कहीं वह स्वयं भी अपनी बहन को देवरानी बनना देखना चाहती थी। दँवरी-ओसावन चंदन ने सब संभल अनाज घर में भर दिया। ओंकार भी अब फिर से थोड़ा बाहर निकलने लगा था। चंदन और ओंकार दोनों भदई बोन की योजना बनाने लगे थे कि रूपा के सातवें महीने में ही प्रसव दर्द की सूचना सुन घर की तरफ भागे। अथक प्रसव दर्द के बाद रूपा ने मरा हुआ बच्चा जना। किंतु बीमारी की कमजोर देह इस दर्द को बर्दाश्त न कर सकी और निष्प्राण हो गई।

एक बार फिर बलिहार की धरती पर ओंकार का दर्द भारी हो पड़ा। घर उजाड़ और सुनसान हो पड़ा। इस दर्द को सोना नदी भी न झेल पाई और बारिश के साथ-साथ बाढ़ भी लायी। गुंजा को भला बिना रिश्ते में बांधे कितने दिन बलिहार रह पाती अतः उसके बाबूजी ओंकार से चौबे छपरा पहुँचाने की बात कह बुलवा लेते हैं। चंदन गुंजा को उसके घर छोड़ भारी मन से लौट आता है।

इधर जैसे चंदन का बिना गुंजा के हाल था वैसे ही हाल गुंजा का था | जहाँ गुंजा चंचल अल्हड थी वैसे ही अब गंभीर हो गई थी | इधर गुंजा के पिता बार-बार ओंकार पर जोर देने लगते हैं कि गुंजा घर-जवार को अच्छे से जानती है सब संभाल लेगी | देह थक जाती है, अब अधिक घूमा-फिरा नहीं जाता | बड़े धर्म-संकट में पड़ा हूँ, जीते-जी यदि वह भार उतर गया तो सुख से मर सकूँगा |”⁴

ओंकार तो गुंजा से ब्याह की बात कभी सोच ही नहीं सकता था | परबस हो चंदन से पूछ बैठा कि चंदन तुम क्या बोलते हो | चंदन अब कहता भी क्या, न गुंजा के पिता को खबर थी कि वह क्या कर रहे न गुंजा को खबर थी कि वैद्यजी उसका ब्याह पहना से तय कर देंगे |

सात दिन बाद सामान्य ढंग से विवाह हो गया चंदन बाहर बाहर से सब जिम्मेदारी संभालता रहा लेकिन मडवे में अपने भाई के साथ गुंजा को फेरे लेते देखने के लिए खुद को खड़ा न रख पाया | कोहबर की रसम जीवन में फिर से सहबाला बन ना दोहरा पाया |

ओंकार से ब्याह के बाद गुंजा बुझी-बुझी रहती लेकिन घर की देखभाल कर चंदन के मिलने की बात जोहती लेकिन चंदन तो घर के भीतर प्रवेश करना ही छोड़ चुका था | जिस वेग से गुंजा गुजर रही थी वह बस एक बार चंदन से पूछना चाहती थी कि आखिर सब जानते बुझते उसने ओंकार से उसका व्याह कैसे होने दिया | वह तो अंजान थी कि उसका वर चंदन नहीं ओंकार है |

क्वारी गुंजा के सपने देखनेवाला चंदन कुछ और था, ब्याह तय हो जाने के बाद गुंजा के बलिहार आ जाने तक वह कुछ और हो गया था | गुंजा की आरत आँखों ने चंदन को दागना आरंभ कर दिया | गुंजा ने चंदन को अपराधी ठहरा दिया - जो कुछ हुआ था सबका जिम्मेदार वह बाहर-भीतर छटपटाने लगा, उसने जबरदस्ती अपने को खेती के कामों में लगाया | उसे खाने-पिने की भी सुध नहीं रहती | कई बार ओंकार उसपर झुंझला उठता, डाँटता, चंदन बड़े भाई की हर बात बिना प्रत्युत्तर के सुन लेता |

ओंकार भी चंदन और गुंजा के भीतरी द्वंद को समझ चुका था | वह जानते बुझते अपने भाई को दुःख में नहीं धकेलना चाहता था लेकिन क्या करता उसके हाथ से बात निकल चुकी थी |

इधर बाला की खबर करने उसकी माँ आई कि बाला को माता आई हैं एक बार देख लो तुम्हें बुलवन भिजवाई है | चंदन जाता तो है देखने लेकिन बड़ी माता (चेचक) के स्मरण मात्र से भयभीत हो जाता है | देखते ही देखते चेचक का प्रकोप बाला के साथ-साथ पूरे गाँव को कंपकपा देती है | पूस के महीने में सरेह की फसलें तेजी से बढ़ रही थी लेकिन गाँव के लोग सरेह की जगह शीतला माता की पूजा कर उन्हें शांत करने में लगे थे | बीस-पच्चीस दिन के भीतर गाँव के छोटे-बड़े पंद्रह आदमी मर गए | रुदन और चीत्कार से बयार में भी हाहाकार भर गया | इधर ओंकार की देह भी तीन से ज्वर में तप्त पड़ा रहा | चंदन और गुंजा दोनों के मन में एक दहशत भर उठी | चौथे दिन देह में चेचक के दाने देख गुंजा काँप गई | बड़ी-बूढ़ी औरतों ने जैसे बताया, गुंजा पति की सेवा में जुट गई | ओंकार के खटिया के नीचे की धरती लीप, अईछा हुआ ढेला रख छाक देती, धूप जलाती, घुटनों के बल बैठ प्रार्थना के गीत गाती, “निमियाँ की डार मईया, लावेली हिडोलवा, कि झूमि-झूमि ना”⁵

किंतु गुंजा की प्रार्थना और पूजा-गीत का कोई फल नहीं मिला | बीमारी के चौदहवीं रात को ओंकार बुरी तरह छटपटाने लगा | भोर होते-होते सारी छटपटाहट भी बंद हो गई | बलिहार की उस भोर में गुंजा

का आर्तनाद गूँज उठा | महामारी का प्रकोप सेरा गया लेकिन जिंदगी को ढर्रे पर लाने में गुंजा और चंदन दोनों को समय लगा |

चले गए का जितना दुःख था, बचे हुए का उतना ही बड़ा आसरा था | बिखरे मन से गुंजा ने खुद को समेटना शुरू कर दिया | लेकिन देह की कमज़ोरी धीरे-धीरे बढ़ने लगी | मासिक धर्म के समय जरूरत से अधिक रक्त निकल जाता | जिसके कारण बेहोशी के दौर भी बढ़ने लगे |

चंदन नई मुसीबत में पड़ा, वैद्यजी हर दूसरे-तीसरे दिन देख दवा दे जाते | कई बार चौबे छपरा गुंजा को ले चलने की बात की लेकिन गुंजा तैयार नहीं हुई | आषाढ़ लग गया भदई बोन की बात होने लगी लेकिन चंदन सुस्त पड़ा रहा | गुंजा ने चंदन से पूछा- “समुहृत नहीं करोगे क्या ?”⁶

“नहीं इस साल बाढ़ आने की पारी है | भदई बोन का कोई लाभ न होगा |”⁷

आषाढ़ बीतते-बीतते गुंजा ने चारपाई पकड़ ली | कब गुंजा बेहोश हो जाए, अंदाजा नहीं लगा पाता | वैद्यजी की दवा कुछ काम नहीं की तो चंदन ने दूसरे वैद्य को पकड़ा | चंदन ही गुंजा को दतुअन-कुल्ला कराता, दवाई खिलाता, चोटी बनाता फिर भी थकता नहीं |

सोना का जल धीरे-धीरे ऊपर चढ़ रहा था | भादो लगते ही गंगाजी ने भी जोर पकड़ा, तो सोना और भी उफन गई | दोनों ओर के सरेहों में जल भर गया | बलिहार के चारों ओर बाढ़ आ गई | गुंजा की बेहोशी घंटे दर घंटे बढ़ने लगी, कई बार युही बड़बड़ाती लेकिन चंदन उसे संभालता रहा | एक दिन गुंजा पूछ बैठी है कि चंदन तुम्हें वह कोहबर की शर्त याद है क्या ? चंदन कहता है- याद है लेकिन वह शर्त असल में क्या थी वह मेरी समझ में नहीं आया | तब गुंजा कहती है कि “अच्छा है जो नहीं समझे, वह तो ऐसी शर्त थी, जिसमें हम दोनों हार गए”⁸

आखरी बेहोशी और गुंजा फिर कभी होश में नहीं आती | बँसवारी बाढ़ से घिरा था लेकिन अर्थी के लिए तो बाँस काटना ही था | अर्थी बनी गुंजा को स्नान करा कफन पहना विमान पर लिटा दिया गया | मरघट तो पानी में डूबा था, जलाने की कोई सुविधा न थी, शव को केवल जल में प्रवाह कर देना था | गंगा का जल तो चारों ओर फैला था, किंतु शव को गंगा की मुख्य धारा में ही डालना था | आखिरी बार चंदन ने डोंगी पर गुंजा का मुँह देखा लेकिन उसे प्रवाहित नहीं कर पा रहा था, लोगों ने हाथ छुड़ाया किसी तरह | गहरे अतल जल में गुंजा समा गई |

उपन्यास में मुख्य रूप से खेती व गुंजा से प्रीति करने वाले नवयुवक के रूप में उभरनेवाला चंदन का जीवन संघर्षों की बाढ़ के बीच घिर जाता है | जिस बाढ़ की उफनती नदी के बीच दो अल्हड जवान दिल मिलते हैं, वहीं वह पूरी तरह अंत में उदास और असहाय रह जाते हैं | इस उपन्यास के लिए पाठकों के मन में अंत तक यह जानने कि इच्छा रहती है कि आखिर कोहबर की शर्त थी क्या ? जिसे गुंजा ने लगायी थी | दरअसल इसे पढ़ कर ही समझा जा सकेगा |

चंदन का जीवन संघर्ष का पर्याय बन जाता है | चंदन के सामने ही उसके स्वप्न के चार टुकड़े हुए- कुँवारी गुंजा, सुहागिन गुंजा, विधवा गुंजा, और आखिर में कफन ओढ़े मृत गुंजा | चंदन की आखिर क्या मनोदशा रही होगी जो इतना कुछ झेलने पर भी यथार्थ की कठोर धरती पर पूरी दृढ़ता और विश्वास से खड़ा रहता है |

‘कोहबर की शर्त’ जैसी साहित्यिक कृतियों से प्रेरणा लेकर तमाम आपदाओं में सामुदायिक भागीदारी को बढ़ाया जा सकता है | पारंपरिक ज्ञान और सामाजिक सहभागिता को आधुनिक तकनीकों के साथ जोड़कर आपदा प्रबंधन को और भी अधिक सशक्त और प्रभावी बनाया जा सकता है | भारत के विभिन्न क्षेत्रों की पारंपरिक कलाओं को आपदा जागरूकता के लिए उपयोग करने की संभावनाएं तलाशी जा सकती हैं | अलग-अलग आपदाओं जैसे-बाढ़, सूखा, भूकंप, वैश्विक बीमारियों के लिए विशिष्ट समुदाय-आधारित प्रबंधन रणनीतियाँ विकसित की जा सकती हैं |

संदर्भ-सूची

‘कोहबर की शर्त’ केशव प्रसाद मिश्र, राजकमल प्रकाशन प्रथम संस्करण 1986

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- 3) कोहबर की शर्त पृ.69 ,81,117,130,131,133



ETHICAL AI: NAVIGATING CHALLENGES, OPPORTUNITIES, AND RESPONSIBILITIES**Monika Y. Kshirsagar***Research Scholar**M.V.P. Samaj's Adv. Vitthalrao Hande**College of Education Nashik***Dr. Chandrakant M. Borase***Principal,**M.V.P. Samaj's Adv. Vitthalrao Hande**College of Education Nashik*

Abstract

*The rapid advancement of Artificial Intelligence (AI) has brought significant opportunities and challenges that necessitate a nuanced understanding of the ethical implications involved. This research paper explores the multifaceted landscape of *ethical AI*, focusing on the responsibilities of developers, policymakers, and users in ensuring that AI technologies are developed and deployed in a manner that prioritizes human values and societal well-being.*

We begin by identifying the key challenges posed by AI, including issues of bias, transparency, accountability, and the potential for misuse. These challenges raise critical questions about the fairness and inclusivity of AI systems, prompting a need for robust ethical frameworks that guide AI development. The paper discusses the importance of incorporating diverse perspectives in the design process to mitigate biases that can lead to discriminatory outcomes. Moreover, we highlight the opportunities that ethical AI presents, such as enhancing decision-making processes, improving efficiency, and fostering innovation across various sectors. By adopting ethical considerations, organizations can build trust with stakeholders and promote responsible AI use, ultimately contributing to a more equitable society.

The research also emphasizes the role of regulatory frameworks and collaborative efforts among governments, industries, and academia in establishing standards for ethical AI practices. By fostering a culture of responsibility and accountability, we can navigate the complexities of AI while maximizing its benefits. In conclusion, this paper advocates for a proactive approach to ethical AI, urging stakeholders to recognize their responsibilities in shaping the future of technology. Through a commitment to ethical principles, we can harness the transformative potential of AI while safeguarding the interests of individuals and communities.

Keywords : Artificial Intelligence, Ethical AI, AI technologies, Ethical Challenges, Opportunities, Responsibilities

Introduction

Artificial Intelligence (AI) is transforming industries, redefining societal norms, and influencing decision-making processes in ways that were once thought to be purely speculative. From healthcare and education to finance and governance, the applications of AI are vast and

growing. However, this rapid technological advancement comes with significant ethical challenges that need to be addressed to ensure that AI serves humanity responsibly and equitably. Ethical AI refers to the development and deployment of AI systems that align with human values, promote fairness, and prioritize societal well-being. As AI systems increasingly shape our economic, social, and political landscapes, it becomes imperative to address issues such as bias, transparency, accountability, and misuse. This paper delves into the ethical challenges posed by AI, the opportunities that ethical AI presents, and the responsibilities of stakeholders in navigating this complex terrain. By adopting proactive measures rooted in ethical principles, we can maximize the benefits of AI while minimizing its risks.

OBJECTIVES

1. **Identify Key Ethical Principles:** Examine and define the fundamental ethical principles necessary for the development and deployment of AI technologies, including fairness, accountability, transparency, and privacy.
2. **Assess Current Ethical Frameworks:** Evaluate existing ethical frameworks and guidelines in AI development, identifying gaps and areas for improvement to better address contemporary challenges.
3. **Analyze Stakeholder Perspectives:** Investigate the perspectives of various stakeholders—developers, policymakers, users, and affected communities—regarding the ethical implications of AI technologies.
4. **Examine Real-World Applications:** Explore case studies of AI applications across different sectors (e.g., healthcare, finance, law enforcement) to analyze ethical challenges and identify best practices.
5. **Propose a Comprehensive Ethical Framework:** Develop a holistic ethical framework for AI that incorporates insights from various stakeholders, aiming to guide practitioners in making ethical decisions during AI development and deployment.

Ethical Challenges in AI

The development and deployment of AI systems often pose ethical challenges that can have widespread societal implications. These challenges include bias and discrimination, lack of transparency, accountability gaps, privacy concerns, and the potential for misuse.

Bias and Discrimination

AI systems are only as good as the data they are trained on, and biased datasets can lead to discriminatory outcomes. For example, facial recognition systems have been shown to perform poorly on individuals with darker skin tones, leading to racial disparities in policing and surveillance. Furthermore, hiring algorithms have been found to discriminate against women due to historical biases in training data. To address these issues, developers must prioritize diverse

perspectives in the design process and implement bias detection and mitigation tools.

Lack of Transparency and Explainability

Many AI systems operate as "black boxes," making it difficult to understand how decisions are made. This lack of transparency undermines trust in AI systems and raises concerns about accountability. For example, if an AI-driven loan application system denies a loan, users should have the right to understand why the decision was made. Explainable AI (XAI) techniques are crucial for improving transparency and fostering trust among users.

Accountability Gaps

The question of accountability becomes complex when AI systems make decisions that have real-world consequences. For instance, who is responsible if an autonomous vehicle causes an accident—the developer, the manufacturer, or the user? Without clear accountability frameworks, it becomes challenging to address ethical violations and ensure justice.

Privacy Concerns

AI systems often rely on vast amounts of personal data to function effectively. However, this raises significant privacy concerns, particularly when data is collected and used without explicit consent. Surveillance systems powered by AI, such as those used for mass monitoring, further exacerbate these concerns by infringing on individuals' rights to privacy.

Misuse of AI

The potential misuse of AI, such as the creation of deepfakes, autonomous weapons, and cyberattacks, poses significant ethical dilemmas. For example, deepfake technology has been used to spread misinformation and manipulate public opinion, undermining democratic processes. Addressing these risks requires a collaborative effort among stakeholders to develop safeguards against malicious AI applications.

Opportunities Presented by Ethical AI

Despite the challenges, ethical AI presents numerous opportunities to improve societal outcomes and drive innovation across various sectors. By prioritizing ethical considerations, organizations can unlock the transformative potential of AI while fostering trust and inclusivity.

Enhancing Decision-Making Processes

AI has the potential to improve decision-making by analyzing large datasets and identifying patterns that humans might overlook. For example, AI-powered systems can assist doctors in diagnosing diseases more accurately and efficiently, ultimately saving lives. Ethical considerations, such as ensuring the accuracy and fairness of AI-driven decisions, are essential to realizing these benefits.

Promoting Efficiency and Innovation

AI can streamline processes, reduce costs, and drive innovation in industries such as manufacturing, logistics, and agriculture. For instance, AI-powered robots can optimize production

lines, while machine learning algorithms can predict crop yields and improve food security. By incorporating ethical principles, organizations can ensure that these innovations benefit all stakeholders equitably.

Bridging Educational Gaps

AI has the potential to revolutionize education by providing personalized learning experiences tailored to individual needs. For example, AI-powered tutoring systems can help students in underserved communities access high-quality educational resources. Ethical considerations, such as protecting student data and ensuring equitable access, are critical to maximizing the impact of AI in education.

Addressing Global Challenges

AI can play a significant role in addressing global challenges such as climate change, poverty, and healthcare inequities. For example, AI-driven climate models can help policymakers make informed decisions to combat global warming, while AI-powered telemedicine solutions can improve healthcare access in remote areas. Ethical AI development ensures that these solutions prioritize the well-being of marginalized populations and address systemic inequalities.

Responsibilities of Stakeholders

The successful implementation of ethical AI requires collaboration among various stakeholders, including developers, policymakers, researchers, and society at large.

Developers and Corporations

Developers and corporations bear significant responsibility for ensuring that AI systems are designed and deployed ethically. This includes conducting thorough testing to identify and mitigate biases, implementing transparency and accountability measures, and prioritizing diversity in AI development teams. Additionally, corporations must adhere to ethical guidelines and demonstrate corporate social responsibility in their AI initiatives.

Governments and Policymakers

Governments and policymakers play a crucial role in establishing ethical standards and regulatory frameworks for AI development. For example, the European Union's General Data Protection Regulation (GDPR) sets strict guidelines for data privacy and transparency. Policymakers must also collaborate with international organizations to develop global standards for ethical AI, ensuring that these principles are upheld across borders.

Researchers and Academics

Researchers and academics are instrumental in advancing the field of ethical AI by developing frameworks, methodologies, and tools to address ethical challenges. Interdisciplinary collaboration between computer scientists, ethicists, sociologists, and legal experts is essential to creating comprehensive solutions that align with societal values.

Society and End-Users

Society and end-users have a critical role to play in shaping the future of AI. By staying informed about AI technologies and their implications, individuals can advocate for ethical practices and hold stakeholders accountable. Additionally, user feedback can help developers identify and address ethical concerns in AI systems.

Frameworks for Ethical AI Development

Several frameworks and guidelines have been proposed to ensure the ethical development and deployment of AI systems. These frameworks emphasize principles such as fairness, accountability, transparency, and privacy.

Principles of Ethical AI

Key principles of ethical AI include:

- **Fairness:** Ensuring that AI systems do not discriminate against individuals or groups.
- **Accountability:** Establishing clear mechanisms for holding stakeholders accountable for AI-related decisions.
- **Transparency:** Promoting openness and explainability in AI systems.
- **Privacy:** Protecting individuals' data and ensuring informed consent.

Ethical Guidelines and Standards

Organizations such as the IEEE and OECD have developed ethical guidelines for AI development. For example, the IEEE's *Ethically Aligned Design* framework provides recommendations for creating human-centric AI systems. However, enforcing these guidelines remains a challenge, particularly on a global scale.

Tools for Ethical AI Development

Developers can leverage tools such as bias detection algorithms, explainable AI techniques, and privacy-preserving technologies to address ethical challenges. These tools play a crucial role in ensuring that AI systems align with ethical principles.

Case Studies

Positive Examples

- **IBM's AI Ethics Board:** Demonstrates how organizations can integrate ethical considerations into their development processes.
- **AI for Good Initiatives:** Highlight projects leveraging AI to address global challenges such as poverty and climate change.

Negative Examples

- **Cambridge Analytica Scandal:** Illustrates how AI-powered data misuse can undermine democracy.
- **Facial Recognition Bans:** Reflects the ethical concerns surrounding mass surveillance and

- racial bias in AI systems.

The Future of Ethical AI

The future of ethical AI depends on the ability of stakeholders to address emerging challenges and foster collaboration. As AI technologies continue to evolve, new ethical dilemmas will arise, necessitating proactive measures and adaptive frameworks. International cooperation, interdisciplinary research, and public engagement are vital to ensuring that AI serves as a force for good.

Educational Implications

1. **Curriculum Development:** Educational institutions need to integrate ethical AI principles into computer science and engineering curricula, ensuring that future AI practitioners are equipped with an understanding of ethical considerations in their work. This includes creating specialized courses in AI ethics that cover the foundational principles and real-world applications.
2. **Interdisciplinary Learning:** Encourage interdisciplinary programs that combine AI technology with philosophy, law, sociology, and public policy. This approach will foster a deeper understanding of the societal impact of AI technologies and equip students to tackle ethical challenges from multiple perspectives.
3. **Hands-On Training:** Institutions should emphasize experiential learning by offering workshops, hackathons, and collaborative projects that allow students to engage with ethical dilemmas in AI. This will enhance their problem-solving skills and ethical reasoning capabilities.
4. **Awareness Campaigns:** Higher education should promote awareness campaigns around ethical AI, engaging students and the community in discussions about the implications of AI technologies. This can also involve guest lectures from industry experts and ethicists.
5. **Research Opportunities:** Institutions should encourage research initiatives focused on ethical AI, providing students and faculty with the resources to

Conclusion

Ethical AI represents both a challenge and an opportunity in the modern technological landscape.

By addressing issues such as bias, transparency, accountability, and misuse, stakeholders can create AI systems that align with societal values and promote equity.

The responsibilities of developers, policymakers, researchers, and society at large are critical to navigating the complexities of AI while maximizing its benefits. Through a commitment to ethical principles and collaborative efforts, we can harness the transformative potential of AI to create a more just and inclusive future.

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THE IMPACT OF TECHNOLOGIES IN EDUCATION SYSTEM**Prithviraj Solanki***Student of SSR college of ACS, Silvassa**SSR college of ACS, Silvassa***And****Sunanda Kangane***Assistant Professor (History),*

Abstract

The integration of technology into India's educational system has brought both opportunities and challenges. Technology has enhanced access to education, especially in rural and remote areas, through online platforms, smart classrooms, and educational apps. It allows personalized learning, helping students learn at their own pace, thus improving engagement and retention. Additionally, technology supports teachers' professional development through online training and resources. However, challenges such as the digital divide, inadequate infrastructure, and insufficient teacher preparation hinder the full potential of technology in education. Many rural areas lack basic digital resources, and teachers often receive insufficient training to effectively use digital tools in the classroom. Despite these obstacles, the future of education in India is promising, as technology can help close educational gaps, foster creative learning, and prepare students for a digital workforce. To fully utilize technology's benefits, a comprehensive strategy is needed, focusing on equitable access to digital resources, robust teacher training, and infrastructure development. Studies show that when properly integrated, technology improves student performance and helps develop digital skills. In Means while challenges remain, technology's potential to transform India's education system is vast, offering new opportunities for both students and teachers.

Keywords: -Technology, Ancient Education system, Spiritual tradition, Holistic approach, Moral values.

Introduction: -

The Indian education system has undergone significant changes over the decades, particularly after the 42nd Amendment of the Constitution in 1976, which moved education from the State List to the Concurrent List. This shift allowed the central government to play a larger role in shaping education policies while state governments continued to have autonomy in implementation. Given India's vast size, with 28 states and 8 union territories, this has resulted in regional variations in policies, programmes, and initiatives related to school education. Despite national education frameworks guiding state-level policies, there remains a significant difference

in the quality of education across different regions.

A large portion of primary and upper primary schools in India are managed by government bodies, and this number has been steadily increasing. At the same time, private schools have also grown in number. In 2005-06, about 83.13% of elementary schools (Grades 1-8) were government-managed, while 16.86% were private schools. Among the private schools, one-third were aided (receiving government support), while two-thirds were unaided (independently funded). School enrolment data showed that 73% of students in Grades 1-8 studied in government schools, while 27% attended private institutions. This distribution varied in rural and urban areas; in rural India, 80% of children studied in government schools, whereas in urban areas, 66% were enrolled in private schools.

India has made significant strides in improving literacy rates over the decades. The 2011 Census reported a literacy rate of 73%, with male literacy at 81% and female literacy at 65%. A later survey by the National Statistical Commission in 2017-18 estimated the literacy rate at 77.7% overall, with 84.7% for males and 70.3% for females. These numbers reflect a substantial improvement compared to earlier decades—in 1951, literacy stood at just 18% overall (27% for males and 9% for females), and in 1981, it had risen to 41% overall (53% for males and 29% for females).

Higher education in India has expanded, contributing to the country's economic growth. Over the past decade, enrolment in higher education institutions has increased steadily, with the Gross Enrolment Ratio (GER) reaching 26.3% in 2019. Despite this progress, India still lags behind developed nations in tertiary education enrolment, which is seen as crucial for economic and technological advancement. Higher education institutions, particularly public universities and research centers, have played a major role in India's growth, especially in scientific research and technological development.

While India has made significant progress in literacy and higher education, challenges remain, including unequal access to quality education, regional disparities, and the need to further expand higher education to maximize the country's demographic dividend. Education continues to be a key driver of economic and social progress, and ongoing reforms aim to improve accessibility, affordability, and quality across all levels of education.

Indian Ancient education system

The ancient education system in India was deeply rooted in the country's rich cultural and spiritual traditions, with a strong emphasis on holistic development, moral values, and practical knowledge. Education during this period was imparted in Gurukuls (traditional learning centers) and Ashrams, where students learned directly from teachers or Gurus in an intimate, personalized setting.

The ancient Indian education system was largely oral, relying on the transmission of knowledge through lectures, discussions, and recitations. The subjects taught were diverse, ranging from Vedic literature, grammar, mathematics, astronomy, philosophy, and logic to music, arts, and spirituality. These subjects were often centered around the religious and philosophical texts, particularly the Vedas, Upanishads, and Puranas, which served as the core curriculum. The focus was on developing a deep understanding of life, the self, and the cosmos, with an emphasis on moral and ethical conduct.

One of the key aspects of the ancient system was its inclusivity in terms of the variety of disciplines taught, with even advanced subjects like astronomy and medicine being covered. The ancient Indians made significant contributions to various fields, particularly in mathematics, where concepts such as zero, the decimal system, and algebra were developed. Ancient universities like Nalanda and Takshashila attracted students from all over the world, and these institutions offered a comprehensive education in a wide range of subjects.

The teacher-student relationship in the Gurukul system was considered sacred, with students often living with their Gurus for years, learning not only academic knowledge but also life lessons. Discipline, respect for teachers, and a commitment to learning were considered fundamental values.

However, the ancient education system was not without its limitations. It was largely exclusive to certain classes of society, particularly Brahmins, and was mostly oral and memorization-based, leaving little room for innovation or critical thinking. The system was also mostly accessible to males, while girls and women had limited educational opportunities.

In that means, the ancient education system in India was deeply spiritual, holistic, and comprehensive, focused on character-building, knowledge, and wisdom. It laid the foundation for many of the philosophical and scientific advancements that India contributed to the world. However, it also had its restrictions, particularly in terms of accessibility and gender equality.

Medieval Education System

Islam's arrival in India led to a growing influence of Islam on ancient educational practices. Prior to the Mughal era, Qutb-ud-din Aybak and other Muslim kings established educational institutes that taught religious knowledge. Scholars like Moinuddin Chishti and Nizamuddin Auliya founded Islamic monasteries and rose to prominence as teachers. Students traveled to India to study science and the humanities from Afghanistan and Bukhara. Before Islam extended from Persia and the Middle East to India, these territories had Greek traditions that affected the teachings of grammar, philosophy, mathematics, and law in their traditional madrassas and maktabas. The link between science and the humanities was emphasized in traditional Islamic education.

Holistic approach of NEP-2020

The National Education Policy 2020 (NEP 2020), approved by the Cabinet of India on 27 July 2020, aims to revamp the Indian education system, replacing the 1986 National Policy on Education. It provides a comprehensive framework covering elementary to higher education and vocational training across both rural and urban India. The policy is designed to modernize education and equip students with 21st-century skills.

One of the major highlights of NEP 2020 is its focus on language in education. It emphasizes that the mother tongue or local language should be the medium of instruction up to Class 5, with a recommendation to extend this approach until Class 8 and beyond. However, the policy ensures that no language will be imposed on students, maintaining flexibility for states, institutions, and schools in its implementation. Since education is under the Concurrent List, both the central and state governments play a role in execution.

The policy aims to overhaul the school and higher education system by making it more flexible, multidisciplinary, and skill-oriented. It introduces significant changes such as holistic learning approaches, reducing curriculum overload, and encouraging critical thinking. NEP 2020 also promotes vocational training from an early stage to bridge the gap between education and employment opportunities.

For higher education, NEP 2020 envisions a multi-disciplinary approach and proposes the phasing out of rigid degree structures. It also introduces a four-year undergraduate degree with multiple exits options and seeks to increase the Gross Enrolment Ratio (GER) in higher education.

Technology and Today's Education System

Technology has revolutionized education, making learning more accessible, engaging, and personalized. Here's how technology is shaping modern education:

1. Digital Learning Platforms

- E-Learning & MOOCs: Websites like Coursera, Udemy, Khan Academy, edX, and Byju's provide online courses on a variety of subjects.
- Interactive Videos & Simulations: Platforms like YouTube Education, TED-Ed, and VR/AR tools enhance understanding with visual learning.
- Virtual Classrooms: Google Classroom, Microsoft Teams, and Zoom enable remote learning and collaboration.

2. AI & Personalized Learning

- Artificial Intelligence (AI): AI-powered platforms analyze student performance and adapt content to their needs (e.g., Duolingo, Knewton, Squirrel AI).
- Adaptive Learning Systems: AI customizes lessons based on a student's strengths and weaknesses.

3. Gamification & Engagement

- Educational Games: Apps like Kahoot, Quizizz, Duolingo, and Minecraft Education make learning fun through rewards and challenges.
- Badges & Leaderboards: Encourages student participation and competition.

4. Virtual Reality (VR) & Augmented Reality (AR)

- VR for Immersive Learning: Virtual reality enables students to experience historical events, space exploration, and medical surgeries. (e.g., Google Expeditions, Oculus Education).
- AR for Interactive Learning: Augmented reality apps like Merge Cube bring 3D models to life in classrooms.

5. Online Assessments & AI Proctoring

- Digital Exams: Online quizzes and tests reduce paperwork and give instant results.
- AI Proctoring: Tools like Proctor use AI to monitor students during exams.

6. Smart Classrooms & IoT

- Smart Boards & Digital Whiteboards: Interactive screens replace traditional blackboards (e.g., Promethean, SMART Board).
- IoT (Internet of Things): Smart attendance, AI tutors, and connected devices enhance classroom management.

7. Blockchain in Education

- Secure Credentials: Blockchain ensures tamper-proof certificates and transcripts for students.
- Global Access: Students can store and share academic records easily.

Challenges of use Technology in Education system

Technology has significantly transformed education, making learning more accessible and interactive. However, its integration into the education system also presents several challenges that need to be addressed for effective learning.

1. Digital Divide & Accessibility

One of the biggest challenges is the digital divide—the gap between students who have access to technology and those who do not. Many students, especially in rural and underprivileged areas, lack devices, stable internet connections, or electricity, preventing them from benefiting from digital education.

2. Distraction & Screen Time

With smartphones, tablets, and computers being primary learning tools, students are more prone to distractions from social media, games, and non-educational content. Additionally, excessive screen time can lead to eye strain, reduced attention span, and mental health issues like anxiety and stress.

3. Cybersecurity & Privacy Concerns

Online learning platforms require students to share personal information, making them vulnerable to data breaches, hacking, and cyber threats. Many educational institutions lack proper cybersecurity measures, putting students' and teachers' data at risk.

4. Teacher Training & Adaptation

Not all educators are tech-savvy, and many struggle to adapt to modern teaching tools. A lack of proper training and resistance to change make it difficult for teachers to effectively incorporate technology into their lessons.

5. Technical Issues & Infrastructure

Frequent internet outages, software glitches, and device malfunctions can disrupt the learning experience. Many schools and institutions lack proper IT support to address technical issues efficiently.

While technology has great potential in education, these challenges must be addressed through better infrastructure, digital literacy training, and cybersecurity measures to ensure equal and effective learning opportunities for all.

The Future of Technology in Education system

Technology is set to reshape the education system in unprecedented ways, making learning more personalized, immersive, and accessible. As advancements in artificial intelligence (AI), virtual reality (VR), blockchain, and 5G technology continue to evolve, the future of education will be defined by smart learning environments that cater to individual needs.

One of the most significant developments in education will be AI-driven personalized learning. AI algorithms will analyze students' strengths and weaknesses, providing customized study plans, interactive feedback, and real-time tutoring. AI chatbots and virtual assistants will offer instant support, reducing the dependency on traditional classroom settings. Additionally, machine learning will help educators create adaptive curricula, ensuring that students receive the most relevant and effective instruction based on their progress.

The use of Virtual Reality (VR) and Augmented Reality (AR) will enhance experiential learning. Students will be able to explore historical sites, conduct virtual science experiments, and engage in immersive simulations, making abstract concepts easier to understand. Medical students, for instance, can practice surgeries in virtual environments before performing real procedures, while engineering students can interact with 3D models of complex machinery.

Blockchain technology will play a crucial role in securing academic records and certifications. By using blockchain, students will have tamper-proof digital credentials that can be easily shared and verified globally. This will simplify the admission and job application process while reducing the risk of fraud in academic qualifications.

Moreover, 5G and cloud computing will enable seamless online education, ensuring high-speed connectivity and uninterrupted access to learning materials. Smart classrooms equipped with IoT (Internet of Things) devices will facilitate interactive and data-driven teaching methods, improving engagement and efficiency.

Despite these advancements, challenges such as the digital divide, cybersecurity risks, and ethical concerns regarding AI in education must be addressed. Schools and governments must focus on providing equal access to technology, investing in teacher training, and implementing strong cybersecurity measures.

In the coming years, technology will make education more flexible, efficient, and inclusive, preparing students for the demands of an ever-evolving digital world. The future of education lies in harnessing these innovations while ensuring equitable access for all learners.

Technology has revolutionized education, making learning more accessible, engaging, and personalized. Here's how technology is shaping modern education:

The policy sets ambitious goals for transforming India's education system by enhancing accessibility, affordability, and quality. While the full implementation will require collaboration between the central and state governments, NEP 2020 marks a significant shift towards a more inclusive and modern education system.

Conclusion

Technology has significantly transformed the education system in India, making learning more accessible, interactive, and efficient. Online learning platforms, AI-driven personalized education, and digital classrooms have revolutionized traditional teaching methods. However, challenges such as the digital divide, lack of infrastructure, and cybersecurity concerns remain. To fully harness the benefits of technology in education, the government and private sectors must work towards improving digital accessibility, teacher training, and internet connectivity. With continued advancements and equitable implementation, technology can bridge educational gaps, enhance learning outcomes, and empower students across India for a brighter, more knowledge-driven future.

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UNPACKING THE GURUKUL SYSTEM: A CRITICAL ANALYSIS OF ITS IMPLEMENTATION IN NEP 2020

Samrudhi A. Kelkar

Abstract

Education is a priceless treasure for humanity. Like a shining gem, education adds value to a person's life, enhancing their honour and respect. Education systems have transformed over time to meet the changing demands of society. Among the earliest and most respectful forms of education in India was the Gurukul system - the education in the Vedic era, which prepared learners not only for worldly life, but also for self-realization, personal enlightenment, and social integration.

As India transitions to a more modern education system with NEP 2020, rapidly adapting to technology, embracing digital and AI-driven learning, it becomes crucial not to lose sight of our roots, our tradition, and values. This research paper investigates the possibility of integrating aspects of the Gurukul system into the framework of NEP 2020.

Through a public survey, the research examines how the public perceives the relevance of the Gurukul system in today's educational context and assesses the potential benefits of integrating its key elements, such as moral education, discipline, self-regulation, and spiritual education, into the modern education framework. The findings of the study aim to shed light on the public's view on possible enhancements to education in India, creating a more balanced and effective learning environment.

Keywords: Gurukul system, NEP 2020, Holistic education, moral values, Educational transformation.

Introduction

The education system in India has always been a powerful catalyst for social change. Overtime, a test shifted from being a privilege of the elite to a universal right. It has come a long way from its humble beginnings. In ancient times, it was about passing down wisdom through stories and rituals. As societies grew, so did the need for formal systems like gurukuls, madrasas and universities. The industrial age made education accessible to the masses, and today, technology is revolutionising how we learn. Through its evolution, education has remained a beacon of hope and powered individuals to dream, innovate and build a better future.

When we date back to ancient times, we learn that gurukuls and ashrams were learning centres. During the Vedic period, education was primarily oral, focusing on scriptures, philosophies, and ethics. The medieval error saw the establishment of madrasas and Islamic schools under Mughal rule, while the British colonial period introduced a formal, Western style

education system. Post independence, India has made significant strides in expanding access to education, but the challenges like inequality and quality persist.

As we reflect on the evolution of education, we are reminded of the timeless wisdom and enduring legacy of India's ancient learning tradition, which laid the groundwork for a rich cultural and intellectual history. The Gurukul system is more than just a chapter in the history of education, it is the very foundation of our cultural and intellectual heritage. Remind us of a time when learning was not confined to the classroom or exams but was a rhythm of living, deeply intertwined with nature, spirituality and community. The Guru shishya tradition, with its emphasis on respect, discipline and holistic development, laid the ground work for values that remain relevant even today. In ancient India, the Gurukul system was a way of life. Students are less than homes at a young age to live in the guru's ashram, observation, practice and dialogue. The curriculum was diverse, covering spiritual, intellectual and physical development. The guru was not just a teacher but a mentor who guided students in every aspect of life, fostering a deep bond of trust and respect. This system aimed to create well-rounded individuals who were not only knowledgeable but also ethical and self-reliant.

The values of holistic learning and mentorship embodied in the Gurukul system find a model echo in the national education policy 2020, which seeks to transform India's education landscape.

The new education policy 2020 focuses on a multi-disciplinary approach. The policy encourages students to break away from regular subject boundaries and explore a mix of arts, science and vocational subjects. It aims to create a flexible and dynamic learning environment where students can pursue their passions while developing critical skills. It also emphasizes the importance of regional language, cultural heritage and ethical values in shaping a well-rounded education.

As we embrace the modern education system and the Technology advancements, we must not forget the Gurukul system, for it is our roots. We can still draw inspiration from the time less principles of the Gurukul system. The values of holistic learning, mentorship and community-based education that refined the gurukuls can be seamlessly integrated into our modern education system. We can combine the best of both worlds, to create a unique blend of traditional wisdom and contemporary relevance. By remembering and honouring the Gurukul system, we can stay connected to our past while building a future that is both progressive and grounded in timeless wisdom.

Research objectives

The Gurukul system, an ancient Indian educational model, holds profound significance as the foundation of India's educational and cultural heritage. This research paper aims to delve into the intricacies of this system, exploring its fundamental principles with special attention towards

ethical and moral aspects. Through the objectives mentioned below, the research aspires to bridge the gap between tradition and modernity, offering insights into how the past can guide the future of education.

1. To explore vital components of the Gurukul System with a special focus on moral education, discipline, self-regulation, and spiritual education.
2. To assess contemporary public awareness and perception of the Gurukul system, identifying how it is viewed in the context of modern education.
3. To draw parallels between the Gurukul system and NEP 2020 by comparing the practices of both, highlighting adaptations of the Gurukul system for today's educational frameworks.

Research Methodology

For this study, data were collected through random sampling, with a predetermined sample size of 36 participants, including teachers, professors, B.Ed. students, and educators. A self-structured questionnaire was initially piloted to refine the tool, leading to minor additions and deletions before finalizing it. The final questionnaire was circulated using Google Forms for ease of data collection. The analysis of the collected data was conducted using basic statistical tools such as frequency, percentage, and cross-tabulation to identify correlations between variables. Statistical software was employed to process the data, and the findings are presented graphically for clarity and better interpretation.

Statistical interpretation

To capture data from various societal perspectives, the questionnaire was structured to yield highly targeted responses. In line with the study's goals and the data obtained, a fundamental statistical analysis was conducted. This analysis demonstrates correlations among variables, and multi-variable tables were created using statistical software to illustrate specific outcomes relevant to the primary objective.

Literature review

Imagine a time when education was not confined to textbooks or classrooms but was a way of life. This was the essence of the Gurukul system, which flourished during the Vedic period. Education was oral, with a focus on scriptures, philosophy, and ethics, passed down through generations. The guru-shishya relationship was the soul of this system—a bond of trust and respect where the guru mentored the student in every facet of life. The curriculum was holistic, blending spiritual wisdom, intellectual rigor, and physical discipline¹. Students lived in the guru's ashram, learning through observation, practice, and dialogue, fostering a sense of community and shared purpose. At its core, the Gurukul system emphasized moral and ethical values, instilling principles like truthfulness, non-violence, and respect for all life. It was not just about acquiring knowledge

but about becoming a better human being, grounded in values that promoted personal growth and societal well-being²⁻⁵.

From the intimate, holistic learning environment of the Gurukul system, education began to adapt to changing times. The evolution of education in India can be traced through distinct phases. The medieval period introduced madrasas, blending religious and secular knowledge. During the British colonial era, Western-style education emerged, emphasizing formal schooling and English. Post-independence, India expanded access to education, building schools and universities.

But, with the expansion of education came the realization that academic achievement must be complemented by the development of essential values^{6,7}. At the heart of a fulfilling life lies the importance of values, which act as the moral and ethical framework for our existence. Values provide clarity and direction, helping us set priorities and make decisions that resonate with our deepest beliefs. They inspire us to act with kindness, honesty, and responsibility, fostering meaningful relationships and a sense of belonging. In times of uncertainty or difficulty, values serve as a source of strength, reminding us of what truly matters. By embracing and living by our values, we create a life of purpose, authenticity, and lasting impact.

While values are essential for guiding our lives and shaping our character, the process of developing and internalizing these principles often begins with education⁸. Education is not just about acquiring knowledge or skills; it is also a transformative journey that helps individuals understand, embrace, and live by core values⁷. Through education, we learn not only about the world around us but also about ourselves, our responsibilities, and the importance of values like empathy, integrity, and respect. As we explore the transformative potential of values in education, we see a natural alignment with the goals and objectives of the National Education Policy (NEP) 2020, which aims to revitalize India's education system⁹.

The National Education Policy (NEP) 2020 is a bold step toward reimagining education in India. It envisions a system that goes beyond textbooks and exams, focusing instead on holistic development, multidisciplinary learning, and the nurturing of values. At its core, NEP 2020 seeks to bridge the gap between tradition and modernity, weaving India's rich cultural heritage into the fabric of contemporary education. It encourages students to think critically, embrace technology, and stay connected to their roots—a delicate balance between the old and the new. This is where the timeless wisdom of the Gurukul system comes into play. The Gurukul system, with its emphasis on moral education, self-discipline, and community living, offers a blueprint for instilling values like empathy, integrity, and respect¹⁰⁻¹². This can let us imagine a modern classroom where students not only learn math and science but also engage in discussions about ethics, participate in community service, and build meaningful relationships with their teachers—much like the guru-shishya bond of the Gurukuls¹³. By integrating these elements, NEP 2020 can

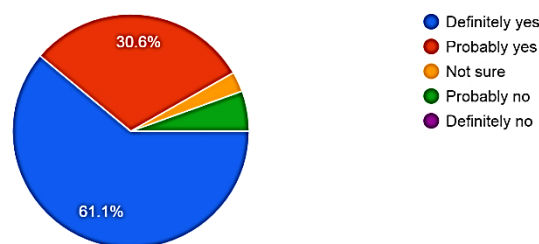
create an education system that doesn't just produce skilled professionals but also compassionate, ethical individuals¹⁴.

In essence, NEP 2020 has the potential to blend the best of both worlds: the Gurukul's focus on character-building and the modern world's demand for innovation and critical thinking. It's not just about preparing students for jobs; it's about preparing them for life. By drawing inspiration from the Gurukul system, NEP 2020 can craft an education system that is as much about the heart as it is about the mind. The revitalized Gurukul system, infused with the vision of the NEP 2020, must now be scrutinized through the lens of public perception, considering how this reimagined education paradigm aligns with the values, hopes, and fears of the Indian people. This analysis can set the stage for further research and reflection on the revitalized Gurukul system, inviting educators, policymakers, and scholars to join the conversation on reimagining Indian education for the 21st century.

Interpretation of data:-

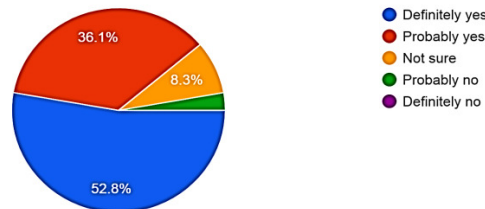
The overwhelming majority of respondents, representing 85.7% of the total, firmly believe that the Gurukul system was significantly more effective than modern education systems in instilling moral values and ethics in students. This strong consensus is further supported by an additional 11.4% who, while not as emphatic, still lean towards agreement with this sentiment. Only a single respondent expressed uncertainty, and there was a complete absence of negative responses. This data indicates a widespread perception that the Gurukul system possessed a superior ability to cultivate morality and ethical behavior among its students compared to contemporary educational approaches.

3. Do you think the Gurukul system was more effective in instilling moral values and ethics in students compared to modern education systems/ तुम... आधुनिक शिक्षण प्रणालीपेक्षा अधिक प्रभावी होते का?
36 responses



The findings of this study reveal significant support for the integration of Gurukul-based skill training within the vocational education framework of NEP 2020. A majority (60.6%) of respondents strongly supported this initiative, while 30.3% expressed moderate agreement, reflecting a positive attitude toward the incorporation of traditional learning methodologies into modern skill development programs. In contrast, 6.1% of participants remained neutral, and 3.0% indicated slight opposition, with no respondents expressing outright disapproval.

9. Do you think Gurukul based skill training is a good model to promote vocational education for NEP 2020/ NEP 2020 अंतर्गत व्यावसायिक शिक्षणाला चाल...धारित कौशल्य प्रशिक्षण एक चांगला पर्याय आहे का?
36 responses



Suggestions

- The Gurukul system, with its emphasis on living in ashrams, renouncing material comforts, and dedicating years to learning under a guru, may not be entirely practical in today's fast-paced, technology-driven world. Modern lifestyles, career demands, and societal structures make it challenging to adopt such an immersive and time-intensive model.
- According to public perception, certain aspects of the Gurukul system remain highly relevant. For instance, its focus on moral education, discipline, and holistic development resonates deeply in a world where academic success often overshadows character building.
- Modern curricula can incorporate some subject from the Gurukul system, which can equip students with skills for the 21st century.

Conclusion

The findings of this study indicate a strong preference for integrating elements of the traditional Gurukul system into modern education under NEP 2020, particularly in areas such as moral education, discipline, skill training, and value-based learning. A majority of respondents acknowledged the effectiveness of the Gurukul system in fostering holistic development and expressed support for incorporating its pedagogical approaches, including oral traditions, spiritual education, and open-air learning spaces. While there is widespread recognition of NEP 2020 as a transformative reform, concerns regarding its practical implementation highlight the need for a balanced approach that harmonizes traditional methodologies with contemporary educational practices. By selectively integrating beneficial aspects of the Gurukul system within the NEP 2020 framework, India can cultivate a holistic, skill-oriented, and culturally rooted education system that aligns with modern pedagogical advancements.

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**BUILDING RESILIENT COMMUNITIES: EXPLORING GENDER
DIFFERENCES IN CYBER VICTIMIZATION AMONG SCHOOL STUDENTS**

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1.0 Abstract:-

The nature of warfare is evolving, and future conflicts may not involve traditional battles between humans and machines. Instead, the new battleground is cyberspace, where enemies focus on exploiting online interactions. This shift highlights the importance of cyber security, as digital communications, social media, and data exchanges become potential sources of intelligence for adversaries. Children in today's digital world frequently explore the internet without fully understanding the potential risks. As they browse, they unknowingly leave behind digital footprintstraces of their personal information, browsing habits, and online interactions that can be tracked, analyzed, and misused by cybercriminals. Without proper awareness and guidance, they may unintentionally share sensitive data, increasing their exposure to cyber threats. The evolving nature of warfare extends into cyberspace, where adversaries exploit online interactions for strategic advantage. This underscores the critical importance of cyber security, particularly as digital communication and social media become potential sources of intelligence. Children, navigating the digital landscape, are especially vulnerable due to their often-unconscious creation of digital footprints. These traces of personal information and online activity can be exploited by cybercriminals, highlighting the need for increased awareness and protective measures. This study analyzed cyber victimization among school students, revealing a statistically significant gender difference ($t = 2.32, p = 0.05$). Female students reported higher cyber victimization scores (mean = 70.23) compared to male students (mean = 70.03), with greater variability observed among males ($SD = 14.99$) than females ($SD = 14.15$).

1.1 Introduction:-

The concept of cyber victimization emerged with the rise of cybercrime. A victimization relationship is one in which one party is at a disadvantage while the other party experiences abuse, suffering, destruction, exploitation, and injustice. While committing a crime, criminals may manipulate their victims into acting out roles that are similar to those of master and slave, winner and loser, champion and defeated, or predator and prey. Victimization in all its manifestations has been considered unlawful throughout history. These acts encompass various forms of oppression

and exploitation, including sexual assault, theft, and deceit. Nevertheless, each of these methods of victimization could be classified as conventional victimization.

Unlike traditional bullying, the effects of cyber victimization are often hidden, making early detection within school settings challenging.

➤ **Mood Deregulation:**

Students experiencing cyber victimization may exhibit emotional distress such as anxiety, irritability, sadness, or sudden changes in behaviour. They may become withdrawn, lose interest in academics or extracurricular activities, or show increased emotional reactivity in school

➤ **Online Interaction and Expression:-**

Affected students may alter their online behaviours, such as reducing social media activity, deleting posts, blocking individuals, or using coded language to express distress. These subtle shifts can provide clues to educators and parents about their struggles.

➤ **Evolving Digital Language:**

As students develop their own digital culture, new slang, emojis, and coded phrases are often used to discuss cybervictimization without explicitly stating it. This evolving language poses a challenge for educators and caregivers trying to identify and intervene in cases of online harassment. Understanding this linguistic shift is essential for effective intervention.

1.2 **Barriers to Reporting Cybervictimization:**

Despite the significant emotional toll, many students do not report cybervictimization due to various psychological and social barriers. These were categorized into subthemes:

• **Fear of Retaliation and Social Stigma**

Many students hesitate to report cyber victimization due to fear of retaliation from peers or concerns about social stigma. They worry that speaking up may lead to further harassment, exclusion from friend circles, or being labelled as weak. The pressure to conform to peer expectations often discourages victims from seeking help, leaving them to cope in silence. Schools must foster a culture of empathy and support where students feel safe discussing their online experiences without fear of judgment or retribution.

• **Lack of Trust in Teachers and Parents**

A significant barrier to reporting cybervictimization is the lack of trust in adults, including teachers and parents. Students often feel that adults may not understand their digital interactions or might overreact by restricting their access to the internet and social media. Many fear that their concerns will be dismissed or that they will be blamed for engaging in certain online activities. To address this, schools and families must create open

communication channels where students feel heard, validated, and assured of support rather than punishment.

- **Impact of Digital Footprint**

With increasing awareness of digital footprints, students may hesitate to report cyber victimization for fear of scrutiny of their past online behaviour. They worry that their messages, posts, or shared content may be used against them or that they might be held responsible for engaging in risky digital interactions. Schools should educate students on managing their online presence responsibly while ensuring that reporting mechanisms focus on protection and resolution rather than blame or disciplinary action.

- **Fear of Losing Digital Access**

One of the most pressing concerns for students is the fear of losing access to their digital devices or online platforms if they report cyber victimization. Many believe that parents or teachers might impose restrictions as a protective measure, cutting them off from their social networks. Since digital communication plays a crucial role in their social lives, this fear of isolation discourages students from seeking help. Schools and parents should prioritize guidance over punishment, helping students navigate online challenges while maintaining safe access to digital spaces.

- **Fear of Missing Out (FOMO) and Social Pressure**

The psychological phenomenon of **Fear of Missing Out (FOMO)** further discourages students from reporting cyber victimization. They fear that if they take action against online harassment, they may be excluded from social media groups, online gaming communities, or other digital interactions. This pressure to stay connected, even in distressing situations, often keeps students silent. Schools must integrate digital well-being education into their curriculum, encouraging students to prioritize their mental health and recognize the value of a safe and respectful online environment.

- **Addressing Barriers Through NEP 2020 and Digital Literacy**

The National Education Policy (NEP) 2020 emphasizes digital learning and the responsible use of technology, making it crucial for schools to address cyber victimization as part of digital literacy programs. Schools should implement awareness campaigns, provide counseling support, and create anonymous reporting mechanisms to ensure that students feel comfortable seeking help. By fostering a culture of trust, digital responsibility, and psychological safety, schools can empower students to report cyber victimization without fear, ensuring a healthier and more secure online environment for all.

- **Minimization or Disconnection from Cybervictimization and Its Impact on Mental Well-being**

Many students minimize or emotionally disconnect from their experiences with cybervictimization, viewing it as an unavoidable aspect of online interactions. The normalization of digital aggression and peer pressure can lead them to believe that seeking help is unnecessary or ineffective. This disengagement can have significant consequences for their mental well-being, contributing to stress, anxiety, and feelings of helplessness. Additionally, some students fear that reporting the issue may result in restrictive measures, such as loss of digital access, further isolating them from their social circles. To address this, schools must actively promote digital resilience, encourage open discussions about online experiences, and create a supportive environment where students feel safe seeking help without fear of judgment or punitive actions.

1.3 Characteristics of Cyber Victimization among School Students:-

- **Anonymity of Perpetrators:-**

Cyberbullying in schools becomes worse when the bully stays anonymous. Many students, both boys and girls, are harassed by unknown people or even classmates using fake profiles. Since the bully's identity is hidden, they feel less afraid of getting caught, which encourages more frequent and severe online harassment.

- **Low Reporting Rates Among Students:-**

A significant number of school students hesitate to report cyberbullying incidents due to fear of retaliation, social stigma, or lack of trust in adults' intervention. Male students may avoid reporting due to societal expectations of toughness, whereas female students might refrain due to concerns about victim-blaming or reputation damage. Additionally, many students fear that reporting cyberbullying will result in restrictions on their internet use, further discouraging them from seeking help.

- **Rapid Dissemination of Harmful Content:-**

The speed and reach of digital communication make cyberbullying particularly harmful for students. Hurtful messages, edited images, or false rumours can spread rapidly across social media, school group chats, and online forums, often causing emotional distress, humiliation, and social isolation. For female students, character attacks and privacy violations (such as the spread of manipulated images, photo, video) can have severe psychological consequences, while male students may experience online exclusion that affects their self-esteem

1.4 Objectives:

- To examine the extent and nature of cyber victimization among school students.

- To analyze gender-based differences in experiences of cyber victimization.

1.5 Hypotheses:

- There is no statistically significant difference in cyber victimization experiences between male and female school students.

1.6 Variables of the Study:

- **Dependent Variable:** Cyber victimization
- **Independent Variable:-** Gender

1.7 Operational definition: -

- **Cyber Victimization:-**

It is an act of victimising others through the Internet and communication technology. Peers harm students through electronic gadgets, which are called cyber victimisation. (D.Kalia 2018)

1.8 Sample:-

This study utilizes a combined sampling approach that integrates stratified random sampling and simple random sampling to ensure a comprehensive and representative selection of participants. The stratification is based on English-medium educational institutions across 12 talukas in Goa, ensuring equal representation from each region. Within each stratum, simple random sampling is employed to select participants, minimizing selection bias and enhancing the generalizability of the findings.

1.9 Tool:-

This study employs the Cyber Victimization Scale developed by D. Kalia (2016) as the primary instrument for quantitative data collection and analysis. The scale is designed to assess the extent and nature of cyber victimization among school students, providing reliable and valid measurements for statistical analysis.

1.10 Analysis:-

Gender	N	Mean	Mode	Median	SD	Sk	Kurtosis	T-test	Level	Level
M	449	70.03	67	70	14.99	0.14	-0.33	0.82	0.01	0.05
F	640	70.23	77	70	14.15	0.018	-0.16		2.32	2.57

The mean cyber victimization score for males is 70.03, while for females it is 70.23. The mode cyber victimization score for males is 67, while for females it is 77. The median cyber victimization score is the same for both males and females, at 70. The standard deviation (SD) of cyber victimization scores is slightly higher for males (14.99) compared to females (14.15), indicating greater variability among males. The skewness (Sk) and kurtosis values indicate relatively normal distributions for both groups. The t-test statistic is 2.32, which is greater than the

critical value at a significance level of 0.05, indicating no significant difference between males and females in terms of cyber victimization.

1.11 Conclusion:-

Cyber victimization is a growing concern among school students, affecting their emotional well-being, academic performance, and social interactions. This study highlights how students experience online harassment differently, with gender playing a role in shaping these experiences. Many students hesitate to report incidents due to fear of retaliation, social stigma, or the possibility of losing access to digital platforms. This lack of reporting prevents timely intervention and support.

To address cyber victimization effectively, schools must implement digital literacy programs, encourage open communication, and establish safe reporting mechanisms. Special attention should be given to creating awareness about online risks and promoting responsible digital behaviour among students. Additionally, fostering a supportive school environment where students feel comfortable discussing their online experiences can help in early identification and intervention.

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शाश्वत विकासाला पूरक व मारक ठरणान्या सद्यस्थितीतील घटनांचा अभ्यास

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प्रस्तावना:-

माणसाच्या सभोवताली जैविक व अजैविक घटक आहेत. जैविक घटकांमध्ये आजूबाजूच्या परिसरातील प्राणी वनस्पती यांचा समावेश होतो तर अजैविक घटकांमध्ये ,पाणी, अन्न, खनिजे, जमीन ,सूर्यप्रकाश इत्यादींचा समावेश होतो. माणसाने बुद्धिमत्तेच्या जोरावर अनेक क्षेत्रे पादाक्रांत केलेली आहेत. विज्ञान व तंत्रज्ञानाच्या जोरावर मानवाने विविध क्षेत्रे पादाक्रांत करत असताना पर्यावरणाकडे दुर्लक्ष केलेले आहे. तसेच त्यामुळे पर्यावरणाचा मोठ्या प्रमाणावर ऱ्हास झालेला दिसतो. हवा ,पाणी आणि वायू प्रदूषणामध्ये झालेली वाढ तसेच त्यामुळे निर्माण झालेले विविध प्रकारचे आजार, नैसर्गिक स्रोतांची अनुपलब्धता तसेच जागतिक तापमान वाढ,ऊर्जा समस्या अशा अनेक समस्यांना मानवाला सामोरे जावे लागत आहे. अनेक वनस्पती, प्राणी, पक्षी दुर्मिळ होत चाललेले आहेत.त्यामुळे जैवविविधता कमी होत चाललेली आहे. त्याचा परिणाम परिसंस्थेमधील अन्नसाखळीवर झालेला दिसतो.त्यामुळे मानवाचा झालेला विकास हा तात्पुरता विकास आहे असे खेदाने म्हणावे लागेल. कोणताही विकास हा कायमस्वरूपी असणे महत्त्वाचे आहे. यामध्ये जीवनाची गुणवत्ता वाढविणे आवश्यक आहे. परंतु हा शाश्वत विकास होत असताना नैसर्गिक स्रोतांची समृद्धता आणि उपलब्धता कमी होताना दिसत आहे .तसेच निसर्गाचे आणि नैसर्गिक स्रोतांचे संवर्धन याकडे दुर्लक्ष होताना दिसत आहे. जीवनाच्या गुणवत्तेमध्ये सर्वकष स्वरूपाची वृद्धी होताना दिसत नाही. त्यामुळे सध्या झालेला विकास हा शाश्वत विकास नाही असे म्हणावे लागेल.

शाश्वत विकासामधील मूलभूत आव्हाने म्हणजे हवामान बदल, पर्यावरणीय समस्या, आरोग्य, पोषण आणि जागतिक समस्या आहेत. या घटकांमुळे शाश्वत विकासामध्ये अडथळे निर्माण होत आहेत. त्यामुळे संशोधकाने शाश्वत विकासावर परिणाम करणाऱ्या घटकांचा अभ्यास करण्याचे ठरविले आहे. त्यासाठी संशोधकाने सद्यस्थितीत पर्यावरणासंबंधी दैनंदिन जीवनामध्ये घडणाऱ्या विविध घटना वृत्तपत्रांमधून प्रसिद्ध होत असतात. त्या माहितीचही संशोधकाने अभ्यास केलेला आहे.

संशोधनाची गरज:- पृथ्वीतलावर येणाऱ्या भावी पिढ्यांच्या गरजा भागविण्यात पर्यावरणाची गुणवत्ता कायम राखून वर्तमान पिढ्यांच्या गरजा भागविण्याच्या दृष्टीने साधण्यात येणारा विकास म्हणजे शाश्वत विकास होय. आपणाकडे जे नैसर्गिक साधन स्रोत उपलब्ध आहेत त्यांना हानी न पोहोचवता शाश्वत विकास करणे शक्य आहे. सद्यस्थितीमध्ये

हवामान बदलाच्या अनेक घटना घडताना दिसतात. या घटना घडण्यामागे काही कारणे अंतर्भूत आहेत. या सर्वांचा परिणाम शाश्वत विकासावर होत आहे.सद्यस्थितीमध्ये हवामान बदलाच्या कोणत्या घटना घडतात याचा शोध घेण्याचा प्रयत्न संशोधकाने केलेला आहे. तसेच या घटना घडण्यामागची कारणे कोणती आहेत याचा शोध संशोधकाने घेतलेला आहे. सद्यस्थितीमध्ये शाश्वत विकास होण्यासाठी कोणत्या उपाययोजना करता येतील याचाही शोध संशोधकाने घेतलेला आहे.

संशोधनाची उद्दिष्टे:-

- 1) सद्यस्थितीतील हवामान बदलाच्या विविध घटनांचा अभ्यास करणे.
- 2) सद्यस्थितीतील हवामान बदलास कोणते घटक कारणीभूत आहेत याचा शोध घेणे.
- 3) सद्यस्थितीत शाश्वत विकासासाठी कोणत्या उपाययोजना केल्या जातात त्यांचा अभ्यास करणे.

संशोधनाचे व्याप्ती: -

- 1) सदरच्या संशोधना मध्ये सद्यस्थितीतील हवामान बदलाच्या घटनांचा अभ्यास केलेला आहे.
- 2) सदरच्या संशोधनामध्ये सद्यस्थितीमधील हवामान बदलासाठी कारणीभूत असणाऱ्या घटकांचा अभ्यास केलेला आहे.
- 3) सदरच्या संशोधना मध्ये शाश्वत विकासासाठी सद्यस्थितीत केल्या जाणाऱ्या उपाययोजनांचा अभ्यास केलेला आहे.

संशोधनाच्या मर्यादा: -

1. सदरच्या संशोधनात सद्यस्थितीतील केवळ हवामान बदलाच्या घटनां व्यतिरिक्त अन्य घटनांचा अभ्यास केलेला नाही.
2. सदरच्या संशोधनामध्ये सद्यस्थितीतील केवळ हवामान बदलासाठी कारणीभूत असणाऱ्या घटकां खेरीज अन्य घटकांचा अभ्यास केलेला नाही.
- 3) सदरच्या संशोधनात सद्यस्थितीतील शाश्वत विकासा साठीच्या उपाययोजना व्यतिरिक्त अन्य उपाययोजनांचा अभ्यास केलेला नाही.

संशोधनाच्या पद्धती:- सदरच्या संशोधनात तुलनात्मक कार्यकारण संशोधन पद्धतीचा वापर केलेला आहे.

संशोधनाची साधने :- सदरच्या संशोधनात संशोधकाने निरीक्षण या संशोधन साधनाचा वापर केलेला आहे.

विश्लेषण व अर्थनिर्वचन:- सद्यस्थितीतील हवामान बदलाच्या विविध घटनां खालील प्रमाणे सांगता येतील
उद्दिष्ट क्रमांक 1 चे विश्लेषण व अर्थनिर्वचन -

1. सद्यस्थितीमध्ये फेब्रुवारी महिन्यात तापमान एप्रिल मे या महिन्यात प्रमाणे वाढलेले दिसते. तसेच दुपारी खूप जास्त तापमान व रात्री खूप कमी तापमान असा तापमानातला बदल अनेक आरोग्य विषयक तक्रारी निर्माण होण्यासाठी कारणीभूत ठरलेला आहे. विषाणूजन्य संसर्गाला नागरिक बळी पडत आहेत. जागतिक तापमान वाढ ही एक मोठी समस्या झालेली आहे. तापमान वाढल्यामुळे हिमनद्या वितळत आहेत आणि त्यामुळे समुद्राची पातळी वाढून काही शहरे जलमय होण्याचा धोका निर्माण झालेला आहे. तसेच गोड्या पाण्याचे स्रोत कमी होताना दिसत आहेत. त्यामुळे दुष्काळाला सामोरे जावे लागत आहे. तापमान वाढल्यामुळे पाण्याच्या गुणवत्तेवर परिणाम होत आहे
2. सद्यस्थितीमध्ये अवकाळी पाऊस, सुनामी वादळ, अनेक वेळेला होणारी गारपीट, ओला दुष्काळ पडणे, कोरडा दुष्काळ पडणेअशा अनेक प्रकारच्या घटना हवामान बदलाच्या द्योतक आहेत असे आपल्या लक्षात येते.

उद्दिष्ट क्रमांक 2 चे विश्लेषण व अर्थनिर्वचन -सद्यस्थितीमध्ये हवामान बदलासाठी कारणीभूत असणारे घटक खालील प्रमाणे सांगता येतील.

1. जंगलामध्ये लागणारे वणवे यामुळे वनक्षेत्रामध्ये घट झालेली आहे. तसेच औद्योगीकरण आणि विविध प्रकल्पासाठी मोठ्या प्रमाणात झाडे तोडली जात आहेत.
2. अनेक ठिकाणी वृक्षारोपण केले जात आहे. परंतु झाडांच्या पुढील वाढीकडे तेवढे लक्ष दिले जात नाही. त्यामुळे झाडे लावण्याचे प्रमाण जास्त आहे. परंतु त्यातील सर्व झाडे जगताना दिसत नाहीत.
3. वाहनातून बाहेर पडणारा धूर, तसेच कारखान्यातून बाहेर पडणारा धूर यामधून मिथेन, कार्बन डाय-ऑक्साइड यासारखे वायू बाहेर पडतात. त्यामुळे दिवसेंदिवस तापमान वाढ होताना दिसत आहे. जीवाश्म इंधन जाळल्यामुळे हवेमध्ये कार्बन डाय-ऑक्साइड वायू मोठ्या प्रमाणात सोडला जात आहे. त्यामुळे हरितगृह वायूंचे प्रमाण वाढत आहे. हे वायू पृथ्वीभोवती गुंडाळलेल्या चादरीचे काम करत आहेत. त्यामुळे तापमानामध्ये वाढ होत आहे.
4. अनेक ठिकाणी इमारतींचे बांधकाम प्रचंड प्रमाणात होताना दिसते. परंतु सध्या जे नागरिक त्या परिसरांमध्ये राहत आहेत त्या इमारतींना पुरेसा पाणीपुरवठा होत नाही. नव्याने तयार झालेल्या इमारतींना वाढीव पाणीपुरवठा कोठून करणार हा प्रश्न निर्माण झालेला आहे. म्हणजेच नवीन जलस्रोतांची गरज आहे.
5. विकासाच्या नावाखाली जमीन नष्ट होण्याच्या प्रमाणात वाढ झालेली आहे. अनेक पाणथळ ठिकाणी भराव घातला जात आहे. खारफुटीवर अतिक्रमण केले जात आहे. गवताळ जमीन विकास करण्यासाठी वापरली जात आहे. त्यामुळे तेथील पक्षांचे अधिवास कमी होत चाललेले आहेत. जैवविविधता कमी होत चाललेली आहे. पक्षांचे प्रमाण कमी होताना दिसत आहे.
6. अनेक शहरांमध्ये डम्पिंग राऊंड च्या जवळ असणाऱ्या इमारतींना दुर्गंधीचा सामना करावा लागतो. तसेच इमारतींचे बांधकाम करताना वापरले जाणारे सिमेंट, काँक्रीट यामुळे हवेच्या प्रदूषणात भर पडत आहे.
7. इंडिया स्टेट ऑफ फॉरेस्टच्या या वर्षीच्या रिपोर्ट नुसार गेल्या दोन वर्षात देशातील 3162 चौरस किलोमीटर घनदाट क्षेत्र कमी झालेले आहे. तसेच गेल्या दहा वर्षांमध्ये ईशान्य भारतातील 312 चौरस किलोमीटर क्षेत्रावरील वनक्षेत्र संपुष्टात आलेले आहे.
8. तसेच खारफुटीचे क्षेत्रफळ गेल्या दोन वर्षांच्या तुलनेत सरासरी 7.50 चौरस किलोमीटरने कमी झालेले आहे. खारफुटीचे क्षेत्र कमी होत चाललेले आहे. तसेच पाणथळ जागा कमी होत चालल्यामुळे तेथील जैवविविधता धोक्यात आलेली आहे.
9. विज्ञान तंत्रज्ञानाच्या वापरामुळे नवनवीन शोध लागलेले आहेत. असाध्य रोगांवर औषधे निघालेली आहेत. त्यामुळे माणसाचे आयुर्मान वाढलेले आहे. याचा परिणाम लोकसंख्या वाढीमध्ये झालेला दिसतो. वाढत्या लोकसंख्या वाढीमुळे मूलभूत सुविधा उपलब्ध होण्यासाठी घरांची आवश्यकता आहे. त्यासाठी जंगलतोड म्हणजेच वृक्षतोड करून नवनवीन इमारती उभ्या राहताना दिसतात. वृक्षतोड केल्यामुळे त्यावरील पक्षांचे अधिवास कमी झालेले आहेत. तसेच जंगलव्याप्त जमीन कमी झाल्यामुळे प्राण्यांचे अधिवास सुद्धा कमी झालेले दिसतात. जंगलामधील परिसंस्था धोक्यात आलेली दिसत आहे. त्यामुळे मानवी वस्तीमध्ये बिबट्यांचा शिरकाव झालेला दिसतो. कबुतरांची

संख्या खूप मोठ्या प्रमाणात वाढलेली दिसते.

10. मुंबईच्या समुद्रकिनाऱ्यावर वाढत्या प्रदूषणामुळे ऑलिव्ह रिडले जातीच्या कासवाची घरटी नामशेष झालेली आहेत. अलिबागच्या समुद्रकिनाऱ्यावर 40 वर्षांच्या कालावधीनंतर ऑलिव्ह रिडले या कासवाने प्रदूषण कमी झाल्याने अंडी घातल्याचे दिसून आलेले आहे.
11. हवामान बदलामुळे प्राणी त्यांचे अधिवासाचे ठिकाण बदलत आहेत. त्यामुळे परिसंस्थेचे स्वरूप बदलत आहे. तसेच अधिक तापमान असलेल्या ठिकाणी मानवी वस्ती विरळ होत जाते.
12. राज्यात वाघांची संख्या वाढल्यामुळे मानवी जीवित आला धोका निर्माण झालेला आहे तसेच शेतीचेही मोठ्या प्रमाणामध्ये नुकसान होत आहे.

उद्दिष्ट क्रमांक 3 चे विश्लेषण व अर्थनिर्वचन:- सद्यस्थितीत शाश्वत विकासासाठी केल्या जाणाऱ्या उपाययोजना पुढीलप्रमाणे :-

1. गोरई येथे कांदळवन उद्यान तयार करण्यात आलेले आहे. या कांदळवन उद्यानाला भेट देणाऱ्या व्यक्तींना कांदळवन परिसंस्थेचे महत्त्व तसेच कांदळवनाचे मानवाला होणारे फायदे समजणार आहेत तसेच कांदळवनाचे संवर्धन का केले जावे आणि ते कसे करता येईल याची माहिती त्या ठिकाणी देण्यात येणार आहे.
2. भारतामध्ये गंगा, ब्रह्मपुत्रा या नद्यांमध्ये 6300 प्रकारचे डॉल्फिन आढळून आलेले आहेत. डॉल्फिन प्रकल्प अंतर्गत भारतामध्ये प्रथमच नद्यांमध्ये आढळून येणारे डॉल्फिन यांची संख्या मोजण्यात आली हे जगातील सर्वात मोठे सर्वेक्षण आहे. डॉल्फिन आणि अन्य पाण्यात आढळणाऱ्या प्रजातींचे संवर्धन करण्यासाठी हा प्रकल्प हाती घेण्यात आलेला आहे. तसेच मे 2025 मध्ये आशियाई सिंहांच्या सोळाव्या गणनेच्या अंदाज घेण्यात येणार तसेच सिंहांच्या संवर्धनासाठी 2900 कोटी पेक्षा अधिक निधी मंजूर करण्यात आलेला आहे.
3. प्रदूषण नियंत्रण केल्यामुळे 40 वर्षांनंतर अलिबागच्या समुद्रकिनाऱ्यावर ऑलिव्ह रिडले या कासवाची अंडी आढळून आलेली आहेत. अलिबागच्या समुद्रकिनाऱ्यावर ऑलिव्ह रिडले या कासवाच्या घरट्याच्या भोवताली तारेचे कुंपण घातले जाणार आहे. त्याचे संरक्षण केले जाणार आहे.
4. मुंबई आयआयटी मध्ये झालेल्या संशोधनानुसार समुद्रकिनाऱ्यावरील वनस्पतींमुळे कांदळवनात येणाऱ्या सुनामी तसेच लाटा रोखण्यासाठी मदत मिळत आहे. कांदळ वनामुळे सुनामी आणि पुराचा धोका कमी होतो असा निष्कर्ष या संशोधनातून निघालेला आहे. कांदळ वनांची निर्मिती आवश्यक आहे. इमारती किंवा औद्योगिक क्षेत्र निर्माण करण्यासाठी पाणथळ जमिनीमध्ये भराव घातले जात आहेत. परंतु त्यामुळेच सुनामी व पुरांचा धोका निर्माण होत आहे.
5. जागतिक तापमान वाढ यामुळे होणारा पर्यावरणाचा ऱ्हास थांबवण्यासाठी वृक्ष प्राधिकरणामार्फत नवनवीन उपक्रम हाती घेण्यात आलेले आहेत. नवी मुंबईमध्ये हवा प्रदूषण कमी करण्यासाठी 42 लाख 800 वृक्षांची लागवड करण्यात येणार आहे.
6. वाघांची संख्या वाढल्यामुळे मानवी जीवित आला होणारा धोका कमी करण्यासाठी सौर कुंपण बनवले जाणार आहे.

निष्कर्ष:-

वरील सर्व घटनांचा अभ्यास केला असता असे लक्षात येते की सद्यस्थितीमध्ये हवामान बदलाच्या अनेक घटना घडताना दिसत आहेत. त्यासाठी अनेक घटक कारणीभूत आहेत. परंतु मानवाने पर्यावरणाचा न्यास केलेला आहे. त्यामुळे शाश्वत विकासामध्ये अडथळे निर्माण होत आहेत. निसर्ग हे अंतिम सत्य असून त्याचे संवर्धन व जतन करणे हे मानवाच्या हातात आहे. शाश्वत विकास होण्यासाठी काही चांगल्या घटना आपल्याला सद्यस्थितीमध्ये घडताना दिसत आहेत. शाश्वत विकासाच्या दृष्टीने वाटचाल करण्यासाठी अशा घटना म्हणजे आपल्यासाठी एक आशेचा किरण आहे.

सारांश :-

शाश्वत विकास म्हणजे कायमस्वरूपाचा विकास. शाश्वत विकासामध्ये जीवनाची गुणवत्ता वाढविणे, पर्यावरण संवर्धन करणे, नैसर्गिक साधनसंपत्तीच्या स्रोतांची जपणूक करणे या गोष्टी समाविष्ट आहेत. परंतु सद्यस्थितीमध्ये मानवाने निसर्गावर केलेल्या आक्रमणामुळे हवामान बदलाच्या अनेक घटना घडताना दिसतात. या हवामान बदलाच्या सध्या सद्यस्थितीतील घटकांना कारणीभूत असणाऱ्या घटकांमध्ये खारफुटी वर केलेले अतिक्रमण पाणथळ जागांवर भराव टाकून बांधलेल्या इमारती इत्यादी अनेक घटक कारणीभूत आहेत. जागतिक तापमान वाढ यामुळे हवामान बदल होताना दिसत आहे. त्याचा परिणाम शाश्वत विकासावर होत आहे. परंतु आशेचा किरण म्हणजे पर्यावरण संवर्धनाच्या सद्यस्थितीमध्ये घटना घडताना दिसत आहेत. या सगळ्याचा शोध संशोधकाने घेण्याचा प्रयत्न केलेला आहे.

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Introduction:

Buddhist philosophy is the philosophy of ethical life. Mahatma Buddha's life philosophy is compiled in his many discourses. Although the Buddha did not write any books, his teachings were remembered by his disciples and after his Nirvana he tried to transcribe them. Lord Buddha did not spend time in the discussion of philosophy, because according to him man cannot progress through it. Buddha's view was that it is futile to try to satisfy those subjects who do not have sufficient quantity to satisfy them. Let the Buddha accept truth as the essence of life. He did not reason about indirect and powerful subjects, because according to them they obstruct the path of liberation.

Key Words: Sangh, Shiksha, shil, punchshil, Samyak,

The concept of punishment:

No definite concept of punishment has been defined in Buddhist philosophy. Because Mahatma Buddha who is considered to be the originator of Buddhist philosophy, always stayed away from philosophical controversies. "The Buddhist world did not allow the freedom of its monasteries and seclusion to receive punishment. All kinds of religious and temporal punishment were with the monks." Therefore, in conclusion, it can be said that the definition of Shiksha according to Buddhist philosophy is as follows - "Siksha (Jnana) is the best means of attaining Moksha (Nirvana)." From the above definition it is clear that Shiksha is a means of Mukti. In other words, Shiksha is the process which helps a person to get rid of worldly sufferings and attain Nirvana.

Purpose of punishment:

All Indian philosophies begin with sadism and all philosophies consider the purpose of punishment to be relief from suffering, but Buddhist philosophy is particularly sadistic. According to Buddhist philosophy, the world is a house of suffering and punishment helps to get rid of these sufferings. There are four noble truths based on Buddhist philosophy such as - life is full of suffering, the cause of suffering, the end of suffering is possible and the solution to the end of

suffering. According to Buddhist philosophy, the cause of suffering is ignorance and if that ignorance is removed then suffering can end and only punishment can do this. The Eightfold Path which Lord Buddha has described for leading a good life can actually be considered as the purpose of Buddhist punishment. They are the following:

1. Samyak Drishti (Right Seeing)
2. Samyaka-sankalpa (True Resolution)
3. Samyak-vak (True Word)
4. Samyak Karma (Working Rightly)
5. Samyak-Ajeevika (Doing Business Rightly)
6. Samyak-Vyayam (Doing Business Rightly)
7. Samyak-smriti (right thinking)
8. Samyak Samadhi (Correcting the mind properly)

In the course of time, some practical purposes got a place in the Buddhist education system, that is, the Buddhists managed the big education institutions in that country and put the actual form of Buddhist education in front of us.

These objectives are also known as Sangat objectives of punishment which are as follows

1. Development of moral life
2. Development of personality
3. Protection of culture
4. Holistic development

Course in Buddhist Philosophy:

According to Buddhist philosophy, this world is changing. Man also changes and nothing is permanent in the world. Even the soul is not permanent. That is also changeable from moment to moment. The basic insistence of Buddhism is limited to sadism and the solution of suffering. If the syllabus is limited to these ideas only, then the syllabus of Buddhist-Shiksha-philosophy would be as follows:

1. PurnaParipaka of the Four Noble Truths
2. The art of making a living properly.
3. Study of Buddhist literature.
4. Study of biographies of Lord Buddha and other scholars

After studying the biographies of Lord Buddha and other scholars, the expansion of the Buddhist curriculum in the Buddhist education system is seen.

5 types of studies were taught in Buddhist monasteries and monasteries-

1. Vocabulary - It included word formation, etymology and grammar knowledge.
 2. Shilpasana-Vidya It includes various types of industries and arts.
 3. Medical science includes medicine, physiology etc.
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4. Hetu Vidya- This includes the study of logic.
5. AdhyatmaVidya includes the comparative study of Buddhist philosophies and other philosophies. After the teacher's explanation, there was a group discussion about the topic and after mutual discussion, the students put their remaining doubts before the teacher. In this way, apart from group study-teaching method, some individual study methods were also used which are as follows-
 - c. Memorize formulas
 - b. Remembering and storing facts
 - c. Rethink the material read
 - d. Retain the acquired material with firmness.

Concept of Teacher:

The position of teacher is important in Buddhist philosophy. According to Buddhist philosophy, a person can become a teacher who has understood the Four Noble Truths and who himself leads his life in accordance with the Ashtanga Path. Acharya various categories. In Buddhist philosophy, two categories of gurus are mentioned-

1. The teacher does the work of teaching keeping in mind the differences of the students and fulfills the objectives of teaching different methods. Why does Samyak Drishti develop in students?
2. The Acharya propels the students towards right Samadhi by right concentration, right speech, right exercise, and right memory. Acharya takes the moral life of the students from higher to higher while Upadhyay also gives him training in livelihood etc. Education also aims to make worldly life happy, but the ultimate goal of all is to free the student from suffering. In this way, the teacher has a prominent place in Buddhist education philosophy.

In the practical form of Buddhist education, in Buddhist-education institutions like today there was an Acharya, under that Acharya came many Upadhyayas who were specialists in their respective subjects. Each Upadhyay had a small group of students. Study-teaching process was going on in this small group.

Student Key Concept

1. Admission of students:

There was no Gurukul tradition in Buddhist philosophy. Students used to stay in Mathas, Sanghas, Viharas and obtain Shiksha. Punishers used to come from far and wide to receive punishment. As in the Vedic period, upanayana rites were performed before admission, in the same way students had to perform the pavvajja and upasampada rites to enter the institute of education during Buddhist times.

2. Pavvajja or Pravjaya: A student had to join the Sangha at the age of 8 years apart from his family. After joining the Sangha, the child had to lead a hermit's life. He had to shave his head and
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wear orange clothes. He used to pray to the bhikshu se apnisharanmeinlene ki and the bhikshu used to chant 'Buddha SharanGachchami', 'RdhamSharanGachchami', 'SanghSharanGachchami' 3 times and become a monk. Along with this, he had to take a pledge to renounce the life of indulgences. While in the Sangh, he had to take every promise and strictly follow it. They were called by this rule. The child who was circumcised was called 'Samner'.

3. Upasampada :Upasampada rites were performed after receiving punishment as per rules in the Sangh till the age of 20 years. In this rite, all the monks of the Sangha were gathered and the contestants had to satisfy them through their merits and duties. After the completion of this rite, he was legally considered a member of the Sangh.

Guru-disciple relationship :In the Sanghas of Buddhist times, the guru-disciple relationship was that of father and son. The Guru used to treat his disciples sweetly. used to determine his routine. The disciple also used to serve the Guru with body and mind.

Guru's duty

1. Acharya used to treat the disciple like a son.
2. He used to make arrangements for pots and kheer when the disciple was in short supply.
3. When a disciple becomes sick, serve the disciple and treat him with the best physician.
4. To impart high degree of mental and spiritual discipline to the disciple.
5. Spend only three times as much as students.

Duties of students

In the same way the Guru used to fulfill his duties and responsibilities towards the students, in the same way the students also had to fulfill their duties towards the Guru. The duties of the student were as follows-

1. Rise up from Upadhyay.
2. Sona after Upadhyaya.
3. Arrange datun, water and soil for Guru in the morning.
4. Place a seat for the Guru to sit.
5. Arrange Kheer for Guru.

Discipline in Buddhist philosophy

Buddhist philosophy is the philosophy of moral discipline. Lord Buddha considered it useless to spend time in the discussion of Tattva Mimamsa, because it does not help in the advancement of human life. Buddha believed that it is futile to try to solve matters that do not have enough substance to solve them. Buddha declared many of the pre-existing philosophical views to be irrational and baseless. He avoided reasoning about indirect and ambiguous subjects, because it did not pave the way for salvation.

Establishment of viharas

Similar to Vedic education, many centers of education were established during Buddhist

philosophy. These centers were known as viharas. In this, while giving punishments, care was taken to ensure that sectarianism is not strengthened with Dhamma Prachar. In these viharas, students of all castes, classes, genders, religions etc. were given equal punishment.

During the Buddha's time, many famous viharas were built in Rajagagriha, Vaishali Sravasti and Kapilavastu etc. which became major centers of Buddhist education. Venuvan, Yestivan and Gitavan in Rajagriha, Kutagarshala and Purvaram in Vaishali were famous viharas of this era. In addition to these many viharas were created. He was called Sangharam. There was spiritual contemplation in these sangharams. Acharya here used to enlighten his disciples in the ocean of spiritual knowledge. At the time of Buddha, the monks of the Buddhist Viharas used to get the opportunity to listen to the discourses of Sariputta, Mahamoggalan, Mahakacchan, Mahakotthith, Mahakashmin, Mahachunda Anuruddha, Revat, Upali, Ananda and Rahul etc. and converse with them. These people were often itinerant and in the vihara where they stopped to spend some time, the monks of that place would spontaneously get the opportunity to resolve their doubts by discussing such complex subjects. At that time Nalanda and Vallabhi Mahaviharas were famous as centers of learning. All subjects were taught in this.

Management of Buddhist Shiksha Kendras

After Mahatma Buddha, Buddhist monasteries and monasteries began to develop as centers of Buddhist education. The entire system of Buddhist educational institutions was in the hands of Buddhist monks. There were several committees to assist the Acharya in his administration. In which Shiksha Samiti and Management Samiti were prominent. Their economic status depended on charity.

A major Buddhist-learning center

1. Nalanda University: In the seventh century Nalanda Vihara was a famous center of Buddhist education in all of Asia.

Nalanda area was purchased and offered to Mahatma Buddha for 10 crores in 500 categories. 200 villages were donated for the expenses of this university, the income of which fed the monks here. Residents of this village used to send many maunds of rice and milk here every day. No fee was charged from the students. Their accommodation and food were provided free of charge. Access to Nalanda was difficult. Scholars were stationed at the entrance who conducted oral examinations of the students. This admission was given on passing it. About 30 percent of the students were successful. Women were also allowed to be prisoners. Special Mahayana branch was studied in Nalanda. 'Pali' language was compulsorily taught, Nagarjuna, Vasubandha, Asanga, Dharmakirti etc. were great thinkers who promoted themselves from this center of education. The Chinese traveler Hawensang has mentioned many acharyas who were great scholars in their respective subjects and came from different regions of India to study and teach here. Dharmapala, Chandrapala, Prabhamitra, Aryadev etc. are such talented rulers who earned their name here.

2. Vikramshila University

This university was established in the eighth century by the Pala dynasty ruler of Bengal, Dharmapala, 25 miles away from Bhagalpur in Bihar region. It was a famous center of India from 8th to 12th century. Here, many scholars have composed various texts which have a name in Buddhist literature, among which Buddha, Slakarshanti, Dipankar etc. are prominent. Dipankar composed hundreds of books and was the most talented scholar of this university. He was punished by Buddhist masters like Shilarakshit and Chandrakirti.

In addition to Buddhism and philosophy, justice, philosophy, grammar etc. were taught here. Books were also made available for the convenience of the students and their queries were satisfied by the Acharya. Students from foreign countries also used to come for study. After receiving the punishment, the student's vigilance was considered in the subject of the degree that was obtained. There were also a large number of teachers who lived in viharas and residences.

3. Vallabhi University

Gujarat Kathiawar was the Vallabhi Shiksha Center near the sea which developed along with Nalanda. So far, the fame of this university has spread throughout the country. There were many Buddhist scholars. 100 scholars and 8000 monks have also been given by Havensang.

4. Sharavasti Nagar KaShiksha Kendra

During the lifetime of Mahatma Buddha, the city of Sravasti became a center of Buddhism and education. The chief Shrestha Acharya who built this Vihara during the time of Buddha. Buddhism and ethics were punished here.

5. Jagaddal University

The Buddhist Pal king of Bengal was a great lover of learning. King Rampal (1054-1130 AD) built a new capital at the confluence of the Ganga and its tributary Kartaya. Her name was named Ramavati. A Buddhist Pala king established a Buddhist university named Jagaddal here. It will be barely a century and a half. Later it was also destroyed in the Muslim invasion of Bihar. But in this short period of time, there were many scholars in this university, whose names we know today only from the date of the books. These mentions exist only in two languages, Sanskrit and Tibetan.

6. Odantapuri University

It was founded by Maharaja Gopal (Palvanshi) in Bihar in the 12th century. It had thousands of students and teachers. its destruction

The Muslim invader Muhammad b. It is said that the first Buddhist school in Tibet was built on the model of this university. The tradition of Nalanda was carried on by these universities, which continued till the Muslim conquest. After leaving these universities many scholars came to Tibet where they wrote their books.

Conclusion:

Many of the characteristics of Buddhist punishments are relevant even in the present time. Although the main objective of Buddhist discipline was to propagate Buddhism, other objectives of Buddhist discipline such as development of personality, development of moral character, are completely relevant even today. There are those who have been tried to be included in the new punishment system 2020. Buddhism and teachings of Gautama Buddha were the focal points of the Buddhist punishment system, but there are many principles of peace, non-violence, tendency of democratic organization, self-sacrificing life of students and teachers etc. contained in Buddhist punishment which will contribute meaningfully in the current life full of luster, lust for wealth and power and hatred and hatred.

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**ASSESSMENT OF DIGITAL PROGRAM ON INCLUSIVE EDUCATION
THROUGH DELPHI METHOD**

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Abstract

This article focuses on assessment of digital program on inclusive education. In digital era development of digital program on inclusive education is need of hour. This digital program is a bundle of e-tools which contains e-content on the basis of B.Ed. second year inclusive education syllabus, power point presentations, multimedia including audio, videos and pictures, slogans, short stories, case studies, provoking questions and e-tools like WhatsApp, Zoom, Google classroom. Objective of this study is to validate the digital program through expert's and scientifically through statistical method.

Key Points:The key points are digital program, inclusive education, assessment tool, and Delphi method.

1. Introduction:

This paper is a research based which discussed about validation of digital program through Delphi method which is based on statistic.

2. Introduction of Digital Program:

This is a digital program developed by researcher under guidance of guide; experts and reviews of related literature. This program is a bundle of e-tools which contains e-content on the basis of B.Ed second year inclusive education syllabus, power point presentations, multimedia including audio, videos and pictures, slogans, short stories, case studies, provoking questions and e-tools like WhatsApp, Zoom, Google classroom.

3. Objectives of the Digital Program:

- 1) To enhance knowledge and understanding of inclusive education principles and practices.
- 2) To develop skills in designing and implementing inclusive lesson plans and assessment.
- 3) To foster positive attitude and values among B.Ed. students towards inclusive education and diversity.

4. Content:

Module I and II used as a module for e- content.

5. Instructional Strategies and delivery methods:

Online platform: Google classroom was used as a digital platform.

6. Assessment and evaluation method:

- 1) Immediate feedback through questions.
- 2) Knowledge Test.
- 3) Through case study done by B.Ed students.

All above process was done for developing digital program on inclusive education for B.Ed students. After development of program Delphi method was used for validation. This method is based on expert's opinion and statistical techniques.

7. Development of Assessment Tool for assessing Digital Program:

An assessment tool for a program is a systematic method or instrument used to measure, evaluate and document the effectiveness, quality and impact of a program. Assessment tool help program administrator to validate the program and improve program quality. This tool has six sections, namely,

1. e-Content
2. Instructional Strategies and delivery methods
3. Technical Qualities
4. Interactive and Engagement
5. Assessment and evaluation method
6. Cultural Sensitivity

Every section has closed questions.

8. Methodologies:

The methodology of the study depends upon the purpose of the study. The present study is aimed to assess digital program on inclusive education for B. Ed students.

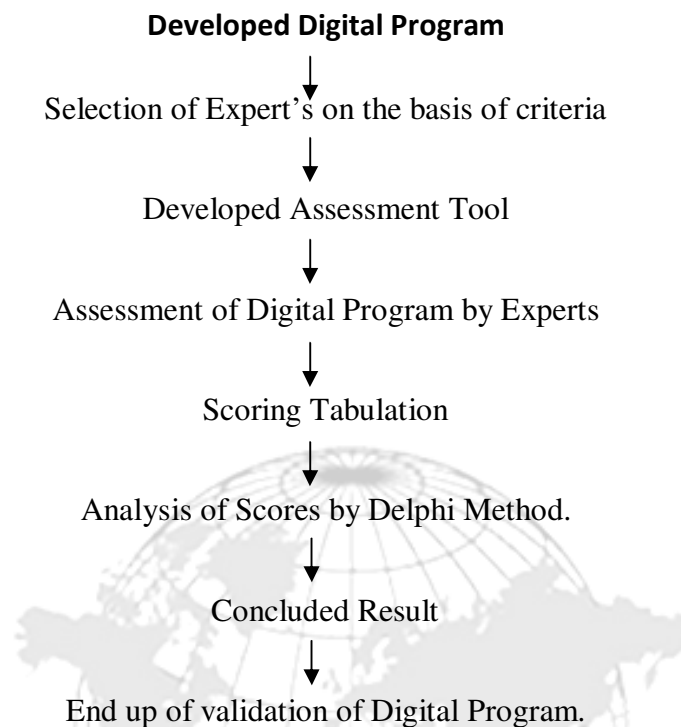
8.1 Method of Research: Survey method was used.

8.2 Population: Teacher educators who have 5 years' experience.

8.3 Sample: 14 Teacher educators are who have 5 years' experience by using non probability based purposive sampling.

8.4 Data Collection Tool: Researcher made assessment tool.

9. Research Procedures:**Implementation Plan and Procedure:**



10. Analysis of Scores by Delphi Method.

For analysis of scores Delphi technique was used and concluded the validation of digital program.

10.1 Delphi Method:

Present study involves experts rating items on a digital program, and then revising their ratings based on feedback from other experts.

Validity of Digital Program was established by using above methods of validity.

Analysis of Delphi Method:

Table
Comparison of Score

Question No.	First Expert Team : 6 Experts Total Score	Second Expert Team :4 Experts Total Score	Third Expert Team :4 Experts Total Score	Decision
1. e-content	6	4	4	Accepted
2. Instructional Strategies and delivery methods	6	4	4	Accepted
3. Technical Qualities	6	4	4	Accepted
4. Interactive and Engagement	6	4	4	Accepted
5. Assessment and evaluation method	6	4	4	Accepted
6. Cultural Sensitivity	6	4	4	Accepted

Observation:

Involves experts rating items on a digital program, and then revising their ratings based on feedback from other experts is equal and the digital program has best quality it is decided by the criteria given by Lawshe

Criteria of Acceptance or Rejection Of Items Given By Lawshe:

1. Score of statement is six that means 6 experts are given 1 score then that statement is accepted.
2. Scores smaller than 3 that means fewer than 50% then the statement is rejected.
3. Scores smaller than 1 and larger than equal to 3 then statement is accepted with expert's remark and make changes according to remark.

Interpretation: Quality of Digital Program is best and it is user friendly.

Result: Result is drawn on the basis of Delphi method and remark of Expert's.

1. e-Content:

The course content is comprehensive and aligned well with objectives. It offers the real-world applications that could directly relate to future teaching goals.

2. Instructional Strategies and delivery methods:

The Course is delivered on online platform is easily navigate and instructional strategy is student centered. Strategies are used in Discussion, thought provoking questions, situation-based problem solving.

3. Technical Qualities:

No technical issues.

4. Interactive and Engagement:

The videos and materials are clear and highly interactive. It fosters an interactive learning environment.

5. Assessment and evaluation method:

Uses quick assessment and continuous comprehensive evaluation.

6. Cultural Sensitivity: Yes, this program has cultural sensitivity.

At the end researcher can conclude that this article is based on research and focuses on assessment of digital program on inclusive education that means validation of program. In digital era development of digital program on inclusive education is need of hour. This digital program is a bundle of e-tools which contains e-content on the basis of B.Ed. second year inclusive education syllabus, power point presentations, multimedia including audio, videos and pictures, slogans, short stories, case studies, provoking questions and e-tools like WhatsApp, Zoom, Google classroom. Objective of this study is to validate the digital program through expert's and scientifically through statistical method.

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A STUDY OF THE FUTURE OF ENERGY: TRANSITIONING TO RENEWABLE AND SUSTAINABLE PRACTICES

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Abstract: -

The global energy landscape is shifting rapidly as countries, industries, and researchers focus on transitioning from fossil fuels to renewable and sustainable energy sources. This transition is driven by the urgent need to combat climate change, reduce carbon emissions, and enhance energy security. Renewable energy technologies such as solar, wind, hydro, geothermal, and bioenergy are increasingly becoming viable alternatives due to advancements in efficiency, declining costs, and supportive policy frameworks.

However, the transition presents challenges, including the intermittency of renewables, the need for large-scale energy storage solutions, infrastructure upgrades, and economic feasibility. Additionally, policy and financial mechanisms play a crucial role in accelerating renewable energy adoption while ensuring a just and equitable transition. Technological innovations such as smart grids, battery storage, green hydrogen, and carbon capture are emerging as key enablers of a sustainable energy future.

This study explores the future of energy by analysing the current state of renewables, the challenges associated with their integration, and the role of technological and policy advancements. The research highlights the economic, environmental, and social implications of energy transition and provides recommendations for achieving a cleaner, more sustainable, and resilient global energy system. The findings suggest that with continued investment, innovation, and collaboration, a renewable energy future is not only possible but essential for long-term global prosperity

Key Words: Solar energy, Global Wind Energy Council, Energy Independence and Security

Introduction: -

The global energy landscape is undergoing a significant transformation as the world shifts toward renewable and sustainable practices. Driven by the need to reduce carbon emissions, combat climate change, and ensure energy security, this transition is reshaping industries, economies, and daily life. Traditional fossil fuel-based energy systems are being replaced by cleaner alternatives such as solar, wind, hydro, and bioenergy, while advancements in energy storage and smart grids are making renewables more reliable and accessible. As governments, businesses, and individuals embrace sustainable energy solutions, challenges such as infrastructure upgrades, resource availability, and policy frameworks must be addressed. This transition is not

just about technology—it requires collaboration, innovation, and long-term planning to create a future where energy is abundant, affordable, and environmentally responsible. The global energy sector is at a turning point, facing the urgent need to transition from traditional fossil fuel-based systems to renewable and sustainable alternatives. With the growing impact of climate change, rising energy demands, and the depletion of finite resources, countries and industries worldwide are accelerating efforts to adopt cleaner, more efficient energy solutions. The shift toward renewable energy is not just a response to environmental concerns but also a strategic move to ensure long-term energy security, economic stability, and technological advancement.

Objectives OfThe Study:-

1. Examine the current state and growth trajectory of renewable energy sources.
2. Identify the challenges associated with integrating renewables into existing energy systems.
3. Explore technological innovations in energy storage, smart grids, and electrification.

The Future of Energy: Importance of Transitioning to Renewable and Sustainable Practices:

As the world moves toward a more energy-efficient and environmentally conscious future, transitioning to renewable energy and sustainable practices is no longer a choice—it's a necessity. Here's why this transition is critical for the future:

1. Ensuring Long-Term Energy Security

Fossil Fuel Depletion: Coal, oil, and natural gas are finite resources. Investing in renewables ensures a stable energy supply for future generations.

Energy Independence: Countries can reduce reliance on imported fossil fuels, making economies more resilient to global energy crises and market fluctuations.

Decentralized Power Grids: Renewable energy sources like solar and wind, combined with battery storage, enable localized power generation, reducing vulnerability to blackouts.

2. Mitigating Climate Change and Environmental Impact

Reducing Greenhouse Gas Emissions: A transition to renewables helps meet global climate targets (e.g., net-zero emissions by 2050).

Protecting Natural Ecosystems: Sustainable energy sources prevent deforestation, oil spills, and habitat destruction linked to fossil fuel extraction.

Cleaner Air and Water: Moving away from coal and oil reduces pollution-related health problems, improving quality of life.

3. Economic Growth and Job Creation

Expanding Green Job Markets: The renewable energy sector is projected to create millions of jobs in solar, wind, bioenergy, and energy efficiency industries.

Lower Energy Costs in the Long Run: As technology advances, the cost of renewables continues to decrease, making energy more affordable for businesses and households.

Sustainable Business Opportunities: The future economy will be built on circular models, energy-efficient designs, and carbon-neutral industries.

4. Advancements in Clean Energy Technologies

Energy Storage and Smart Grids: Innovations in battery technology and AI-driven grid management will allow for more efficient energy distribution.

Hydrogen and Next-Generation Renewables: Green hydrogen and advanced biofuels will provide clean alternatives for heavy industries and transportation.

Electrification of Everything: The shift to electric vehicles, smart homes, and digital energy solutions will reduce overall carbon footprints.

5. Social and Global Equity

Energy Access for All: Renewable microgrids and off-grid solutions will bring affordable electricity to rural and underserved areas.

Climate Resilience for Vulnerable Communities: Sustainable practices can help protect regions most affected by climate change, ensuring food security and disaster preparedness.

Just Energy Transition: Governments and industries must ensure that workers in fossil fuel-dependent sectors have opportunities in the new green economy.

6. Policy and Global Commitments

Paris Agreement & Net-Zero Goals: Governments worldwide are setting ambitious targets to phase out fossil fuels and scale up renewables.

Corporate ESG Responsibility: Businesses are increasingly held accountable for their environmental, social, and governance (ESG) performance.

Incentives and Regulations: Future policies will likely favour carbon pricing, subsidies for green energy, and stricter environmental regulations.

The Role of the Future of Energy in Transitioning to Renewable and Sustainable Practices:-

The future of energy plays a critical role in ensuring a sustainable, secure, and efficient global energy system. As the world shifts away from fossil fuels, renewable energy and sustainable practices are becoming the foundation of economic growth, environmental protection, and social equity. Here's how the future of energy will drive this transition:

1. Leading the Fight Against Climate Change

Reducing Greenhouse Gas Emissions: Transitioning to renewable energy sources such as solar, wind, and hydro will significantly cut global carbon emissions.

Achieving Net-Zero Goals: Countries and businesses are setting targets to achieve carbon neutrality by 2050, requiring a massive shift to renewables.

Mitigating Extreme Weather Effects: Climate change is causing more frequent hurricanes, heatwaves, and wildfires; clean energy solutions can slow this impact.

2. Ensuring Global Energy Security and Stability

Reducing Dependence on Fossil Fuels: Moving toward renewable energy reduces reliance on volatile fossil fuel markets and geopolitical conflicts.

Developing Decentralized Energy Systems: Localized renewable energy generation (e.g., solar microgrids) increases resilience against power outages.

Energy Independence: Countries can harness their own renewable resources instead of importing oil and gas, improving national security.

3. Driving Economic Growth and Job Creation

Expanding Green Jobs: The renewable energy sector is creating millions of jobs in solar panel manufacturing, wind farm construction, and energy efficiency.

Cost-Effective Energy Solutions: The declining cost of solar and wind energy makes them more affordable than fossil fuels in many regions.

Encouraging Sustainable Business Models: Companies are adopting circular economy principles, reducing waste, and investing in green innovations.

4. Advancing Clean Energy Technologies

Breakthroughs in Energy Storage: Improved battery storage and smart grid technologies will make renewable energy more reliable.

Hydrogen and Next-Gen Renewables: Green hydrogen and new biofuels will provide clean energy alternatives for heavy industries and transportation.

AI and IoT in Energy Management: Smart systems will optimize energy use, reduce waste, and improve efficiency across industries.

5. Promoting Social Equity and Sustainable Development

Universal Energy Access: Off-grid solar and wind solutions will bring electricity to underserved communities, improving healthcare, education, and economic opportunities.

Just Energy Transition: Governments and industries must ensure fair transitions for fossil fuel workers by providing retraining and job opportunities in clean energy.

Climate Justice: Vulnerable populations are most affected by climate change; renewable energy can reduce their risk while promoting sustainable development.

6. Shaping Global Policies and Regulations

Strengthening Renewable Energy Mandates: Governments will continue enforcing policies that promote clean energy adoption, such as carbon pricing and green incentives. Corporate ESG (Environmental, Social, and Governance) Commitments: Businesses will be required to meet sustainability standards to remain competitive.

International Climate Agreements: Global cooperation, such as the Paris Agreement, will drive coordinated efforts toward sustainable energy policies.

Challenges and Opportunities in the Future of Energy Transitioning to Renewable and Sustainable Practices :-

The future of energy is shifting toward renewable sources and sustainable practices. While this transition is necessary for environmental and economic sustainability, it presents several challenges and opportunities.

Challenges:-

1. Energy Storage and Grid Stability

Issue: Solar and wind energy are intermittent, requiring efficient energy storage solutions.

Impact: Without advancements in battery technology and grid modernization, energy supply reliability may suffer.

2. High Initial Costs and Investment Gaps

Issue: Transitioning from fossil fuels requires significant upfront investments in infrastructure, technology, and workforce retraining.

Impact: Developing nations and lower-income communities may struggle with funding large-scale renewable projects.

3. Supply Chain and Resource Scarcity

Issue: Renewable technologies rely on critical minerals (e.g., lithium, cobalt, rare earth elements), which are limited and often concentrated in specific regions.

Impact: Geopolitical tensions, price volatility, and environmental concerns about mining practices.

4. Policy and Regulatory Uncertainty

Issue: Inconsistent policies, slow regulatory changes, and subsidies for fossil fuels slow down the transition.

Impact: Investors and businesses hesitate to commit to large-scale renewable projects.

5. Economic and Workforce Disruptions

Issue: The decline of fossil fuel industries affects workers and communities dependent on coal, oil, and gas jobs.

Impact: Job losses and economic downturns in traditional energy regions unless reskilling programs are implemented.

6. Land Use and Environmental Concerns

Issue: Large-scale solar and wind farms require vast land areas, potentially affecting biodiversity and agriculture.

Impact: Land-use conflicts and resistance from local communities.

7. Technological and Infrastructure Challenges

Issue: Outdated energy grids are not built for decentralized renewable energy distribution.

Impact: Infrastructure upgrades are costly and take time to implement.

Opportunities:-**1. Technological Innovation and Efficiency Improvements**

Advancement: Smart grids, AI-driven energy management, and next-generation batteries (e.g., solid-state, hydrogen storage).

Impact: Increased efficiency, reliability, and affordability of renewable energy.

2. Job Creation and Economic Growth

Opportunity: Renewable energy industries (solar, wind, hydrogen, battery storage) create millions of new jobs.

Impact: Economic diversification and employment opportunities in clean energy.

3. Energy Independence and Security

Advantage: Localized energy production reduces dependence on fossil fuel imports.

Impact: Greater national energy security and economic resilience.

4. Environmental and Health Benefits

Benefit: Reduced greenhouse gas emissions, cleaner air, and lower health costs from pollution-related diseases.

Impact: Improved public health and a significant contribution to climate change mitigation.

5. Expansion of Green Finance and Investment

Trend: Growth in ESG (Environmental, Social, and Governance) investing, carbon pricing, and green bonds.

Impact: Financial incentives drive faster adoption of clean energy solutions.

6. Global Collaboration and Policy Support

Progress: International agreements (e.g., Paris Agreement) encourage coordinated action.

Impact: Governments work together to implement policies, trade agreements, and technology sharing.

7. Decentralized and Community Energy Solutions

Innovation: Microgrids, peer-to-peer energy trading, and local solar/wind projects empower communities.

Impact: Greater energy access, particularly in remote or underdeveloped areas.

Conclusion :-

The global energy landscape is undergoing a profound transformation as societies increasingly prioritize sustainability, climate resilience, and energy security. The shift from fossil fuels to renewable energy sources is not merely a trend but a necessary transition driven by environmental, economic, and technological imperatives. This study has explored the challenges, opportunities, and innovations shaping the future of energy, highlighting the critical role of policy, investment, and public engagement in achieving a sustainable energy future.

One of the key findings is that renewable energy sources—such as solar, wind, hydro, and geothermal—offer a viable and scalable alternative to fossil fuels. Technological advancements in energy storage, smart grids, and efficiency improvements have significantly enhanced the feasibility and reliability of renewables. Additionally, the falling costs of renewable technologies and increased investments in research and development indicate a promising trajectory toward a decarbonized energy system. Economic factors also support the transition, as renewable energy creates new job opportunities, fosters innovation, and enhances energy independence for nations. The long-term economic benefits of renewables outweigh the short-term costs associated with infrastructure changes, making the transition not only an environmental necessity but also a strategic economic decision. The role of consumers, businesses, and communities in driving the transition cannot be overlooked. Increasing awareness, changing consumption patterns, and decentralized energy production empower individuals and organizations to contribute actively to sustainability goals. As more businesses adopt corporate sustainability initiatives and consumers demand cleaner energy, the momentum for a global energy transition continues to grow.

In conclusion, the future of energy lies in a diversified, resilient, and renewable-driven system. While challenges remain, the collective efforts of governments, industries, researchers, and consumers are paving the way for a more sustainable and equitable energy future. The transition to renewable and sustainable practices is not only possible but imperative for environmental preservation, economic stability, and long-term energy security. By embracing innovation, fostering collaboration, and committing to sustainable policies, the global community can ensure a cleaner and more prosperous energy future for generations to come.

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TECHNOLOGY IN EDUCATION: ENHANCING LEARNING, RESEARCH, AND INNOVATION.**Mr. Dinesh Tembarya Vasave***Ph.D research student***Dr. R.L. Rajani***Research Supervisor*

Abstract:

Technology has significantly transformed education by enhancing learning experiences, improving research methodologies, and fostering innovation. This paper explores the role of technology in education, examining its impact on teaching strategies, student engagement, accessibility, and academic research. Furthermore, the paper discusses emerging technologies such as artificial intelligence, virtual and augmented reality, and blockchain in education. The challenges associated with technology integration, including digital divide concerns, privacy issues, and pedagogical shifts, are also analyzed. The study concludes by emphasizing the need for a balanced approach that maximizes the benefits of technology while addressing its limitations.

Keywords: Technology in education, e-learning, digital pedagogy, artificial intelligence, virtual reality, research innovation, accessibility, online learning

1. Introduction:

Technology has become an indispensable part of modern education, reshaping traditional learning paradigms and introducing new possibilities for knowledge dissemination. Integrating digital tools into education has led to significant improvements in accessibility, engagement, and personalization. Advancements in artificial intelligence (AI), big data analytics, virtual reality (VR), and cloud computing have further revolutionized how educators and students interact with knowledge.

The purpose of this paper is to examine the role of technology in education, focusing on its impact on learning experiences, research methodologies, and academic innovation. By analysing the benefits and challenges associated with technology-driven education, this study provides insights into how digital tools can be effectively utilized to enhance the educational ecosystem.

2. The Role of Technology in Learning:**2.1 Personalized Learning and Adaptive Technologies:**

One of the most significant contributions of technology in education is the ability to personalize learning experiences. AI-driven adaptive learning platforms analyse students' strengths and weaknesses, adjusting content accordingly to optimize their learning paths. Such platforms use machine learning algorithms to offer customized exercises, remedial lessons, and real-time feedback.

For example, intelligent tutoring systems (ITS) like Carnegie Learning and Knewton

utilize AI to provide tailored instructional support, ensuring that students receive content suited to their pace and competency levels. Research indicates that adaptive learning technologies improve student retention and comprehension by offering personalized interventions (Roll & Wylie, 2016).

2.2 Online Learning and E-Learning Platforms:

The rise of online learning platforms such as Coursera, edX, and Udemy has democratized education by providing access to high-quality courses from top universities and institutions. The effectiveness of online education has been particularly evident during the COVID-19 pandemic, which accelerated the shift toward remote learning.

E-learning offers several advantages, including:

- **Flexibility:** Students can learn at their own pace and schedule.
- **Accessibility:** Geographic and financial barriers are reduced.
- **Scalability:** Massive Open Online Courses (MOOCs) allow thousands of learners to enroll simultaneously.

However, online learning also presents challenges such as the lack of face-to-face interaction, potential distractions, and varying levels of digital literacy among students and instructors (Means et al., 2014).

2.3 Gamification and Interactive Learning:

Gamification incorporates game elements such as points, badges, leaderboards, and challenges into educational content to enhance student motivation and engagement. Research has demonstrated that gamified learning environments can improve problem-solving skills and retention rates (Deterding et al., 2011).

Tools like Kahoot, Duolingo, and Classcraft leverage gamification principles to create interactive and engaging learning experiences. Virtual and augmented reality technologies further enhance experiential learning by immersing students in simulated environments, making abstract concepts more tangible.

3. Technology in Research and Academic Innovation:

3.1 Digital Research Tools and Data Analytics:

The integration of digital tools has significantly improved research methodologies, allowing scholars to analyse vast datasets efficiently. Tools such as SPSS, R, and Python have enabled researchers to conduct complex statistical analyses, machine learning modelling, and big data processing.

Furthermore, reference management software like EndNote, Mendeley, and Zotero has streamlined literature review processes, enhancing citation management and collaboration among researchers.

3.2 Open Access and Knowledge Dissemination:

Technology has facilitated open access to academic resources, breaking down barriers to

knowledge sharing. Open-access journals such as PLOS ONE and arXiv allow scholars to publish and access research without paywalls, promoting global collaboration.

Preprint repositories and digital libraries, including Google Scholar and PubMed Central, have increased the visibility of scholarly work, accelerating the dissemination of knowledge.

3.3 Artificial Intelligence in Academic Research:

AI-powered tools are transforming academic research by automating tasks such as literature review, data extraction, and plagiarism detection. Natural language processing (NLP) algorithms, for example, can summarize vast amounts of text, helping researchers synthesize information efficiently.

AI-driven research assistants like Semantic Scholar and Elicit use machine learning to recommend relevant papers and generate insights from academic literature. These advancements reduce the time required for manual research and improve the accuracy of literature analysis.

4. Emerging Technologies in Education:

4.1 Virtual and Augmented Reality (VR/AR):

VR and AR technologies are revolutionizing education by providing immersive learning experiences. VR applications like Google Expeditions allow students to explore historical landmarks, while AR apps overlay digital information onto real-world environments, enhancing interactive learning.

Research suggests that VR-based learning enhances memory retention and conceptual understanding, particularly in subjects requiring spatial awareness, such as anatomy and engineering (Merchant et al., 2014).

4.2 Blockchain for Academic Credentials:

Blockchain technology is increasingly being adopted in education for secure credential verification. Universities and institutions are using blockchain-based digital diplomas and certificates to prevent fraud and ensure the authenticity of academic achievements.

Platforms like Blockcerts provide a decentralized and tamper-proof system for storing academic credentials, reducing the reliance on traditional paper-based certificates.

4.3 Artificial Intelligence and Chatbots in Education:

AI-powered chatbots and virtual teaching assistants enhance student engagement by providing real-time support. Tools like IBM Watson Tutor and OpenAI's ChatGPT assist students with answering queries, generating explanations, and offering tutoring services.

These AI-driven systems can analyse student performance data to provide personalized learning experiences, improving educational outcomes.

5. Challenges and Ethical Considerations:

5.1 Digital Divide and Accessibility Issues:

Despite the benefits of educational technology, disparities in access to digital tools remain

a significant challenge. The digital divide, characterized by unequal access to devices and the internet, exacerbates educational inequalities, particularly in underprivileged regions. To bridge this gap, governments and institutions must invest in infrastructure, provide affordable internet access, and implement digital literacy programs.

5.2 Data Privacy and Security:

The use of technology in education raises concerns regarding data privacy and security. Online learning platforms collect vast amounts of student data, necessitating stringent policies to protect personal information from cyber threats. Institutions must adhere to data protection regulations such as the General Data Protection Regulation (GDPR) and implement encryption measures to safeguard user data.

5.3 Pedagogical Shifts and Teacher Training:

The integration of technology requires educators to adapt to new pedagogical approaches. Effective implementation necessitates teacher training programs to ensure that instructors can leverage digital tools effectively.

Furthermore, while technology enhances learning, it should complement—not replace—traditional teaching methods. A balanced approach that combines digital and in-person learning is essential for maximizing educational outcomes.

6. Conclusion:

Technology has undeniably transformed education, enhancing learning experiences, research methodologies, and academic innovation. The adoption of AI, VR, blockchain, and e-learning platforms has improved accessibility, personalization, and engagement in education. However, challenges such as the digital divide, data privacy concerns, and pedagogical shifts must be addressed to ensure equitable and effective technology integration.

Future research should focus on evaluating the long-term impacts of digital education on learning outcomes and exploring innovative solutions to bridge accessibility gaps. By strategically integrating technology while considering ethical and social implications, education can continue to evolve, fostering a more inclusive and efficient learning ecosystem.

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TO INTEGRATE INDIAN KNOWLEDGE SYSTEM IN EDUCATION AND RESEARCH

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Introduction:

Integrating the Indian Knowledge System (IKS) into education and research involves incorporating traditional Indian knowledge, values, and philosophies into the contemporary educational framework. This integration aims to preserve cultural heritage, promote holistic education, and create an inclusive learning environment. Indian knowledge system is the key system which can lead India from developing to developed India in Education as well as another field. The paper will cover the area of Incorporating Indigenous Knowledge, Interdisciplinary Approach, Language and Literature, Reviving Ancient Practices and Techniques, Traditional Wisdom for Modern Challenges etc.

Key Words: curriculum, interdisciplinary approach, Ancient Practices

Here are key approaches to achieving this:

1. Curriculum Design

1) **Incorporating Indigenous Knowledge:** Infuse traditional Indian knowledge systems, such as Ayurveda, Yoga, Vedas, and ancient sciences, into the curriculum. This could be done in subjects like science, philosophy, literature, history, and even medicine. It is the need of time to collaborate old education system and new and generate the new approach towards the education.

2) **Interdisciplinary Approach:** Combine the teachings of IKS with modern disciplines like physics, mathematics, and engineering to create a multidisciplinary approach to education. Interdisciplinary approach can be benefited to researchers, students, and the citizens. The students from the humanities stream if he interested in science so he can choose an interdisciplinary subject even from the science. So, it is the best option for the interested student.

3) **Language and Literature:** Promote learning of Indian languages like Sanskrit, Tamil, Hindi, and others to understand ancient texts and philosophies like the Upanishads, Bhagavad Gita, and works of great philosophers like Chanakya, Patanjali, etc. The new Education policy has focused to promote the local languages and enhance the skill among the students.

2. Research and Innovation

1) **Reviving Ancient Practices and Techniques:** Encourage research into ancient Indian practices in fields like agriculture (organic farming, sustainable methods), architecture (Vastu Shastra), and health (Ayurveda, Yoga).

2) **Traditional Wisdom for Modern Challenges:** Research how traditional Indian methods can address contemporary issues such as climate change, environmental sustainability, mental health, and community development.

3) **Collaboration between Traditional and Modern Knowledge:** Promote joint research projects where scholars of modern science work with those well-versed in ancient knowledge systems, creating a hybrid approach to solving complex global issues.

3. Cultural and Ethical Values

1. **Promotion of Values:** Indian Knowledge System emphasizes values like compassion, ethics, self-discipline, and respect for nature. These principles can be integrated into education to build character and moral responsibility in students.

2. **Spiritual and Emotional Development:** IKS offers methods to cultivate emotional intelligence and spirituality, which can contribute to personal development and social harmony. Practices like meditation, mindfulness, and Yoga can be integrated into the school and university systems for holistic education.

4. Pedagogical Methods

1. **Student-Centered Learning:** Traditional Indian education often emphasized experiential learning, debates, discussions, and dialogue. Reviving these methods can foster critical thinking, creativity, and deeper engagement with subjects.

2. **Use of Storytelling and Oral Traditions:** Storytelling, a key element of Indian culture, can be used as an effective pedagogical tool to teach history, values, and critical life lessons.

3. **Guru-Shishya Tradition:** Reinforce the importance of the teacher-student relationship, emphasizing mentorship and personal development alongside academic learning.

5. Collaboration with Global Education Systems

1. **Exchange Programs and Global Research:** Develop partnerships with international institutions to exchange knowledge on Indian traditional practices, creating a global awareness of the IKS.

2. **Incorporate Global Perspectives into IKS:** While integrating Indian knowledge, ensure it's done in a way that resonates with a global audience, blending traditional wisdom with contemporary insights to foster a more inclusive worldview.

6. Policy and Institutional Support

1. **Government Initiatives:** The Indian government can play a key role by providing funding and institutional support to encourage the inclusion of IKS in educational institutions, including creating research centers dedicated to studying and applying IKS.

2. **Incentivizing Research:** Research grants and scholarships can be awarded to scholars focusing on the integration of Indian traditional knowledge with modern research, encouraging innovation rooted in Indian wisdom.

Conclusion:

The integration of Indian Knowledge Systems into education and research offers a chance to create a more holistic, inclusive, and culturally rooted educational framework. It bridges the gap between traditional wisdom and modern science, fostering a learning environment that respects cultural heritage while addressing contemporary challenges. This process will also promote a balanced approach to knowledge that encompasses both material and spiritual aspects of life.

■ The need for the study of the Indian education system in Indian research and education system.

The study of the Indian education system in the context of Indian research and education is crucial for several reasons:

- 1) **Preserving Cultural Heritage:** It helps in understanding and preserving India's rich educational traditions, including ancient philosophies, methods, and values that shaped the system.
- 2) **Relevance to Modern Needs:** By studying the Indian education system, we can identify how traditional models can be adapted to address contemporary challenges in education and research, such as fostering creativity, critical thinking, and inclusivity.
- 3) **Holistic Development:** The Indian education system traditionally emphasizes a balance between academic knowledge and moral, physical, and spiritual development. Reviving this holistic approach can enhance overall educational outcomes.
- 4) **Global Competitiveness:** Analyzing India's historical educational practices and integrating them with global standards can help create a more dynamic, competitive, and innovative educational environment in the country.
- 5) **Policy and Reform:** Understanding the historical evolution and current status of the Indian education system is vital for informed policy-making and reforms that promote sustainable growth, equity, and accessibility in education and research.

In short, studying the Indian education system is essential to create an educational framework that is both rooted in tradition and responsive to modern educational needs.

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DECODING THE SCIENCE OF THE SOMRASAND INDIAN MYTHOLOGY IN
AMISH TRIPATHI'S THE IMMORTALS OF MELUHA

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Abstract

*Lord Shiva's complex character serves as a powerful allegory, allowing writers to explore profound themes such as transformation, spirituality, and the delicate balance between creation and destruction. The present study is based on *The Immortals Of Meluha* (2010), the first book of the *Shiva Trilogy* and a mythological tale written by Amish Tripathi, a celebrated Indian English author. The narrative focuses on a Tibetan chief named Shiva, who arrives in the idyllic society of Meluha, founded by Lord Ram. Shiva becomes the focal point of an ancient prophecy, foretelling the arrival of a blue-throated savior who will protect Meluha from its enemies, the Chandravanshis and Nagas.*

The paper explores the conceptualization of immortality in the novel and examines its intersections with modern scientific thought and the traditional Indian knowledge system. In the narrative, myth and history coalesce to reimagine the legendary figure of Shiva as a transformative mortal whose journey reflects humanity's perennial quest to transcend mortality. The novel draws upon ancient Indian philosophies—emphasizing cyclical time, spiritual rebirth, and the interplay between destiny and self-realization—to craft a rich symbolic framework for immortality. By juxtaposing these mythic narratives with contemporary scientific pursuits in biogerontology, genetic research, and life-extension technologies. This interdisciplinary inquiry reveals that the aspiration for immortality, deeply embedded in the Indian knowledge tradition through Ayurveda, Yoga, and Vedic cosmology, finds a modern echo in the scientific endeavor to decode the biological secrets of aging. Ultimately, the paper inspects the dialogue between myth and modernity not only revitalizes cultural narratives but also challenges the boundaries between metaphorical and empirical modes of knowing, offering a nuanced perspective on the eternal human desire to overcome the limitations of mortal existence.

Keywords – Modern Science, Ayurveda, Hindu mythology, Self Discovery, Spirituality

INTRODUCTION:

Mythology comes from the Greek words *mythos* (meaning story) and *logos* (meaning word or speech), referring to the collection and study of myths. A myth is a traditional tale, often involving gods, goddesses, heroes, supernatural beings, or significant events. These stories can

take place in either historical or modern settings, and often incorporate elements like magic, adventure, heroism, and the portrayal of virtues and vices. Myths typically mix factual elements with imagination, and they can vary based on different cultures, traditions, and beliefs. They are passed down through generations to help maintain social order, and they reflect a society's religious and moral values.

Mythology has existed for centuries, and each major civilization has its own set of mythical stories, such as Chinese, Indian, Roman, and Egyptian mythologies. Myths often cover not only sacred tales but also legends about creatures like vampires, werewolves, and demons, and they explore the balance of good and evil. Myths are shared not just through stories, but also through songs, dances, and visual arts, and they play a role in all forms of communication and cultural expression. Dr. Daulat Ram Rathore has asserted in his paper *An Analysis Of Mythical Elements In Amish Tripathi's The Immortals Of Meluha (2023)* that “myth is not a story but a reality lived, believed to have once happened in long times before...In modern scientific world human race has lost their values and identity but myth has been playing the vital role of torch bearer and light house in it.”

In India, mythology has been transmitted through generations via oral traditions, written texts, drama, sculpture, and paintings. It serves not only as entertainment and education but also has influenced scientific discoveries. Hinduism plays a central role in Indian mythology, with foundational texts such as the Vedas, Brahmanas, Upanishads, Mahabharata, Ramayana, and the Puranas forming the core of Hindu mythological stories.

In the context of Ayurveda, which is an ancient system of natural medicine from India, the idea of longevity and wellness is central. Ayurveda promotes balanced health through herbs, lifestyle practices, and the maintenance of equilibrium between mind, body, and spirit. While Ayurveda does not mention somras directly, it emphasizes substances and practices that promote rejuvenation, vitality, and healing.

In *The Immortals of Meluha*, the somras elixir could be seen as a mythical parallel to certain Ayurvedic practices or potions that enhance life expectancy and vitality. For example, Ayurvedic treatments like rasayanas (rejuvenative therapies) are meant to slow aging, enhance immunity, and promote long life. The somras in the novel, although not directly derived from Ayurveda, resembles the Ayurvedic principles of healing, rejuvenation, and the pursuit of immortality, albeit with a more fantastical element.

In *The Immortals of Meluha*, the first book of Amish Tripathi's *Shiva Trilogy*, the concept of somras plays a pivotal role in the narrative, blending elements of mythology with the pursuit of immortality. Somras, an elixir that grants immense power and longevity, is depicted as a divine substance capable of transforming ordinary humans into near-immortal beings. This mythical

substance not only serves as a key plot device but also introduces readers to the fusion of mythological themes with the rich cultural heritage of ancient India.

At the heart of this concept lies the deep connection between mythology and the search for immortality, a theme explored in numerous ancient traditions. In Indian mythology, particularly in the Vedic texts, the idea of immortality and divine elixirs is closely linked to gods like Indra and the mysterious Soma, a sacred drink that grants immortality to the gods. Somras in *The Immortals of Meluha* draws inspiration from such mythological tales, where life-extending substances are often presented as the key to divine powers or the ultimate goal of human existence.

Decoding somras in *The Immortals of Meluha* provides a fascinating exploration of how ancient myths and modern storytelling converge, revealing the timeless allure of immortality and the ethical questions that arise when such power is within reach. By delving into the connections between mythology, Ayurveda, and the fictional universe of the book, we gain insight into the broader themes of human ambition, the consequences of unchecked power, and the quest for eternal life.

DISCUSSION

Amish Tripathi, a renowned author of mythological fiction, gained recognition with *The Shiva Trilogy*, which marked the beginning of his literary success. This trilogy includes three novels: *The Immortals of Meluha* (2010), *The Secret of the Nagas* (2011), and *The Oath of the Vayuputras* (2013). In addition to this, he has also written the *Ram Chandra Series* and *Immortal India* (2017), a book that presents his interviews and insights on various subjects such as religion, mythology, social issues, history, and personal reflections.

Set in 1900 BC, the novel introduces Shiva as the leader of the Guna tribe, who is always prepared to defend his people from the attacks of the Pakratris. He later accepts an invitation from Nandi, a representative of the Meluhan kingdom, to migrate to Meluha. This land is ruled by King Daksha, a member of the Suryavanshi race. In Meluha, Shiva and his tribe are given Somras, a sacred drink believed to prolong life, by the chief physician, Ayurvati. Upon consuming the Somras, Shiva's throat turns blue, a change first noticed by Ayurvati. Soon, the people of Meluha recognize this as a divine sign and declare Shiva as Neelkanth, their prophesied protector against threats like the Brangas and the Nagas. From this moment, Shiva embarks on a journey to seek out and eliminate evil. The central theme of *The Shiva Trilogy* revolves around his quest as Neelkanth to uncover and combat the forces of darkness.

In contemporary times, the concept of immortality is often regarded as folklore, with examples found in ancient tales of Rishi-Munis, who were believed to have lived long and healthy lives. This suggests that the people of Meluha in Amish Tripathi's novel are also on a quest for longevity, which they achieve by consuming Somras to delay death.

Lord Brahma, known as the creator of the world, is similarly portrayed by Tripathi as the

chief scientist responsible for the production of Somras. In this way, Brahma is depicted as the creator of life for the Meluhan people. In the novel, Brahma uses the waters of the River Saraswati and leaves from the Sanjeevani tree to create Somras. Meanwhile, the Chandravanshis also desire this powerful drink, leading to a conflict with the Suryavanshis. This struggle can be linked to the ancient myth of the battle between the Devas and Danavas over Amrit during the Samudra Manthan. The preparation of Somras takes place on Mount Mandar under the supervision of chief scientist Brahaspati and a team of selected scientists.

Another fascinating detail mentioned by Tripathi is that Somras can only be made using water from the River Saraswati. If water from any other river is used, the drink loses its ability to extend life.

“Manufacturing the Somras is not without its fair share of difficulties. It requires various ingredients that are not easily available. For example, the Sanjeevani trees. The manufacturing procedure also generates a lot of heat. So we have to use lot of water during the processing to keep the mixture stable. Also, the crushed branches of the Sanjeevani tree have to be churned with the waters of the Saraswati River before processing begins. Water from other sources doesn’t work” (136)

However, the process of crafting Somras is highly intricate and demanding, requiring rare and elusive ingredients. One such vital component is the Sanjeevani tree, which is scarce in cultivation. The production process generates an immense amount of heat and consumes substantial quantities of water. Before the preparation begins, Sanjeevani is blended with water, and only the sacred waters of the Saraswati River are deemed suitable for the formulation of Somras.

The Meluhans take great pride in their unparalleled knowledge and advanced capabilities in mass-producing Somras, considering it a defining factor of their superiority over the Chandravanshis. In *The Immortals of Meluha* by Amish Tripathi, Somras, the elixir that grants extended life to the Meluhans, becomes a problem when its side effects and ethical concerns come to light. It requires large quantities of water, specifically from the Saraswati River. The excessive consumption of river water for its production is causing the river to dry up. This is first hinted at when Shiva learns about the gradual disappearance of the Saraswati. This realization shakes Shiva, as he understands that the immortality of Meluhans is coming at the cost of nature’s destruction.

One of the most significant revelations is that the waste from Somras production is responsible for mutations, leading to the birth of deformed children, who are then abandoned and labeled as Nagas. This truth is revealed by Brahaspati, the chief scientist of the Meluhan empire. This moral dilemma forces Shiva to question whether Meluha’s reliance on Somras is justified or not. As Shiva learns more, he realizes that the Somras is not just a divine gift but a tool of inequality. Only select groups have access to it, and its production harms others, making it an

unfair advantage rather than a blessing. Somras, initially seen as the foundation of Meluha's greatness, is revealed to be a double-edged sword—causing environmental harm, social discrimination, and moral corruption. Shiva's growing realization about these consequences turns the elixir of immortality into a curse, making it one of the central problems in the Shiva Trilogy.

Amish Tripathi's *The Immortals of Meluha* is deeply rooted in Indian mythology, reinterpreting Hindu legends and philosophical concepts in a logical, historical manner. Amish Tripathi's *The Immortals of Meluha* deeply explores the philosophical concepts of karma (action and its consequences) and dharma (righteous duty) through Shiva's journey, challenging black-and-white morality and emphasizing that good and evil are relative. Karma, as the law of cause and effect, plays a crucial role in shaping both individuals and societies. Shiva, initially an outsider, takes personal responsibility when he chooses to accept the role of the Neelkanth, knowing that his actions will define the fate of many. As he realizes that his decisions—whether fighting the Chandravanshis or questioning Meluha's laws—carry consequences, he begins to understand that karma is not just personal but collective. The Meluhan society, despite its claim of perfection, has accumulated karmic debt by marginalizing the Nagas and hoarding the Somras, leading to suffering beneath its flawless surface. No civilization, no matter how ideal, is free from the repercussions of its actions.

Dharma, or righteous duty, is also examined in a nuanced way. Initially, Shiva believes that his dharma is to aid the Meluhans against their enemies, but his perception changes when he meets the Chandravanshis and realizes they are not inherently evil. This forces him to question whether his duty lies in blindly serving the Meluhans or in seeking the greater truth. The novel emphasizes that evil is not a person or ideology but an imbalance, making dharma a complex and evolving concept rather than an absolute rule. His struggle intensifies when he learns that the Nagas, whom society deems evil, are actually victims of the Somras' side effects. This moral dilemma—whether dharma lies in upholding tradition or embracing compassion—mirrors the teachings of the *Bhagavad Gita*, which suggests that true duty sometimes requires breaking conventional beliefs. By the end of the novel, Shiva realizes that karma and dharma are interconnected, and his responsibility is not just to Meluha but to justice itself. He understands that a true leader's duty is to the truth, not just to his people. This transformation marks his journey from a mere warrior to Mahadev, the bringer of balance, reinforcing the novel's central theme that righteousness is not about rigid laws but about seeking harmony in an ever-changing world.

In *The Immortals of Meluha*, the Nagas are depicted as a mysterious and feared community, often misunderstood and outcast due to their physical deformities. This portrayal draws strong parallels with the Nāgas in Hindu mythology, who are semi-divine serpentine beings known for their wisdom, power, and enigmatic nature. The topic is further explained in the text lines that follow.

‘Now who the bloody hell are the Nagas? Asked Shiva “They are cursed people, my Lord,” gasped Nandi. “They are born with hideous deformities because of the sins of their previous births. Deformities like extra hands or horribly misshapen faces.”(59)

In Hindu texts like the Mahabharata, Ramayana, and Puranas, Nāgas are both revered and feared—they are associated with great knowledge and protection, yet also with destruction and revenge. Similarly, in the novel, the Nagas are initially seen as monstrous outcasts, but Shiva later discovers that they are victims of the Somras, suffering from genetic mutations rather than being inherently evil. This reflects a deeper philosophical theme in Hinduism, where appearances can be deceiving, and those considered “demons” may actually be the oppressed. The mythological Nāgas, such as Sheshnag, Vasuki, and Takshaka, are powerful beings who guard hidden knowledge, much like the Nagas in the novel, who possess secrets about the Somras and its consequences. Moreover, Hindu mythology often portrays Nāgas as dwelling in Patala (the underworld), but they are not inherently evil—some, like Ananta (Sheshnag), are symbols of cosmic balance. Likewise, the Nagas in *The Immortals of Meluha* are marginalized yet crucial to the balance of society, ultimately playing a key role in Shiva’s awakening. Their serpent-like symbolism aligns with the Hindu concept of transformation and renewal—just as a snake sheds its skin, the Nagas represent the hidden truth that challenges societal norms. By reinterpreting them, Amish Tripathi not only modernizes ancient myths but also questions prejudices, urging readers to look beyond surface judgments and recognize the deeper truths hidden in history and tradition.

CONCLUSION

The concept of Somras in *The Immortals of Meluha* serves as a profound reinterpretation of amrit, the mythical nectar of immortality in Hindu mythology. Traditionally, amrit is considered a divine elixir that grants eternal life, obtained during the Samudra Manthan (churning of the ocean). However, Amish Tripathi presents a more nuanced perspective by depicting Somras as both a blessing and a curse—while it extends life, it also causes genetic mutations, environmental degradation, and suffering for the Nagas. This aligns with the law of karma, where every action, even if intended for good, has consequences. Just as Hindu mythology warns that immortality comes at a cost (as seen in the disputes between devas and asuras over amrit), the novel suggests that unchecked pursuit of longevity and power can lead to ethical and moral dilemmas. Furthermore, the secrecy surrounding Somras parallels the mystical knowledge guarded by ancient sages and Nāgas in Hindu scriptures, reinforcing the idea that wisdom and power must be balanced with responsibility. Shiva’s realization that Somras is the root of both Meluhan prosperity and Naga suffering echoes the Hindu philosophical notion of dharma and balance—that no extreme, even in pursuit of righteousness, is sustainable. In conclusion, *The Immortals of Meluha* not only modernizes Hindu mythology but also invites readers to reflect on the duality of progress, the

consequences of human ambition, and the deeper truths hidden in ancient wisdom, making it a compelling fusion of myth and philosophical inquiry.

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CULTIVATING SUSTAINABILITY: INTEGRATING IKS AND YOGA INTO SCHOOL EDUCATION

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Abstract:

This conceptual paper explores the potential of integrating Indian Knowledge Systems (IKS), particularly Yoga, into school education to foster a sustainable future. It argues that IKS's holistic worldview, emphasizing interconnectedness and ethical living, aligns with the principles of sustainability. By incorporating Yoga's ethical guidelines, mindfulness practices, and traditional ecological knowledge, schools can nurture environmentally conscious and responsible citizens. This paper outlines the need, benefits, and challenges of integrating IKS and Yoga into the educational curriculum, advocating for a holistic approach that cultivates both individual well-being and ecological awareness.

Introduction:

The global community faces unprecedented challenges related to climate change, resource depletion, and social inequality. Addressing these issues requires a fundamental shift in our worldview and values. Education plays a crucial role in shaping the next generation of leaders and citizens, equipping them with the knowledge, skills, and ethical framework necessary for a sustainable future. In this context, Indian Knowledge Systems (IKS), with its rich heritage of holistic wisdom, offers valuable insights. IKS, encompassing disciplines like Yoga, Ayurveda, and traditional ecological knowledge, emphasizes the interconnectedness of all living beings and the importance of living in harmony with nature. Integrating IKS, especially Yoga, into school education can foster a deeper understanding of sustainability and cultivate responsible environmental stewardship.

Yoga is not ancient myth buried in obligation. It is the most valuable inheritance of the present. It is the essential need of Today & the Culture of Tomorrow." One's ability to leave, build relationships, manage stress basically depends upon the mental and physical health.

Yoga will teach a way of living that aims towards the healthy mind & healthy body. And we all know that "Healthy Mind lives in Healthy Body". Yoga helps to reduce the stress which relaxes the mind. This improves the concentration and visualisation. This will help us to give better results & performance. Apart from mental health, there are physical health benefits also. It improves our strength, stamina, posture, flexibility builds strong immunity which lowers the risk of diseases. It also contributes to build self confidence and self esteem which Improves the inner

strength.

The Need for IKS and Yoga in School Education:

Holistic Worldview:

Modern education often focuses on fragmented knowledge, neglecting the interconnectedness of systems. IKS, with its emphasis on holistic understanding, can provide a more integrated and comprehensive view of the world.

Yoga's philosophy, particularly the concept of "VasudhaivaKutumbakam" (the world is one family), promotes a sense of global citizenship and responsibility.

Ethical Foundation: The Yamas and Niyamas of Yoga provide a strong ethical framework for sustainable living.

"Ahimsa" (non-violence) encourages respect for all living beings, "Aparigraha" (non-possessiveness) promotes mindful consumption, and "Saucha" (purity) emphasizes environmental cleanliness.

Mindfulness and Well-being:

Yoga and meditation practices cultivate mindfulness, which can lead to greater self-awareness and conscious decision-making.

These practices also promote physical and mental well-being, which is essential for active engagement in sustainability initiatives.

Traditional Ecological Knowledge:

IKS includes a wealth of traditional ecological knowledge (TEK) related to sustainable agriculture, resource management, and conservation. Integrating TEK into the curriculum can provide students with valuable insights into traditional practices that promote ecological balance.

National Education Policy (NEP) 2020:

The NEP 2020 strongly emphasizes the integration of IKS into the education system. This policy provides a governmental backing for implementation of these concepts.

Yoga as a Core Subject:

Integrate Yoga as a core subject, focusing on both physical postures (asanas) and ethical principles.

Include pranayama (breathing exercises) and meditation to cultivate mindfulness and emotional regulation.

IKS Integration Across Disciplines:

Incorporate IKS concepts into existing subjects, such as science, social studies, and language arts.

For example, teach about traditional water conservation methods in science classes and explore ancient Indian texts on environmental ethics in language arts.

Experiential Learning:

Encourage experiential learning through nature walks, gardening, and community service projects. Organize workshops and field trips to learn about traditional ecological practices.

Teacher Training:

Provide comprehensive training for teachers on IKS and Yoga, equipping them with the necessary knowledge and skills. Develop resources and curriculum materials that integrate IKS and Yoga into the existing educational framework.

Community Engagement:

Involve parents, community members, and traditional knowledge holders in the educational process. Organize community events and workshops to raise awareness about IKS and sustainability.

Challenges and Considerations:**1) Curriculum Integration:**

Integrating IKS and Yoga into an already crowded curriculum can be challenging. It requires careful planning and collaboration among educators and curriculum developers.

2) Teacher Capacity:

Many teachers may lack the necessary training and expertise in IKS and Yoga. Investing in teacher training is crucial for successful implementation.

3) Cultural Sensitivity:

It's essential to approach IKS with cultural sensitivity and avoid cultural appropriation. Ensure that the curriculum is inclusive and respectful of diverse cultural perspectives.

4) Assessment and Evaluation:

Developing appropriate assessment methods to evaluate students' understanding of IKS and Yoga can be challenging.

Focus on holistic assessment that includes ethical behaviour and environmental awareness.

5) Standardization:

Creating a standard for IKS and Yoga within the education system, that is both respectful of the source material, and practical for use in modern education.

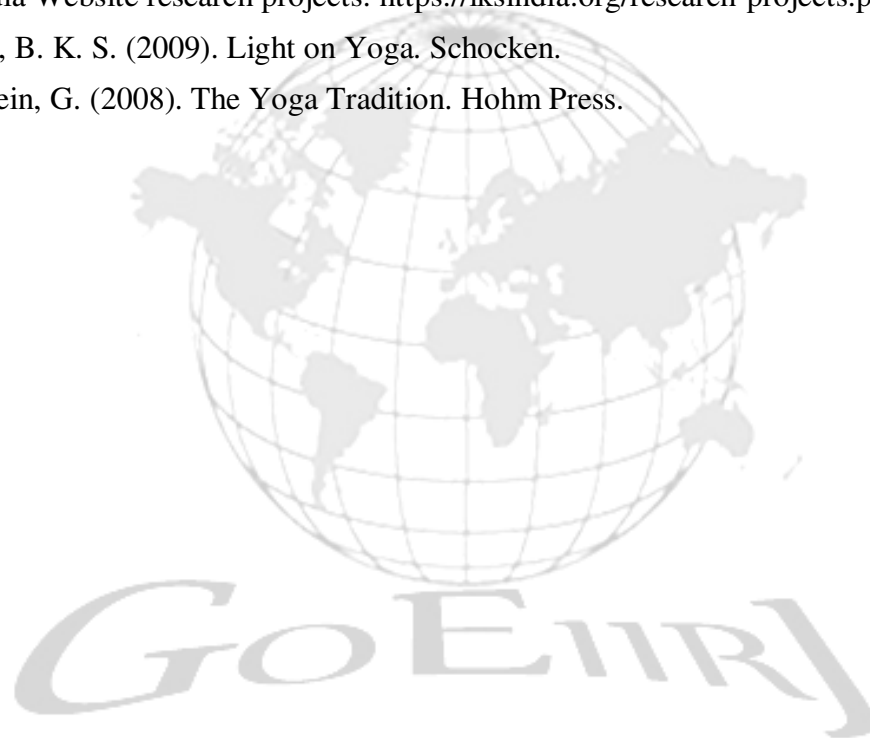
Conclusion:

Integrating IKS and Yoga into school education offers a promising pathway towards a sustainable future. By cultivating a holistic worldview, ethical values, and mindfulness practices, schools can empower students to become responsible and environmentally conscious citizens. Overcoming the challenges requires a collaborative effort involving educators, policymakers, and community members. By embedding the wisdom of IKS and Yoga into the fabric of education, we can create a generation that is not only knowledgeable but also deeply connected to the planet and committed to its well-being. Youths are the strength of the nation and for their development, the

fusion of ancient Yoga and AI is the revolutionary platform. Here technology meets tradition, and unlocks the new era future of our nation.

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PLANET PROTECTORS: DISCOVERING SUSTAINABLE SOLUTIONS FOR BETTER TOMORROW

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Abstract

As the world faces unprecedented environmental, social, and economic challenges, the need for sustainable practices has never been more pressing. This research explores innovative strategies to foster greener and more resilient societies capable of adapting to climate change, resource depletion, and socio-economic inequalities. By integrating cross-disciplinary approaches, the study emphasizes the importance of sustainable urban planning, renewable energy adoption, circular economy practices, and community-driven initiatives to build a sustainable future.

The paper highlights key strategies such as transitioning to carbon-neutral energy systems, enhancing biodiversity through regenerative agriculture, and incorporating smart technologies to optimize resource efficiency. Additionally, the role of education and policy frameworks in accelerating sustainable development is examined. Special attention is given to the resilience of vulnerable communities, focusing on disaster preparedness, equitable resource distribution, and inclusive governance models.

Through case studies and data-driven analysis, the research underscores the impact of localized solutions in achieving global sustainability goals. By addressing the interplay between environmental stewardship, economic stability, and social equity, the findings aim to provide actionable insights for policymakers, businesses, and individuals.

Ultimately, this study envisions a future where sustainability and resilience are embedded into the fabric of human systems, enabling societies to thrive within planetary boundaries while safeguarding the well-being of future generations. The research concludes with a roadmap for actionable strategies that align with the United Nations' Sustainable Development Goals (SDGs) and provide a foundation for a greener and more resilient tomorrow.

Keywords : Sustainability, Resilience, Climate Change, Renewable Energy, Circular Economy,

Introduction

The 21st century has seen an alarming acceleration in climate change, resource depletion, and socio-economic inequalities. The urgent need for sustainable development has never been more apparent, as humanity faces the daunting task of balancing environmental stewardship, economic stability, and social equity within the limits of planetary boundaries. This research paper seeks to explore holistic approaches for sustainable development, emphasizing actionable

strategies to combat these crises. Key focus areas include carbon-neutral energy systems, biodiversity conservation through regenerative agriculture, circular economy practices, and the integration of smart technologies. Additionally, this study highlights the importance of inclusive governance and education in fostering a culture of sustainability. The ultimate goal is to provide a comprehensive framework for building resilient societies that thrive while protecting the planet for future generations.

Need for Sustainable Solutions : The **need** for sustainable solutions arises due to the rapid and ongoing degradation of our planet

Climate Change: Climate change is one of the most pressing global challenges, with increasing temperatures, rising sea levels, and more frequent natural disasters. Human activities, such as burning fossil fuels, deforestation, and industrial pollution, are contributing to the greenhouse effect.

For instance, according to the IPCC (Intergovernmental Panel on Climate Change), global temperatures are projected to rise by 1.5°C within the next decade if immediate actions are not taken.

Environmental Degradation: Activities like overfishing, deforestation, and mining are causing the loss of ecosystems and biodiversity at an alarming rate.

Approximately **1 million species** are at risk of extinction due to human activities, as reported by the United Nations. This not only disrupts ecosystems but also threatens food security, water availability, and the balance of the natural world.

Resource Scarcity: The Earth's finite resources, such as freshwater, arable land, and non-renewable energy, are being consumed faster than they can regenerate. This overconsumption leads to resource shortages and conflicts.

For example, by 2025, it is estimated that half of the world's population could face water scarcity, underscoring the urgent need for sustainable water management.

Population Growth and Urbanization: The global population is expected to reach **9.7 billion by 2050**, and urbanization is accelerating. This growth increases the demand for food, energy, and housing while straining natural resources and contributing to pollution.

Economic and Social Inequalities: Unsustainable practices disproportionately affect marginalized communities, as they are often more vulnerable to environmental degradation, resource scarcity, and climate disasters.

For example, developing countries are more likely to suffer from the impacts of climate change despite contributing less to global emissions. This highlights the need for equity in sustainability efforts.

Importance of Sustainable Solutions

The **importance** of sustainable solutions lies in their ability to create a balance between

environmental conservation, economic development, and social well-being. Here are the major reasons why sustainability is crucial:

Preserving Natural Ecosystems:

Ecosystems provide essential services like clean air, water filtration, pollination, and climate regulation. Sustainable solutions, such as reforestation and habitat conservation, are essential to maintaining these services.

For example, mangrove forests protect coastal communities from storms and flooding while acting as carbon sinks, reducing greenhouse gases in the atmosphere.

1. Ensuring Intergenerational Equity:

Sustainable solutions aim to meet current needs without compromising the ability of future generations to meet their own needs. This principle ensures that resources remain available and ecosystems stay intact for years to come.

2. Economic Benefits:

Contrary to the misconception that sustainability is costly, it can lead to long-term economic growth. Green technologies, renewable energy, and sustainable agriculture reduce costs and create new job opportunities.

For instance, a report by the International Renewable Energy Agency (IRENA) indicates that the renewable energy sector could create over **42 million jobs worldwide by 2050**.

3. Addressing Climate Change:

Climate action through sustainable initiatives is vital to mitigating global warming and reducing vulnerabilities to climate-related disasters. For example, investing in green infrastructure (e.g., flood-resistant cities) can save lives and reduce economic losses.

The Paris Agreement's goal to limit global warming to 1.5°C highlights the international importance of transitioning to sustainable practices.

4. Health and Well-being:

Unsustainable practices lead to air and water pollution, which are linked to numerous health problems such as respiratory diseases, cancers, and waterborne illnesses. Sustainability ensures cleaner environments and healthier populations.

For example, using cleaner energy sources like electric vehicles can significantly reduce air pollution, improving public health in urban environments.

5. Global Cooperation and Peace:

Sustainability fosters global cooperation by addressing shared challenges such as climate change and resource scarcity.

For instance, initiatives like the United Nations' Sustainable Development Goals (SDGs) bring countries together to achieve common objectives like eradicating poverty, achieving clean

energy, and promoting sustainable cities.

In essence, the **need** for sustainability is driven by the urgent environmental, social, and economic challenges humanity faces today.

Objectives

1. To Identify the Need for Sustainability.
2. To Promote Awareness.
3. To Explore Mixed-Method Approaches for Solutions.
4. To Suggest Practical and Scalable Solutions.
5. To Foster Collaboration and to ensure better future.

Literature Review

Numerous studies have emphasized the importance of sustainable solutions in mitigating environmental degradation and achieving socio-economic balance. For instance, the Intergovernmental Panel on Climate Change (IPCC) (2021) has stressed the critical need for transitioning to renewable energy systems to limit global warming to 1.5°C above pre-industrial levels. Similarly, Ellen MacArthur Foundation (2020) has championed the adoption of circular economy practices to minimize waste and optimize resource use. Regenerative agriculture is another area gaining traction, with studies showing its potential to restore ecosystems, enhance biodiversity, and sequester carbon (Lal, 2020). Urban planning literature highlights the role of green infrastructure and smart city technologies in improving resource efficiency and resilience to climate shocks (UN-Habitat, 2021). This review underscores the interconnectedness of these strategies and their collective potential to foster a sustainable future.

Methodology

This research employs a mixed-methods approach, combining qualitative and quantitative analyses to examine sustainable solutions. Case studies of successful implementations globally were analyzed to identify best practices. Data from reports by international organizations, such as the United Nations Environment Programme (UNEP) and World Resources Institute (WRI), were utilized to assess the effectiveness of various strategies. Surveys and interviews with environmental experts, urban planners, and policymakers provided insights into challenges and opportunities for scaling these solutions.

Findings and Discussion

1. Transitioning to Carbon-Neutral Energy Systems

The energy sector remains the largest contributor to greenhouse gas emissions globally. Transitioning to carbon-neutral energy systems is a cornerstone of sustainability. Renewable energy sources, such as solar, wind, and hydropower, have demonstrated their potential to significantly reduce emissions. For example, Denmark generates over 40% of its electricity from wind energy, setting a global precedent. However, challenges such as high initial investment costs

and energy storage limitations persist. Governments must incentivize renewable energy adoption through subsidies, tax breaks, and research funding

2. **Enhancing Biodiversity Through Regenerative Agriculture**

Agricultural practices contribute to deforestation, soil degradation, and biodiversity loss. Regenerative agriculture, which focuses on restoring soil health, enhancing biodiversity, and sequestering carbon, presents a sustainable alternative. Techniques such as crop rotation, cover cropping, and agroforestry have proven effective in restoring ecosystems. Case studies from India and Brazil illustrate the success of regenerative agriculture in improving soil fertility and increasing farmers' income. Policymakers must prioritize funding and education for farmers to adopt these practices, ensuring food security while protecting biodiversity.

3. **Circular Economy Practices**

A circular economy aims to minimize waste and maximize resource efficiency by promoting recycling, reuse, and remanufacturing. The current linear "take-make-dispose" model is unsustainable, leading to resource depletion and environmental degradation. Countries like Sweden have embraced circular economy practices by implementing repair incentives and promoting product longevity.

4. **Sustainable Urban Planning and Smart Technologies**

As urbanization accelerates, cities must adopt sustainable planning practices to accommodate growing populations. Green infrastructure, such as parks and green roofs, enhances urban resilience by mitigating heat islands and reducing flood risks. Additionally, smart technologies, such as IoT-based water management systems and energy-efficient buildings, optimize resource use. Singapore serves as a model for sustainable urban planning, integrating green spaces and smart technologies. Urban planners must prioritize sustainability in city designs, supported by robust policy frameworks.

5. **The Role of Education and Policy**

Education is a powerful tool for fostering a culture of sustainability. Integrating environmental education into school curriculums can create environmentally conscious citizens. Additionally, vocational training programs equip individuals with skills for green jobs. Policy frameworks play a critical role in accelerating sustainable development. Governments must enact and enforce regulations that promote renewable energy, biodiversity conservation, and waste reduction. International cooperation is essential to align efforts with global sustainability goals.

Suggestions for Sustainable Solutions

Policy and Governance:

Governments should implement stricter environmental regulations and incentivize green technologies.

Policies must focus on protecting critical habitats and promoting renewable energy sources.

Community Engagement:

Encourage local communities to participate in conservation efforts.

Promote grassroots movements that advocate for sustainable practices.

Educational Initiatives:

Integrate environmental education into school curricula to instil sustainable values from a young age.

Launch global campaigns to raise awareness about the importance of sustainability.

Technological Innovation:

Invest in research and development of sustainable technologies, such as carbon capture and renewable energy systems.

Leverage digital tools to monitor and reduce environmental impacts.

Behavioural Change:

Encourage individuals to adopt eco-friendly habits, such as reducing waste, conserving energy, and supporting sustainable products.

Foster a culture of accountability and responsibility toward the environment.

Educational Implications

The topic of sustainability and discovering innovative solutions for a better tomorrow holds profound educational implications. Integrating this knowledge into educational systems can inspire students, teachers, and communities to take active roles in protecting the planet. Below are detailed educational implications:

1. Incorporating Sustainability into Curriculum

- **Holistic Understanding of Sustainability:** Educators can embed topics like climate change, renewable energy, circular economy, and biodiversity into science, geography, economics, and social studies lessons. The aim is to provide students with a comprehensive understanding of the environmental, social, and economic aspects of sustainability.

- **Cross-Disciplinary Learning:** Sustainability should not be restricted to one subject. Instead, it can be integrated across disciplines. For example:

- **Mathematics:** Modeling carbon footprints or analyzing energy consumption data.

- **Art:** Designing posters or campaigns for environmental awareness.

- **History:** Learning from past environmental challenges and policy responses.

- **Technology:** Exploring smart technologies that promote resource efficiency.

2. Promoting Experiential and Project-Based Learning

- **Hands-On Activities:** Students can participate in activities such as community clean-ups, tree-planting drives, or creating small-scale renewable energy projects (e.g., solar ovens or wind

turbines).

- **Case Studies and Localized Learning:** Teachers can use real-world examples of successful sustainable practices (e.g., regenerative agriculture in rural areas or urban green spaces) to illustrate concepts. This localized approach makes learning more relatable and actionable.

- **School Gardens and Biodiversity Projects:** Schools can establish gardens or biodiversity projects where students learn about sustainable agriculture and the importance of ecosystems.

3. Developing Skills for the Future

- **Critical Thinking and Problem Solving:** Addressing sustainability challenges requires creative and analytical thinking. Students can engage in discussions or debates on solutions to climate change, waste management, or energy transitions.

- **Collaboration and Leadership:** Group projects focused on sustainability encourage teamwork and leadership skills. Students can work together to develop solutions for school-based sustainability initiatives, such as reducing energy use or waste.

- **Digital Literacy:** As smart technologies play a critical role in sustainability, students can learn to use digital tools to map resources, monitor energy consumption, or design futuristic sustainable cities.

4. Fostering Environmental Stewardship

- **Cultivating a Sense of Responsibility:** Education can instill a sense of responsibility toward the planet. For example, students could engage in reflective exercises about their personal environmental impact and identify lifestyle changes to reduce their carbon footprint.

- **Connecting with Nature:** Schools can organize field trips to local ecosystems (forests, rivers, or wetlands) to help students develop an emotional connection with the environment. This connection can inspire long-term environmental stewardship.

- **Empowering Student Advocacy:** Students can be encouraged to participate in or lead environmental advocacy campaigns in their communities, fostering a sense of agency and purpose.

5. Supporting Equity and Inclusivity

- **Addressing Global and Local Challenges:** Education on sustainability should highlight global issues (e.g., rising sea levels) while also addressing local challenges (e.g., water scarcity in certain regions). This dual approach ensures that students understand the interconnectedness of global and local systems.

- **Focus on Vulnerable Communities:** Lessons can emphasize the disproportionate impact of climate change on marginalized populations, encouraging students to think about equitable

solutions.

- **Inclusive Education:** Sustainability education can be designed to include diverse voices, perspectives, and traditional knowledge systems (e.g., indigenous practices for land conservation).

6. Preparing Students for Green Careers

- **Career Awareness:** As the demand for green jobs increases, students can be introduced to career pathways in renewable energy, sustainability consulting, urban planning, and environmental sciences.
- **Practical Training:** Vocational programs can include sustainability-focused training, such as installing solar panels, designing energy-efficient buildings, or developing waste management systems.
- **Entrepreneurship:** Schools can encourage entrepreneurial thinking by helping students develop sustainable business ideas, such as eco-friendly products or services.

7. Encouraging Lifelong Learning

- **Sustainability as a Lifelong Value:** Education should aim to instill sustainability as a core value that extends beyond school. Students can be taught to adapt to changing environmental and societal conditions and continue to learn about sustainability throughout their lives.
- **Community Engagement:** Schools can act as hubs for sustainability education, engaging parents, local organizations, and policymakers in discussions and initiatives.

8. Role of Technology and Innovation in Education

- **Use of Smart Technologies:** Schools can incorporate smart technologies into learning. For instance:
 - Using apps to track waste reduction or carbon footprints.
 - Virtual reality (VR) simulations to explore climate change scenarios.
- **Data-Driven Learning:** Students can use real-world data to analyze trends, such as deforestation rates or renewable energy adoption, fostering data literacy and evidence-based reasoning.

9. Aligning with Global Goals

- **Connecting to SDGs:** Teachers can align lessons with the United Nations Sustainable Development Goals (SDGs), helping students see their role in achieving these global benchmarks.
- **Global Citizenship Education:** By emphasizing the interconnectedness of global systems, students can develop a sense of global citizenship and understand the collective responsibility to protect the planet.

10. Policy and Institutional Implications

- **Advocating for Policy Change:** Sustainability education can prepare students to advocate for policies that promote renewable energy, circular economies, and inclusive governance.
- **Institutional Sustainability:** Schools themselves can model sustainable practices (e.g., reducing water and energy use, implementing recycling programs) to set an example for students.
- **Teacher Training:** Teachers need adequate training to effectively teach sustainability

topics and integrate them into existing curricula.

Findings

The findings of this research highlight the interconnectedness of environmental, social, and economic systems in achieving sustainability.

Transitioning to carbon-neutral energy, adopting regenerative agriculture, implementing circular economy practices, and fostering community-driven initiatives are key strategies for a sustainable future. Education and policy frameworks act as enablers, while localized solutions ensure inclusivity and resilience.

By aligning efforts with the United Nations Sustainable Development Goals, societies can thrive within planetary boundaries, safeguarding the well-being of current and future generations. The time to act is now, and collective action from individuals, businesses, and governments is essential to protect the planet and build a better tomorrow.

The topic of "Planet Protectors" offers immense potential to transform education into a platform for fostering sustainability and resilience. By embedding these ideas into educational frameworks, we can empower future generations with the knowledge, skills, and attitudes needed to address the pressing environmental, social, and economic challenges of our time. Education becomes not only a means of personal development but also a tool for collective action toward a sustainable and equitable future.

Conclusion

The topic of "Planet Protectors" offers immense potential to transform education into a platform for fostering sustainability and resilience.

By embedding these ideas into educational frameworks, we can empower future generations with the knowledge, skills, and attitudes needed to address the pressing environmental, social, and economic challenges of our time.

Education becomes not only a means of personal development but also a tool for collective action toward a sustainable and equitable future.

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YOGA: TRADITIONAL WAY OF DEVELOPING MENTAL HEALTH IN STUDENTS

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Abstract

Yoga is a word derived from the Sanskrit word “yuj” which means unite or join. The word itself means the coordination of physical as well as mental peace so as to gain the harmony in life. According to NEP 2020, Indian knowledge system (IKS) also emphasis on yoga as it is the most wanted spiritual practise for the betterment of people through self realisation. Self realisation is an important aspect in today’s world as it enables the individuals to believe in themselves and gain the confidence and courage to live the life. Yogais a traditional way of uniting the body along with the mind to lead a harmonious life. It includes the meditation, breathing control as well as body balance. In short it is the state in which the body is under the control of our mind. Nowadays the individuals lack the happiness due to the various stress factors such as work stress, studies related stress, anxiety issues etc. These all problems can be sorted to an extent with the help of yogic practices. Yoga connects the body with the mind along with the flow of body movements so as to hold the control of our body along with the mind to stay fit. This paper signifies the meaning of “yoga”, the importance of yoga in students, hindrances towards the implementation of yoga in student’s life. It signifies the awareness of yogic practices and states the asana (yogic postures) that enhances mental concentration.

Keywords: Indian knowledge system (IKS),NEP 2020, Mental concentration, spiritual practise, hindrances.

Introduction

MEANING

The yoga means to connect the body along with the mind through breathing exercise, body movements stretching etc. It leads to the harmonious development of body and mind to realise the internal aspect of our soul. It emphasis on breathing, flexibility and spiritual practices.

HISTORY

The yoga practice was initiated in the pre-vedic period.It was believed that yoga emerged around 1000 years ago. Yoga word was found in ancient text “**Rigveda**”. It was developed by the sages (Rishis) in various sacred scriptures. It is believed to be the part of Hinduism.

In earlier times the term “Asana” was interpreted as ‘seat’ which is now modernised as the practice of yoga with physical postures. Similarly the term “Pranayama” is interpreted as the force of life with the body. Later on, it was also modernised and executed as various breathing exercises.

IKS Vs Yoga

The yogic practices promote students to build traditional as well as modern educational differences (Tikhe et al., 2023). It unites the cultural aspects of the country as well as restores the historical significance. The interconnection with the tradition of ancient knowledge and modern knowledge enhances the holistic development of the students (Tikhe et al., 2023).

Lord Shiva is considered or believed to be the first yogi hence fore also known as **Adhiyogi**. There are various fundamentals of yoga. It works on the level of one's body mind, emotion and energy. India is considered to be the rich cultural and historical heritage. It promotes various factors that work on the betterment of one's life (Khan et al., 2024)

- PHYSICAL FITNESS
- STRESS REGULATION
- IMPROVES THE RESPIRATORY RELATED PROBLEMS
- TACKLES THE CARDIOVASCULAR ISSUES etc. (Khan et al., 2024)

According to Atik Khan, yoga through yoga one can examine the spirituality and vale the cultural heritage of India. The IKS states the importance of the same by advocating moral values such as truthfulness, non-violence , conservation etc.

IMPORTANCE OF YOGA IN STUDENTS' LIFE

Student life is the stage which lies between the childhood and adulthood that is the stage between the children to transform into an adult. In this stage students needs to inculcate various moral values and disciplines in the life so as to maintain a healthy as well as spiritual life.

This stage is the important part and where they learn each value that can be inculcated in the life further.

The students life is moreover depend upon the school where school plays a major role in the development of an adult with various values. According to the international school of Thrissur, a study reveals that various factors are the main productive part of yogic practices.

Factors Of Yoga Practices
• Discipline
• Weight Management
• Self Realistation
• Mindfulness
• Exam Stress Management

- **DISCIPLINE**

It leads to a healthy lifestyle by acquiring a discipline in the daily routine of each individual.

- **WEIGHT MANAGEMENT**

It helps to manage the weight, which the students are struggling in modern days.

- **SELF REALISATION**

It promotes the self awareness in the student's life, it promotes the students inner urge to know and understand the earth elements and love the natural elements.

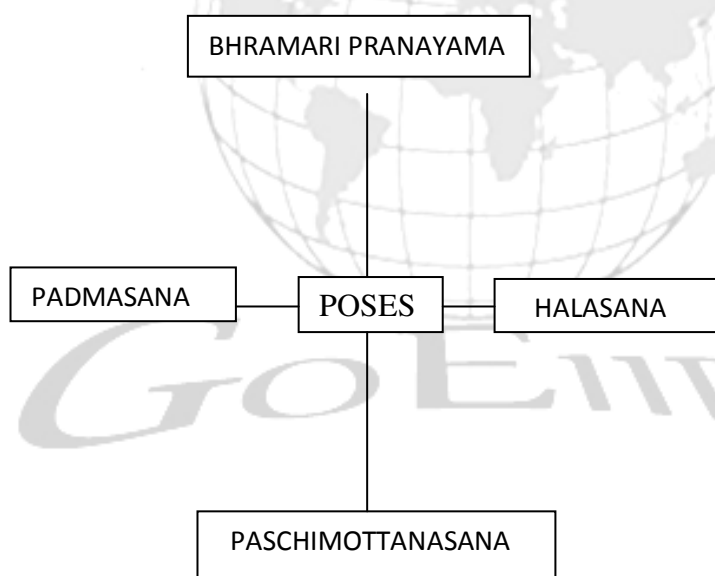
- **MINDFULNESS**

It increases the memory span of an individual as well as help in reducing stress.

- **EXAM STRESS MANAGEMENT**

It enables the student's life to be better as it enhances them to tackle the issue of exam stress with ease.

ASANAS THAT ENHANCE THE STUDENT'S LIFE.



MENTAL HEALTH

Mental health plays an important role in student's life as the mental ability affects the physical balance and vice versa. The important factor that enables a student's life is mental health regarding attending the exams as well as relationship aspects also effects the student's life.

The mind of the student should be stable so as to tackle the issues regarding their development. The first step of mental health is to gain the courage to face any problems that can be solved from the student's life; therefore they can make themselves capable to tackle the issue in the future too.

The mental health can be stable only when the hormones related to the body secreted properly for those yogic practices plays a major role that has been evident from our ancient time too.

HINDRANCES IN IMPLEMENTING YOGA IN LIFE

- Improper understanding of yoga and practising it without understanding the techniques can lead to injuries.
- The willingness to acquire yogic practices also creates an obstacle.
- Yogic practices without knowing the body.
- The insufficient knowledge regarding the significance of yoga.

HINDRANCES IN IMPLEMENTING YOGA IN SCHOOL.

➤ NO PROPER TRAINED INSTRUCTORS IN SCHOOL.

The yoga needs to execute only with a help of a trained instructor as yoga includes various rules related to the body movements and its type. Each yogic posture includes various rules and regulations that are too followed during the yoga practices. If there is no proper trainer the yogic poses can lead to injuries without proper instructions.

➤ AWARENESS OF YOGA AMONG PARENTS

The parents are not much aware about the yoga and its practices. So the first is to Make them understand the importance of the same in student's life.

➤ WILLINGNESS OF THE STUDENTS

The student's knowledge regarding the yoga practices must be enhanced and appreciated so as to make them willing to follow the yogic practices.

CONCLUSION

Yoga therefore is an ancient practice that is followed as in modern days also. The awareness of the yoga along with the spiritual aspect is much important in student's life also to bring the moral as well a healthy life. The spiritual aspect enables the children to acquire peacefulness in their life as well as create a self confidence among them.

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ROLE OF READING COMPREHENSION ON SUSTAINABLE FUTURE: A COMPARATIVE SURVEY BETWEEN HINDI AND ENGLISH MEDIUM

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Abstract

Reading comprehension is essential for academic success and intellectual development, particularly in multilingual environments. Reading comprehension, encompassing both traditional and modern reading practices, plays a vital role in fostering resilience and promoting a sustainable future by cultivating critical thinking, problem solving, and emotional intelligence. This comparative study explores the effectiveness of traditional reading comprehension strategies for students in both mediums, focusing on three key components: (a) Meaning of words and phrases (b) understanding of contextual meaning (c) Comprehension of messages. Despite the extensive research on reading comprehension, limited studies exist comparing how these strategies work across language mediums in India. This research addresses the gap by investigating the differences in comprehension abilities between Hindi and English medium students. The study uses a survey methodology, with a questionnaire as the primary data collection tool. Preliminary findings indicate that while students in both groups show strong comprehension skills, English medium students tend to perform better in contextual and message comprehension, likely due to greater exposure to diverse linguistic contexts. In contrast, Hindi medium students excel in understanding meaning of words but face challenges with contextual variations in English texts. The results provide valuable insights for educators, emphasizing the need for tailored reading comprehension strategies that address the specific needs of students in different language mediums.

Keywords: Reading comprehension, Hindi medium, and English medium.

Introduction

Reading comprehension is a complex skill that requires more than just reading the words on the page, but also reading the meaning, context and nuances behind the text. It involves integrating many processes, phonemic awareness, vocabulary, grammar, syntax, and background knowledge. Helps many students who can get meaning by reading written material. This approach is meant to encourage active engagement with the text, during which readers predict, question, and summarize information as they read.

In the information age, reading comprehension is more critical than it has ever been. And, with so much more content being published online, we also need to be able to read and evaluate

what we are reading in order to navigate misinformation, make understanding better.

Concept of Reading Comprehension :

Reading Comprehension is the ability to understand, interpret, and analyse written texts. It is a complex cognitive process that involves decoding words, recognizing their meanings, and integrating information to get meaning from the text. Reading comprehension is essential for academic success, effective communication, and lifelong learning.

Importance of Reading Comprehension:

1. Academic Success- To perform better in all subject areas, strong comprehension skills are required.
2. Professional development- To analyse and understand written materials of various career requires the ability to comprehend texts.
3. Personal growth- Reading updates knowledge by enhancing critical thinking and problem solving skills.

Need of study :

The study of reading comprehension is crucial from a researcher's point of view, as many students from different age groups face challenges in understanding the context and meaning of words and phrases. This struggle not only affects their ability to interpret and analyse texts but also impacts their overall academic performance and critical thinking skills. Tailoring effective reading strategies and instructional methods can help improve comprehension skills which makes it easier for students to engage with difficult texts and apply their knowledge in various subjects. Hence, exploring and addressing these challenges is essential for improving literacy and fostering lifelong learning.

Review of Related Literature :

AkeAndriani (2011) A comparative study on Reading comprehension between the students taught by using Read, Examine, Decide, and Write (REDW) strategy and those taught by using conventional technique at the grade eleven students of SMA N 1 Enok. Two groups of students (experimental and control group) at the grade eleven of SMA N 1 Enok participated in this research. Each group had different treatment; experimental class was treated by Read, Examine, Decide, and Write (REDW) Strategy and control class was treated by conventional strategy. This research was done for eight meetings. The data had been collected by administering reading comprehension test to experimental and control groups at beginning and the end of the research. The instrument consists of 20 reading comprehension questions. The test item had been made based on the indicators of reading comprehension. The researcher checked the reliability of the instrument by analysed the try out result by using Hoyt's formula. To describe whether the hypothesis is accepted or rejected, the researcher used the analysis of observation and t-Test formula.

LilisSholihah (2013) this study is aimed to find out the differences on reading comprehension between students of junior high school in city and rural area. The method used was quantitative method in the form of comparative study. The writer used Ex Post Factor Design in this research. The population of the research was all the third year students of those four schools. The sampling technique was purposive sampling. The writer took 80 students for the sample. The instruments for collecting data were questionnaire, interview, test and also unstructured observation.

Shamaila Amir (2019) the study was based on numerical difference of girl and boy students of secondary school in their reading comprehension scores. The study was designed to evaluate with regards to comprehension between boys and girls at secondary level schools of Karachi.

Shamaila Amir and Dr Muhammad Akhtar Kang (2018) this study was based on comparative study of reading comprehension between male and female students of secondary level students of Karachi in both private and government schools.

Objectives of study

1. To Compare reading comprehension of English and Hindi medium students of secondary schools.
2. To study Meaning of words and phrases of English medium and Hindi medium students of secondary school.
3. To study Understanding of contextual meaning of English medium and Hindi medium students of secondary school.
4. To study Comprehension of messages of English medium and Hindi medium students secondary school.

Research Methodology: The research was based on Survey method.

Sampling Design:

The researchers visited few schools of Nashik district from which two schools granted permission to conduct the research, one of English medium and other of Hindi medium.

The school was selected by incidental sampling. In both the schools the students were selected by cluster sampling. The sample size of the survey was 100 students.

Data Collection tool : The tool used by researchers for the survey was Questionnaire.

Data collection : The researchers visited few schools of Nashik district from which two schools granted permission to conduct the research, one of English medium and other of Hindi medium.

The researchers tailored questionnaire based on the framed objectives. The questionnaire was checked by experts of secondary schools of Nashik. The data collected is analysed using percentage.

Data Analysis

Comparative study for English and Hindi medium secondary school students of 8th grade. The data collected is analysed using percentage.

The researchers have labelled the data into low, medium and high to establish data collection from both the mediums. Students who scored Below 50% are in low level, students who scored between 51 % to 75% are in medium level and who scored more than 75 % are in high level of comprehension.

Objective 1 -To Compare reading comprehension of English and Hindi medium students of secondary schools.

Table 1

Comparison between English and Hindi medium students with respect to reading comprehension

		English medium		Hindi medium	
Level	Percentage	No. of students	Percentage of students	No. of students	Percentage of students
Low	Below 50%	23	46%	43	86%
Medium	51%to 75%	23	46%	7	14%
High	76% & above	4	8%	0	0%
Total		50		50	

The Table 1 interprets that in English medium school 46% students are in low level 50 % while in Hindi medium school 86% are in low level students 50%.

In English medium school 46% students are in medium level 51% to 75% while in Hindi medium school 14% students are in medium level 51% to 75%.

In English medium school 8% students are in high level 76% and above while in Hindi medium school students are in high level 76% and above.

To conclude, English medium students outperformed Hindi medium students in Reading comprehension.

Objective 2- To Study Meaning of words and phrases of English medium and Hindi medium students of secondary school.

Table 2

Comparison between English and Hindi medium students with respect to Meaning of words and phrases.

		English medium		Hindi medium	
Level	Percentage	No. of students	Percentage of students	No. of students	Percentage of students
Low	Below 50%	8	16%	35	2%
Medium	51%to 75%	22	44%	14	30%
High	76% & above	20	40%	1	68%
Total		50		50	

The table 2 interprets that in English medium school 16% students are in low level 2 % while in Hindi medium school 86% are in low level students 50%.

In English medium school 44% students are in medium level 51% to 75% while in Hindi medium school 30% students are in medium level 51% to 75%.

In English medium school 40% students are in high level 68% and above while in Hindi medium school students are in high level 76% and above.

To conclude, Hindi medium students outperformed English medium students in Meanings of words and phrases.

Objective 3-To Study Understanding of contextual meaning of English medium and Hindi medium students of secondary school

Table 3

Comparison between English and Hindi medium students with respect to understanding of contextual meaning

		English medium		Hindi medium	
Level	Percentage	No. of students	Percentage of students	No. of students	Percentage of students
Low	Below 50%	10	20%	32	64%
Medium	51%to 75%	11	22%	12	24%
High	76% & above	29	58%	6	12%
Total		50		50	

The table 3 interprets that in English medium school 20% students are in low level 50 % while in Hindi medium school 64% students are in low level 50%.

In English medium school 22% students are in medium level 51% to 75% while in Hindi medium school 24% students are in medium level 51% to 75%.

In English medium school 58% students are in high level 76% and above while in Hindi medium school 12% students are in high level 76%.

To conclude, English medium students outperformed Hindi medium students in understanding of contextual meaning.

Objective 4 - To study Comprehension of messages of English medium and Hindi medium students of secondary school.

Table 4

Comparison between English and Hindi medium students with respect to Comprehension of messages.

		English medium		Hindi medium	
Level	Percentage	No. of students	Percentage of students	No. of students	Percentage of students
Low	Below 50%	5	10%	27	54%
Medium	51%to 75%	18	36%	13	26%
High	76% & above	27	54%	10	20%
Total		50		50	

The table 4 interprets that in English medium school 10% students are in low level 50 % while in Hindi medium school 54% students are in low level 50%.

In English medium school 36% students are in medium level 51% to 75% while in Hindi medium school 26% students are in medium level 51% to 75%.

In English medium school 54% students are in high level 76% and above while in Hindi medium school 20% students are in high level 76%.

To conclude, English medium students outperformed Hindi medium students in Comprehension of messages.

Major Findings

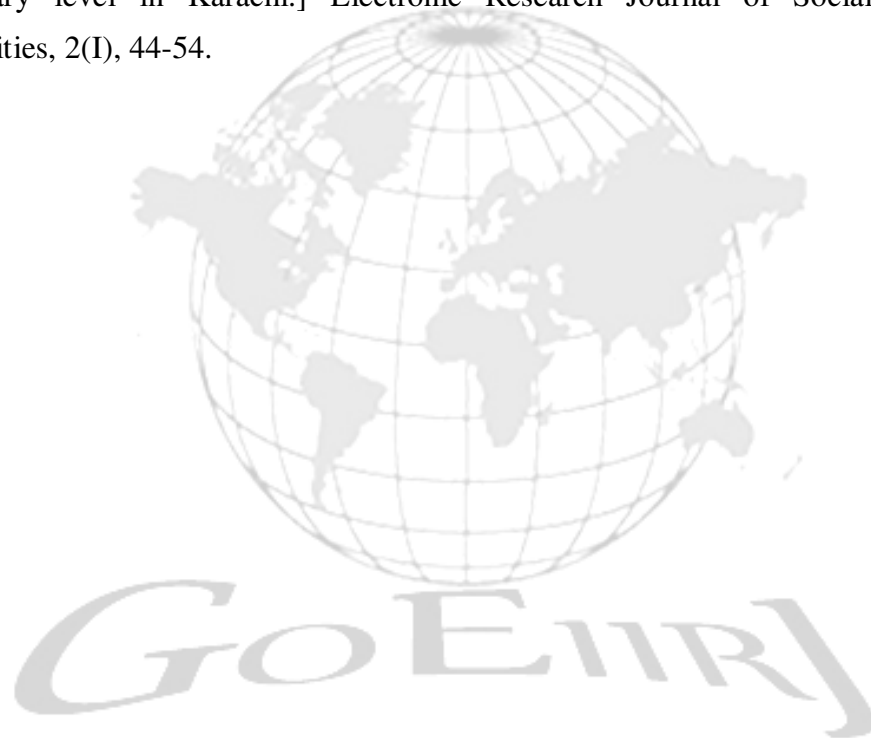
- In overall Reading comprehension, there are more percentage of students in high level from English medium school as compared to Hindi medium school.
- In meanings of words and phrases, there are more percentage of students in high level from Hindi medium school as compared to English medium students.
- In understanding of contextual meaning, there are more percentage of students in high level from English medium school as compared to Hindi medium school.
- In comprehension of messages, there are more percentage of students in high level from English medium school as compared to Hindi medium school.

Conclusion

In conclusion, the researchers found that this comparative study shows a significant difference between English and Hindi medium secondary school students in the 8th grade. English medium students outperformed Hindi medium students across three out of four objectives, with a higher percentage achieving scores above 75%. In contrast, Hindi medium students face significant challenges, particularly in understanding contextual meanings and comprehension of messages as evidenced by the large number scoring below 50%. The findings highlight the need for improvement in Hindi medium schools to enhance language proficiency through strategic approaches to surge overall comprehension. Bridging these gaps can help improve student performance and ensure more efficient educational outcomes.

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ARTIFICIAL INTELLIGENCE IN HEALTHCARE: PRACTICAL APPLICATIONS AND CHALLENGES

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Abstract:

By developing modern innovations that enhance diagnosis, treatment, and patient management, artificial intelligence (AI) has entirely reshaped the healthcare sector. Several AI applications in healthcare are examined in this paper, along with their possible positive aspects, including increased efficiency and accuracy. It also highlights the difficulties and moral issues related to the adoption of AI, such as biases and privacy issues. The review concludes by examining AI's potential to advance healthcare systems and enhance patient outcomes in general.

Yet there are also a lot of obstacles to overcome in integrating AI in healthcare. For AI to be used safely and effectively, it is imperative that ethical issues, data privacy concerns, and the requirement for legal frameworks be addressed. Furthermore, the equal delivery of healthcare is at danger due to the dependence on high-quality data and the possibility of algorithmic bias. This essay examines the level of artificial intelligence (AI) in healthcare today, its real-world uses, and the obstacles that need to be removed in order to fully fulfil its promise to revolutionize healthcare systems around the world.

1. Introduction:

Computer systems that can mimic human intellect through learning, reasoning, and self-correction are referred to as artificial intelligence (AI).^[1] AI is revolutionizing a number of healthcare domains, such as drug development, customized treatment, robotic surgery, medical diagnostics, and administrative procedures. AI improves surgical precision, speeds up the creation of new medications, increases diagnostic accuracy, and accelerates healthcare administration through examining vast amounts of data and finding patterns. AI-powered solutions help physicians make better, quicker judgments, which eventually leads to better treatment results. The future of healthcare delivery is being shaped by these technology developments, which result in greater efficiency, lower costs, and more effective, individualized patient care.

2. Applications of AI in Healthcare

Healthcare could undergo a transformation with the help of AI, especially in the field of medical diagnostics. Both patients and clinicians can gain from its applications' increased accuracy, speed, and efficiency. These are a few noteworthy applications:

2.1 Medical Diagnostics: Machine learning and deep learning algorithms are two examples of

AI-driven tools that have shown remarkable accuracy in disease diagnosis. Among the examples are:

- **Image Analysis:** Artificial intelligence (AI) algorithms are highly accurate at analyzing medical pictures, including CT, MRI, and X-ray scans.^[2] Convolutional neural networks (CNNs), for instance, are AI models that can identify abnormalities in imaging data, such as cancers, fractures, and lesions, frequently more accurately than human radiologists.
- **Early Detection:** AI technologies are being created to use imaging data to identify early indicators of diseases like cancer, Alzheimer's, or cardiovascular disorders, enabling early therapies.^[3]
- **Predicting Disease Progression:** AI is able to evaluate pathology data to forecast how diseases will develop, including cancer staging, and suggest individualized treatment regimens.
- **DNA Sequencing Analysis:** AI assists in analyzing of genomic data to identify genetic illnesses or mutations, offering information on the risk factors for conditions such as rare genetic disorders, cancer, and heart disease.
- **Clinical Decision Support:** By examining trends in patient data, symptoms, medical history, and clinical guidelines, AI-powered systems can help physicians make diagnostic judgments.

2.2 Drug Discovery and Development: AI has the potential to revolutionize this field by speeding up, lowering costs, and improving efficiency. Drug discovery has historically been a time-consuming and costly process, but AI can expedite many of the procedures. Here are a few significant applications of AI in this area:

- **Predicting Biological Targets:** AI is capable of identifying possible therapeutic targets by analyzing enormous volumes of biological data, including transcriptomic, proteomic, and genomic data. Relationships between illnesses and molecular targets that might not be readily obvious through conventional study can be found using machine learning methods.^[4]
- **Target Validation:** Using clinical, molecular, and genetic data, AI models can assist in determining whether a biological target is feasible for drug development.
- **Lead Compound Optimization:** AI can analyze the chemical structure of lead compounds to suggest modifications that could improve their effectiveness, stability, and safety.

2.2 Personalized Medicine: AI in personalized medicine is a quickly expanding field that customizes medical care to each patient's unique needs. AI aids in the creation of individualized treatment regimens that are safer, more effective, and more efficient by evaluating vast datasets that include genetic, environmental, and lifestyle aspects. Key uses of AI in customized medicine include the following:

- **Genetic Profiling:** AI is capable of examining a patient's genetic composition to find

mutations or genetic variations that could affect how they react to specific therapies. AI assists in developing individualized therapeutic approaches, such as selecting medications that are more likely to be beneficial or avoiding potentially dangerous pharmaceuticals, by comprehending genetic predispositions.^[5]

- **Genetic Risk Prediction:** Based on a patient's genetic profile, AI tools may evaluate genetic data to estimate a person's risk for a number of diseases, including cancer, heart disease, and Alzheimer's. They can also recommend early interventions or preventive measures.
- **Drug Response Prediction:** By examining a patient's genetic information, AI can forecast how they will react to or metabolize particular medications.^[6] For instance, some genetic variations may affect a drug's effectiveness, adverse effects, or absorption. AI can assist in choosing the best drug and dosage for a patient by taking these aspects into account, enhancing treatment results and reducing side effects.
- **Better Patient Outcomes:** AI-driven tailored medicine can result in quicker recovery times, better chronic condition management, and an overall higher quality of life by concentrating on individual features.

2.4 Robotic Surgeries: Combining the accuracy of robotic systems with the analytical capabilities of artificial intelligence, robotic surgeries are a quickly developing field of medicine.^[7] Highly precise, minimally invasive procedures that improve surgical results, shorten recuperation periods, and reduce human error are made possible by this combination. The following are the main uses of AI in robotic surgery:

- **Robot-Assisted Surgery:** Artificial intelligence (AI)-driven robotic devices, like the **da Vinci Surgical System**, are capable of extremely accurate motions with few tremors or deviations. AI helps by improving the robot's movement in response to real-time surgical data processing, which results in more precise tissue handling, incisions, and surgical instrument placement.
- **Intraoperative Monitoring:** During surgery, AI may continuously evaluate real-time data from sensors, imaging, and other diagnostic instruments to notify the surgeon of any abnormalities or changes in vital signs. AI, for example, can track oxygen levels, blood loss, and tissue reactions, which can assist inform surgical choices and improve results.^[8]
- **Predictive analytics:** By evaluating data in real-time, AI can anticipate possible surgical issues (such as bleeding, infection risks, or organ damage). This lowers risks during the treatment by enabling the surgical team to take preventative action before a problem worsens.
- **Endoscopic Surgery:** AI can drive robotic endoscopic equipment to observe and explore interior organs with greater accuracy, performing procedures through small incisions (e.g., laparoscopy) rather than big open cuts.

2.5 Virtual health assistants (VHAs) and chatbots: AI in healthcare is revolutionizing patient interactions with healthcare systems by providing round-the-clock access to medical

advice, monitoring, and guiding through VHAs and chatbots. These AI-powered solutions improve patient care, expedite processes, and assist physicians by providing individualized services. Using chatbots and virtual health aides, the following are the main uses of AI in healthcare:

- **Initial Assessment:** AI-powered virtual assistants may evaluate symptoms and provide a preliminary diagnosis based on patient input.^[9] They use natural language processing, or NLP, to understand the patient's symptoms, ask follow-up questions, and direct the patient to the appropriate care. For example, Babylon Health and Ada Health are tools that guide users through a list of symptoms and recommend whether they should see a doctor, go to an urgent care center, or conduct something different.
- **Decision Support for Patients:** Virtual health aides improve early detection and reduce unnecessary journeys to medical facilities by helping patients gauge the severity of their symptoms and offering recommendations for next steps, such as taking care of themselves or visiting a doctor.
- **Health Information and Education:** Depending on the patient's needs, virtual assistants can provide evidence-based health advice, explain medical terms, and respond to questions about conditions or treatments. Additionally, they offer educational materials tailored to the patient's medical need.
- **Medication Adherence:** Virtual health assistants can help patients manage their medication schedules by reminding them when to take their pills.^[10] They can also record a patient's medication history and alert them when their prescriptions need to be refilled. This will be tremendously helpful for patients managing chronic conditions or on complex medication regimens.

2.6 Workflow optimization and healthcare administration: AI is increasingly being used in these fields to enhance system efficiency, reduce costs, streamline operations, and improve patient care. By automating repetitive tasks, analyzing data in real-time, and supporting decision-making, artificial intelligence (AI) has the potential to significantly reduce administrative burdens and improve the efficacy of healthcare organizations. AI has significant applications in healthcare management and workflow optimization, including the following:

- **Billing and Coding:** AI can automate the medical billing and coding process by applying the proper billing codes and gathering relevant information from patient records. This reduces human error and speeds up the compensation procedure.^[11] AI-powered systems like Cerner and Optum360 help optimize the entire billing cycle, from coding to claims submission.
 - **Clinical Data Entry Automation:** AI can assist doctors by automatically completing EHR data fields with structured or unstructured data sources. The decrease in time spent on manual recording allows medical staff to spend more time with patients.
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3. Challenges and Limitations of AI in Healthcare: There are several challenges to be addressed before AI can be fully adopted, despite the fact that it has the potential to completely transform healthcare by improving diagnosis, treatment, and operational performance. These concerns need to be addressed in order to ensure that AI technologies deliver the intended benefits while maintaining patient safety, privacy, and confidence. Some of the primary barriers and limitations of AI in healthcare include the following:

- **Data Privacy and Security:** Sensitive Information: Genetic information, medical records, and personal health information are all examples of extremely sensitive healthcare data.^[12] It is essential to make sure that this data is sent and stored securely.

Cybersecurity Threats: As data volumes rise, there is a greater chance of data compromises, ransomware attacks, and cyberattacks that could endanger patient privacy and the integrity of healthcare systems.

- **Bias and Ethical Issues:** The data used to train AI algorithms may contain biases. The AI system may make biased conclusions if the training data is not representative of various populations, which could result in unequal healthcare delivery. When developing AI models, prejudice and data diversity must be addressed.

- **Legal and Regulatory Concerns:** Regulatory Approval: Organizations like the FDA (U.S.) or EMA (Europe) must conduct a thorough regulatory review of AI systems, particularly those that are used for medical diagnosis or treatment recommendations.^[12] The duration, cost, and complexity of this certification procedure can impede the rapid adoption of AI.

- **Integration with Legacy Systems and Current Systems:** The technology used by many healthcare facilities is ancient or incompatible, making it difficult to connect with current AI systems. The smooth data flow needed for AI to operate at its best may not be supported by outdated electronic health record (EHR) systems or diagnostic tools.

Interoperability: AI solutions must be compatible with a variety of platforms and gadgets used by healthcare institutions (such as lab results, EHRs, and diagnostic imaging). The seamless incorporation of AI into regular activities may be hampered by a lack of compatibility among various platforms.

- **Trust and Acceptance:** Fear of Job Displacement: Clinicians in particular may worry that AI may take their position or lessen their contribution to patient care. Even while AI is meant to supplement human expertise rather than replace it, this can result in resistance to embracing AI technologies.

4. Ethical Issues in Healthcare Driven by AI: Significant improvements in diagnosis, treatment, and overall healthcare delivery result from the application of artificial intelligence (AI) in the medical field. But it also presents difficult moral issues that need to be resolved in order to

guarantee that AI technologies are applied sensibly, securely, and fairly. The following are the main moral issues with AI-powered healthcare:

- **Informed Consent:** Respecting patients' autonomy is one of the most important ethical precepts in healthcare.^[13] It's crucial in AI-driven healthcare to make sure patients comprehend exactly how AI technologies are being applied to their treatment. This includes describing the ways in which AI tools support diagnosis, treatment strategies, and decision-making.
- **Explainability and Transparency:** Patients need to understand the nature of AI technologies, how they affect decision-making, and any possible hazards related to using AI in their medical treatment. This calls for concise, understandable explanations in everyday language.
- **Accountability:** It's still difficult to assign responsibility for AI-driven mistakes in diagnosis or therapy.
- **Equity in AI Deployment:** Regardless of a patient's socioeconomic background, location, or level of technology proficiency, efforts must be taken to guarantee that AI-driven healthcare technologies are available to all. If equitable access is not provided, current health disparities may worsen.

5. Future Prospects of AI in Healthcare

- AI has a bright future in healthcare in recognition of developments in:
- **AI-Powered Health Ecosystems:** To enable comprehensive patient care, the future of AI in healthcare entails building interconnected ecosystems where AI technologies smoothly interact across multiple healthcare domains (diagnostics, therapy, patient engagement, etc.).
- **AI with Wearables:** Wearable technology that incorporates AI will track patients' health in real time, generating constant streams of data that can be examined to anticipate illness, identify health problems early, and customize treatment regimens.^[14]
- **Natural Language Processing (NLP):** As NLP advances, AI systems will be able to comprehend and evaluate unstructured language found in patient contacts, research publications, and clinical notes. This will automate documentation processes and improve decision-making.
- **AI in Public Health:** By evaluating vast amounts of data to forecast disease outbreaks, track epidemiological patterns, and maximize healthcare resources at the population level, AI will become more and more significant in the field of public health.^[15]
- **Quantum Computing in AI:**Facilitating genomics and drug discovery powered by AI.

6. Conclusion: Artificial intelligence (AI) is revolutionizing healthcare through increasing the precision of diagnoses, improving treatment plans, simplifying administrative work, and spurring advancements in customized medicine and medication development. The potential advantages of AI in healthcare are enormous, despite issues with adoption, ethics, and data protection. AI will keep helping doctors, empowering patients, and streamlining healthcare systems around the world

as it develops. AI has the ability to transform healthcare and enhance patient outcomes globally with cautious regulation, openness, and responsible application.

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GOEIIRJ

**INDIAN KNOWLEDGE SYSTEM IN GITHA HARIHARAN'S THE GHOSTS OF
VASU MASTER**

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Abstract:

Githa Hariharan is a distinguished post-modern novelist. His The Ghosts of Vasu Master(1994) is a second novel double to the size of her first novel. She writes on various cultures. Her When Dreams Travel is on Arabian culture. It depicts the life of royal as well as the life of courtesans. In Times of Siege is a campus novel. It describes university life. The Thousand Faces of Night is based on south Indian family life. The novel The Ghosts of Vasu Master focuses on the Vasu Master and his family members. The novel also set in the typical south Indian environment. The novel deals with the Indian Knowledge system. Vasu is a widower. His wife dies at early age and leaves him widower in youth. He decides not to marry for the sake of his two children. He sacrifices his life for his sons. He memorizes his wife and the happy days of past life. The novel also deals with Vedic culture and focuses on Ayurveda. Father is the only support of children after the death of their mother. Vasu Master is very fit to this dictum. His wife has died. He lives with his two sons Vishnu and Venu. The present paper lights on the Vedic issues in the novel.

Keywords: Indian Knowledge system, Yoga, Ayurved, Panchatantra. cultural education issues, literature, society, Vedic, issues.

The Ghosts of Vasu Master is a nice composition of Githa Hariharan. The novel is set in a typical south Indian Village, Elipettai near Madras. The novel describes some oriental concepts of Hindu religion. Vasu Master is a main character in the novel. He spends most of his life in countryside school. He is a widower in his youth. He does not marry after the death of his wife. He grows up his two children after the death of his wife. He plays a role of mother and father. Vasu Master has taken the responsibility to grow up his two children after the death of his wife. He takes care of his sons as mother does. He teaches cycling to his sons. It is seen in India the father who does not marry after the death of his wife is supposed to be an ideal person. He avoids the trouble of his children by sacrificing his own happiness in life. Vasu lives a life of saint. He lives a life of Indian Rishi tradition. In modern age remarriages are possible but Vasu Master has made sacrifice for his children and took care of his children educated them and made them to stand on their own strength.

Githa Hariharan has writes on various issues. Her novels reveal the vital issues of contemporary India. As India is a land of saints, beautiful beliefs and culture. The tradition of India, advocates its natives to consider teachers as equal to God. Since the culture has long heritage of vedic ideas and its ideals and values. *The Ghosts of Vasu Master* accomplishes special attention at the Indian culture. She criticizes present day education system. Hariharan presented concepts of religion in the novel. He believes in the ideal education in time of Vedic period. The story telling is also one of the methods from ancient times in India. Vasu Master adopts the same method of story- telling. He tells stories from *Panchatantra* to Mani. He gets success in teaching abnormal child Mani who was neglected by many schools.

The Ghosts of Vasu Master is an example of spirit of brotherhood. He had spent, most of his life, teaching at the private school in the Indian town of Elipettai. He lives alienated life. His wife is dead. She is present in the novel by the memories of Vasu Master. His two sons write a letter to him. Vasu is a spiritual teacher. He teaches the abnormal child Mani, for long time. His student and he himself grow and learn and come to terms with the world around them. His effort to teach Mani has broadest sense in pedagogy. Present day Indian teaching system believes Lord Macaulay's education system. In such environment Vasu's approach is very significant. He is visionary and intelligent. He is very honest in his profession and very confident about his teaching. So, he continues to be a teacher after retirement. He had not many students. His last student, Mani has a brain of seven-year child though he is elder. He tells him the fantastic stories from *Panchatantra*. The relationship between Mani and Vasu Master reminds us Gurukulam system. Indians have traditions from long ago to tell stories to their children. In the evening time grandfather and grandmother used to tell the stories to their grandchildren. The sources of the stories were from our Panchatantra, Jataka tales and from masterpieces. The relationship is fine example of *Guru-shishya* Relationship. We have some fine examples of Shrikrishna and Sandipani and Dronacharya and his disciples Pandavas and Kauravas stayed with Drona for their education. Mani also stays with Vasu Master. Vasu remembers his past. His past, future and present are shadowed in the story as we read the story. Mani takes interest in Vasu Master's fantastic stories. Each story has its moral.

Vasu Master searches for higher truth through his life. He is an *Ayurvedacharya* and helps the people. Ayurveda is a part of Indian culture. Indians like to follow Vedic way of life. Vasu Master has treasure of his forefathers to treat different types of patients. He has learnt it from his father and the heritage is continued by Vasu Master. He cures the patient by his ayurvedic practice. Vasu Master had lost his mother when he was child. Vasu Master was Brahmin. In his house each was individual. They were distinct in his father's mind because they had different stomachs. His father was preparing *rasayanas* for healing people. They believe that food cures body. Though he

has been cured with food in his childhood he consults the doctor. His father believes in *ayurveda*. Vasu Master recalls the days spent with his father during his childhood. He describes: “the panchagam distilled the riches of Hindu astronomy to specify auspicious dates” (Hariharan - 19)

His father was not an ordinary healer. His father had knowledge of ayurveda. Ayurveda is a great boon to mankind. Ayurveda is making a great contribution to Indians in present days. Ayurveda means the word ayu means life and veda means to know. To know about life means ayurveda. Vasu master remembers his father’s words as he would say:

What are you? A creature full of vata, pitha and kapha.” Hariharan -21)

Ayurveda refers to ‘panchamahabhuta’ (five basic elements of the entire creation), and or three doshas or primary forces of prana or vata (air), agni or Pitta (fire) or soma and kapha (water and earth) as comprising the basic principles of ayurveda. We have three temples of Panchmahabhutas in India. These temples are distanced hundreds of kilometers but these are in one line. It shows Indians knowledge of longitude and latitude. He believes in Charka’s philosophy that complexion, clarity, good voice, genius, happiness, satisfaction, nourishment, strength, intellect all these are conditioned by food. Food cures the body and it also kills human being if it is not used properly. Vasu Master’s dreaming days are over as novel starts. Hariharan states on the very first page of the novel the quotations of Charka:

“The entire world is teacher to the intelligent and for to the unintelligent.” (p, 1)

His father also prepares rasayanams. The rasayana (mixture) prepared by his father was given to patients. His father was of the opinion that each individual has unique constitution of humour. It was method of treatment to purify and strengthens the tissues of body.

The vedic values and morals are presented in the novel through the stories of *Panchatantra*. The karma theory is a part of Vedic culture. The Lord Krishna has told it to Arjuna on the battlefield of Kurukshetra. The stories of Nagaleela’s are also associated with environmental issues and Mahabharata. Bheema one of the Pandavas is given poison by Kaurava’s and was drowned in the river. Bheema reaches to Naglok and they gave him elixir and Bheema gets the strength of ten elephants.

He also presents the practice of Yoga is good for health. In the chapter The Fatal Kundalini, the character of Swami talks about the concept of Yoga. Through Yoga one can purify and strengthens Physical mental and spiritual systems of individuals.

Githa Hariharan also describes a story of Vanadevi, Goddess of forest. Indians have feelings from ancient time to sustain environment. The Nagas worships the forest the forest goddess. Indians see god’s existence in the elements of nature. Paganism to see God in nature is a part of Indian culture. Indians trust forest as their mother since ancient times. Worshipping nature is a part of Indian life. Thus, eternal sources like river and forests are preserved in this way. We have

sacred rivers like Ganga, Yamuna, Godavari, Kshipra and Tapi, Vasu Master lived in past and present in the novel. His wife, Mangala, died many years earlier and she only gradually becomes a strong presence in the book. He has the album of his memories. The present is his room surrounded by Peepal tree thrust a few branches into the room and provides a leafy curtain of the window. Vasu Master's physical conditions are not good as we see him in the beginning of the novel, he consults physicians. He cannot get diagnosed himself. This is the present-day tragedy of physicians. The practice confuses patient. There is a chain of doctors. His papers and X-rays cause him alienation. He bitterly attacks on present day medical profession. On other hand his father was more human in treating patients. Vasu Master's father was a doctor. He was very wise and he could treat the patients. Vasu Master is a patient of Insomnia and diarrhea. He consults doctors. He was told to consult another doctor. No one could treat him properly. Vasu could not get proper treatment.

Hariharan's *The Ghosts of Vasu Master* presents moral, social, ethical, spiritual, human values. The novel focuses on the spirit of oneness in the thought and activity of the individual by means of the concept of equality. The concept of oneness (advait) is found in the novel. Vasu Master is spiritually attached to his wife with his thought she is dead. She is always in the mind of Vasu. His relations with his two sons are a good example of attachment and parent child relationship. Love is everyone's right and Mani, an unintelligent student also involved by Vasu Master and he teaches him telling fantastic stories and the deprived Mani begins to learn.

Githa Hariharan's, *The Ghosts of Vasu Master* lights on the various vedic issues like Guru-shishya relationship, karma theory, Ayurveda, Yoga, concept of oneness (advait) Panchangam, and life of Rishis. The practices are useful for Indians. It is hidden Indian treasure of Indian knowledge system. It has proved its usefulness and people all over the world are interested in it.

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E-LEARNING: PROS AND CONS

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Abstracts

Today's knowledge and human abilities have a shorter lifespan than in the past, which increases the need to continue learning and growing throughout a person's career. In the age of globalization and technological innovation, four-year degrees are only the beginning of a forty-year continuing education program. Digital learning platforms are substantially changing our educational system. The days of traditional classroom instruction are gradually coming to an end due to technological innovation and high-speed internet. The pandemic has increased the significance of e-learning on a global scale. This paper focuses on the concept of e-learning, its significance, its benefits, its future in India, and its obstacles. In the modern world, lifelong learning is quickly becoming essential, and globalization has created a positive vibe in India. Computer technology is the medium of instruction in electronic learning, also known as e-learning or e-learning, a sort of technology-supported education/learning (TSL).

Keywords: E-learning, Technology, Multimedia.**INTRODUCTION**

E-learning is a systematic teaching-based learning system that makes use of electronic resources'-learning is the process of learning that is made possible by information and communication technology (ICT) that allows anyone to learn at any time and from any location. E-learning is simply the process of connecting professors and students who are geographically separated by distance using technology. Multimedia is used in e-learning to improve student learning. Expert advice, training, and just-in-time information transmission are all possible components of e-learning. Although instruction can take place both within and outside of classrooms, the mainstay of e-learning is the use of computers and the Internet. Another way to describe e-learning is as a network-enabled transfer of knowledge and skills that allows for the broad distribution of education. The process of acquiring knowledge and skills through the use of electronic technologies, such as local and wide area networks, computer and Internet-based courseware, is known as e-learning. A broad description of the discipline that deals with delivering training and education programs through technology. Usually used to refer to wireless, mobile learning, the Internet, CD-ROM, and intranet media. Some people classify knowledge management as an online learning format. When it was first presented in 1995, it was known as

"Internet-based Training" (IBT). Later, it was renamed "Web-based Training" (WBT) to indicate that distribution could occur via the Internet or an intranet. Finally, it was dubbed "Online Learning" or "e-learning," adopting the popular usage of the letter "e" during the dot com boom. The industry was able to raise hundreds of millions of dollars thanks to the "e-" breakthrough from venture capitalists who were willing to invest in any industry that began with this magical letter. The transfer of knowledge and skills made possible by computers and networks is called e-learning. It is widely believed that emerging technologies have the potential to significantly impact education. Young children in particular can benefit from the immense interactivity of modern media to expand their knowledge, abilities, and worldview—of course, under parental supervision. Many e-learning supporters think that everyone needs to know the fundamentals of technology and be able to utilize it as a tool to accomplish specific tasks.

History of E-Learning

Human civilization has advanced significantly as a result of the information technology revolution and the creation of the internet. Information now takes precedence over industry in society. The most significant development in technology this century has been the emergence of information technology. All of a sudden, information technology became a vital component of our civilization. The same applies to education. The field of education welcomes the use of networking and multimedia. The University of Illinois created a classroom with connected computer terminals in 1960 so that students may view lectures from a specific course that had been recorded. This was the first time that e-learning in any kind was used few Stanford University professors began using computers in the early 1960s to teach reading and math in elementary schools. Numerous e-learning courses originated from computer-based learning. Correspondence schools like University of Phoenix began expressing interest in virtual education as the internet grew in the 1990s. The first virtual high school, CAL Campus, opened for business in 1994. More success has been achieved when face-to-face instruction and online learning are combined than when they are used alone. A multimedia network education is how some experts describe education in the twenty-first century. All countries in the globe are accepting and promoting educational information. According to data from the National Center for Education Statistics, there were 18 million students globally enrolled in online programs in 2008—a 1.6% rise over the previous year. Although the numbers are not very big, there is still a lot of opportunity for online learning in India. In this context, the educational system, instructional strategies, and a host of other education-related issues are evolving. E-learning is the result of this change.

Importance of E-Learning

Technology and e-learning techniques are crucial for student education as well as the career advancement of working adults. The swift advancement of technology has increased the significance of personnel possessing the necessary competencies and education. For instance, it is

anticipated that the development of quantum computing capabilities would cause a significant change in the way that contemporary firms run, affecting those who work in internet security, hardware development, and coding. Many of these workers will need to be retrained and reskilled, and learning environments like e-learning will be crucial in helping with that. Additionally, businesses are using online learning more and more to provide employees with continual training and upskilling. In business environments, learning management systems, or LMSs, are very well-liked. Both within and outside of traditional classrooms, higher education institutions use internet-capable electronic devices and online learning methodologies. In 2022, McKinsey & Company polled 7,000 students across 17 countries, and found that 65% of those in higher education wanted to see some form of online learning continue in institutions in the post-pandemic era.

DIFFERENT APPROACHES TO E-LEARNING

There are two types of online learning or e-learning:

Interactive or synchronous e-learning: In this kind of e-learning, instructors and students communicate with one another in real-time. Everything takes place on a digital platform, exactly like in a typical classroom. It makes it possible for teachers and student to communicate more effectively.

Asynchronous Online Learning: Students can view pre-recorded videos in this kind of online learning at their convenience. The teacher and pupils are not having any conversations. Different formative scenarios can be formed using e-learning, and when they are coupled, they can yield more meaningful learning:

Type of learning	Traditional Formation	E-Learning
Synchronic	A typical class in which it takes part a teacher and several students	All the class is connected to the Internet in a Chat. The participants present ideas to the class using audio, text, or videoconference.
Synchronic/ Asynchronous	Groups of students meet outside the class timetable to do some tasks. The teacher meets with students during tutorship hours	Groups of students meet in a Chat to make a proposed task. The teacher uses the tutorship hours to advise, in a chat, to students.
Asynchronous	The students complete individually assigned tasks, making reports for the teacher. The library is used as a formation resource	The students download the tasks and resources of information from the Web site. The teacher provides the student tutorship hours by e-mail. The students have access to excellent information onthe Internet through proposed connections.

Advantages of E-LEARNING

- **Flexibility is a feature of e-learning**, also known as online learning, since it allows students to access the material whenever it's convenient for them. Students have the option of studying from a recorded video or attending live classes. Thus, there is no need to be concerned

about falling behind in class. You can also learn online or through e-learning while you're on the go.

- **Online education saves time:** Students can save a tone of time by learning online or through e-learning, which eliminates the need for them to physically visit the university. Students can now learn at home with the use of online or e-learning.

- **E-learning is an Effective Method of Learning:** by the use of links, PowerPoint presentations, and other extra content, lessons can be given effectively through e-learning. It is possible to record lessons and distribute them to pupils.

- **E-learning lets you learn at your own pace:** A lot of students are too timid to ask questions about a subject; for those students, e-learning is a godsend since it allows them to go back and review any material they may have missed. Pupils are free to learn at their own speed.

E-learning is Economical: Since students must pay less for e-learning than for traditional classroom instruction, it is extremely economical.

- **Since teachers and students don't have to travel to the institutions,** e-learning can result in higher attendance in the classroom. Both teachers and students can participate in class from home.

- **With e-learning, students may access course materials** from any location as long as they have an internet connection and a smartphone, tablet, or laptop.

- The user can access an infinite number of resources through e-learning.

Cons of E-Learning

- **E-Learning is Limited:** E-Learning has a limitation regarding the use of learning methodology. Certain aspects of education should be accessed or studied practically in the classroom only, which cannot be done in an online class.

- **E-learning is less accessible:** Not all students have access to a smartphone/PC/Laptop. Students in Rural area as well as in slum areas of the city doesn't have smart devices like smartphone, tablets, laptops PCs, or Internet to access E-learning or online learning. So, if a student doesn't have access to an electronic device and internet, then they can't learn.

- **E-Learning is less User Friendly:** For many students, E-learning is not user friendly.

- **E-Learning has authenticity issues:** In this digital world E-learning totally based on the right and authentic information. But nowadays there is a lot of fake websites that are not the authentic source of educational material.

- **E-Learning can cause Health Issues:** Since students have to spend around 5-7 Hrs in front of an electronic screen. A student has to stay in front of an electronic screen that emits blue light, this will cause damage to the eye when exposed for a longer time period. It may cause strain, tiredness, or back problems, mental health issues also if certain measures are not taken properly.

- **E-Learning may encourage the cheating culture:** Since a student is sitting behind the screen at some remote place it's hard to stop them from cheating in the examinations.
- **In E-Learning is hard to take subjective tests,** a mostly objective test is taken only.
- **E-learning may develop Social Isolation** among the students as there is no face-to-face communication. In E-learning or Online learning, students just sit alone and study. The E-learning atmosphere is not as engaging as the classroom provides to a student.
- **Technical knowledge required for E-Learning:** If a student is not familiar with electronic devices, then it's hard for him to learn via E-learning. For E-learning computer or smartphone literacy is a must which is not possible for many as many people don't even have access to these electronic devices. Along with this for E-learning, a good internet connection is also required otherwise it won't be possible to take live classes. If we leave big cities then the internet connection situation is not that good in many places

FUTURE OF E-LEARNING IN INDIA

India has a major role to play in the international e-learning services industry. It is already one of the leading ITservice provider countries, and it is now aiming to achieve the same position in IT-enabled services. The presence of world-class educational infrastructure and training professionals enables it to be one of the leading e-learning services providers in the world. On the domestic front, the government and private sectors have taken many e-learning initiatives. Though these initiatives have been met with a lot of enthusiasm and user acceptance, their commercial viability is still under consideration. The government has been taking some proactive measures in a regulatory and financial capacity to boost the e-learning environment in India. Funds have been invested in setting up Internet in rural areas for communication, which can be used for e-learning initiatives as well and can help in providing informal and vocational training as well as formal education.

The following are the primary advantages of the Indian e-learning services market:

1. Manpower that speaks English, is highly qualified and is tech-savvy
2. Safe Electronic Environment: Accreditation of E-transactions and Digital Signatures by the Government
3. Less expensive human capital than in developed nations
4. A robust and thriving domestic education sector that makes it easier to introduce new products and upgrade skills

Conclusion

This century is referred to as the digital and information era. E-learning makes it easier for instructional training to be widely used. E-learning offers several benefits and is superior to conventional teaching techniques. Online learning is the most practical approach to earn a degree

in higher education. A flexible, self-directed approach to fulfilling their degree requirements appeals to many of these individuals. Teachers and students are driven to learn the new technology and utilize all available resources for efficient teaching and learning, despite the difficulties that come with online instruction. The administration of the school should mandate that teachers receive adequate training on learning software so they can instruct and mentor pupils in an effective and efficient manner.

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EMPOWERING PRINCIPALS THROUGH SKILL DEVELOPMENT AND VOCATIONAL TRAINING

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Abstract

Principals need to have the necessary skills, knowledge, and attitudes to lead and manage their schools effectively. The role of principals in the context of the National Education Policy (NEP) 2020 is also crucial. Principals are expected to provide leadership and vision in implementing the NEP 2020 in their respective schools. Principals need to have the necessary skills, knowledge, and attitudes to lead and manage their schools effectively. It is very much needed to accelerate key skills, skill development and vocational training programs. Effective skill development and vocational training programs for principals should include a range of components, such as industry partnerships, hands-on training, mentorship and coaching, personalized learning, assessment and evaluation, certification and credentialing, technology integration, and sustainability and support. By investing in skill development and vocational training for principals, we can empower them to lead and manage schools effectively, improve educational outcomes, and shape the future of education in India.

Key words: Empowerment, Principal, skill development, vocational training.

Introduction

Empowering principals is essential for improving educational outcomes, enhancing teacher morale, and fostering a positive school culture. Principals need to be empowered to lead instructional improvement efforts, including curriculum development, teacher professional development, and assessment. They should be given training and development opportunities to enhance principals' various skills like leadership, instructional, and management skills. Foster collaboration among principals, teachers, and other stakeholders to promote shared leadership and decision-making can empower principals with administrative skills. For effective management of school budgets and resources, including personnel, facilities, and technology and to engage with the community, including parents, local businesses, and community organizations skill Development and Vocational Training for Empowering Principals. The role of principals in the context of the National Education Policy (NEP) 2020 is also crucial. Principals are expected to

provide leadership and vision in implementing the NEP 2020 in their respective schools. They need to develop a clear understanding of the policy's goals and objectives and communicate them effectively to teachers, students, and other stakeholders. The role of principals in NEP 2020 is critical in implementing the policy's vision and goals. Principals need to have the necessary skills, knowledge, and attitudes to lead and manage their schools effectively.

Key Components of Effective Skill Development and Vocational Training Programs

Industry Partnerships: Partnerships with industry leaders and employers to ensure training is relevant and effective. **Hands-on Training:** Opportunities for hands-on training and practice. **Mentorship:** Mentorship and coaching from experienced professionals. **Assessment and Evaluation:** Regular assessment and evaluation to ensure trainees are meeting learning objectives. **Certification and Credentialing:** Opportunities for certification and credentialing to recognize trainees' skills and knowledge.

Why skill development and vocational training are important for principals:

1. **Effective Leadership**

Principals need to develop leadership skills to manage and motivate teachers, staff, and students, and to create a positive school culture.

2. **Strategic Planning**

Principals must develop strategic planning skills to align school goals with district and state objectives, and to ensure that the school is meeting its academic and operational goals.

3. **Instructional Leadership**

Principals need to develop instructional leadership skills to support teacher development, improve student outcomes, and create a culture of academic excellence.

4. **Communication and Collaboration**

Principals must develop effective communication and collaboration skills to work with teachers, parents, and the community, and to build partnerships that support student learning.

5. **Data-Driven Decision Making**

Principals need to develop skills in data analysis and interpretation to inform instructional decisions, and to ensure that the school is using data to drive improvement.

6. **Managing Change and Innovation**

Principals must develop skills to manage change and innovation, including the implementation of new technologies, programs, and initiatives.

7. **Building and Maintaining Relationships**

Principals need to develop skills to build and maintain relationships with teachers, staff, students, parents, and the community, and to create a positive and inclusive school culture.

8. **Managing Conflict and Crisis**

Principals must develop skills to manage conflict and crisis, including the ability to remain

calm under pressure, to communicate effectively, and to make difficult decisions.

9. Fostering a Growth Mindset

Principals need to develop skills to foster a growth mindset in themselves and others, including the ability to take risks, to learn from failure, and to persist in the face of challenges.

10. Staying Current with Best Practices

Principals must develop skills to stay current with best practices in education, including the ability to read and apply research, to attend conferences and workshops, and to participate in professional learning communities.

By developing these skills, principals can become more effective leaders, improve student outcomes, and create a positive and inclusive school culture.

Here are some key skills for principals:

Leadership and Management

Strategic planning: Developing and implementing a vision for the school.

Teacher evaluation and supervision: Evaluating teacher performance and providing feedback.

Budgeting and resource management: Managing school resources, including budget, personnel, and facilities. Communication: Communicating effectively with teachers, staff, students, parents, and the community.

Problem-solving and decision-making: Analyzing problems and making informed decisions.

Instructional Leadership

Curriculum development and implementation: Developing and implementing curriculum that aligns with state and national standards. Teacher professional development: Providing opportunities for teacher growth and development. Instructional coaching and mentoring: Coaching and mentoring teachers to improve instructional practices. Data-driven instruction: Using data to inform instructional decisions.

Assessment and evaluation: Developing and implementing assessments to evaluate student learning.

Communication and Collaboration

Building relationships: Building positive relationships with teachers, staff, students, parents, and the community. Conflict resolution: Resolving conflicts in a fair and timely manner. Communication with diverse audiences: Communicating effectively with diverse audiences, including parents, community members, and students with diverse needs. Collaboration with teachers and staff: Collaborating with teachers and staff to achieve school goals. Community engagement: Engaging with the community to build support for the school.

Data-Driven Decision Making

Data analysis: Analyzing data to inform instructional decisions. Data interpretation: Interpreting data to identify trends and patterns. Data-driven instruction: Using data to inform

instructional decisions. Assessment and evaluation: Developing and implementing assessments to evaluate student learning. Program evaluation: Evaluating programs to determine effectiveness.

Emotional Intelligence and Well-Being

Self-awareness: Recognizing one's own emotions and how they impact leadership. Self-regulation: Managing one's own emotions and behaviors. Motivation: Motivating oneself and others to achieve school goals. Empathy: Understanding and appreciating the perspectives of others. Social skills: Building positive relationships with others.

Digital Literacy and Technology

Digital citizenship: Modeling and promoting digital citizenship. Technology integration: Integrating technology into instructional practices. Digital communication: Communicating effectively using digital tools. Data management: Managing and analyzing data using digital tools. Cyber security: Protecting school data and systems from cyber threats.

Other skills

Adaptability: Adapting to changing circumstances and priorities.

Resilience: Managing stress and maintaining a positive outlook.

Creativity: Finding innovative solutions to problems.

Critical thinking: Analyzing complex problems and making informed decisions.

Time management: Managing time effectively to prioritize tasks and achieve goals.

Vocational training programs for principals

Leadership Development Programs

➤ National Association of Elementary School Principals (NAESP) Leadership Development Program: A comprehensive program that provides training and support for elementary school principals.

➤ National Association of Secondary School Principals (NASSP) Leadership Development Program: A program that provides training and support for secondary school principals.

➤ American Association of School Administrators (AASA) Leadership Development Program: A program that provides training and support for school administrators.

Instructional Leadership Programs

➤ National Institute for School Leadership (NISL) Instructional Leadership Program: A program that provides training and support for instructional leaders.

➤ Harvard Graduate School of Education Instructional Leadership Program: A program that provides training and support for instructional leaders.

➤ University of Washington Center for Educational Leadership Instructional Leadership Program: A program that provides training and support for instructional leaders.

Mentorship and Coaching Programs

➤ New Leaders Mentorship Program: A program that provides mentorship and coaching for new school leaders.

➤ National Association of Elementary School Principals (NAESP) Mentorship Program: A program that provides mentorship and coaching for elementary school principals.

➤ National Association of Secondary School Principals (NASSP) Mentorship Program: A program that provides mentorship and coaching for secondary school principals.

Online and Blended Learning Programs

➤ Coursera School Leadership Specialization: A online program that provides training and support for school leaders.

➤ edX School Leadership MicroMasters: A online program that provides training and support for school leaders.

➤ University of Michigan School of Education Online Master's Program in Educational Leadership: A online program that provides training and support for educational leaders.

Other Programs

➤ National Principals Leadership Institute (NPLI): A program that provides training and support for principals

➤ The Principals' Center at Harvard Graduate School of Education: A program that provides training and support for principals.

➤ The National Association of School Superintendents (NASS) Leadership Development Program: A program that provides training and support for school superintendents.

Benefits of skill development and vocational training for principals

Improved Leadership and Management

➤ Enhanced leadership skills: Principals develop the skills to lead and manage schools effectively.

➤ Better decision-making: Principals learn to make informed decisions that benefit the school and its stakeholders.

➤ Improved communication: Principals develop effective communication skills to interact with teachers, students, parents, and the community.

Instructional Leadership

➤ Improved instructional practices: Principals learn to support teachers in improving instructional practices.

➤ Enhanced student achievement: Principals develop strategies to improve student achievement and academic success.

➤ Better teacher evaluation and support: Principals learn to evaluate teacher performance and provide support for professional growth.

Effective Communication and Collaboration

- Improved relationships: Principals develop positive relationships with teachers, students, parents, and the community.
- Better conflict resolution: Principals learn to resolve conflicts effectively and efficiently.
- Enhanced community engagement: Principals develop strategies to engage with the community and build partnerships.

Data-Driven Decision Making

- Improved data analysis: Principals learn to analyze data to inform instructional decisions.
- Better assessment and evaluation: Principals develop strategies to assess and evaluate student learning.
- Data-driven instruction: Principals learn to use data to drive instructional decisions.

Personal and Professional Growth

- Increased confidence: Principals develop confidence in their leadership abilities.
- Improved job satisfaction: Principals report higher job satisfaction and engagement.
- Enhanced career advancement opportunities: Principals develop skills and knowledge to advance their careers.

Benefits for Students and Teachers

- Improved student achievement: Principals develop strategies to improve student achievement and academic success.
- Better teacher support: Principals learn to support teachers in improving instructional practices.
- Positive school culture: Principals develop strategies to create a positive school culture that supports student learning and well-being.

Benefits for Schools and Districts

- Improved school performance: Principals develop strategies to improve school performance and academic achievement.
- Better district leadership: Principals develop skills and knowledge to support district leadership and initiatives.
- Enhanced community partnerships: Principals develop strategies to build partnerships with the community and support student learning.

Conclusion

Principals play a critical role in shaping the future of education, and it is imperative that they possess the necessary skills, knowledge, and attitudes to lead and manage schools in the 21st century. The National Education Policy (NEP) 2020 emphasizes the importance of teacher training and principal leadership in improving educational outcomes. Skill development and vocational training programs can help principals develop the necessary skills to lead and manage schools, including leadership, management, communication, and pedagogical skills. Effective skill

development and vocational training programs for principals should include a range of components, such as industry partnerships, hands-on training, mentorship and coaching, personalized learning, assessment and evaluation, certification and credentialing, technology integration, and sustainability and support. By investing in skill development and vocational training for principals, we can empower them to lead and manage schools effectively, improve educational outcomes, and shape the future of education in India.

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बी.एड. छात्राध्यापकांच्या आहारविषयक सवयींचा अभ्यास: एक शोध.

शितल महाले

सहाय्यक प्राध्यापक

स्नेहवर्धक मंडळ सोशल अँड एज्युकेशनल ट्रस्ट बी.एड कॉलेज.

• प्रस्तावना:

आज भौतिक विज्ञानाच्या क्षेत्रामध्ये होत असलेल्या विकासामुळे व्यक्ती एखाद्या गोष्टीला वैज्ञानिक आधार असेल तरच ती गोष्ट स्वीकारतो. त्यामुळेच आज "आहार" या विषयावर आहार तज्ञांच्या विचारांना महत्त्व मिळत आहे.परंतु आहारा संदर्भात आधुनिक आहार तज्ञ शरीराला ताकदवान व शक्तिशाली बनविण्यासाठी प्रथिने, खनिजे, कर्बोदके, मीठ, पाणी आणि कॅल्शरीची किती मात्र असावी याला खूप महत्त्व देताना दिसतात. परंतु त्यांच्या स्त्रोतांकडे दुर्लक्ष करताना दिसतात. याचा परिणाम म्हणून पौष्टिकतेच्या नावाखाली खाण्यास योग्य व खाण्यास अयोग्य, करण्यास योग्य व करण्यास अयोग्य, तसेच हिंसा व अहिंसा आणि परोपकार व स्वार्थ याबाबतीतला विवेक आजचा मनुष्य प्राणी गमवून बसला आहे .

"आहार" या विषयांतर्गत आहाराच्या पौष्टिक तत्त्वांपर्यंत चर्चा केली जाते . ती मर्यादित स्वरूपात आहे. आहारामुळे संपूर्ण जीवन कशाप्रकारे प्रभावित होते, जेवण का? कधी, कुठे , किती व कसे करायला हवे, जेवणाचा स्त्रोत शुद्ध, पवित्र, सात्विक व नैतिक असला पाहिजे यालाच आयुर्वेदिक भाषेत 'आहार विधी' असे म्हणतात. याविषयी चर्चा होणे आवश्यक आहे.

स्नेहवर्धक मंडळ सोशल अँड एज्युकेशनल ट्रस्ट बी.एड कॉलेज ,तळेगाव दाभाडे येथील छात्राध्यापकांच्या आहार विधी संदर्भात सर्वेक्षण करण्यात आले व त्यांच्या आहार विषयक सवयींचा शोध घेण्याचा प्रयत्न संशोधकाने केला आहे.

• गरज व महत्त्व:

जीवन जगण्यासाठी आहार अनिवार्य आहे. शरीररूपी गाडी चांगल्या पद्धतीने सुरु ठेवण्यासाठी आहाररूपी तेल आवश्यक आहे. जेव्हा आहार गरजेपेक्षा जास्त घेतला जातो अथवा घेतलेल्या आहारामध्ये पोषक तत्वे नसतील किंवा तो योग्य पद्धतीने घेतला गेला नाही तर शरीरामध्ये अनेक आजार उत्पन्न होऊ शकतात. अकाली वृद्धत्व येऊ शकते. अशा प्रकारे अनेक शारीरिक आपत्तींचा सामना करावा लागू शकतो. हे सर्व टाळण्यासाठी व सुदृढ दीर्घायुष्यासाठी समतोल आहाराचे योग्य प्रमाणात सेवन होणे आवश्यक आहे.

• कार्यात्मक व्याख्या:

1. बी.एड. छात्राध्यापक: शिक्षक बनण्यासाठीचे प्रशिक्षण घेणारा विद्यार्थी.
2. आहार: सर्व रसांचा (मधुर, लवण, कटु, तिक्त, कषाय)समावेश असलेले जेवण.
3. सवय : सातत्याने अंगवळणी पडलेली कृती.

• गृहीतके :

1. धकाधकीच्या जीवनशैलीमुळे आहारविषयक संदर्भात समस्या निर्माण होतात.

• व्याप्ती व मर्यादा:

व्याप्ती : सदर कृती संशोधन बी.एड कॉलेजमधील विद्यार्थ्यांसाठी आहे.

मर्यादा : सदर कृती संशोधन हे स्नेहवर्धक मंडळ सोशल अँड एज्युकेशनल ट्रस्ट बी.एड कॉलेज, तळेगाव दाभाडी येथील 30 विद्यार्थ्यांपुरते मर्यादित आहे.

• **नमुना निवड :**

बी.एड. कॉलेजमधील 30 छात्र अध्यापकांची निवड प्रासंगिक नमुना निवड पद्धतीने करण्यात आली.

• **संशोधन पद्धती:**

प्रस्तुत कृती संशोधनासाठी संशोधकाने सर्वेक्षण पद्धतीचा अवलंब केला आहे.

• **माहिती संकलनाची साधने :** प्रस्तुत कृती संशोधनामध्ये माहिती संकलनासाठी प्रश्नावली या साधनाचा संशोधकाने वापर केला आहे .

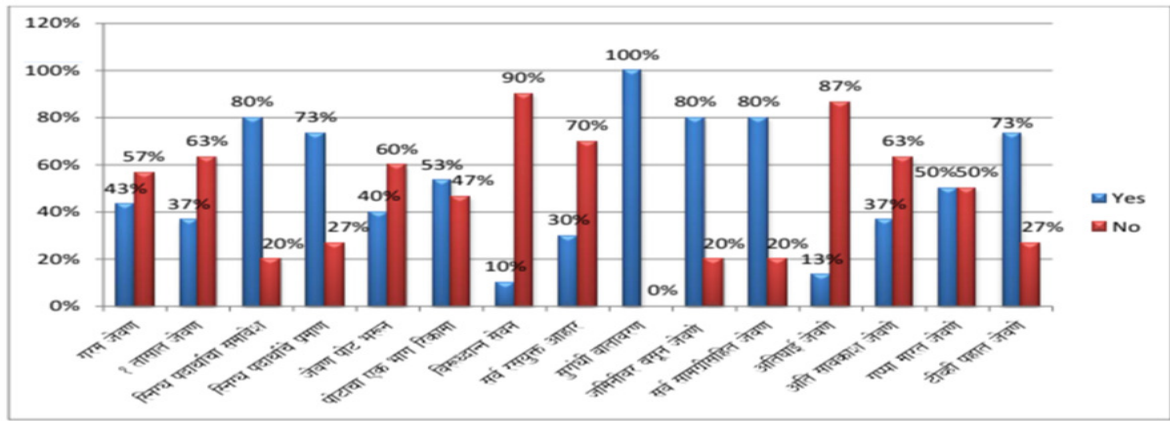
• **सांख्यिकीय तंत्र :** प्रस्तुत संशोधनामध्ये संकलित केलेल्या माहितीचे विश्लेषण करण्यासाठी संशोधकाने शेकडेवारी या संख्याशास्त्रीय तंत्राचा वापर केला आहे.

• **संशोधनाची प्रत्यक्ष कार्यवाही:** प्रस्तुत कृती संशोधनासाठी संशोधकाने सर्वेक्षण पद्धतीचा उपयोग केला. संशोधकाने संदर्भ साहित्याचा अभ्यास करून वरील अभ्यास विषयाची निवड केली. त्यानंतर संशोधन पद्धती निश्चित करून प्रश्नावली हे माहिती संकलनाचे साधन तयार केले. त्यानंतर नमुना निवड केलेल्या छात्राध्यापकांना प्रश्नावली दिल्या. त्या पूर्ण भरून झाल्यानंतर जमा करण्यात आल्या व या प्रश्नावलीचे विश्लेषण करून अर्थनिर्वचन केले.

• **निष्कर्ष:**

1. 43% छात्राध्यापक गरम जेवण करतात. पण 57% छात्र अध्यापक गरम जेवण करत नाहीत.
2. 37 % छात्राध्यापक अन्न शिजवल्यानंतर एक तासात जेवण करतात तर 63 % छात्राध्यापक अन्न शिजवल्यानंतर एक तासात जेवण करत नाहीत.
3. 80% छात्राध्यापक जेवणात स्निग्ध पदार्थांचा समावेश करतात.तर 20 % छात्राध्यापक जेवणात स्निग्ध पदार्थांचा समावेश करत नाहीत.
4. 73 % छात्राध्यापकांच्या जेवणात स्निग्ध पदार्थांचे प्रमाण दोन चमच्यापेक्षा कमी असते. तर 27% छात्राध्यापकांच्या जेवणात स्निग्ध पदार्थांचे प्रमाण दोन चमच्यापेक्षा कमी नसते.
5. 40% छात्राध्यापक जेवण पोटभरून करतात. 60 % छात्राध्यापक जेवण पोट भरून करत नाहीत.
6. 53% छात्राध्यापक जेवताना पोटाचा एक भाग रिकामा ठेवतात. 47% छात्राध्यापक जेवताना पोटाचा एक भाग रिकामा ठेवत नाहीत.
7. 10% छात्राध्यापक जेवताना विरुद्धान्न सेवन करतात. 90% छात्राध्यापक जेवताना विरुद्धान्न सेवन करत नाहीत.
8. 30 % छात्राध्यापक जेवताना नेहमी सर्व रसांचा (मधुर, लवण, कटु, तिक्त, कषाय) समावेश असलेला आहार घेतात . 70 % छात्राध्यापक जेवताना सर्व रसयुक्त आहार घेत नाहीत.
9. 100% छात्राध्यापक नेहमी स्वच्छ हवेशीर व सुगंधी वातावरणात जेवतात.
10. 80% छात्राध्यापक नेहमी जमिनीवर बसून जेवतात. 20% छात्राध्यापक जमिनीवर बसून जेवत नाहीत.

11. 80% छात्राध्यापक जेवणाच्या सर्व सामग्री सहित (ताट,,वाटी, पाणी, मीठ) जेवणास बसतात . 20% छात्राध्यापक जेवणाच्या सर्व सामग्री सहित जेवणास बसत नाहीत.
12. 13% छात्राध्यापक जेवताना अति घाईने जेवण करतात. 87 % छात्राध्यापक जेवताना अति घाईने जेवण करत नाहीत.
13. 37% छात्राध्यापक जेवताना अति सावकाश जेवतात . 63%छात्राध्यापक जेवताना अति सावकाश जेवत नाहीत .
14. 50% छात्राध्यापक जेवताना गप्पा मारत जेवतात. 50% छात्राध्यापक जेवताना गप्पा मारत जेवण करत नाहीत.
15. 73% छात्राध्यापक टी. व्ही. पहात अथवा मोबाईलवर बोलत जेवतात. 27 % छात्राध्यापक जेवताना टी.व्ही. पहात अथवा मोबाईलवर बोलत जेवण करत नाहीत.



कोष्टक १

उपाय योजना:

आयुर्वेदानुसार खालील उपाययोजना केल्यास छात्राध्यापक खात्रीशीरपणे सुदृढ, दीर्घायुषी होऊ शकतात.

1. जेवण नेहमी गरम व ताजे घ्यावे.
2. अन्न शिजविल्यानंतर एका तासात जेवण करावे.
3. दिवसभरातील जेवणात किमान दोन चमचे साजूक तूप /लोणी असावे.
4. जेवणामध्ये सर्व रसांचा समावेश असलेला आहार घ्यावा.
5. जेवण गप्पा मारत करू नये.
6. जेवण टी.व्ही. पहात अथवा मोबाईलवर बोलत करू नये.

संदर्भ:

1. निसर्गोपचार वार्ता (राष्ट्रीय प्राकृतिक चिकित्सक संस्थान,Ministry of AYUSH, Govt of India).
2. योग पदविका अभ्यास क्रम पुस्तिका.

SKILL DEVELOPMENT AND VOCATIONAL TRAINING: EMPOWERING A SUSTAINABLE FUTURE

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Abstract:

Skill development and vocational training are critical in creating a sustainable future by equipping individuals with industry-relevant skills, reducing unemployment, and promoting economic growth. This paper explores the role of skill development and vocational training in fostering sustainability, addressing environmental challenges, and meeting the demands of evolving job markets. It also examines barriers to effective implementation and suggests strategies for improvement. Skill development and vocational training are essential for economic growth, employment generation, and sustainability. Governments and non-governmental organizations (NGOs) play a crucial role in implementing and promoting skill development programs. This paper examines how NGOs and governments contribute to vocational training, address skill gaps, and foster sustainable development. It also discusses challenges and potential strategies for improvement.

Key Words- Technology, Education, Skill development, Sustainable & Vocational Training.

Introduction:

In an era of rapid technological advancements and changing job markets, skill development and vocational training have become essential for sustainable development. Unlike traditional education, vocational training focuses on practical skills and hands-on learning, preparing individuals for specific industries. This paper discusses how skill development contributes to sustainability by enhancing employability, promoting green skills, and supporting economic resilience. Skill development and vocational training are key drivers of economic growth, employment generation, and environmental sustainability. A well-trained workforce is essential to meet the demands of evolving industries. Teacher educators act as facilitators in this process by designing, implementing, and improving vocational education programs. They ensure that trainees acquire industry-relevant skills and contribute to sustainable economic development.

The Role Of Skill Development In Sustainable Development:

Sustainable development requires a skilled workforce that can adapt to new challenges. Skill development supports sustainability in the following ways:

- 1. Economic Growth and Employment Generation** - Reduces unemployment by aligning workforce skills with industry needs. Encourages entrepreneurship, reducing dependence on

formal employment. Improves productivity and innovation, leading to economic stability.

2. Social Inclusion and Equity - Provides opportunities for marginalized groups, including women and people with disabilities. Reduces income inequality by offering skills-based career paths. Strengthens communities by promoting lifelong learning.

3. Environmental Sustainability - Supports the transition to a green economy by training workers in renewable energy, waste management, and sustainable agriculture. Encourages eco-friendly business practices through green skill training. Helps industries adopt sustainable technologies and resource-efficient processes.

Vocational Training: Bridging The Skill Gap-

Vocational education is a key driver in equipping individuals with job-ready skills.

1. Industry-Relevant Training - Offers specialized training in areas such as construction, healthcare, information technology, and manufacturing. Enhances employability through practical experience and apprenticeships.

2. Digital and Technological Skill Development - Provides training in digital literacy, coding, artificial intelligence (AI), and data analytics. Prepares workers for Industry 4.0 by integrating automation and smart technologies.

3. Green and Sustainable Skills - Includes training in solar panel installation, energy-efficient construction, and sustainable farming. Encourages businesses to adopt environmentally friendly practices.

Challenges In Implementing Skill Development And Vocational Training:

Despite its benefits, several challenges hinder the effectiveness of skill development programs:

1. Lack of Infrastructure and Funding – Many developing countries lack resources to implement large-scale training programs.

2. Mismatched Skills and Industry Needs – Training programs may not align with evolving industry demands.

3. Limited Awareness and Social Stigma – Vocational training is often undervalued compared to formal education.

4. Technological Disruptions – Rapid changes in technology require constant curriculum updates.

Strategies For Strengthening Skill Development And Vocational Training

To maximize impact, skill development programs must be well-structured and inclusive. Key strategies include:

1. Public-Private Partnerships - Collaboration between governments, industries, and educational institutions to ensure relevant training. Industry-led certification programs to enhance

credibility.

2. Integration of Digital Learning - Use of online platforms, virtual reality (VR), and artificial intelligence (AI) for skill training. Expansion of e-learning for remote and underprivileged communities.

3. Focus on Lifelong Learning and Reskilling - Continuous skill upgrading to keep pace with industry advancements. Government-led initiatives to support reskilling and upskilling programs.

4. Policy Reforms and Investment in Vocational Education - Increased funding for vocational training centers. Policy frameworks to integrate skill development into national education systems.

Role Of Government In Skill Development And Vocational Training

Governments play a vital role in providing policies, funding, and infrastructure for skill development. Their contributions include:

1. Policy Formulation and Implementation - Establishing national skill development policies and vocational training frameworks. Aligning training programs with labor market demands and sustainable development goals.

2. Funding and Infrastructure Development - Allocating budgets for technical and vocational education institutions (TVETs). Establishing skill development centers, especially in rural and underprivileged areas.

3. Public-Private Partnerships (PPP) - Collaborating with industries, educational institutions, and private companies to ensure relevant training. Encouraging apprenticeship programs and on-the-job training.

4. Promoting Green Skills and Sustainability - Developing training programs focused on renewable energy, sustainable agriculture, and eco-friendly construction. Encouraging industries to adopt environmentally responsible practices through skilled workforce training.

5. Government-Led Skill Development Programs - Many governments worldwide have launched initiatives to enhance vocational training, such as:

Role Of Ngos In Skill Development And Vocational Training:

NGOs complement government efforts by providing grassroots-level training, advocacy, and community engagement. Their roles include:

1. Bridging Skill Gaps in Underserved Communities - Providing training to marginalized groups, including women, people with disabilities, and rural populations. Offering free or low-cost vocational training programs in sectors like healthcare, construction, and IT.

2. Promoting Entrepreneurship and Livelihood Development - Assisting individuals in setting up small businesses and self-employment opportunities. Offering microfinance and

mentorship programs to support entrepreneurs.

3. Implementing Sustainable and Green Skill Training - Educating communities on sustainable farming, waste management, and renewable energy jobs. Collaborating with international organizations to promote eco-friendly industries.

4. Capacity Building and Advocacy - Conducting awareness campaigns on the importance of skill development. Partnering with corporations and donors to expand training programs.

5. Examples of NGOs Supporting Skill Development - Several NGOs have significantly contributed to vocational training initiatives: The World Bank and IFC's "Skills for Jobs" Programs – Global initiatives promoting workforce development. SEWA (Self-Employed Women's Association, India) – Provides skill training to women in informal sectors. Education for Employment (EFE) – Offers vocational training in the Middle East and North Africa. TVET Africa Trust – Focuses on technical and vocational education in Africa.

Challenges Faced By Governments And Ngos:

Despite their efforts, governments and NGOs face several challenges:

1. Lack of Funding and Resources – Many programs suffer from inadequate financial support.

2. Mismatched Skills and Market Demands – Training programs may not always align with industry needs.

3. Limited Awareness and Societal Stigma – Vocational training is often undervalued compared to traditional education.

4. Technological Advancements and Skill Gaps – Rapid changes in technology require continuous curriculum updates.

Strategies For Strengthening Government-Ngo Collaboration

To enhance the impact of skill development programs, the following strategies should be adopted:

1. Strengthening Public-Private Partnerships (PPPs) – Encouraging businesses to invest in vocational training.

2. Increasing Investment in Digital Learning – Expanding e-learning platforms for skill development.

3. Fostering Lifelong Learning and Reskilling – Supporting continuous education programs.

4. Enhancing Monitoring and Evaluation – Ensuring training programs achieve desired employment and sustainability outcomes.

Governments and NGOs play a critical role in empowering individuals through skill development and vocational training. By addressing skill gaps, promoting sustainability, and fostering economic resilience, they contribute to a sustainable future. Strengthening collaborations,

increasing funding, and integrating technology-driven training will ensure long-term success.

Role of Teacher Educators in Skill Development and Vocational Training

Teacher educators serve as the backbone of vocational education, preparing skilled professionals who can contribute to sustainable economic and social development. Their key roles include:

- 1. Curriculum Development and Training Design** - Developing industry-aligned curricula to ensure that vocational training meets labor market demands. Integrating sustainability and green skills into vocational training programs. Designing modular and flexible courses that cater to different learning needs.
- 2. Training and Capacity Building of Vocational Instructors** - Preparing future vocational trainers with the necessary pedagogical and technical skills. Conducting professional development programs to update educators on emerging technologies and sustainable practices. Encouraging innovative teaching methods, such as experiential learning and competency-based training.
- 3. Promoting Industry-Academia Collaboration** - Facilitating partnerships between vocational training institutes and industries. Organizing apprenticeships, internships, and on-the-job training programs. Ensuring that vocational training remains relevant to current and future job market trends.
- 4. Integrating Digital Learning and Emerging Technologies** - Leveraging online platforms, artificial intelligence (AI), and virtual reality (VR) for skill training. Training vocational educators to use digital tools for remote and hybrid learning. Encouraging the use of simulation-based training for technical skills.
- 5. Fostering Entrepreneurship and Innovation** - Encouraging learners to develop entrepreneurial skills and start their own businesses. Providing mentorship and guidance on business development and financial literacy. Promoting a culture of innovation through project-based learning.
- 6. Ensuring Sustainability and Green Skill Development** - Training students in renewable energy, sustainable agriculture, and eco-friendly construction. Educating learners on waste management, circular economy, and energy efficiency. Advocating for green jobs and sustainable workforce development.

Future Prospects Of Skill Development For Sustainability:

The future of skill development lies in innovation, digital transformation, and sustainability-focused education. Key trends include:

- 1. Expansion of Green Jobs** – Increased demand for environmental and sustainability-related careers.

2. **AI and Automation Training** – Preparing workers for technological shifts in various industries.

3. **Decentralized Learning Models** – Use of mobile apps and remote training to reach wider audiences.

Conclusion

Skill development and vocational training are fundamental to achieving a sustainable future. By providing industry-relevant skills, fostering economic resilience, and supporting environmental goals, these programs empower individuals and communities. Governments, businesses, and educational institutions must work together to enhance vocational training and ensure sustainable employment opportunities for future generations. Teacher educators play a vital role in shaping a skilled workforce that supports a sustainable future. By equipping learners with practical, industry-relevant skills, promoting entrepreneurship, and integrating sustainability into vocational training, they contribute to long-term economic and environmental well-being. Strengthening their professional development, enhancing industry linkages, and investing in digital learning will further empower teacher educators in their mission to drive skill-based education forward.

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**INTEGRATING WISDOM: ADVANCING SCHOOL EFFECTIVENESS
THROUGH ANCIENT SCHOLARS' CONTRIBUTIONS IN THE CONTEXT OF
NEP 2020**

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Abstract

Ancient wisdom is a foundation for the development of modern education. This paper explores the alignment between ancient knowledge systems and NEP 2020 while providing strategies to integrate these ideas into contemporary schooling. By examining the pedagogical models advocated by ancient scholars, this study highlights how these philosophies can be adapted to current educational practices. Furthermore, the fusion of ancient wisdom with modern technology, including digital learning platforms and artificial intelligence, can make education more interactive, engaging, and effective.

Keywords: Ancient Wisdom, NEP 2020, Holistic Education, Pedagogical Models, Artificial Intelligence

Introduction

Education serves as the foundation for personal and societal development. RAJ (2024) stated that National Education Policy (NEP) 2020 envisions an education system rooted in Indian traditions while incorporating 21st-century skills. Ancient Indian scholars such as Chanakya, Panini, Patanjali, and Swami Vivekananda have laid the groundwork for holistic education. Their contributions provide valuable insights that can be leveraged to improve the quality and effectiveness of schooling in India today.

Maheshkumar and Soundarapandian (2024) stated that the incorporation of ancient wisdom into modern education can foster a well-rounded and balanced approach to learning. Ancient scholars focused on disciplines such as ethics, governance, language, and mindfulness, which remain

relevant even in today's fast-paced digital era. By understanding and applying their teachings, schools can create an educational environment that nurtures critical thinking, leadership, and ethical responsibility among students. This paper explores the alignment between ancient knowledge systems and NEP 2020 while providing strategies to integrate these ideas into contemporary schooling.

Theoretical Framework

The wisdom of ancient scholars provides a framework that emphasizes moral education, interdisciplinary learning, experiential knowledge, and the role of teachers as facilitators of wisdom. The NEP 2020 supports similar ideologies by promoting flexible curricula, critical thinking, and ethical development.

The Integrated Knowledge Systems (IKS) framework serves as the foundation for this study. This framework allows a holistic approach by combining traditional knowledge with modern educational advancements. Ancient Indian educational traditions stress self-discipline, lifelong learning, and student-centered methodologies, which correspond with NEP 2020's objectives. By exploring the pedagogical models advocated by ancient scholars, this study highlights how these philosophies can be adapted to current educational practices.

Contributions of Ancient Scholars to Education

Chanakya (Kautilya) – (Strategic Learning, Governance, and Practical Education)

Chanakya, also known as Kautilya, was a visionary philosopher, economist, and political strategist whose treatise *Arthashastra* laid the foundation for governance, leadership, and statecraft. His philosophy emphasized that education should not only be about acquiring knowledge but should also serve as a tool for personal empowerment, national progress, and economic stability. He championed strategic and analytical thinking, advocating for education that enhances critical thinking, logical reasoning, and problem-solving skills. His teachings encourage leadership development, strategic decision-making, and adaptability—qualities essential in modern governance and business management. *Arthashastra* covered various subjects, including politics, economics, diplomacy, and ethics, which can be integrated into modern education in fields like political science, international relations, business management, and finance. Chanakya also emphasized ethical leadership, stressing that true leaders should be self-disciplined, just, and responsible. His principles remain relevant in leadership training programs and civic education, fostering responsible citizens and policymakers. His economic policies on wealth creation, trade, and taxation provide valuable insights for entrepreneurship programs and financial literacy courses.

Additionally, his contributions to military science and strategic warfare remain relevant in modern military education and conflict resolution studies.

Panini –(Linguistic Excellence, Computational Linguistics, and Cognitive Development)

Panini, an ancient grammarian and linguistic scholar, transformed the study of language with his systematic and precise approach to Sanskrit grammar. His *Ashtadhyayi* remains one of the most sophisticated linguistic frameworks ever developed, influencing modern linguistics, artificial intelligence, and cognitive science. His work laid the foundation for structured linguistic studies, helping learners develop a systematic approach to language acquisition, comprehension, and articulation. Panini's grammar rules have had a profound impact on computational linguistics and AI, particularly in natural language processing (NLP), computational grammar, and machine translation. His framework has been instrumental in developing linguistic algorithms and AI-driven language models. The precision of his linguistic structure enhances analytical thinking and logical reasoning, which are essential for fields like mathematics, coding, and data analysis. Additionally, his work on phonetics and sound patterns contributed to advancements in linguistic research, speech recognition technologies, and cross-language translation tools. His structured approach to language learning has inspired grammar studies in multiple languages, making his work relevant in language teaching and cognitive linguistics worldwide.

Patanjali –(Mindfulness, Cognitive Development, and Holistic Education)

Patanjali, the compiler of the *Yoga Sutras*, emphasized mindfulness, self-discipline, and cognitive development, highlighting the role of mental and physical well-being in education. His teachings align closely with modern neuroscience, psychology, and well-being studies. His philosophy promotes yoga and meditation as tools for enhancing concentration, emotional stability, and stress management. Schools integrating yoga into their curriculum can improve students' focus, self-discipline, and emotional resilience. Modern research supports Patanjali's idea that meditation enhances cognitive function, memory retention, and problem-solving abilities. His techniques can be integrated into classroom learning to boost academic performance. His emphasis on holistic education ensures a balance between physical, mental, and emotional well-being, inspiring modern education models that focus on developing a student's overall personality rather than just academic excellence. Furthermore, his principles have influenced modern psychological therapies, including cognitive behavioral therapy (CBT), mindfulness-based stress reduction (MBSR), and therapeutic meditation techniques, making his teachings invaluable in mental health and well-being initiatives.

Swami Vivekananda –(Holistic, Practical, and Value-Based Education)

Swami Vivekananda was a social reformer and philosopher who believed that education

should empower individuals with knowledge, self-reliance, and spiritual awareness. His educational philosophy focused on character-building, national pride, and self-discipline. He emphasized that education should instill strong moral values, integrity, and social responsibility, aligning with NEP 2020's focus on value-based education. He advocated for an education system that balances scientific advancements with ethical and philosophical wisdom, ensuring that students develop both intellectual and moral strength. Vivekananda believed in hands-on, real-world learning experiences, supporting modern experiential learning methods such as project-based learning, internships, and skill development programs. He was also a strong proponent of women's education, believing that empowering women through education would lead to societal progress. His vision remains relevant in modern gender equality and women's empowerment initiatives. Additionally, his ideas on youth empowerment and leadership development encourage self-confidence, discipline, and a sense of responsibility toward society. His principles can be integrated into leadership training and youth development programs to inspire young minds toward personal and professional growth.

Aligning Ancient Wisdom with NEP 2020

The National Education Policy (NEP) 2020 emphasizes holistic and experiential learning, reflecting the essence of the ancient Indian Gurukul system. By drawing inspiration from ancient scholars, modern education can be significantly enriched. Experiential and hands-on learning, as advocated by NEP 2020, resonates with Chanakya's practical approach to education, fostering better decision-making skills among students. Additionally, a multidisciplinary approach, similar to Panini's structured learning methods, can help create well-rounded curricula that integrate various disciplines seamlessly.

Ethical and value-based education, emphasized in NEP 2020, finds strong roots in the teachings of Chanakya and Swami Vivekananda, who highlighted the importance of morality in education. Furthermore, mindfulness and well-being, inspired by Patanjali's teachings on cognitive and psychological health, can be incorporated into school programs to enhance students' emotional resilience. Finally, the fusion of ancient wisdom with modern technology, including digital learning platforms and AI, can make education more interactive, engaging, and effective. By integrating these elements, NEP 2020 ensures that traditional knowledge and contemporary advancements complement each other, creating a well-rounded and future-ready education system.

Challenges and Implementation Strategies

Integrating ancient wisdom into modern education presents several challenges, including curricular redesign, teacher training, and technological adaptation. NEP 2020 provides a strategic

roadmap to overcome these barriers, ensuring a seamless blend of traditional and contemporary learning methodologies. Reid (2014) stated that resistance to change remains a significant obstacle, as many educators and institutions may be hesitant to adopt new approaches. Additionally, Singh et al. (2021) stated that the lack of formal training in ancient knowledge systems poses difficulties for teachers in effectively incorporating these teachings into their lessons. Logistical challenges, such as adapting new teaching methodologies within existing educational frameworks, further complicate implementation.

To address these challenges, educators must be trained to integrate traditional wisdom with modern pedagogical techniques. Drake and Reid (2020) stated that curricula should be designed to incorporate ancient scholars' teachings in practical and applicable ways, ensuring relevance in today's educational landscape. Walter (2024) stated that leveraging AI and digital tools can make ancient knowledge more accessible and engaging for students, bridging the gap between tradition and technology. Encouraging interdisciplinary collaborations can help merge ancient philosophical perspectives with contemporary scientific advancements, fostering a well-rounded approach to education. Furthermore, strengthening research on ancient Indian educational practices can provide evidence-based methodologies to enhance modern classrooms. By implementing these strategies, NEP 2020 can successfully integrate the rich heritage of Indian knowledge with the demands of the 21st-century education system.

Case Studies and Global Relevance

The integration of ancient Indian educational philosophies extends beyond India, with several global education systems successfully adopting similar approaches. Kramer (2024) stated that Finland's education model, known for its emphasis on experiential learning and student-centered pedagogy, aligns with Patanjali's cognitive development techniques, which focus on mindfulness and holistic growth. Similarly, Brinkmann (2016) stated that the Montessori education system reflects the principles of the ancient Gurukul tradition, promoting self-directed learning and hands-on experiences to nurture a child's intellectual and emotional development.

Isser et al. (2024) stated that Japan's education system places a strong emphasis on moral and ethical learning, mirroring Chanakya's advocacy for value-based education. This approach ensures that students develop a strong moral foundation alongside academic excellence. Additionally, the application of Sanskrit in artificial intelligence showcases the continued relevance of ancient Indian knowledge. Panini's grammatical structures have contributed significantly to computational linguistics, demonstrating how traditional wisdom can enhance modern technological advancements.

By examining these global case studies, it becomes evident that the integration of ancient educational principles with contemporary systems can lead to a more well-rounded, effective, and future-ready education model. NEP 2020, with its emphasis on holistic and interdisciplinary learning, provides an opportunity to harness the timeless wisdom of ancient Indian traditions while aligning with modern global educational practices.

Future Directions

To further the integration of ancient wisdom into modern education, several strategic initiatives can be undertaken. Establishing dedicated research centers focused on blending traditional knowledge with contemporary educational methodologies will provide a strong foundation for evidence-based implementation. These centers can serve as hubs for scholars, educators, and policymakers to collaborate on refining curricula and instructional techniques.

Developing digital platforms will play a crucial role in making ancient wisdom more accessible to both students and educators. Interactive online resources, AI-driven tools, and virtual learning environments can enhance engagement and ensure that traditional teachings remain relevant in the digital age. Additionally, fostering collaborative projects between historians, educators, and policymakers will help create well-structured educational content that effectively integrates ancient philosophies with modern learning needs.

Expanding outreach programs will also be essential in promoting traditional education methods across various regions and demographics. Workshops, seminars, and community-driven initiatives can help bridge the gap between historical knowledge and contemporary education. Furthermore, leveraging AI-driven learning analytics can provide valuable insights into the effectiveness of integrating ancient wisdom into school curricula, allowing for continuous refinement and improvement.

By taking these steps, education systems can successfully merge the richness of ancient traditions with the innovations of modern pedagogy, ensuring a holistic and future-ready learning experience for students.

Conclusion

Integrating ancient Indian wisdom into modern education fosters critical thinking, ethical values, and holistic development. Scholars like Chanakya, Panini, Patanjali, and Swami Vivekananda contributed insights that align with NEP 2020's vision of multidisciplinary and experiential learning. Combining traditional knowledge with modern advancements can create a well-rounded education system. Addressing challenges like curricular adaptation and teacher training through strategic planning and technology can ensure effective implementation. Embracing

this rich heritage will help shape responsible, innovative individuals, making education both future-ready and deeply rooted in timeless wisdom.

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**AI AND MODERN EDUCATION : IMPLEMENTING NEP 2020 FOR
FUTURE EDUCATORE**

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Abstract :

The rapid development of artificial intelligence (AI) has created new opportunities across a range of industries, including education. Technology integration is emphasized in the National Education Policy-2020 (NEP-2020) of India as a means of transforming the educational system. One crucial area of focus is the application of AI to the NEP-2020. Within the NEP-2020 framework, this research study seeks to assess the advantages and drawbacks of adopting AI in education. The introductory paragraphs of the article provide a summary of the NEP-2020 and highlight its focus on technology integration. The potential applications of AI in education are then discussed, including automated tests, intelligent tutoring systems, and personalized learning. It highlighted how AI might improve academic performance, student engagement, and administrative effectiveness. Under the NEP-2020 framework, there are a lot of opportunities for using AI in education, but there are a lot of challenges as well. Issues with ethics, data security, and privacy, equity, teacher preparation and readiness, and infrastructural limitations are a few of these challenges. The report goes into great detail about each issue, giving readers an understanding of the difficulties and potential dangers involved with integrating AI. The research report also looks at suggestions and strategies for solving these issues. It emphasizes the requirement for precise regulations and legislation that regulate the use of AI in education in order to promote transparency, accountability, and fairness. Additionally, it highlights the significance of thorough teacher training programs to improve their technical proficiency and foster their comfort with using AI tools. A thorough assessment of the literature, case studies, and interviews with decision-makers in the field of education policy, administrators, teachers, and students are all part of the research approach.

Keywords : AI , Modern Education , NEP 2020 , Future Education , teacher training, artificial intelligence

Introduction:

Artificial intelligence (AI) has emerged as a transformative force across various industries,

and its potential in education has gained significant attention in recent years.

The National Education Policy-2020 (NEP-2020) in India recognizes the importance of technology integration to revolutionize the education system and prepare students for the future. As part of this vision, AI is expected to play a crucial role in reshaping teaching and learning practices. However, the successful implementation of AI in education under the NEP-2020 framework presents several challenges that need to be addressed. The NEP-2020 sets forth a comprehensive vision for transforming education in [country]. It aims to provide an inclusive and flexible education system that promotes critical thinking, creativity, and problem-solving skills among students. With technology as a key driver, the NEP-2020 emphasizes the integration of digital tools and resources to enhance learning outcomes and improve administrative efficiency (Ministry of Education, 2020). The potential applications of AI in education align closely with the goals of the NEP-2020. AI can enable personalized learning experiences by adapting instructional content and strategies to individual student needs (Baker, Inventado, Labrum, & Blikstein, 2019). Intelligent tutoring systems powered by AI can provide real-time feedback, guidance, and adaptive learning paths, improving student engagement and mastery of concepts (VanLehn et al., 2019). Automated assessments driven by AI algorithms can enable efficient and objective evaluation of student progress (Pardo & Siemens, 2014). The benefits of AI in education are well-documented. Research has shown that AI-powered tools can enhance student engagement, motivation, and learning outcomes (Blikstein, 2018; Luckin et al., 2016). Additionally, AI technologies have the potential to alleviate the burden on teachers by automating administrative tasks, enabling them to focus more on individualized instruction and support (Dede, 2017).

Thus, AI holds the promise of transforming education and creating a more personalized and effective learning environment. This research paper aims to critically examine the role of AI in implementing the NEP-2020 in India, focusing on the challenges and opportunities it presents. By exploring these challenges, the paper seeks to provide insights and recommendations for policymakers, educational institutions, and stakeholders involved in AI integration in education. The findings will contribute to informed decision-making and effective implementation strategies, ensuring the equitable and successful adoption of AI technologies in line with the NEP-2020.

Literature Review:

1. AI for Personalized Learning and Adaptive Instruction: The concept of personalized learning and adaptive instruction has gained significant attention in the field of education. AI technologies have the potential to tailor educational content and strategies to individual student needs, thereby enhancing learning outcomes. Baker, Inventado, Labrum, and Blikstein (2019) discuss the use of AI algorithms to analyze student responses and provide personalized feedback. They highlight the effectiveness of intelligent tutoring systems in adapting instructional

approaches based on individual progress and mastery.

2. Benefits of AI in Education: Numerous studies have demonstrated the benefits of AI in education. Blikstein (2018) explores the promises and challenges of using AI systems in educational settings. The author emphasizes that AI-powered tools can enhance student engagement, motivation, and learning outcomes. Luckin et al. (2016) present a comprehensive review of AI in education and highlight its potential in transforming traditional instructional practices. They discuss the positive impact of AI on student achievement, knowledge retention, and critical thinking skills.

3. Ethical Concerns and Transparency: As AI becomes increasingly integrated into education, ethical concerns arise regarding algorithmic biases, data privacy, and transparency. Sawyer et al. (2019) examine the ethical implications of AI in education and advocate for greater transparency and accountability in algorithm design and data usage. They argue for the development of ethical guidelines to ensure fairness and equity in AI-driven educational systems.

4. Equity and Access to AI-Enabled Education: Achieving equity in the implementation of AI technologies in education is a critical challenge. Dhillon (2020) explores the role of AI in addressing educational inequalities and highlights the importance of considering equity concerns in the deployment of AI systems. The author emphasizes the need for policies and initiatives that bridge the digital divide and provide equal access to AI-enabled educational resources.

5. Teacher Training and Readiness: The successful integration of AI in education relies on the preparedness and training of teachers. Darling-Hammond et al. (2017) discuss the importance of teacher professional development programs to enhance technological skills and pedagogical practices. They emphasize the need for ongoing support and training to ensure teachers can effectively utilize AI tools and adapt to evolving educational landscapes.

6. Data Privacy and Security: Safeguarding student data in AI-driven educational systems is crucial. Hill and Sinha (2019) examine the challenges and implications of data privacy and security in the context of AI-enabled education. They highlight the need for robust data protection policies and secure infrastructures to mitigate risks and maintain trust in AI applications.

Objectives of the Study:

1. To provide a comprehensive understanding of the National Education Policy-2020 (NEP-2020) and its emphasis on technology integration in education.
2. To explore the potential applications of artificial intelligence (AI) in education within the framework of the NEP-2020.
3. To examine the benefits and opportunities offered by AI in enhancing teaching and learning practices, student engagement, and administrative efficiency.
4. To identify and analyze the challenges and barriers associated with the implementation of

AI in education under the NEP-2020, including ethical concerns, data privacy, equity, teacher training, and infrastructure limitations.

5. To investigate strategies and recommendations for addressing the challenges and optimizing the opportunities presented by AI integration in education.

6. To understand the implications of AI in promoting inclusive education and bridging the digital divide in line with the goals of the NEP-2020.

7. To provide insights and recommendations for policymakers, educational institutions, and stakeholders involved in the implementation of AI technologies in education under the NEP-2020.

8. To contribute to the body of knowledge on the role of AI in education and its potential impact on transforming the education system in alignment with the NEP-2020.

Research Methodology:

The research paper titled "The Role of Artificial Intelligence in Implementing the National Education Policy-2020: Challenges and Opportunities" adopts a mixed-methods approach to investigate the topic comprehensively. The research methodology encompasses **both primary and secondary data collection and analysis techniques**, providing a holistic understanding of the challenges and opportunities associated with AI implementation in education under the NEP-2020 framework.

1. **Literature Review:** A comprehensive literature review is conducted to establish a theoretical framework and explore existing research, scholarly articles, reports, and policy documents related to AI in education and the NEP-2020. This review helps identify key concepts, frameworks, and best practices, forming the foundation for the research paper.

2. **Case Studies:** Multiple case studies are conducted to gain insights into real-world examples of AI implementation in education under the NEP-2020. Educational institutions, both at the national and regional levels, are selected as case study sites. Data is collected through interviews, observations, and document analysis to understand the challenges faced and opportunities realized in integrating AI technologies within the NEP-2020 framework.

3. **Interviews:** Semi-structured interviews are conducted with policymakers, education administrators, teachers, students, and experts in the field of AI and education. The interviews aim to gather qualitative data regarding their perspectives, experiences, and insights on the challenges and opportunities associated with AI implementation in education under the NEP-2020. These interviews provide valuable first-hand information and nuanced viewpoints.

4. **Integration and Synthesis:** The findings from the literature review, case studies, interviews, and surveys are integrated and synthesized to provide a comprehensive analysis of the challenges and opportunities of AI implementation in education within the NEP-2020 framework. The results are presented in a coherent manner, supporting the research objectives and providing meaningful

5. insights. The research methodology outlined above ensures a rigorous and comprehensive investigation into the role of AI in implementing the NEP-2020 in education. By combining qualitative and quantitative approaches, the research paper aims to provide a well-rounded understanding of the challenges and opportunities, thereby contributing to evidence-based recommendations and strategies for policymakers and stakeholders.

- **A comprehensive understanding of the National Education Policy-2020 (NEP-2020) and its emphasis on technology integration in education:-**

The National Education Policy-2020 (NEP-2020) is a landmark policy document in India that sets the vision and direction for transforming the education system. It emphasizes the integration of technology to enhance teaching and learning practices, improve educational access and quality, and equip students with the necessary skills for the 21st century.

The NEP-2020 envisions a holistic and learner-centric approach to education, focusing on the development of cognitive, social, emotional, and vocational skills. Technology integration is regarded as a key enabler in achieving these goals. The policy recognizes that technology has the potential to revolutionize education by providing personalized learning experiences, facilitating access to quality educational resources, and promoting efficient administrative practices. One of the key aspects of the NEP-2020 is the integration of digital tools and resources across all levels of education. It emphasizes the use of educational technology, including artificial intelligence, virtual reality, augmented reality, and gamification, to create interactive and engaging learning environments. The policy acknowledges that technology can adapt to individual learner needs, provide real-time feedback, and support personalized instruction.

The NEP-2020 also focuses on bridging the digital divide by ensuring equitable access to technology-enabled education. It recognizes that disparities in technology infrastructure and resources can exacerbate educational inequalities. The policy emphasizes the need to provide equal opportunities for all learners, regardless of their socioeconomic background or geographic location, to access digital resources and benefit from technology integration.

To facilitate the integration of technology in education, the NEP-2020 calls for the establishment of a robust digital infrastructure, including high-speed internet connectivity, computer labs, and access to digital devices. It highlights the importance of developing digital content in local languages and promoting open educational resources to enhance educational accessibility and inclusivity. Overall, the NEP-2020 underscores the transformative role of technology in education. It envisions a future where technology integration is seamlessly woven into the fabric of the education system, empowering learners, and equipping them with the skills necessary to thrive in the digital age. The policy recognizes the potential of technology to revolutionize teaching and learning practices, improve educational outcomes, and create a more

inclusive and equitable education system.

- **The potential applications of artificial intelligence (AI) in education within the framework of the NEP-2020:-**

Artificial intelligence (AI) has the potential to revolutionize education by enhancing teaching and learning practices, personalizing instruction, and improving educational outcomes within the framework of the National Education Policy-2020 (NEP-2020). Here are some potential applications of AI in education:

1. **Personalized Learning and Adaptive Instruction:** AI can enable personalized learning experiences by adapting instructional content, pace, and strategies to individual student needs. Intelligent tutoring systems powered by AI algorithms can provide personalized feedback, guidance, and adaptive learning paths based on individual learner progress (VanLehn et al., 2019). This personalized approach enhances student engagement, motivation, and mastery of concepts.
2. **Automated Assessment and Feedback:** AI can automate assessment processes, saving teachers' time and providing timely feedback to students. Automated assessment systems powered by AI algorithms can evaluate student responses, analyze patterns, and provide immediate feedback on their performance (Pardo & Siemens, 2014). This not only supports individualized learning but also enables teachers to identify areas where students may need additional support.
3. **Intelligent Learning Analytics:** AI-based learning analytics can analyze vast amounts of data generated by students' interactions with digital learning platforms and resources. These analytics can provide insights into student progress, learning patterns, and areas of difficulty, allowing teachers to make data-driven decisions about instructional strategies and interventions (Baker, Corbett, & Aleven, 2008). It enables educators to identify learning gaps and provide targeted interventions to improve student outcomes. These potential applications of AI in education align with the goals and vision of the NEP-2020 by promoting personalized learning, adaptive instruction, and leveraging technology to enhance educational experiences. By integrating AI technologies into the education system, the NEP-2020 aims to create a learner-centric environment that caters to the individual needs and preferences of students, thereby improving learning outcomes and preparing them for the future.

- **The benefits and opportunities offered by AI in enhancing teaching and learning practices, student engagement, and administrative efficiency: -**

The integration of Artificial Intelligence (AI) in education offers a wide range of benefits and opportunities for enhancing teaching and learning practices, student engagement, and administrative efficiency. Here are some of the key benefits and opportunities:

1. **Personalized Learning:** AI enables personalized learning experiences by adapting instruction to individual student needs. AI-powered intelligent tutoring systems can provide

tailored content, adaptive feedback, and individualized learning paths, leading to improved student outcomes (VanLehn et al., 2019).

2. **Enhanced Student Engagement:** AI-based educational tools can increase student engagement by offering interactive and immersive learning experiences. Virtual reality (VR) and augmented reality (AR) technologies provide students with hands-on and immersive learning environments, fostering curiosity, creativity, and active participation (Wu et al., 2019).

3. **Intelligent Assessment and Feedback:** AI automates assessment processes, enabling timely and personalized feedback to students. AI algorithms can analyze student responses, identify misconceptions, and provide immediate feedback, allowing for targeted interventions and improved learning outcomes (Shute, 2017).

4. **Adaptive Content Delivery:** AI algorithms can analyze student data and deliver content tailored to their individual needs. Adaptive learning systems can adjust the pace, difficulty, and sequencing of learning materials, ensuring that students receive content that matches their proficiency level and learning preferences (Brusilovsky, 2016).

5. **Administrative Efficiency:** AI streamlines administrative tasks, saving time and resources. Automated processes such as student registration, grading, and scheduling can be efficiently managed by AI systems, allowing educators to focus on instructional activities and student support (Stevens & Srinivasan, 2018).

6. **Personalized Support for Teachers:** AI-powered tools can provide teachers with personalized support and resources. Natural Language Processing (NLP) chatbots and virtual assistants can assist teachers in lesson planning, resource curation, and addressing common student queries, reducing their workload and enhancing their effectiveness (Alonso-Fernandez et al., 2020). These benefits and opportunities demonstrate the potential of AI in transforming teaching and learning practices, improving student engagement, and optimizing administrative processes in education.

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THE FUTURE OF TEACHER TRAINING: LEVERAGING AI TO PERSONALIZE TEACHER LEARNING AND DEVELOPMENT

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Abstract

The future of teacher training is poised for a significant transformation with the integration of Artificial Intelligence (AI). This conceptual paper explores the potential of AI to personalize teacher learning and development, enhancing the effectiveness and efficiency of teacher training programs. We discuss the current state of teacher training, the limitations of traditional approaches, and the opportunities presented by AI-powered personalized learning. We also examine the implications of AI-driven teacher training for teacher education programs, schools, and policymakers.

Key Words:- Artificial Intelligence (AI), Teacher Training, Personalized Learning, Teacher Education, Professional Development

Introduction

Fuelled by technological advancements and the growing need for individualized and impactful teaching, the teaching profession stands at the threshold of significant change. A key element of this transformation is the integration of Artificial Intelligence (AI) into teacher training, poised to revolutionize how educators learn and refine their abilities. Traditional teacher training models have been widely criticized for their rigid, uniform approach, failing to address the varied requirements and capabilities of individual teachers and often relying on outdated instructional methods that inadequately prepare them for the complexities of contemporary classrooms.

AI integration offers a compelling solution, enabling personalized learning within teacher training programs, tailoring experiences to individual needs and abilities. This customized approach can equip teachers with the skills and knowledge necessary to deliver high-quality instruction, ultimately leading to improved student outcomes.

This paper explores the potential of AI to personalize teacher learning and development, analysing the current landscape of teacher training, the shortcomings of traditional methods, and the opportunities presented by AI-powered personalization. Furthermore, it examines the

implications of AI-driven teacher training for teacher education programs, schools, and policymakers.

In India, the current state of teacher training is a critical issue, given the immense requirement for skilled educators to serve a population exceeding 1.3 billion. India's education system, despite being the largest globally with over 1.5 million schools and 8 million teachers, faces challenges concerning quality, often criticized for inadequate infrastructure, limited resources, and insufficiently trained teachers.

Teacher Training Programs in India

India's teacher training landscape encompasses several program types designed to support educators at different stages of their careers:

- **In-Service Training:** Ongoing professional development for practicing teachers, focused on enhancing existing skills and knowledge.
- **Pre-Service Training:** Initial training provided to aspiring teachers before they enter the classroom, equipping them with foundational teaching skills.
- **Refresher Training:** Periodic updates for previously trained teachers to ensure their knowledge and skills remain current.
- **Induction Training:** Orientation programs for newly hired teachers to acclimate them to the school environment and their specific roles.

Challenges in Teacher Training

Despite these programs, significant challenges impede the effectiveness of teacher training in India:

- **Shortage of Qualified Trainers:** An insufficient number of skilled trainers limits the reach and quality of training programs.
- **Lack of Standardization:** The absence of a uniform curriculum results in inconsistent training content and quality across institutions.
- **Inadequate Infrastructure:** Many training facilities lack the resources and equipment necessary to deliver high-quality training.
- **Insufficient Funding:** Limited government investment in teacher training restricts program development and access.

Initiatives for Improvement

Several initiatives aim to address these challenges and strengthen teacher training:

- **NISHTHA:** A national integrated teacher training program launched under the SamagraShiksha initiative.
 - **State Council of Educational Research and Training (SCERT):** State-level organizations responsible for developing curricula, textbooks, and teacher training programs.
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- **District Institute of Education and Training (DIET):** District-level institutions providing both pre-service and in-service training for elementary and secondary school teachers.

Leveraging AI for Personalized Teacher Learning

Artificial Intelligence (AI) offers a potential solution for transforming teacher learning and development by offering personalized learning experiences.

AI-Powered Personalization

This approach uses machine learning to analyse teacher learning data and provide tailored recommendations, helping teachers to:

1. **Identify Knowledge Gaps:** AI systems pinpoint areas where individual teachers require additional support.
2. **Develop Personalized Learning Plans:** AI facilitates the creation of learning plans customized to each teacher's unique needs and abilities.
3. **Access Relevant Resources:** AI-driven systems provide teachers with curated learning materials, such as videos, articles, and online courses.

AI-Driven Learning Platforms

Several platforms have emerged that use AI to support teacher development, including:

1. **Learning Management Systems (LMS):** AI-enhanced LMS platforms offer personalized learning pathways, progress tracking, and real-time feedback.
2. **Intelligent Tutoring Systems:** AI-powered tutors provide individualized support, mimicking the experience of a one-on-one session with a human expert.
3. **Adaptive Learning Systems:** AI adjusts the difficulty and content of learning materials based on a teacher's performance.

Benefits of AI-Powered Personalization

The advantages of using AI for personalized teacher learning include:

1. **Improved Outcomes:** Enhanced skills and knowledge lead to higher-quality instruction.
2. **Increased Efficiency:** Teachers learn more effectively, reducing time and effort.
3. **Enhanced Satisfaction:** Teachers feel more supported and satisfied with their professional development.

Challenges and Limitations of AI implementation

Despite all its benefits, it's important to acknowledge the challenges for AI implementation in the learning and development space.

1. **Data Quality and Availability:** The effectiveness of AI-powered personalization relies on having relevant and accurate data for each teacher's learning and development.
2. **Algorithmic Bias:** To prevent perpetuating inequalities, AI algorithms must be carefully designed and trained to prevent biases.

3. **Teacher Resistance:** The level of adoption for the AI-powered learning and development systems may be limited due to fears of job displacement or loss of autonomy.

AI-Powered Personalized Learning: A Tailored Approach to Education

AI-powered personalized learning models leverage machine learning to analyze student data and create customized educational experiences. These models fall into several key categories:

1. Adaptive Learning Models: Adjusting to the Learner's Pace

These models dynamically adjust the challenge level and content based on individual student performance. Their algorithms work to:

- **Gauge Understanding:** Assess a learner's knowledge and skills to pinpoint strengths and weaknesses.
- **Personalize Learning Paths:** Modify the learning pathway in real-time, offering more challenging material when appropriate or providing extra support where needed.

2. Intelligent Tutoring Systems (ITS): A Virtual One-on-One Experience

ITS provide personalized support, mimicking the interaction with a human tutor. These systems employ algorithms to:

- **Model Learner Behaviour:** Analyse learning patterns and preferences to inform instruction.
- **Offer Instant Feedback:** Provide immediate feedback and guidance, helping students correct errors and deepen their understanding.

3. Learning Recommendation Systems (LRS): Connecting Learners to the Right Resources

LRS suggest personalized learning materials like videos, articles, and online courses. They use algorithms to:

- **Understand Learner Interests:** Analyse individual preferences, interests, and learning goals to identify relevant content.
- **Prioritize Useful Resources:** Rank learning materials based on relevance, accuracy, and overall effectiveness.

4. Cognitive Learning Models: Understanding How Learners Think

These models simulate human cognitive processes to tailor instruction effectively. Their algorithms help to:

- **Model Learner Cognition:** Identify individual strengths, weaknesses, and preferred learning styles.
 - **Provide Personalized Instruction:** Adjust instruction based on the learner's cognitive abilities and individual learning needs.
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5. Hybrid Models: Combining the Best of Both Worlds

Hybrid models integrate multiple AI-powered personalized learning approaches, such as adaptive learning and intelligent tutoring. These models use algorithms to:

- **Integrate Data from Multiple Sources:** Combine data on student performance, preferences, and cognitive abilities.
- **Provide Comprehensive Support:** Offer well-rounded support, adapting to the learner's unique needs and capabilities based on the integrated data.

Implications for Education: Shaping the Future of Teaching and Learning

The integration of AI-powered personalized learning has significant implications for teacher education, schools, and policymakers:

Teacher Education Programs:

1. **Curriculum Redesign:** Update curricula to incorporate AI-powered personalized learning, equipping teachers with the necessary skills and knowledge.
2. **AI Competency Development:** Foster AI-related skills like data analysis, algorithmic thinking, and AI-based instructional design.
3. **Ongoing Support and Training:** Provide continuous support and training to help teachers effectively integrate these models.

Schools:

1. **Investment in AI Infrastructure:** Invest in the necessary hardware, software, and technical support for effective implementation.
2. **Developing AI Policies and Guidelines:** Create policies to ensure equitable and effective use of AI-powered personalization.
3. **Teacher Support and Training:** Provide ongoing support and training for teachers to confidently and effectively utilize AI tools.

Policymakers:

1. **AI Policy and Regulation Development:** Establish policies that promote equitable and effective use of AI in education.
2. **Investment in AI Infrastructure and Research:** Fund AI infrastructure and research to develop more effective and efficient personalized learning models.
3. **Teacher Support and Training Initiatives:** Provide ongoing support and training to empower teachers to leverage AI effectively.

Conclusion

The future of teacher training is poised for a significant transformation with the integration of AI. By leveraging AI to personalize teacher learning and development, we can enhance the effectiveness and efficiency of teacher training programs, ultimately improving student learning

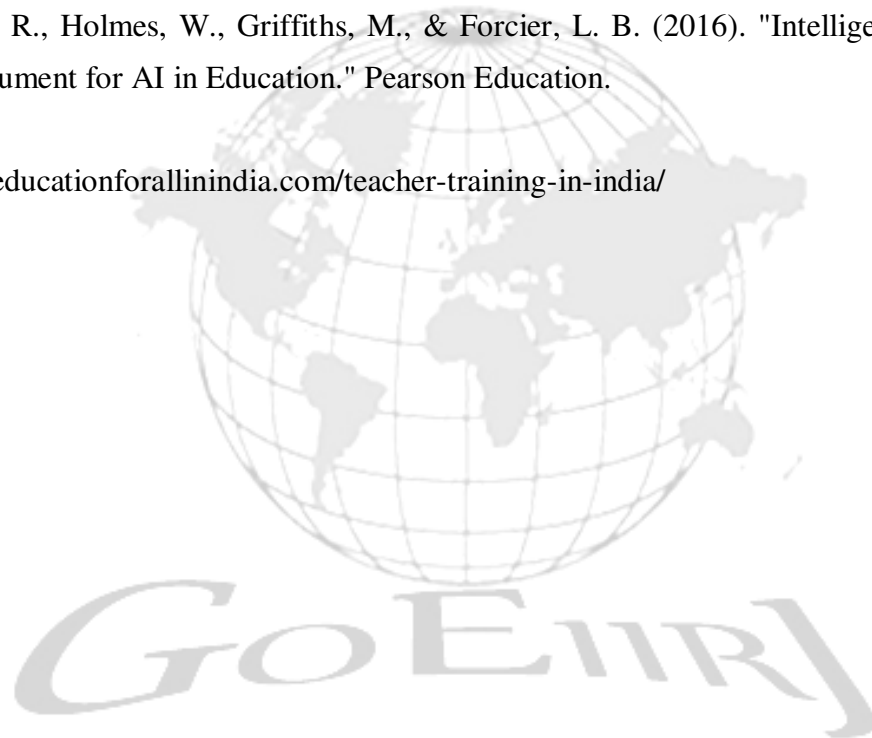
outcomes. However, the integration of AI in teacher training also raises important ethical and practical considerations, which will need to be addressed through ongoing research and development.

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A STUDY ON GREEN HRM PRACTICES AND THEIR ROLE IN BUILDING SUSTAINABLE ORGANIZATION

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Abstract

Green Human Resource Management has emerged as a crucial approach in today's corporate landscape, driven by a global green movement. It focuses on integrating sustainable practices into HR policies to minimize environmental impact. While the concept of Green HRM varies across individuals and industries, its core objective remains the same – reducing energy consumption, curbing pollution, and fostering an eco-conscious workplace. Green HRM involves engaging employees in sustainability efforts, promoting energy conservation, and enhancing awareness of eco-friendly lifestyles. As organization is increasingly striving to lower their environmental footprint, the role of HRM has become instrumental in embedding sustainability within corporate frameworks. Key Green HR management practices, such as green recruitment, environmental training and development, and performance management in sustainability initiative, contribute significantly to building sustainable organizations. This study, conducted through a secondary research methodology, examines the impact of GHRM on corporate sustainability. Findings reveal that practices like environmental training, green rewards and sustainable workforce management not only improve environmental performance but also enhance employee commitment and organizational reputation. This study underscores the need for integrating Green HRM into business strategies, offering valuable insight for HR practitioners, policymakers, corporate leaders. By adopting Green HRM, organization can achieve long term resilience, balance economic success with environmental responsibility.

Keywords: Green HRM, Sustainable organization, Environmental Sustainability, Employee engagement, corporate sustainability.

Introduction

Green Human Resource Management (Green HRM) has evolved as a significant concept within the broader discussions of sustainable development and corporate sustainability. It emphasizes the role of HRM in promoting environmentally responsible practices within organizations. The foundation of Green HRM can be traced back to Wehrmeyer (1996), who highlighted that the success of an environmentally conscious company largely depends on its employees. Over time, the concept has gained momentum, with increasing recognition of the need to align HR policies with sustainability goals. In May 2011, the German Journal of Human

Resource Management dedicated a special issue to Green HRM, featuring five key contribution on the subject. The origins of the sustainability- driven HR practices can be linked to the social movements of the 1960s and 1970s, which advocated for civil rights, women’s rights, and environmental protection (Carroll &Shabana, 2010). These movements, led by social activities and scholars, emerged in response to concerns over corporate environmental negligence and unethical political engagements (Waddock, 2004). As public awareness of environmental degradation caused by corporate activities increased, organizations, including multinational corporations and domestic firms, recognised the need for responsible business practices. Consequently, companies began implementing policies to reduce their environmental footprint, manage human capital more effectively and integrate sustainable practices into their operations.

Literature Review

Green HRM has gained significant attention as organization seek to incorporate sustainable practices into the operations of management. The concept, which integrates the environmental sustainability into HRM policies, has evolved from the broader movement towards corporate sustainability and social responsibility. Several studies have examined the role of Green HRM in fostering sustainability, enhance the employee engagement, and improving environmental performance.

1. **Foundation of Green HRM:** Wehrmeyer (1996) established the groundwork for Green HRM by emphasizing the pivotal of employees in achieving environmental sustainability within organizations. His research suggested that integrating green values into HR policies is essential for fostering eco-conscious workplaces.
2. **Green HRM and Organizational Sustainability:** Wang et al. examined how Green HRM practices, such as green recruitment, eco-friendly training, and performance appraisals, contribute to corporate sustainability. Their study highlighted that companies adopting Green HRM strategies experience improved environmental performance and operational efficiency.
3. **Impact on Employee Engagement:** Kuo et al. explored the link between Green HRM and employee motivation, revealing that sustainable HR practices enhance job satisfaction and organizational commitment. Their finding indicates that employees are more engaged when organizations actively promote green initiatives and recognize sustainable efforts.
4. **Green HRM and Workforce Management:**Salim et al. investigated how Green HRM supports sustainable workforce management. They found that organizations implementing green training and awareness programs cultivate a culture of environmental responsibility, encouraging employees to adopt sustainable practices in their professional and personal lives.

5. **Competitive Advantage through Green HRM:** Studies suggest that organizations embedding Green HRM practices gain a competitive edge by enhancing corporate reputation, reducing costs through sustainable operations, and improving compliance with environmental regulations (Waddock, 2004).

The literature indicates that Green HRM plays an important role in shaping sustainable organization by integrating eco-friendly practices into HR functions. By focusing on Green recruitment, training & development, and performance management, organizations can achieve long-term sustainability goals while enhancing employee commitment and corporate reputation. Future research should explore innovative strategies to overcome challenges in Green HRM implementation and assess its long term impact on corporate sustainability.

Objective

- 1) To identify the various Green HRM practices of organization that promote environment sustainability for long term growth.
- 2) To examine how Green HRM associate with core HRM activities such as training and development, recruitment and selection and performance management.
- 3) To know how Green HRM practices contribute to long term organization growth by enhancing environment responsibility and employment engagement in sustainable engagement.

Research Methodology

The research methodology used in this paper is the Descriptive Method. This study relies on the secondary data sourced from various research papers, articles, journals, and other credible sources. It aims to explore different Green HRM practices and their integration with core HR activities, highlighting their role in fostering long-term sustainability within organizations.

Green HRM Practices

Green HRM refers to a set of HR policies, strategies and system designed to encourage environmentally responsible behavior among employees, ultimately creating a sustainable and resource – efficient organization. It aims to integrate sustainability into HR functions, ensuring that employees are aware of global environmental challenges and are actively engaged in green initiatives. Key Green HRM practices include green recruitment, where companies hire environmentally conscious employees; eco-friendly training programs, which educate employees on sustainable workplace practices; and employee engagement initiative, which encourage participation in sustainability programs.

In today's competitive and changing business environment, organizations are expected to balance economic success with social and environmental responsibility. Achieving this balance, however, can be challenging, as it requires a shift in organizational culture and policies (Renwick

et al., 2013). Nonetheless, GHRM has emerged as a crucial strategy for organizations seeking to enhance operational efficiency, minimize environmental impact, and build a sustainable future.

Green HRM Role in Core HRM Activity

1) Recruitment and Selection:

Green Recruitment plays a crucial role in ensuring that organizations attract and hire individuals who align with sustainable practices. Wehrmeyer (1996) emphasized that integrating sustainability into recruitment ensures that new employees understand and commit to corporate environmental objectives. (2013) highlighted that green recruitment enhances an organization's ability to attract innovative and environmentally conscious employees, thereby improving talent acquisition. Companies such as Google and Timberland have successfully adopted green recruitment strategies, including paperless applications, online interviews, and sustainability – focused job descriptions (Renwick et al., 2008). Nayak and Mohanty (2017) found that green recruitment enhances employee engagement by promoting corporate environmental initiatives. Organizations can strengthen their green employer brand by incorporating sustainability – focused questions interviews and requiring certifications related to environmental awareness. According to Masri and Jaaron (2017), green recruitment helps align employee values with corporate environmental goals, fostering long-term organizational commitment. Surveys indicate that job applicants are increasingly considering an organization's environmental policies in their employment decisions (Wehrmeyer, 1996; Stringer, 2009). To effectively implement green recruitment, firms should include green criteria in job advertisements, promote their CSR initiatives, and ensure transparency about sustainability goals during the hiring process (Harvey et al., 2013; Paillé et al., 2014). These practices contribute to improved environmental performance and long-term organizational sustainability.

2) Training and development:

Green training and development play a crucial role in equipping employees with the necessary skills, knowledge, and attitudes to support environmental sustainability in organizational operations. The primary goal of green training is to create awareness in organizational operations. The primary goal of green training is to create awareness about global environmental challenges, educate employees on sustainable work practices, and encourage eco-friendly decision-making. Organizations achieve this through regular newsletters, training sessions, and interactive discussion with environmental experts. Effective green training helps employees understand how to reduce waste, conserve energy, and implement sustainable business practices. It also empowers operational staff and decision-makers to incorporate circular economy principles and rethink resource consumption strategies. Employees are encouraged to identify opportunities within their roles to contribute to sustainability, fostering an environmentally conscious workforce. Research highlights the critical role of green training in achieving organizational sustainability goals

(Renwick et al., 2013; Paillé et al., 2014). Companies that invest in environmental training enhance employee engagement, promote green behaviours, and improve environmental performance (Zoogah, 2011). Studies suggest that organizations with well-structured green training programs experience higher levels of employee motivation and commitment to sustainability (Daily et al., 2007).

For instance, Land Rover provides job-specific environmental training, conducts regular briefings, and circulates sustainability newsletters. It displays environmental policies at all sites and encourages employees to propose innovative green ideas. Green training and development not only enhance individual competencies but also drive long-term organizational growth by integrating sustainability into corporate culture and operations.

3) **Performance Management:**

Performance Management (PM) is a structured approach to guiding employees toward achieving organizational objective while enhancing their professional skills. Within Green HRM, performance management integrates sustainability goals into employee responsibilities, ensuring accountability for environmental impact. Organizations set clear sustainability key performance indicators (KPIs) within job descriptions, reinforcing green initiatives at all levels. This structured approach enhances employee engagement and contributes to long-term environmental goals. Renwick et al. (2013) emphasize that Green PM improves employee motivation and attitudes toward sustainable practices. Organizations must establish measurable performance indicators, clearly communicate environmental expectations and integrate sustainability targets into performance appraisals. Companies like Tata Group have implemented corporate-wide environmental performance standards, including resource consumption tracking, waste audits, and environmental impact assessments. Effective Green PM align sustainability efforts with corporate strategy. It ensures that employees are well-informed about green objectives, managers actively support sustainable initiatives and performance reviews include environmental contributions. Regular feedback mechanisms allow employees to assess their environmental impact and refine their practices. Research suggests that structured green performance appraisals drive behavioral change, reinforcing eco-friendly workplace habits (Govindarajulu & Daily, 2004; Darvishmotevali&Altinay, 2022). Green PM fosters accountability across all organizational levels by integrating sustainability within evaluation metrics. Transparent performance assessments, timely feedback, and fair recognition of green achievements encourage employees to align their efforts with corporate sustainability goals. Ultimately, Green PM contributes to long-term organizational growth by promoting environmental responsibility and employee engagement in sustainable practices.

Conclusion

Green HRM is a crucial strategic approach that integrates sustainability into core HR functions such as recruitment, selection, training, development and performance management. Organizations worldwide are increasingly adopting Green HRM practices to align their workforce with environmental objectives, ensuring long-term sustainability. The study highlights how Green HRM enhances employee engagement, fosters environmental responsibility and contributes to organizational growth. Effective green recruitment ensures the selection of environmentally conscious employees, while green training and development equip them with the necessary skills to implement sustainable workplace practices. Moreover, green performance management establishes accountability, ensuring that sustainability targets are embedded within employee roles. Findings suggest that organizations that integrate Green HRM practices experience improved environmental performance, reduce waste and enhanced corporate reputation. However, despite its growing importance, challenges such as resistance to change, lack of awareness and insufficient training hinder the effective implementation of Green HRM. To overcome these challenges, organizations must adopt structured approaches to sustainability-driven HR policies.

Suggestion

- 1) To strengthen Green training and development, organizations should provide continuous environmental training to employees at all levels to increase awareness and competency in sustainable practices.
- 2) To embed sustainability in performance metrics, green KPIs should be incorporated into performance appraisals to ensure accountability and drive sustainable behaviours.
- 3) To promote Green Leadership, managers and supervisors should lead by example, advocating for sustainability and integrating green values into corporate strategy.
- 4) By implementing green information systems, organizations can help monitor and improve environmental performance effectively.

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10. State-of-the-Art and Future Directions for Green Human Resource Management: Introduction to the Special Issue Susan E. Jackson, Douglas W. S. Renwick, Charbel J. C. Jabbour, and Michael Muller-Camen



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FROM PRINT TO PIXEL : DIGITAL AGE IS RESHAPING LANGUAGE AND LITERATURE**Mr. Anil Baliram Bagul***Research Scholar, Assistant Professor,**Department of English, SSR College of Arts, Commerce and Science, Silvassa***And****Dr. Mirza Maqsood Baig***Associate Professor, Department of English,**People's College, Nanded Nanded*

Abstract:

The transition from print to digital mediums has fundamentally reshaped the way language and literature are created, distributed, and experienced. The shift from traditional physical books to e-books, audiobooks, and online platforms has revolutionized how readers engage with texts, while simultaneously influencing the form, style, and accessibility of contemporary writing. This research delves into how technology is transforming literature and language, examining the impact of digital tools like e-books, social media, audiobooks, and interactive narratives. Through an analysis of examples from global and Indian literature, the paper explores how digital platforms have democratized literary production, enabling a wider range of voices and perspectives to be heard. These technological advancements have facilitated new modes of creative expression, such as digital poetry, multimedia storytelling, and collaborative online writing.

The research also highlights the evolving relationship between language and technology, investigating how digital communication trends—such as the use of abbreviations, slang, and emojis—are influencing writing styles and the overall structure of narratives. Moreover, the study delves into the rise of self-publishing and the breakdown of traditional publishing gatekeepers, offering new opportunities for writers to reach global audiences. However, the paper also addresses the challenges these changes present, such as the saturation of content, the potential loss of literary depth, and the erosion of the tactile experience of reading physical books. Finally, it underscores how the digital age is both enhancing and complicating the landscape of modern literature, fostering innovation and interactivity, while raising critical questions about the future of reading, writing, and literary criticism in an increasingly digitized world.

Keywords: Digital Age, Language, Literature, Indian Literature, Print, Pixel, E-books, Social Media, Language Evolution, Literary Criticism, Digital Platforms

Introduction:

The Digital Age has ushered in unprecedented changes in almost every aspect of human life, with language and literature being no exceptions. From print books to e-books, from newspapers to online articles, the digital revolution has reshaped how literary works are created, disseminated, and consumed. As digital platforms become the primary medium for information and entertainment, traditional forms of writing are evolving, influencing both the structure of literature and the language itself. This paper delves into the transformation brought about by this digital shift, analyzing the effects on Indian literature and its global implications. Through the integration of social media, blogs, and digital publishing, writers can now reach global audiences instantaneously, democratizing literature and offering new avenues for expression.

Transformation of Language and Writing Styles:

The digital era has brought a shift in language, with the rise of online communication promoting brevity and informality. Abbreviations, slang, and emoji usage are becoming pervasive in literature, particularly in digital platforms like Twitter, Facebook, and blogs. In Indian literature, this shift can be seen in the works of writers like Chetan Bhagat, who write in simple, conversational English, appealing to a young, digital-savvy audience. His novels, such as *Five Point Someone* and *2 States*, use accessible language and deal with contemporary issues that resonate with the digital generation.

E-books and Digital Publishing

One of the most significant transformations in the literary world is the shift from printed books to e-books. Authors no longer rely solely on traditional publishers to bring their works to the masses. In India, platforms like Kindle Direct Publishing have allowed countless writers to self-publish their works. Writers who previously struggled to get their books into print can now reach a global audience. This democratization of literature has led to an explosion of new voices in Indian literature, with authors from diverse linguistic, social, and cultural backgrounds sharing their stories.

Social Media and Digital Criticism

Social media platforms like Twitter, Instagram, and YouTube have redefined literary criticism and discussion.

Readers can engage directly with authors, creating a dynamic, interactive literary environment. In India, platforms like Bookstagram (Instagram for book lovers) have grown immensely, with readers sharing book reviews and recommendations. This has led to a more participatory form of literary criticism, where audiences are not just passive consumers but active contributors. Literary figures like Amish Tripathi, author of the *Shiva Trilogy*, have cultivated a loyal fan base online, where discussions and reviews can shape the reception of their works.

Digital Storytelling and Multimedia Integration

In the digital age, literature is no longer confined to the printed page. Digital storytelling has emerged as a new genre, where authors use multimedia elements like images, videos, sound, and interactive content to enhance their narratives. The Indian author Kiran Nagarkar, known for his works like *Cuckold*, explored the blending of narrative styles, and the rise of digital platforms offers even more avenues for experimentation. Interactive e-books or narrative-based apps, like those seen with Instagram Stories, allow readers to experience literature in a non-linear and multi-sensory way.

Merits

Increased Accessibility

The digital age has made literature more accessible than ever before. E-books and online platforms have removed the barriers of physical space, distribution, and cost, making books available to readers in remote corners of the world. In India, where literacy rates have been historically lower in rural areas, digital platforms have brought literature to a larger audience. For example, the availability of e-books in multiple languages has allowed readers to engage with diverse works.

1. Global Reach and Audience Engagement

The internet has provided writers the opportunity to reach a global audience. Authors from India can now engage with readers worldwide without the constraints of traditional publishing. This has resulted in a more globalized literary landscape, where Indian authors can find a place on international best-seller lists. The engagement through social media further strengthens this connection, allowing writers to interact directly with readers and critics.

2. Creative Freedom

Digital platforms offer authors more creative freedom. Writers are no longer confined to traditional genres or publishing norms. This has encouraged experimentation in both content and format, especially in the realm of short stories, poetry, and experimental literature. Indian authors have embraced this freedom, creating works that reflect diverse narratives and voices.

Demerits

1. Overload of Content

One of the challenges of the digital revolution is the overwhelming volume of content. While this democratization of literature is beneficial, it has led to a saturation of low-quality material, making it difficult for readers to filter through and find valuable works. This "information overload" has had an impact on the quality of writing, with some authors prioritizing quantity over depth and creativity.

2. Loss of Traditional Literary Craft

The digital age has also led to the erosion of some traditional literary practices. The immediacy of online platforms often encourages hastily written, poorly edited works that lack the depth and nuance of their print counterparts. The art of storytelling, honed over centuries, risks becoming diluted as writers prioritize viral potential over literary quality.

3. Reduced Physical Interaction with Books

While digital platforms offer convenience, they lack the sensory experience of reading physical books. The tactile nature of a printed book—its texture, the act of turning pages—has an emotional and intellectual significance that digital reading cannot replicate. The decline in physical bookstores and libraries is a concern for literary culture, especially in a country like India, where books have traditionally been an important part of social and cultural life.

Conclusion

The transition from print to pixel has fundamentally altered the way language is used, literature is consumed, and authors interact with their audiences. Digital platforms have opened up new possibilities for Indian literature, allowing diverse voices and genres to emerge. However, the digital age also brings challenges, such as content overload, declining literary standards, and the loss of the tactile connection with books. As we move forward, it is essential to strike a balance between embracing the benefits of digital technology and preserving the rich traditions of literature.

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ARTIFICIAL INTELLIGENCE (AI) IN ENERGY: APPLICATIONS AND CHALLENGES

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Abstract

The integration of Artificial Intelligence (AI) in the energy sector has the potential to revolutionize the way energy is generated, transmitted, and consumed. This paper explores the applications and challenges of AI in the energy sector, including predictive maintenance, energy trading, smart grids, and energy efficiency. The paper also examines the challenges of integrating AI in the energy sector, including data quality and availability, cybersecurity, regulatory frameworks, and workforce development. Case studies of successful AI applications in the energy sector are also presented. The paper concludes that AI has the potential to improve energy efficiency, reduce costs, and enhance decision-making in the energy sector, but that addressing the challenges of integrating AI will require significant investment and innovation.

Keywords: Artificial Intelligence, Energy Sector, Predictive Maintenance, Energy Trading, Smart Grids, Energy Efficiency.

Introduction

The energy industry is experiencing a major shift as it strives to lower greenhouse gas emissions, increase energy efficiency, and bolster energy security. Artificial Intelligence (AI) is proving to be a pivotal technology in this transition, offering opportunities to enhance efficiency, lower expenses, and improve decision-making. AI's ability to process large datasets, recognize trends, and forecast outcomes makes it particularly well-suited for the energy sector.

Integrating AI into the energy sector holds the potential to revolutionize energy generation, transmission, and consumption. For example, AI-driven predictive maintenance can minimize downtime and improve the reliability of energy infrastructure. Furthermore, AI-powered energy trading can optimize trading strategies and reduce energy costs, while AI-driven smart grids can streamline energy distribution and consumption, leading to less waste and greater efficiency.

While AI offers numerous advantages for the energy sector, challenges remain. These include ensuring data quality and availability, addressing cybersecurity concerns, navigating regulatory landscapes, and developing a skilled workforce. Overcoming these hurdles will require substantial investment and innovation; however, the potential benefits of AI in energy make it a compelling and promising area for research and development.

This paper investigates the applications and challenges of AI within the energy sector, focusing on predictive maintenance, energy trading, smart grids, and energy efficiency. It also examines the obstacles to AI integration, such as data quality and availability, cybersecurity, regulatory frameworks, and workforce development. Finally, it presents case studies of successful AI implementations in the energy sector, highlighting examples like Google's AI-powered energy management, Siemens' AI-driven predictive maintenance, and Enel's AI-enhanced smart grids.

Artificial Intelligence Applications in the Energy Sector:

AI offers a wide range of applications to revolutionize the energy industry:

Predictive Maintenance: AI algorithms analyze sensor data to forecast equipment failures, minimizing downtime and enhancing the reliability of energy infrastructure through proactive maintenance.

Optimized Energy Trading: By analyzing market dynamics, predicting demand, and identifying profitable strategies, AI optimizes energy trading decisions. Platforms leverage weather data, demand forecasts, and market trends for informed transactions.

Smart Grid Management: AI enables efficient energy distribution and consumption through real-time analysis of data from smart meters and sensors, optimizing grid performance.

Enhanced Energy Efficiency: AI identifies opportunities for energy conservation by analyzing consumption patterns from smart meters and other sources.

Renewable Energy Integration: AI facilitates the seamless integration of renewable energy sources like solar and wind by analyzing weather patterns, demand forecasts, and grid conditions.

Energy Storage Optimization: AI optimizes charging and discharging strategies for energy storage systems based on weather predictions and demand forecasts, maximizing efficiency.

Demand Response Management: AI-powered platforms analyze data to develop effective demand response strategies, reducing peak load and improving grid stability.

Accurate Energy Forecasting: AI provides reliable energy forecasts by analyzing weather data, demand projections, and other factors, enabling better decision-making in trading, grid management, and related areas.

Advantages of AI in Energy:

Greater Efficiency: Identifying and eliminating energy waste leads to significant improvements in efficiency.

Higher Reliability: Proactive maintenance prediction minimizes downtime and boosts infrastructure reliability.

Smarter Decisions: Accurate forecasting empowers better-informed decisions related to trading and grid management.

Lower Costs: Optimized trading, storage, and demand response strategies result in reduced energy costs.

Challenges Facing AI Implementation in the Energy Sector

While artificial intelligence offers substantial benefits for the energy sector, several obstacles must be overcome to ensure its successful integration:

1. **Data Quality and Accessibility:** AI algorithms thrive on high-quality, relevant data. The energy industry often struggles with inconsistent data formats and communication protocols, hindering seamless data integration from diverse sources.
2. **Cybersecurity Risks:** Energy systems reliant on AI become tempting targets for cyberattacks, potentially jeopardizing energy security and grid reliability. These threats can originate from various sources, including malicious code, hackers, and coordinated attacks.
3. **Evolving Regulatory Landscape:** The regulatory frameworks governing AI applications in energy are still under development and often lack clarity and standardization. Robust regulations are crucial to ensure AI promotes energy security, reliability, and sustainability.
4. **Workforce Skills Gap:** Effectively using AI in the energy sector necessitates comprehensive workforce development and training programs. These initiatives must equip workers with the necessary skills to manage and interact with AI-powered systems.
5. **Bias and Fairness Concerns:** If not meticulously designed and trained, AI systems can perpetuate existing biases and inequalities. Addressing bias and ensuring fairness is essential for equitable AI implementation in energy.
6. **Lack of Transparency and Explainability:** Complex AI models can be difficult to interpret, making it challenging to understand the rationale behind their decisions. Improving transparency and explainability is vital for building trust and accountability in AI-driven energy solutions.
7. **Scalability and Integration Issues:** AI applications must be scalable and seamlessly integrated with existing energy infrastructure to ensure widespread adoption and effectiveness.

Strategies for Addressing the Challenges

Overcoming these challenges will require focused investment and innovation:

1. **Standardize Data Formats and Protocols:** Establishing standardized formats and protocols will ensure high-quality and relevant data for AI algorithms.
2. **Strengthen Cybersecurity Measures:** Implementing robust cybersecurity protocols will protect AI-powered systems from cyber threats.
3. **Develop Comprehensive Regulatory Frameworks:** Establishing clear regulatory frameworks will promote secure, reliable, and sustainable AI applications in energy.
4. **Invest in Workforce Development Programs:** Targeted training programs will equip workers with the necessary skills to operate and maintain AI-powered systems.

5. **Prioritize Bias Mitigation and Fairness:** Addressing potential biases and ensuring fairness are crucial for equitable AI deployment.

Successful AI Applications: Case Studies

Several real-world examples demonstrate the successful application of AI in the energy sector:

1. **Google's AI-Powered Energy Management:** This system uses machine learning to analyze sensor data, predict energy demand, optimize consumption, and reduce waste.
2. **Siemens' AI-Powered Predictive Maintenance:** This system reduces downtime and improves reliability by analyzing sensor data to predict maintenance requirements.
3. **Enel's AI-Powered Smart Grids:** Enel's smart grid system optimizes energy distribution and consumption by analyzing data from smart meters, sensors, and other sources.

Conclusion

AI holds transformative potential for the energy sector, promising improved efficiency, reduced costs, and enhanced decision-making. Addressing challenges related to data, security, regulation, and workforce development is crucial. Overcoming these hurdles through strategic investment and innovation will unlock the full potential of AI to revolutionize the energy landscape.

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**ARTIFICIAL INTELLIGENCE (AI): TOOLS FOR TEACHERS IN MODERN
EDUCATION WORLD****Ms. Nalini Patel***Research Scholar**Dept. of Education & Extension**Savitribai Phule Pune University***Dr. Nisha Valvi***Associate Professor**Dept. of Education & Extension**Savitribai Phule Pune University*

Abstract:

The use of computers in education is primarily aimed at increasing accessibility – Learning resources can be accessed from anywhere at any time, facilitating personalized learning inside and outside the classroom. Artificial intelligence (AI) has rapidly evolved from a futuristic concept to an essential part of our daily lives, and education is no exception. AI is removing obstacles in education through the development of technologies that accommodate students with diverse needs and learning styles. AI has the potential to revolutionize education as it develops, paving the way for a more effective, inclusive, and individualized learning environment in the future. By using AI, teachers can enhance the abilities of students. In this research paper, the researcher explores the key ways AI can enhance teaching and also the applications & advancements that make AI in teaching beneficial for modern learners. These tools help teachers develop content aligned with curriculum standards, ensuring that educational materials effectively meet diverse student needs. Through this research, the researcher provides details about the AI tools that are useful and effective for smooth classroom transactions in modern education world.

Keywords: Dhodia Bhil Tribe, Culture, Dadra & Nagar Haveli.**Introduction:**

Artificial intelligence (AI) has rapidly evolved from a futuristic concept to an essential part of our daily lives, and education is no exception. Artificial Intelligence (AI) has the potential to address some of the biggest challenges in education today, innovate teaching and learning practices, and accelerate progress towards SDG 4. In 2024, AI technologies are revolutionizing the academic landscape, offering unprecedented opportunities for personalized learning, administrative efficiency, and improved educational outcomes. From intelligent tutoring systems to AI-driven classroom management, AI's impact is significant and far-reaching.

AI is the branch of science and technology that is devoted to the creation of machines (computer systems, Robots, etc.) that learn and think as intelligently as human beings is known as Artificial Intelligence or AI.

The use of computers in education is primarily aimed at increasing accessibility – Learning resources can be accessed from anywhere at any time, facilitating personalized learning inside and outside the classroom. Learning can be tailored and adapted to each student’s goals and abilities through customized programs and time-consuming, tedious tasks such as record keeping or grading multiple-choice tests can be completed through AI automation and exploring fundamental questions about how people learn.

By using AI, teachers can enhance their ability to personalize learning for each student, provide immediate feedback, automate repetitive tasks like grading, gain valuable insights into students’ progress, and ultimately focus more time on individual student needs and engagement in the classroom; essentially making teaching more efficient and effective.

The widespread adoption of AI in the last few years, including its growing use in schools, has caused reactions ranging from outright banning to enthusiastic embrace. Because the tools will continue to evolve and change the way we operate in all areas of life, teachers and educational administrators need to come to terms with several ethical considerations about AI in education.

In this research paper, the researcher explores the key ways AI can enhance teaching and also the applications & advancements that make AI in teaching beneficial for modern learners.

AI in Education: Inclusion and Universal Access:

Bernard Marr explains that AI tools can enhance inclusion and universal access to education in a number of ways, including:

- Helping to “make global classrooms available to all, including those who speak different languages or who might have visual or hearing impairments”
- Creating access for “students who might not be able to attend school due to illness”
- Better serving “students who require learning at a different level or on a particular subject that isn’t available in their own school”

The role of AI in modern education:

The term "artificial intelligence" was actually coined in 1956. In that year, John McCarthy, a Dartmouth College professor, organized a pivotal workshop that coined the term "artificial intelligence" and aimed to create machines capable of reasoning and using human language. Today, AI significantly impacts various sectors, from healthcare to finance, manufacturing, and transportation. Many think it is also poised to revolutionize education.

1. Enhanced Personalized Learning: AI tailors educational content to each student's unique learning style and pace. For example, platforms like DreamBox and Smart Sparrow analyze student responses in real time to adapt lessons dynamically, enabling every student to master concepts at their own speed.

2. Automated Administrative Tasks: AI automates grading, scheduling, and report generation, significantly reducing the workload on educators. Tools like Grade scope provide

consistent and objective grading of assignments, while AI scheduling software helps optimize class timetable and resource allocation.

3. More Engaged Learners: AI makes learning more interactive and engaging through gamified content and adaptive learning platforms for students. Programs like Kahoot and Minecraft: Education Edition use AI to create interactive quizzes and simulations that respond to student input, keeping learners motivated and involved.

4. Improved Accessibility: AI-driven assistive technologies support students with disabilities, ensuring a more inclusive learning environment. Speech recognition software like Notta transcribes spoken words into text for hearing-impaired students, and AI-supported educational games provide personalized learning experiences for young children.

5. Actionable Insights: AI analyzes vast amounts of educational data to provide educators with actionable insights. AI platforms like Knewton Alta track student performance across various metrics, helping teachers identify learning gaps and adjust their instructional strategies accordingly.

6. More Efficient Classroom Management: AI tools help teachers manage classroom behaviour and engagement. For example, Class craft uses AI to gamify classroom management, tracking student behaviour and rewarding positive actions, which helps maintain a productive and motivated classroom environment.

7. Better Security and Assessment Integrity: AI enhances the security and integrity of assessments through advanced proctoring and plagiarism detection. Tools like Turnitin check for originality in student submissions, and AI-supported proctoring systems monitor exam conditions to prevent cheating.

8. Continuous Lifelong Learning and Professional Development: AI supports continuous learning and professional development for educators by recommending personalized resources and courses. AI platforms like Edthena provide tailored learning paths based on educators' career goals and teaching needs.

9. Greater Scalability: AI enables the scaling of educational programs to accommodate more students without compromising quality. AI-based platforms can handle large volumes of data and provide personalized learning experiences to a growing number of learners, ensuring accessibility and consistency in education.

AI in Education:

1. Adaptive Learning: AI-driven platforms assess students' skill levels in real time and tailor instructional content to meet individual needs. These systems adapt lessons dynamically based on student responses, providing customized pathways to help students master concepts at their own pace.

2. **Assistive Technology:** Tools such as speech recognition software transcribe spoken words into text, helping students with disabilities such as hearing impairments or dyslexia to participate more fully in the classroom by converting speech to text and vice versa.
 3. **Data and Learning Analytics:** AI helps analyze data from online learning portals, classroom attendance and grades. This data provides insights into student performance, helping educators identify trends and tailor instruction to address gaps in understanding and performance.
 4. **Classroom Management:** Platforms use AI to gamify classroom management. AI tracks student behaviour and engagement, rewarding positive actions with points and badges and providing teachers with insights into classroom dynamics to manage and motivate students.
 5. **Intelligent Tutoring Systems:** AI-powered tutoring systems such as Carnegie Learning provide personalized feedback and support, adapting to individual learning styles and needs to help students understand complex concepts and improve academic performance.
 6. **Automated Grading and Assessment Tools:** These tools use AI to evaluate assignments and provide detailed feedback, streamlining the grading process, ensuring consistency and saving teachers time. AI can also grade more abstract assessments like essays by analyzing the content for coherence and relevance.
 7. **Chatbots and Virtual Assistants:** AI-driven chat-bots such as Mainstay provide students with immediate support and assistance outside classroom hours. These chat-bots answer questions, remind students of deadlines and guide them through administrative processes, enhancing engagement and promoting independent learning.
 8. **Curriculum Planning:** AI helps educators plan curricula by analyzing educational data to identify trends and gaps. This ensures the curriculum remains relevant, comprehensive and aligned with learning objectives by suggesting updates based on the latest educational needs and standards.
 9. **Interactive and Learning Games:** AI enhances educational games by creating engaging and adaptive learning experiences. These games use AI to provide tasks and challenges that adapt to student responses, promoting active participation and understanding of complex subjects.
 10. **Personalized Learning:** AI learning platforms create customized learning experiences by adapting to the unique ways students understand concepts. This reduces cognitive load and ensures that each student receives instruction tailored to their learning style and pace.
 11. **Task Automation:** AI automates routine tasks such as homework assessment, test grading and report generation. This enables educators to focus on more meaningful instructional activities and student interactions.
 12. **Smart Content Creation:** AI aids instructors in the creation of digital lessons and study materials. AI tools like Magic School AI and EduaideAI simplify lesson planning, create assessments, write individualized education plans (IEPs), and much more to modernize learning and streamline instruction.
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- 13. Proctoring:** AI-powered proctoring systems monitor exams to prevent cheating and ensure academic integrity. These systems analyze students' behaviour during exams, providing real-time alerts for suspicious activities and maintaining a secure testing environment.
- 14. Language Learning:** AI tools such as Duolingo use adaptive algorithms to personalize language learning experiences. The AI adjusts the difficulty of exercises based on the user's progress, ensuring an optimal learning curve and enhancing language acquisition.
- 15. Closing the Skill Gap:** AI identifies skill gaps in students by analyzing their performance data and provides targeted resources to address these deficiencies. This helps learners achieve proficiency in various subjects and prepares them for future academic challenges.
- 16. Dyslexia Detection:** AI tools like Dysolvecan detect dyslexia and other learning disabilities early on by analyzing reading patterns and errors. These tools provide tailored support and interventions to help affected students succeed, such as specialized reading programs and exercises.
- 17. Edutainment and Gamification:** AI integrates game elements into academic content, making learning fun and engaging. Platforms use AI to create interactive quizzes and games that promote deeper understanding and retention of educational material.
- 18. Administrative Support:** AI assists in administrative tasks such as scheduling, budgeting and resource allocation. AI tools like Fetchyoptimize educational operations by providing data-driven insights and recommendations, improving efficiency and reducing workload for educators.
- 19. Virtual 3D Classrooms:** The meta-verse creates immersive virtual classrooms where students can interact with classmates and teachers. AI platforms like Engage VR offer virtual environments that enhance the learning experience beyond traditional methods, providing opportunities for interactive and experiential learning.
- 20. Digital Learning:** AI enhances digital classrooms by providing immersive video content and interactive simulations. AI tools like Nearpod use to deliver engaging and effective learning experiences through interactive lessons and real-time student feedback.
- 21. Virtual Campus Activities:** AI facilitates virtual extracurricular activities, allowing students to participate in clubs and events from anywhere in the world. AI platforms like Remo use to create virtual spaces for networking and collaboration, enhancing student engagement beyond the classroom.
- 22. Interdisciplinary Learning:** AI breaks down barriers between subjects, promoting interdisciplinary learning. AI tools like Wolfram Alpha use to demonstrate real-life applications of various theories, helping students understand the interconnectedness of different fields of study.
- 23. Simulating Real-Life Situations:** AI replicates real-life scenarios in virtual environments, allowing students to conduct experiments and learn through practical experience. AI Platforms

such as Labster offer virtual labs where students can safely explore and experiment with scientific concepts.

24. Building Awareness: AI can teach students about social issues such as climate change and poverty. Tools like Earth-Speaker use to provide a deep emotional understanding alongside theoretical knowledge, promoting awareness and action on global challenges.

25. Virtual Tours: AI-powered virtual tours enable students to explore different parts of the world from their classrooms. AI Platforms like Google Expeditions use to create immersive virtual field trips, broadening students' horizons and enhancing their cultural understanding. These can also be useful in facilitating virtual tours of colleges.

26. Guest Speakers and Events: AI facilitates virtual events and guest lectures, allowing students to learn from prominent figures and experts in various fields. AI tools like Big-Marker tools use to organize and manage virtual conferences, enhancing the learning experience through expert insights.

27. Predictive Analytics: AI algorithms in learning analytics help educators spot trends and predict student performance, enabling early intervention for students who might struggle.

28. Parent-Teacher Communication: AI tools like Remind facilitate seamless communication between parents and teachers, allowing for real-time updates on student progress and classroom activities, thereby enhancing parental engagement and support in the education process.

29. Test Prep: AI platforms like Magoosh provide personalized test preparation by analyzing student performance and adapting practice questions and study plans to focus on areas where students need the most improvement, thereby increasing their chances of success.

30. Learning Management Systems (LMS): AI enhances LMS platforms by providing personalized learning paths, automating administrative tasks and offering data-driven insights into student performance and engagement.

31. Professional Development: AI tools provide personalized professional development opportunities for educators by recommending courses and resources based on their career goals and teaching needs.

32. Transportation: AI-powered systems optimize school bus routes, reducing travel time and improving safety. AI tools like Safe-stop use real-time to track bus locations and provide parents with accurate arrival times, enhancing the overall efficiency of student transportation.

33. Finance: AI assists educational institutions in managing their finances by analyzing spending patterns, predicting future expenses and identifying cost-saving opportunities. AI tools like Allovue help schools allocate resources more effectively and improve financial planning.

34. Cybersecurity: AI enhances the security of educational institutions by detecting and responding to cyber threats in real time. AI tools like Darktrace use to identify unusual network

activity, prevent data breaches and protect sensitive student information.

35. Safety and Security: AI-powered surveillance systems monitor school premises for potential safety threats. AI tools like Avigilon use to analyze video feeds and alert security personnel to suspicious activities, thereby enhancing the overall safety and security of the school environment.

36. Plagiarism Detection: AI tools analyze student submissions for potential plagiarism by comparing them against a vast database of academic content, ensuring academic integrity and originality in student work.

37. Enhanced Online Discussion Boards: AI enhances online discussion boards by moderating content, facilitating discussions and providing personalized feedback.

Teachers have many different ways to use AI capabilities to enhance learning outcomes. Two notable applications include creating visual aids for vocabulary instruction and planning engaging lessons. Teachers need to identify challenging problems related to the teaching-learning process, and vocabulary words for upcoming lessons or chapters and choose an AI tool that fits students' needs and is easy to access. They can use AI to connect topics to real-world applications and student interests, generate word problems, performance tasks, and projects that align with curriculum standards, Design comprehensive lesson plans with essential questions, practice problems, and extension opportunities, and also use AI to create inquiry-based activities that develop critical thinking and quantitative literacy skills. AI applications in education can foster interactive collaboration and facilitate content creation and curation for students and teachers alike. These tools help teachers develop content aligned with curriculum standards, ensuring that educational materials effectively meet diverse student needs. Interactive tools like virtual labs and educational games engage students, while collaborative platforms facilitate peer learning. Teachers can use these technologies and the data-driven insights they provide to personalize learning paths and offer adaptive feedback, enhancing the overall learning experience.

Conclusion:

Integration of technology in Education is essential for the academic growth of students. With access to a wider range of resources and personalized learning experiences, students can develop the skills they need to succeed in the future. The importance of AI will be a transformative force that will reshape how we teach and learn. It will make education more accessible, efficient, and engaging for teachers as well as students. AI applications in education can foster interactive collaboration and facilitate content creation and curation for students and teachers alike. The researcher mentioned above tools help teachers to develop content aligned with curriculum standards, ensuring that educational materials effectively meet diverse student needs. Interactive tools like virtual labs and educational games engage students, while collaborative platforms

facilitate peer learning. Teachers can use these technologies and the data-driven insights they provide to personalize learning paths and offer adaptive feedback, enhancing the overall learning experience. All the AI tools can help teachers for the smooth teaching-learning process during the classroom transaction. Teachers must have qualities as well as the knowledge to apply AI tools during classroom transactions. With the knowledge of all the tools, methods, techniques, and practices used in teaching, teachers can get the best out of their students in schools as regards grades during examinations. To achieve student success or to prepare students for future achievement, teachers have to be very skilful or efficient and they need to be familiar with the variety of AI tools in modern education. This variety of AI tools helps teachers to make a great impact on students learning but this happens only because of those teachers, who have abilities and knowledge & information about the using the tools well.

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भारतीय धान्य प्रणाली और सामाजिक आरोग्य और महिला सशक्तिकरण

प्रा. सुनिता संतोष पवार

समाजशास्त्र विभाग, कला और वाणिज्य महाविद्यालय, अक्कलकुवा

सारांश -

सामाजिक आरोग्य (स्वास्थ्य) शारीरिक या मानसिक स्वास्थ्य तक सीमित नहीं है, बल्कि यह व्यक्ति की सामाजिक और सामुदायिक स्थिति से भी गहरा संबंध रखता है। यह एक समग्र दृष्टिकोण है, जिसमें किसी व्यक्ति की समाज में सामाजिक, आर्थिक, सांस्कृतिक और पर्यावरणीय कारकों के प्रभाव को ध्यान में रखा जाता है। महिला आरोग्य (स्वास्थ्य) और सशक्तिकरण एक-दूसरे से गहराई से जुड़े हैं। महिलाएँ जब स्वस्थ होती हैं, तो वे अपने व्यक्तिगत, सामाजिक और आर्थिक जीवन में अधिक सशक्त होती हैं। महिला स्वास्थ्य में प्रजनन, मानसिक और पोषण संबंधी समस्याएँ प्रमुख होती हैं, जिनमें सुधार के लिए बेहतर स्वास्थ्य सेवाओं और जागरूकता की आवश्यकता है। वहीं, शिक्षा, आर्थिक स्वतंत्रता और राजनीतिक भागीदारी महिला सशक्तिकरण के महत्वपूर्ण स्तंभ हैं। सशक्त महिलाएँ अपने स्वास्थ्य की देखभाल बेहतर ढंग से कर सकती हैं, और यह सशक्तिकरण उन्हें घरेलू हिंसा का सामना करने, मानसिक स्वास्थ्य की देखभाल, और सामाजिक नीतियों में भागीदारी करने में मदद करता है। इस प्रकार, महिला आरोग्य और सशक्तिकरण का आपसी संबंध एक सशक्त समाज की नींव रखता है। भारतीय ज्ञान प्रणाली में महिला सक्षमीकरण को बहुमूल महत्व प्राप्त हुआ है।

बीज शब्द- सामाजिक आरोग्य, महिला सशक्तिकरण, महिला आरोग्य, भारतीय ज्ञान प्रणाली

प्रस्तावना

एक स्वस्थ समाज तब बनता है जब समाज के हर वर्ग को समान अधिकार और न्याय प्राप्त होते हैं। सामाजिक आरोग्य समाज में असमानताओं को कम करने में सहायक होता है, विशेषकर महिलाओं, बच्चों और कमजोर वर्गों के लिए। सामाजिक स्वास्थ्य व्यक्ति के अन्य लोगों के साथ स्वस्थ और सकारात्मक संबंधों को बढ़ावा देता है, जिससे एकता और सहयोग की भावना विकसित होती है। जब किसी व्यक्ति का सामाजिक स्वास्थ्य मजबूत होता है, तो उसका मानसिक और शारीरिक स्वास्थ्य भी बेहतर होता है। सामाजिक रूप से अलगाव या असमानता के कारण व्यक्ति मानसिक तनाव, अवसाद और अन्य शारीरिक बीमारियों का शिकार हो सकता है। महिलाओं के सामाजिक स्वास्थ्य में सुधार से उनके शारीरिक और मानसिक स्वास्थ्य पर भी सकारात्मक प्रभाव पड़ता है। महिलाओं की शिक्षा, स्वास्थ्य सेवाओं तक पहुंच, और सामाजिक भागीदारी बढ़ाने से उनका आत्मविश्वास और निर्णय लेने की क्षमता बढ़ती है।

सामाजिक आरोग्य (स्वास्थ्य) का अर्थ

सामाजिक आरोग्य (स्वास्थ्य) का अर्थ केवल शारीरिक या मानसिक स्वास्थ्य तक सीमित नहीं है, बल्कि यह व्यक्ति की सामाजिक और सामुदायिक स्थिति से भी गहरा संबंध रखता है। यह एक समग्र दृष्टिकोण है, जिसमें किसी व्यक्ति की समाज में सामाजिक, आर्थिक, सांस्कृतिक और पर्यावरणीय कारकों के प्रभाव को ध्यान में रखा जाता है।

सामाजिक आरोग्य को इस प्रकार परिभाषित किया जा सकता है:

व्यक्तिगत और सामूहिक स्तर पर कल्याण की स्थिति, जहाँ समाज के सभी सदस्यों को समान अधिकार, अवसर और संसाधन प्राप्त होते हैं। व्यक्ति का समाज के साथ जुड़ाव, परस्पर सहयोग और उसमें सकारात्मक योगदान देने की क्षमता को भी सामाजिक आरोग्य का हिस्सा माना जाता है। यह उन परिस्थितियों को भी इंगित करता है, जहाँ व्यक्ति को शिक्षा, स्वास्थ्य सेवाओं, रोजगार और सामाजिक सुरक्षा तक समान पहुंच प्राप्त हो।

महिला आरोग्य (Women's Health) और महिला सशक्तिकरण (Women's Empowerment) दोनों आपस में गहराई से जुड़े हुए हैं। स्वस्थ महिलाएँ न केवल अपने परिवार की भलाई में योगदान देती हैं, बल्कि समाज और देश की प्रगति में भी महत्वपूर्ण भूमिका निभाती हैं। वहीं, सशक्त महिलाएँ अपने स्वास्थ्य की देखभाल बेहतर ढंग से कर पाती हैं और अपने अधिकारों के लिए खड़ी हो सकती हैं।

1. महिला आरोग्य (Women's Health):

महिलाओं के स्वास्थ्य का अध्ययन उनके शारीरिक, मानसिक और प्रजनन स्वास्थ्य को शामिल करता है। महिलाओं के समग्र स्वास्थ्य में कई मुद्दे प्रमुख रूप से सामने आते हैं:

- **प्रजनन स्वास्थ्य:** महिलाओं के लिए मातृत्व स्वास्थ्य, गर्भावस्था, प्रसव और नवजात शिशु देखभाल जैसे मुद्दे बहुत महत्वपूर्ण होते हैं। प्रजनन स्वास्थ्य सेवाओं तक पहुंच महिलाओं के स्वास्थ्य को बेहतर करने का एक प्रमुख आधार है।
- **मानसिक स्वास्थ्य:** सामाजिक दबाव, परिवार की जिम्मेदारियाँ, और हिंसा का शिकार होने के कारण महिलाओं में अवसाद और चिंता की दर अधिक होती है। मानसिक स्वास्थ्य सेवाओं की कमी महिलाओं के सशक्तिकरण में बाधा बनती है।
- **पोषण और कुपोषण:** महिलाओं में कुपोषण, खासकर गर्भवती और स्तनपान कराने वाली महिलाओं में, एक प्रमुख समस्या है। सही पोषण की कमी उनके शारीरिक और मानसिक स्वास्थ्य को प्रभावित करती है।

2. महिला सशक्तिकरण (Women's Empowerment):

महिला सशक्तिकरण का अर्थ है महिलाओं को सामाजिक, आर्थिक, और राजनीतिक क्षेत्र में समान अधिकार और अवसर प्रदान करना, जिससे वे आत्मनिर्भर और आत्मविश्वासी बन सकें। महिला सशक्तिकरण के कई आयाम हैं:

- **शिक्षा:** शिक्षा महिलाओं के सशक्तिकरण का सबसे महत्वपूर्ण साधन है। शिक्षित महिलाएँ न केवल अपने स्वास्थ्य और परिवार का ध्यान बेहतर ढंग से रख सकती हैं, बल्कि वे समाज में अपनी आवाज़ भी बुलंद कर सकती हैं।
- **आर्थिक स्वतंत्रता:** महिलाओं की आर्थिक स्वतंत्रता उन्हें अपने जीवन के बारे में स्वतंत्र रूप से निर्णय लेने की क्षमता प्रदान करती है। स्व-रोजगार, स्वरोजगार समूहों (SHGs), और महिला उद्यमिता ने महिलाओं को आत्मनिर्भर बनने में मदद की है।
- **राजनीतिक भागीदारी:** महिलाओं की राजनीतिक भागीदारी भी सशक्तिकरण का महत्वपूर्ण पहलू है। महिला नेताओं ने स्वास्थ्य और शिक्षा से संबंधित नीतियों को बेहतर बनाने में महत्वपूर्ण भूमिका है।

3. महिला आरोग्य और सशक्तिकरण का आपसी संबंध:

- **स्वास्थ्य सेवाओं की पहुंच:** सशक्त महिलाएँ अपने स्वास्थ्य के प्रति अधिक जागरूक होती हैं और स्वास्थ्य सेवाओं का बेहतर उपयोग कर पाती हैं। स्वास्थ्य सेवाओं की बेहतर पहुँच से महिलाओं का स्वास्थ्य सशक्त होता है, जिससे वे अपने और अपने परिवार के लिए निर्णय लेने में सक्षम होती हैं।
- **घरेलू हिंसा और मानसिक स्वास्थ्य:** सशक्त महिलाएँ घरेलू हिंसा का विरोध कर सकती हैं और मानसिक स्वास्थ्य सेवाओं तक पहुँच बना सकती हैं। मानसिक और शारीरिक रूप से स्वस्थ महिलाएँ समाज में अपनी भूमिका को बेहतर ढंग से निभा सकती हैं।
- **नीतियों में सुधार:** महिला सशक्तिकरण से जुड़ी नीतियों और कार्यक्रमों का प्रभाव महिलाओं के स्वास्थ्य को सकारात्मक रूप से प्रभावित करता है। सरकार द्वारा शुरू की गई योजनाएँ, जैसे "प्रधानमंत्री मातृ वंदना योजना" और "बेटी बचाओ, बेटी पढ़ाओ", महिलाओं के स्वास्थ्य और सशक्तिकरण को बढ़ावा देती हैं।

इस प्रकार, महिला आरोग्य और सशक्तिकरण का आपस में गहरा संबंध है। जब महिलाएँ शारीरिक और मानसिक रूप से स्वस्थ होती हैं, तो वे सामाजिक और आर्थिक रूप से अधिक सशक्त बन सकती हैं, और सशक्त महिलाएँ अपने स्वास्थ्य की देखभाल अधिक जिम्मेदारी से कर सकती हैं।

साहित्य समीक्षा

सामाजिक स्वास्थ्य का अर्थ केवल रोग की अनुपस्थिति नहीं, बल्कि समाज में महिला के जीवन की गुणवत्ता से भी जुड़ा होता है। इसमें सामाजिक ताने-बाने, परिवार और समुदाय में महिला की भूमिका, और स्वास्थ्य सेवाओं तक पहुंच जैसी कई बातें शामिल होती हैं। विशेष रूप से विकासशील देशों में, सामाजिक असमानताओं के कारण महिलाओं को स्वास्थ्य सेवाओं तक समान पहुंच प्राप्त नहीं हो पाती है, जिससे उनके समग्र सामाजिक स्वास्थ्य पर प्रभाव पड़ता है। महिलाओं के लिए स्वास्थ्य सेवाओं तक असमान पहुंच एक बड़ा मुद्दा है। विभिन्न अनुसंधान में पाया गया है कि महिलाओं को सामाजिक रूप से सीमांत बनाए जाने की वजह से वे जरूरी स्वास्थ्य सेवाओं से वंचित रह जाती हैं। इसके कारण गंभीर स्वास्थ्य समस्याएँ उत्पन्न होती हैं। जो केवल शारीरिक नहीं, बल्कि मानसिक और भावनात्मक स्वास्थ्य को भी प्रभावित करती हैं।

महिलाओं के स्वास्थ्य पर सामाजिक दबाव का भी बड़ा प्रभाव होता है। उदाहरण के लिए, पारिवारिक जिम्मेदारियों और बच्चों की देखभाल में लगे रहने के कारण महिलाएं अपनी सेहत पर ध्यान नहीं दे पाती हैं। इससे न केवल उनके शारीरिक स्वास्थ्य पर असर पड़ता है, बल्कि मानसिक तनाव भी बढ़ता है।

सामाजिक स्वास्थ्य में सुधार लाने के लिए नीतिगत और सामाजिक स्तर पर कई पहलें की जा रही हैं। इनमें महिला केंद्रित स्वास्थ्य सेवाएं, मानसिक स्वास्थ्य के प्रति जागरूकता, और समुदाय-आधारित कार्यक्रमों का विकास शामिल है। साथ ही, सरकारी और गैर-सरकारी संगठन भी महिलाओं के सामाजिक स्वास्थ्य को बेहतर बनाने के लिए काम कर रहे हैं।

सामाजिक आरोग्य का महत्त्व:

1. **सामाजिक समता और न्याय:** एक स्वस्थ समाज तब बनता है जब समाज के हर वर्ग को समान अधिकार और न्याय प्राप्त होते हैं। सामाजिक आरोग्य समाज में असमानताओं को कम करने में सहायक होता है, विशेषकर महिलाओं, बच्चों और कमजोर वर्गों के लिए।
2. **सामुदायिक संबंधों की मजबूती:** सामाजिक स्वास्थ्य व्यक्ति के अन्य लोगों के साथ स्वस्थ और सकारात्मक संबंधों को बढ़ावा देता है, जिससे एकता और सहयोग की भावना विकसित होती है।
3. **मानसिक और शारीरिक स्वास्थ्य पर प्रभाव:** जब किसी व्यक्ति का सामाजिक स्वास्थ्य मजबूत होता है, तो उसका मानसिक और शारीरिक स्वास्थ्य भी बेहतर होता है। सामाजिक रूप से अलगाव या असमानता के कारण व्यक्ति मानसिक तनाव, अवसाद और अन्य शारीरिक बीमारियों का शिकार हो सकता है।
4. **महिला सशक्तिकरण:** महिलाओं के सामाजिक स्वास्थ्य में सुधार से उनके शारीरिक और मानसिक स्वास्थ्य पर भी सकारात्मक प्रभाव पड़ता है। महिलाओं की शिक्षा, स्वास्थ्य सेवाओं तक पहुंच, और सामाजिक भागीदारी बढ़ाने से उनका आत्मविश्वास और निर्णय लेने की क्षमता बढ़ती है।
5. **सामाजिक विकास:** समाज में हर वर्ग का योगदान तभी हो सकता है जब उनके सामाजिक स्वास्थ्य का ध्यान रखा जाए। समाज का आर्थिक और सांस्कृतिक विकास तभी संभव है जब सभी लोगों को उनके जीवन की बुनियादी आवश्यकताएँ और सामाजिक सुरक्षा प्राप्त हो।

सामाजिक आरोग्य का महत्त्व इसलिए भी बढ़ जाता है क्योंकि यह समाज के संपूर्ण विकास और प्रगति से जुड़ा हुआ है। यदि समाज के सभी वर्ग स्वस्थ और सशक्त होंगे, तो समाज में आर्थिक, सांस्कृतिक और राजनीतिक सुधार अधिक प्रभावी ढंग से हो सकते हैं। महिलाओं और वंचित वर्गों के सामाजिक स्वास्थ्य पर ध्यान देने से समावेशी विकास का मार्ग प्रशस्त होता है।

अध्ययन का उद्देश्य

1. **महिला स्वास्थ्य पर पारिवारिक और सामुदायिक भूमिका का अध्ययन:** पारिवारिक संरचना, सामाजिक दबाव, और पारंपरिक मान्यताओं का महिलाओं के स्वास्थ्य पर क्या प्रभाव होता है, इसे समझने के लिए अध्ययन किया जाता है।
2. **स्वास्थ्य सेवाओं की पहुँच:** अध्ययन का उद्देश्य यह है कि महिलाओं के लिए स्वास्थ्य सेवाएँ कितनी उपलब्ध और सुलभ हैं, विशेषकर ग्रामीण क्षेत्रों में।
3. **महिलाओं के मानसिक स्वास्थ्य का अध्ययन:** घरेलू हिंसा, काम के दबाव, और सामाजिक अपेक्षाओं का महिलाओं के मानसिक स्वास्थ्य पर प्रभाव, और इसे सुधारने के लिए नीतियों का विकास।
4. **महिलाओं की सशक्तिकरण में सामाजिक स्वास्थ्य की भूमिका:** यह अध्ययन इस बात को भी समझने का प्रयास करता है कि महिलाओं के सामाजिक स्वास्थ्य में सुधार उनके सशक्तिकरण के लिए किस तरह सहायक हो सकता है।
5. **नीतियों और कार्यक्रमों का मूल्यांकन:** सरकार और गैर-सरकारी संगठनों द्वारा चलाए जा रहे महिला स्वास्थ्य कार्यक्रमों का मूल्यांकन करना।

महिलाओं के सामाजिक स्वास्थ्य के प्रमुख मुद्दे**1. स्वास्थ्य सेवाओं तक असमान पहुंच:**

- **आर्थिक असमानता:** महिलाओं को आर्थिक संसाधनों की कमी के कारण स्वास्थ्य सेवाओं का उपयोग करने में कठिनाई होती है। खासकर ग्रामीण क्षेत्रों की महिलाएँ स्वास्थ्य सेवाओं से वंचित रहती हैं।
- **स्वास्थ्य सुविधाओं की कमी:** विकासशील देशों और ग्रामीण क्षेत्रों में महिलाओं को उचित स्वास्थ्य सुविधाओं की कमी का सामना करना पड़ता है। मातृत्व देखभाल और प्रजनन स्वास्थ्य सेवाओं की कमी प्रमुख समस्याएँ हैं

2. लैंगिक असमानता और भेदभाव: महिलाओं को अक्सर परिवार में और समाजमें कम प्राथमिकता दी जाती है, जिससे उनके स्वास्थ्य पर नकारात्मक प्रभाव पड़ता है। यह भेदभाव आर्थिक अवसरों, शिक्षा, और स्वास्थ्य सेवाओं तक पहुंच को सीमित करता है

- **पारंपरिक और सांस्कृतिक मान्यताएँ:** कुछ समाजों में सांस्कृतिक मान्यताओं के कारण महिलाएँ स्वास्थ्य सेवाओं का उपयोग करने से कतराती हैं। उदाहरण के लिए, माहवारी या प्रजनन स्वास्थ्य से जुड़े मुद्दों पर खुलकर चर्चा नहीं की जाती, जिससे जागरूकता की कमी होती है।

3. घरेलू हिंसा और मानसिक स्वास्थ्य:

- घरेलू हिंसा महिलाओं के मानसिक और शारीरिक स्वास्थ्य पर प्रतिकूल प्रभाव डालती है। यह चिंता, अवसाद, और PTSD जैसी मानसिक समस्याओं को जन्म देता है।
- **सामाजिक समर्थन की कमी:** हिंसा से प्रभावित महिलाएँ अक्सर उचित सामाजिक समर्थन और मानसिक स्वास्थ्य सेवाओं से वंचित रहती हैं, जिससे उनकी स्थिति और बिगड़ सकती है

4. प्रजनन और मातृत्व स्वास्थ्य:

- महिलाओं के प्रजनन और मातृत्व स्वास्थ्य की देखभाल में कई चुनौतियाँ होती हैं, जैसे कि मातृत्व मृत्यु दर, पोषण की कमी, और गर्भधारण के समय उचित देखभाल की कमी।
- कम उम्र में विवाह और गर्भधारण, शिक्षा की कमी, और स्वास्थ्य सेवाओं तक पहुंच में बाधाएँ मातृत्व स्वास्थ्य को प्रभावित करती हैं।

5. मानसिक स्वास्थ्य समस्याएँ:

- सामाजिक दबाव, परिवारिक जिम्मेदारियाँ, और कार्यस्थल के दबाव के कारण महिलाओं में मानसिक स्वास्थ्य समस्याओं की दर अधिक होती है।
- तनाव, अवसाद, और चिंता जैसी समस्याएँ आम हैं, विशेषकर कामकाजी महिलाओं और माताओं में, जिन्हें परिवार और कार्य जीवन के बीच संतुलन बनाना पड़ता है।

6. पोषण की कमी:

- महिलाओं में कुपोषण और एनीमिया जैसी समस्याएँ आम हैं, खासकर गर्भवती और स्तनपान कराने वाली महिलाओं में। उन्हें अक्सर पोषक आहार नहीं मिलता, जो उनके स्वास्थ्य को गंभीर रूप से प्रभावित करता है।
- विकासशील देशों में महिलाओं को परिवार के पुरुष सदस्यों की तुलना में कम पोषण मिलता है, जिससे उनकी शारीरिक क्षमता और जीवन की गुणवत्ता प्रभावित होती है।

7. स्वास्थ्य शिक्षा और जागरूकता की कमी:

- महिलाओं के बीच स्वास्थ्य शिक्षा और जागरूकता की कमी एक महत्वपूर्ण मुद्दा है। प्रजनन स्वास्थ्य, यौन स्वास्थ्य, और मानसिक स्वास्थ्य से जुड़ी जानकारी का अभाव अक्सर महिलाओं को सही समय पर स्वास्थ्य सेवाएँ लेने से रोकता है।

अध्ययन की सीमाएँ (limitations)

1. **डेटा संग्रह की कठिनाइयाँ:** कई बार महिलाओं से संबंधित सामाजिक स्वास्थ्य डेटा या तो अधूरा होता है या उसका रिकॉर्ड ठीक से नहीं किया गया होता है, खासकर विकासशील देशों में। इससे सही निष्कर्ष निकालने में दिक्कत आती है।
2. **सांस्कृतिक और सामाजिक बाधाएँ:** कुछ सांस्कृतिक और सामाजिक मान्यताओं के कारण महिलाएँ अपने स्वास्थ्य समस्याओं को खुलकर व्यक्त नहीं करती हैं, जिससे डेटा में त्रुटियाँ हो सकती हैं।
3. **भौगोलिक और आर्थिक असमानताएँ:** महिलाओं के सामाजिक स्वास्थ्य पर किए गए अध्ययन अक्सर शहरी क्षेत्रों पर अधिक ध्यान केंद्रित करते हैं, जिससे ग्रामीण क्षेत्रों में महिलाओं के स्वास्थ्य से संबंधित समस्याओं का पूरी तरह से अध्ययन नहीं हो पाता। सीमित वित्तीय संसाधनों के कारण कई बार अध्ययन बड़े पैमाने पर नहीं किया जा पाता, जिससे व्यापक निष्कर्ष निकालना कठिन हो जाता है।
4. **सामाजिक मान्यताओं का प्रभाव:** समाज में प्रचलित धारणाओं और भूमिकाओं के आधार पर महिलाओं के अनुभवों का सटीक आकलन नहीं हो पाता, जिससे अध्ययन में भ्रामक परिणाम आ सकते हैं।
5. **समय और संसाधनों की सीमाएँ:** सीमित समय के कारण कुछ शोध अध्ययन गहन विश्लेषण और अनुवर्ती अनुसंधान से वंचित रह जाते हैं, जिससे निष्कर्ष गहराई में जाने की बजाय सतही रह जाते हैं।

अध्ययन के निष्कर्ष

महिलाओं के सामाजिक स्वास्थ्य में आर्थिक, जातीय, और क्षेत्रीय आधार पर गहरी असमानताएँ पाई गई हैं। खासकर ग्रामीण क्षेत्रों और निम्न आर्थिक वर्ग की महिलाएँ शहरी और उच्च आय वर्ग की महिलाओं की तुलना में स्वास्थ्य सेवाओं तक कम पहुँच रखती हैं। महिलाओं पर पारिवारिक और सामाजिक दबाव उनके मानसिक स्वास्थ्य पर नकारात्मक प्रभाव डालता है। चिंता, अवसाद, और तनाव जैसी समस्याएँ महिलाओं में अधिक पाई जाती हैं, विशेषकर उन महिलाओं में जो पारिवारिक जिम्मेदारियों और कार्यस्थल के बीच संतुलन बनाने की कोशिश करती हैं। घरेलू हिंसा और यौन उत्पीड़न महिलाओं के शारीरिक और मानसिक स्वास्थ्य पर दीर्घकालिक नकारात्मक प्रभाव डालते हैं। हिंसा से पीड़ित महिलाएँ अवसाद, चिंता, और PTSD (पोस्ट-टॉमैटिक स्ट्रेस डिसऑर्डर) जैसी समस्याओं का सामना करती हैं। कुपोषण और एनीमिया जैसी समस्याएँ महिलाओं, खासकर गर्भवती और स्तनपान कराने वाली महिलाओं में आम हैं। पोषण की कमी महिलाओं के समग्र शारीरिक और मानसिक स्वास्थ्य को प्रभावित करती है, जिससे उनकी कार्यक्षमता और जीवन की गुणवत्ता पर भी असर पड़ता है। प्रजनन स्वास्थ्य, यौन स्वास्थ्य, और मानसिक स्वास्थ्य के बारे में जानकारी और जागरूकता का अभाव कई स्वास्थ्य समस्याओं का कारण बनता है। महिलाओं के सामाजिक स्वास्थ्य में सुधार लाने के लिए नीतिगत हस्तक्षेप और सामुदायिक स्तर पर जागरूकता बढ़ाने की आवश्यकता है। इसमें महिला-स्वास्थ्य केंद्रित नीतियाँ और सेवाओं तक पहुँच बढ़ाने के लिए विशेष कदम उठाने की सिफारिश की गई है। इन निष्कर्षों से यह स्पष्ट होता है कि महिलाओं के सामाजिक

स्वास्थ्य को बेहतर बनाने के लिए सामाजिक, आर्थिक, और नीतिगत सुधार आवश्यक हैं। विशेष रूप से जागरूकता, स्वास्थ्य सेवाओं तक पहुंच, और लैंगिक असमानता को दूर करने पर ध्यान देना होगा।

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AI IN TEACHER TRAINING: REVOLUTIONIZING PEDAGOGY FOR FUTURE EDUCATION

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Abstract:

Artificial intelligence (AI) refers to computer systems capable of performing complex tasks that historically only a human could do, such as reasoning, making decisions, or solving problems

Use of AI in education is transforming traditional teaching learning method. And it is also enhancing instruction methodology, personalizing learning experiences and improving the radius of educator overall reshaping the pedagogy in education field. This study also examines how AI tools can act as an aid in education by enhancing pedagogical strategies and accessibility to learning materials.

This study explores the transformative role of AI and its impact on pedagogy in current teaching practices. This survey focuses on understanding teachers perception of AI in their professional development. To understand its impact on teaching methods and challenges related with its implementation like limited knowledge of AI tools, educator resistance to technology adoption and the understanding to balance traditional teaching practices with innovative practices.

This survey will contribute to developing effective AI driving training, models and will well equipped educators with the essential skills in order to bridge the gap of evolving educational landscape. The study highlights the concerning role of AI in reshaping teacher education and informing the policy makers and educators on how AI used to create a more evolving, adaptive and student center teaching framework in diverse learning environment. And hence through exploring both theoretical and practical elements this survey contributes on going evolution of teacher preparation ensuring the need of today's diverse and inclusive learning communities.

The survey also focuses how AI is making teachers' teaching experiences more efficient and personalized by preparing their lesson plans, rubrics, organizing quiz and handouts. It also helps in generating narration, subject assessment and assignments etc.

Key words: AI-driven tools, teachers training, pedagogy, strategies.

Introduction:

The incorporation of Artificial Intelligence (AI) into teacher training programs is reshaping

education, bringing a significant transformation to the way educators are prepared. With classrooms becoming increasingly dynamic and technology-driven, teachers must adapt to the evolving demands of 21st-century education. Conventional teacher training methods primarily emphasize theoretical concepts and standardized instructional techniques, which may not adequately equip educators for diverse and rapidly changing learning environments. AI can help address this challenge by providing tailored training, instant feedback, and data-driven insights that enhance teaching effectiveness.

Artificial Intelligence (AI) is the replication of human intelligence in machines designed to process information, learn from data, and make informed decisions. It includes various technologies such as machine learning, natural language processing, and data analytics, which allow systems to recognize patterns, streamline tasks, and generate smart suggestions. In education, AI-powered tools play a crucial role in teacher training by providing interactive simulations, automated evaluations, and customized learning experiences tailored to meet the unique needs of educators.

The Integration of AI into teacher training empowers educators to adopt flexible teaching approaches, enhance student participation, and improve assessment techniques. By utilizing AI-powered tools like intelligent tutoring systems, virtual simulations, and automated assessment platforms, teacher preparation programs can become more engaging, effective, and student-focused. Moreover, AI-driven data analytics offer valuable insights into teaching performance, enabling educators to recognize areas that need improvement and refine their instructional strategies accordingly.

This study investigates how AI influences teacher training and its potential to transform teaching methods for future education. It explores how AI-based approaches can support professional growth, create tailored learning experiences, and provide teachers with the necessary skills to address contemporary educational challenges. Incorporating AI into teacher training programs can help institutions prepare educators to build inclusive, creative, and technology-driven learning environments for future generations.

Methodology : This research is mixed-methods, meaning it integrates both qualitative and quantitative approaches.

Participation Observation:

1. Survey of different teachers was conducted. Teachers from different sections were evaluated for the survey
2. Evaluation of engagement levels, adaptability and effectiveness in training environments.
3. Direct observation of teacher training sessions utilizing AI tools.

Survey and Questionnaire

1. Distribution of structural surveys among.....educators from various educational level.
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2. Collection of quantitative data on perceptions, ease of AI adoption and pedagogical impacts.
3. Use of likert scale items to evaluate confidence, usability and effectiveness.

Teachers Interviews

1. Semi- structured interviews conducted with selected educators from all the levels of the school
2. Analysis of qualitative responses to identify opportunities and challenges in AI- based training.
3. Exploration of teachers’ personal experiences with AI integration in professional development.

AI Tools Evaluation

1. Comparative assessment of AI-driven training against traditional methods.
2. Identification of features that support or hinder effective teacher development.

Ethical Considerations

1. Obtaining informed consent form all research participants.
2. Ensuring anonymity and confidentiality of participants data.
3. Adhering to ethical guidelines governing educational research.

This methodology is designed to offer an in-depth understanding of AI’s role in teaching training, highlighting it’s potential to reshape future educational practices.

Result and Discussion:

This section presents and analyzes the findings obtained from the study, integrating both qualitative and quantitative data to offer a holistic understanding of the role of AI in teacher training. The results are structured to highlight key patterns, challenges, and transformative impacts observed among educators across different educational levels, ranging from pre-primary to higher secondary.

The quantitative data, gathered through surveys and statistical analysis, provide measurable insights into the effectiveness, accessibility, and perceived benefits of AI-driven training programs. These findings reveal trends in teachers’ engagement with AI tools, their adaptability to new pedagogical methods, and the overall impact on their instructional strategies. The qualitative data, derived from in-depth interviews, further enrich these insights by capturing teachers’ lived experiences, perceptions, and concerns regarding AI integration. Their reflections shed light on the real-world challenges, opportunities, and evolving dynamics of AI-assisted teaching methodologies.

The discussion situates these findings within the broader context of existing literature, drawing comparisons with previous studies while also identifying gaps that require further exploration. By synthesizing the quantitative and qualitative perspectives, this section aims to

provide a nuanced understanding of how AI is shaping teacher education, the pedagogical shifts it facilitates, and the potential areas for further enhancement in training programs.

1. Awareness and Training in AI for Education

The survey results indicate that while a majority of teachers (80%) have heard of AI applications in education, formal training on AI remains limited. Only a small fraction of respondents (around 20%) have undergone structured AI training, highlighting a gap between awareness and preparedness. This suggests the need for institutional efforts to bridge the knowledge gap through professional development programs focused on AI integration in education. Teachers with prior exposure to AI training displayed a greater confidence level in implementing AI tools in their classrooms compared to those without formal training.

2. AI Tool Usage in Teacher Training

A significant portion of respondents reported using AI-powered tools in their teaching practice. The most commonly used tools include virtual teaching assistants (50%), AI-based lesson planning tools (40%), and AI-driven learning management systems (35%). However, many teachers noted that their usage remains sporadic, with only about 50% actively integrating AI into their teaching methods. Teachers with more years of experience in teaching were more hesitant to adopt AI tools, while younger educators appeared more open to experimenting with AI technologies. This generational gap in AI adoption highlights the necessity of targeted training strategies that cater to different levels of technological proficiency.

3. Perceived Effectiveness of AI in Teacher Training

When asked about AI's effectiveness in improving teacher training, the majority of participants (65%) rated it as either "Very Effective" or "Somewhat Effective." Responses suggest that AI enhances lesson planning, automates administrative tasks, and facilitates personalized learning experiences. However, a small percentage (15%) expressed neutrality, possibly due to a lack of hands-on experience with AI applications. Teachers who had used AI-driven tools more extensively reported that these technologies significantly improved their ability to tailor lessons to individual student needs, making learning more engaging and interactive. Additionally, some educators noted that AI's ability to analyze student performance data helped in designing targeted interventions for struggling students.

4. AI Integration in Teaching Practices

Among the respondents currently using AI in their classrooms, AI chatbots, smart content creation tools, and virtual assistants were the most commonly employed technologies. Teachers reported benefits such as enhanced student engagement, streamlined lesson preparation, and improved assessment capabilities. However, the adoption rate remains uneven, indicating barriers to consistent AI integration. Some educators faced institutional resistance or lacked access to adequate AI resources, while others struggled with integrating AI into their existing teaching

frameworks. Furthermore, teachers from urban schools were more likely to use AI tools compared to their counterparts in rural areas, suggesting disparities in technological access.

5. Benefits and Challenges of AI Adoption in Education

Teachers identified several advantages of AI in education, including time-saving features, automation of administrative work, and access to personalized teaching resources. AI's ability to facilitate virtual and interactive learning was also highlighted. On the other hand, key challenges included concerns about misinformation, lack of proper training, and the potential for AI to become a distraction rather than an aid. Some teachers pointed out that AI-generated content is not always accurate or contextually appropriate, necessitating constant supervision and fact-checking. Additionally, resistance from stakeholders, including school administrations and parents, posed a challenge to widespread AI adoption. Ensuring ethical AI usage and data privacy were also noted as critical considerations.

6. Future AI Training Needs

Participants emphasized the need for more structured AI training programs tailored for educators. Many teachers expressed interest in learning about tools like ChatGPT, AI-driven visual learning aids, and predictive analytics in education. Digital literacy and basic computer skills were identified as essential competencies for leveraging AI effectively in the classroom. Some respondents suggested that hands-on workshops and real-time demonstrations of AI tools would be more effective than theoretical training sessions. Furthermore, teachers stressed the importance of ongoing professional development to keep up with rapidly evolving AI technologies.

7. Perspectives on AI as a Mandatory Component in Teacher Training

Responses were mixed on whether AI should be a mandatory part of teacher training. While some educators (55%) supported its inclusion due to AI's potential in enhancing pedagogy, others were hesitant, citing concerns about accessibility and the reliability of AI-generated information. Some teachers worried that an overemphasis on AI training could overshadow traditional teaching methodologies. However, those in favor argued that AI literacy is becoming an essential skill in modern education and should be integrated into teacher training curricula.

Conclusion

The findings underscore the growing awareness of AI in teacher training but also highlight the need for comprehensive training initiatives. While AI tools have demonstrated tangible benefits in teaching and professional development, barriers such as inadequate training, resistance to technology, and concerns about accuracy need to be addressed to ensure more effective adoption in education. A collaborative effort between educational institutions, policymakers, and technology providers is necessary to facilitate AI integration in a way that enhances both teacher capabilities and student learning outcomes.

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BUILDING TOMORROW: HOWSKILL DEVELOPMENT AND VOCATIONAL TRAINING DRIVE SUSTAINABLE DEVELOPMENT**Hiren Hiranman Chaudhari,****And****Monika Yashwant Kshirsagar**

Abstract

In an era marked by rapid technological advancements and environmental challenges, the need for a sustainable future has never been more pressing. Skill development and vocational training play a pivotal role in empowering individuals and communities to adapt to these changes. This paper explores how targeted skill development initiatives can enhance employability, foster innovation, and promote sustainable practices across various sectors. By equipping individuals with the necessary skills, vocational training programs not only address unemployment but also contribute to economic resilience and environmental stewardship. The research emphasizes the importance of aligning educational curricula with industry needs, ensuring that the workforce is prepared for emerging job markets. It highlights successful case studies from around the world where skill development initiatives have directly contributed to sustainable development goals (SDGs). Additionally, the paper discusses the role of public-private partnerships in facilitating access to training programs, thereby increasing participation rates among disadvantaged groups. Through qualitative and quantitative analyses, the findings illustrate that a well-trained workforce is crucial for implementing sustainable practices, leading to enhanced productivity and reduced ecological footprints. Furthermore, the integration of green skills into vocational training programs is essential for fostering a culture of sustainability among future generations. In conclusion, this paper argues that by prioritizing skill development and vocational training, we can build a more sustainable future, ensuring that individuals are not only equipped for current employment opportunities but also prepared to tackle the challenges of tomorrow.

Keywords : Skill Development, Vocational Training, Sustainable Development, Economic Resilience, Green Skills

Introduction

The convergence of globalization and technological innovation has created a landscape characterized by rapid change and uncertainty. As nations strive for sustainable development, they are confronted with the dual challenge of ensuring economic growth while safeguarding environmental integrity. One of the most critical approaches to tackling this challenge lies in skill development and vocational education, which empower individuals to thrive in an evolving job

market. This paper aims to elucidate the fundamental role of skill development and vocational training in achieving sustainable development.

Skill Development and Vocational Training

Skill development refers to the process of acquiring specific abilities or competencies that enhance an individual's employability and productivity in the workforce. This process includes training in both hard skills (technical skills relevant to a specific job) and soft skills (such as communication, teamwork, and problem-solving). Vocational training, on the other hand, is a form of education that prepares individuals for specific trades or occupations. It typically focuses on practical skills and knowledge applicable in the workplace. This training can take various forms, including:

Apprenticeships: On-the-job training where individuals learn skills under the supervision of experienced workers

Technical Schools: Institutions that specialize in training students in specific trades, such as plumbing, carpentry, or healthcare.

College Programs: Often offer certificate and diploma programs that provide vocational skills.

Skill India Mission

The Skill India Mission, launched in July 2015 by the Government of India, is a flagship initiative aimed at creating an empowered workforce with the necessary skills to meet industry demands and drive economic growth. The mission seeks to provide a comprehensive framework for enhancing the quality of skill development in India.

Objectives of the Skill India Mission:

1. **Increase the Number of Skilled Workers:**

The mission aims to train over 400 million individuals in various skills by 2022, addressing the increasing demand for skilled labour in the workforce.

2. **Promote Vocational Training:**

It encourages the establishment of vocational training centres and partnerships with institutions to ensure access to skill training across the country.

3. **Align Training with Industry Needs:**

Skill India aims to align the skill training programs with the requirements of various industries, ensuring that individuals are ready to meet the expectations of employers.

4. **Foster Entrepreneurship:**

The mission encourages entrepreneurship by providing individuals with the skills and resources necessary to start their own businesses.

5. **Promote Inclusivity:**

Skill India targets disadvantaged groups, including women, rural youth, and individuals from economically weaker sections, to ensure equitable access to skill development opportunities.

Objectives of the study

1. To analyse the relationship between skill development, vocational training, and sustainable development.
2. To highlight successful case studies and best practices from around the globe.
3. To assess the significance of public-private partnerships in skill development initiatives.
4. To explore the integration of green skills into vocational training programs.
5. To provide systematic recommendations for enhancing the impact of vocational training on sustainable development.

Need for Skill Development and Vocational Training**High Unemployment Rates:**

Many young people and marginalized groups lack the necessary skills to enter the workforce, where vocational training can provide immediate pathways to employment.

Technological Advancements:

Rapid changes in technology create a demand for skilled workers capable of operating in innovative environments. This necessitates relevant training programs to help workers adapt.

Environmental Challenges:

As industries increasingly focus on sustainability, there is a pressing need for individuals skilled in environmentally friendly practice

Importance of Skill Development and Vocational Training

1. **Enhancing Employability:** Skill development increases employability by equipping individuals with in-demand skills aligned with industry requirements. By focusing on skill development, individuals can improve their qualifications, making them more attractive to employers and lessening unemployment rates.
2. **Fostering Economic Resilience:** A skilled workforce contributes to economic growth and stability by driving innovation and productivity. A skilled workforce can better respond to economic downturns and shifts in market demand. This promotes stability and growth.
3. **Promoting Sustainability:** Training focused on green skills promotes environmentally friendly practices, reducing ecological footprints. Training tailored around sustainable practices encourages workers to adopt eco-friendly habits in their professional roles, contributing to environmental goals.
4. **Empowering Disadvantaged Groups:** Vocational training can bridge the gap for marginalized communities, offering opportunities for social mobility. Vocational training initiatives specifically targeting underserved communities can bridge societal gaps and provide crucial opportunities for upward mobility.

Key Components of the Skill India Mission:

Pradhan Mantri Kaushal Vikas Yojana (PMKVY):

A flagship scheme under the Skill India Mission, PMKVY provides financial incentives to candidates undergoing skill development training and ensures that the training is aligned with the needs of the industry.

2. National Skill Development Corporation (NSDC): NSDC acts as a facilitator and funder of skill development initiatives in the country, partnering with various organizations to increase access to quality training.

3. Sector Skill Councils (SSCs): These councils represent specific sectors and are responsible for defining the skill requirements and creating National Occupational Standards that guide the training processes.

4. Skill Development Centres:

The mission focuses on establishing Centres of Excellence that provide high-quality training in specific industries, ensuring that programs are relevant and effective.

5. Outreach and Awareness: The initiative emphasizes outreach programs to raise awareness about the importance of skill development and vocational training among potential candidates, especially in rural areas.

Analysis of Successful Case Studies

Several initiatives around the world exemplify the successful integration of skill development and vocational training with sustainable practices:

Germany's Dual Education System: Focuses on combining vocational training with hands-on experience, resulting in low youth unemployment rates and a robust economy. Integrating classroom education with practical work experience has resulted in low youth unemployment and a well-matched labour market.

India's Skill India Initiative: Aims to provide skill training to millions of individuals, promoting entrepreneurship and sustainable employment. Launched to strengthen vocational training for millions, it aims to create a competent workforce and promote entrepreneurship among the youth.

Green Skills Training in Australia:

Programs designed to integrate environmental education into vocational training have led to a rise in eco-friendly job opportunities. Programs designed to promote eco-friendly skills have significantly impacted employment opportunities while advocating for sustainability.

Skill development and vocational training play a crucial role in promoting sustainable development practices. As the global focus on sustainability intensifies, the need for a workforce equipped with relevant skills becomes increasingly important. Here are some key points highlighting this significance:

1. Alignment with Sustainable Development Goals (SDGs):

Vocational education and training systems are essential for achieving the Sustainable Development Goals. They must adapt to meet the evolving needs of the economy and society, preparing students with the skills necessary for sustainable practices. This alignment ensures that the workforce can contribute effectively to sustainable initiatives across various sectors.

2. Addressing Environmental Challenges:

The urgency of environmental issues, such as climate change and biodiversity loss, necessitates a workforce that is knowledgeable about sustainable practices. Vocational training can equip individuals with the skills to implement environmentally friendly practices in their respective fields. This is vital for fostering a culture of sustainability within industries.

3. Economic Empowerment and Job Creation:

Effective vocational training programs enhance employability by providing practical skills tailored to specific industries. This not only improves individual job prospects but also contributes to economic growth by creating a skilled workforce that can drive innovation and efficiency. Moreover, programs that integrate practical experience and soft skills training have shown to improve labour market outcomes significantly.

4. Promoting Social Inclusion

Skill development initiatives can empower marginalized groups by providing them with the necessary tools to participate in the economy. This inclusivity is essential for sustainable development, as it ensures that all segments of society can contribute to and benefit from economic growth.

5. Fostering Lifelong Learning:

The dynamic nature of the job market requires continuous skill development. Vocational training encourages a culture of lifelong learning, enabling individuals to adapt to changing technologies and practices. This adaptability is crucial for maintaining a sustainable workforce that can respond to new challenges and opportunities.

skill development and vocational training are integral to advancing sustainable development practices. By equipping individuals with the necessary skills, these programs not only enhance employability but also contribute to environmental sustainability, economic growth, and social inclusion.

Educational Implications

To effectively support sustainable development, educational institutions must:

Align Curriculum with Industry Needs: Ensuring that programs are relevant and responsive to the changing demands of the job market. Collaboration with industries is essential for developing relevant programs that meet market demands.

Promote Lifelong Learning: Encouraging continuous skill development to adapt to technological advancements. Encouraging continuous education ensures workers can adapt to

changing technologies and practices.

Integrate Green Competencies: Adding sustainability concepts into core training programs to foster environmentally responsible practices. Educational programs should include sustainability as a core aspect, fostering environmentally responsible citizens.

Suggestions

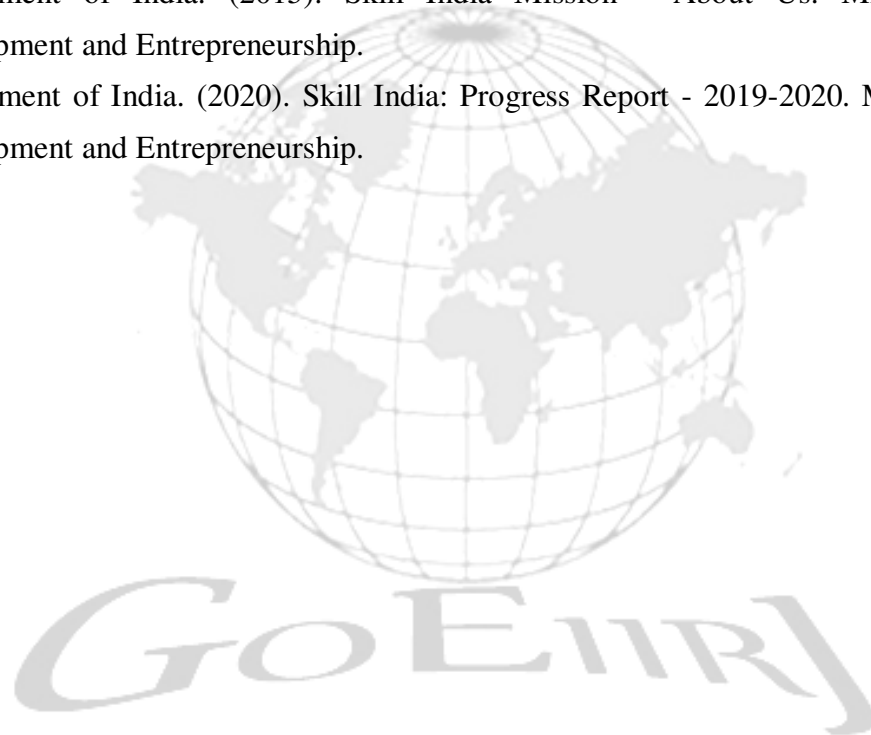
1. **Strengthening Public-Private Partnerships:** Collaborate with industries to design and implement training programs that reflect real-world applications. Collaboration between governments and businesses can lead to training programs that are effective and aligned with current job market needs.
2. **Increased Funding for Skill Development Initiatives:** Governments and organizations should prioritize funding for vocational training programs to expand outreach, especially among disadvantaged populations. Investments in skill development initiatives are crucial for expanding opportunities, especially for marginalized groups.
3. **Regular Assessment and Evolution of Training Programs:** Continually evaluate and update curricula to reflect the latest industry standards and sustainable practices. Continuous evaluation will help in updating curricula to reflect the latest industry trends and sustainable practices.

Conclusion

Skill development and vocational training are fundamental to building a sustainable future. By equipping individuals with the skills required for today's job market and instilling a culture of sustainability, societies can achieve economic resilience and environmental stewardship. As outlined, prioritizing these initiatives can significantly impact sustainable development, ensuring individuals are not only prepared for immediate employment opportunities but also equipped to tackle the challenges of the future. The conclusion reiterates the importance of prioritizing skill development and vocational training as essential components of sustainable development efforts. By equipping individuals with relevant skills, societies can achieve both economic and environmental goals, preparing the workforce not just for today but for future challenges. The paper advocates for a collective, purposeful approach in this regard, with an emphasis on collaboration, investment, and adaptation. Skill development and vocational training are imperative for meeting the workforce demands of today and tomorrow. The Skill India Mission represents a comprehensive approach to building a skilled labour force, addressing both economic and social dimensions of development. By enabling individuals to acquire relevant skills, the initiative not only contributes to personal empowerment but also plays a critical role in the broader goals of sustainable economic growth and environmental stewardship. Continued government support, public-private partnerships, and a focus on quality will be essential for the mission to fulfil its objectives and drive lasting change.

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Transforming Teacher Training With AI: Shaping The Future Of Pedagogy**Khushbu Halpati***Alumni**SSR College of Education, Sayli, Silvassa.*

Abstract

The incorporation of Artificial Intelligence (AI) in teacher training has the potential to profoundly transform the education sector, particularly in India. In alignment with the seminar theme, "Integrating Wisdom and Technology: Indian Knowledge System, AI, and Human Resilience for a Sustainable Future," this paper investigates how AI can serve as a transformative tool in the preparation of future educators while remaining congruent with the principles of the Indian Knowledge System (IKS). By exploring the role of AI in contemporary pedagogy, its compatibility with traditional wisdom, and its capacity to promote human resilience, this paper aims to propose a comprehensive framework for integrating AI into teacher training programs. The discussion focuses on AI-driven personalized learning, the enhancement of teacher-student interactions, and the development of emotional intelligence and ethical awareness, all essential for fostering a sustainable future in education.

Keywords: Artificial Intelligence (AI) Teacher training, Indian Knowledge System (IKS), Pedagogy, Sustainable future in education, Integration of WISDOM AND TECHNOLOGY

Introduction

In an era characterized by rapid technological advancements, traditional educational paradigms are undergoing significant transformation. The emergence of Artificial Intelligence (AI) is revolutionizing various sectors, with education being no exception. As the global education system grapples with challenges such as adapting to diverse learning needs, ensuring accessibility, and enhancing teacher effectiveness, AI presents a promising solution. Specifically, for future educators in India, AI offers innovative approaches to address these challenges while incorporating the time-honored wisdom of the Indian Knowledge System (IKS). This integration of AI and IKS has the potential to foster a resilient and sustainable educational ecosystem for the future.

India, with its rich heritage of knowledge and wisdom, provides a unique opportunity to combine modern technological advances with traditional educational practices. The Indian Knowledge System emphasizes holistic development, moral values, and a deep understanding of human potential, offering a solid foundation for a more effective teacher training model.

This paper explores the transformative role of AI in teacher training, focusing on how it can revolutionize pedagogy for future educators. It examines the synergy between IKS and AI, highlighting the combined potential of these approaches in cultivating resilient, technologically

proficient, and ethically grounded educators for the 21st century.

The Role of AI in Teacher Training

Personalized Learning :AI's primary advantage in teacher training lies in its capacity to offer personalized learning experiences. Traditional teacher training programs often struggle to meet the varied needs of individual trainees, but AI has the ability to bridge this gap. By leveraging machine learning algorithms and data analytics, AI can assess each trainee's strengths and weaknesses, adapt content accordingly, and deliver real-time feedback. This personalized approach enhances the overall effectiveness of teacher training programs.

For example, AI-powered platforms can provide customized resources and lesson plans that are tailored to the unique teaching style and strengths of the trainee. Moreover, AI can facilitate competency-based training, enabling teachers to progress at their own pace while addressing areas that require improvement. This fosters a culture of continuous learning and professional growth, ensuring that future educators are well-prepared to address the complexities of modern classrooms.

Enhancing Pedagogical Skills

AI-driven technologies have the potential to significantly enhance pedagogical skills by offering simulations and virtual classrooms. These technologies provide trainees with immersive, hands-on experiences in classroom management, instructional design, and student engagement. AI-powered platforms enable teacher trainees to interact with virtual students in a variety of scenarios, thereby developing problem-solving, communication, and decision-making skills in real-time. Such platforms also create a safe environment for experimentation, allowing trainees to test various teaching strategies and analyze student responses without the risk of negative consequences for real students. By incorporating AI into teacher training, the quality of pedagogical skills among future educators can be substantially improved.

AI in Teacher-Student Interaction

AI can play a pivotal role in improving teacher-student interactions by providing intelligent systems that track and analyze student behavior, engagement, and learning patterns. AI-powered tools such as chatbots, virtual assistants, and personalized learning applications can assist teachers in managing large classrooms, providing individualized attention, and meeting the diverse needs of students.

By incorporating AI into teacher-student interactions, educators can focus more on cultivating meaningful relationships with students, while AI handles routine administrative tasks. This shift enables teachers to devote more time to mentoring, emotional support, and personalized feedback, thereby enhancing the overall learning experience.

Integrating the Indian Knowledge System with AI in Teacher Training

Wisdom of the Indian Knowledge System (IKS) :

The Indian Knowledge System is founded on values such as holistic development, ethical

conduct, and the cultivation of wisdom. IKS places a strong emphasis on the development of both cognitive and emotional intelligence, the importance of experiential learning, and the fostering of resilience in the face of challenges. These values provide a rich foundation for AI-based teacher training programs, which often focus predominantly on technical skills and cognitive development. To integrate IKS with AI, teacher training programs can incorporate traditional Indian wisdom, such as the principles of Dharma (righteousness), Karma (action), and Sankhya (knowledge), alongside AI tools that promote personalized learning, data analytics, and emotional intelligence. By blending these approaches, future educators can develop both intellectual and ethical maturity, enabling them to navigate the complexities of modern education while remaining grounded in time-honored values.

Ethical Implications of AI in Education:

A core aspect of IKS is the emphasis on ethics and morality. When applied to the context of AI in education, it is critical to consider the ethical implications of using technology in this domain. AI algorithms may inadvertently reinforce biases or marginalize certain groups, making it essential to design AI systems that promote fairness, equity, and inclusivity. To address these concerns, teacher training programs must incorporate discussions on the ethical use of AI in education. Educators should be trained to critically assess AI-driven tools and understand their potential impact on students' lives. Furthermore, integrating IKS into AI-based teacher training can encourage educators to approach technology with a deep sense of responsibility, ensuring that AI is used to enhance human well-being rather than diminish it.

Incorporating Ancient Pedagogical Approaches: AI can be used to digitally document and incorporate traditional Indian pedagogical methods such as the Gurukul system, where teachers focused on personalized, holistic learning. AI tools can help adapt these methods for modern classrooms, encouraging self-directed learning and experiential teaching.

Using AI to Preserve Indian Knowledge Systems: AI can be employed to digitize and categorize ancient texts, scriptures, and philosophies (like Vedas, Upanishads, and Patanjali's Yoga Sutras). These can be made accessible to teachers worldwide for deeper integration into curricula, helping them understand how traditional Indian wisdom can complement modern teaching.

Personalized Learning Based on Indian Philosophies: AI can facilitate adaptive learning, helping educators provide individualized attention to students based on their learning needs. This mirrors the Indian philosophical idea of **individualized Dharma** (duty), where a teacher tailors lessons to the unique nature and needs of the learner.

Promoting Emotional Intelligence and Mindfulness: Integrating AI-driven tools to teach and assess emotional intelligence, meditation, and mindfulness can align with India's rich tradition of mental discipline and self-awareness, as seen in practices like **Vipassana** or **Yoga**. These skills can

be incorporated into teacher training to enhance classroom management and create emotionally intelligent educators.

Blending Traditional Values with Modern AI Tools: Teacher training programs can include modules where AI-driven tools help explore traditional Indian values such as respect for diversity, non-violence (Ahimsa), and the interconnectedness of all life (VasudhaivaKutumbakam). AI can simulate scenarios that allow teachers to practice how to instill these values in students.

AI-Assisted Analysis of Indian Texts: AI tools can help teachers better understand ancient Indian texts through natural language processing (NLP). For instance, AI could analyze texts like the **Bhagavad Gita** or **Arthashastra** and provide insights, patterns, and interpretations that can be used in classrooms for discussions on ethics, governance, and leadership.

Cultural Sensitivity in AI-Based Teacher Training: AI systems can be designed to include cultural contexts that are rooted in Indian traditions, helping teachers recognize and respect cultural diversity in their classrooms. These tools can also simulate real-life classroom situations where educators can practice resolving cultural issues, using the Indian value system as a guide.

Collaborative Platforms for Global Sharing of IKS and AI Knowledge: AI can facilitate global collaborations where educators across the world can access training content based on the Indian Knowledge System. This could lead to the formation of online platforms for sharing knowledge that blends Indian educational philosophies with AI innovations, ensuring a diverse and inclusive educational framework.

AI and Human Resilience in Education

Building Emotional Intelligence

Human resilience is crucial for ensuring the sustainability of education, and AI can play a pivotal role in developing emotional intelligence (EI) among educators. Emotional intelligence refers to the capacity to recognize, understand, and manage one's own emotions, as well as those of others. Teachers with high EI are better equipped to address the challenges of student engagement, conflict resolution, and fostering a positive learning environment.

AI-powered tools can support EI development by providing real-time feedback on teachers' emotional responses during interactions with students. For example, AI platforms can analyze facial expressions, tone of voice, and body language to assess emotional states, helping educators become more self-aware and empathetic. By integrating AI with EI development, future educators can cultivate the emotional resilience necessary to navigate the pressures of teaching.

Enhancing Teacher Well-being

Teacher well-being is closely linked to their ability to provide effective education. AI can support teacher well-being by reducing administrative burdens and offering personalized wellness resources. AI systems can assist educators in managing their workload, provide stress-relief

techniques, and promote work-life balance. Additionally, AI tools can help identify early signs of burnout, enabling timely interventions to ensure teachers remain resilient and motivated.

Promoting Lifelong Learning: AI helps create opportunities for continuous learning, giving students the freedom to access educational resources and courses beyond the traditional classroom. This flexibility encourages students to adopt a growth mindset and build resilience by taking control of their own learning journey, continuously acquiring new knowledge and skills to stay relevant in an ever-changing world.

Enhancing Collaborative Learning: AI-powered tools can bring students together, enabling collaboration with peers, mentors, and experts from all over the world. This creates a supportive learning environment, where students not only strengthen their academic resilience but also develop key skills like teamwork, problem-solving, and adaptability—traits essential in today's interconnected digital world.

Data-Driven Insights for Early Intervention: With its ability to analyze vast amounts of data, AI can help educators spot early signs of student disengagement or struggles. By offering actionable insights into both academic performance and emotional well-being, AI empowers teachers to intervene before issues escalate, offering timely support that builds resilience in students facing challenges.

Equity and Inclusivity: AI has the potential to level the playing field by providing personalized learning tools for students with diverse needs, such as those with disabilities or language barriers. This commitment to inclusivity fosters a more resilient education system, ensuring that all students, regardless of their background, have the resources and support they need to succeed.

Ethical Considerations and Human Oversight: As AI becomes an integral part of education, it's crucial to address ethical concerns like data privacy, algorithmic bias, and decision-making transparency. Keeping human oversight in place is essential to ensure that AI serves as a trusted tool in education, upholding fairness and accountability to maintain resilience and trust in the system.

Fostering Autonomy and Self-Regulated Learning: AI encourages students to take charge of their own learning by providing them with the tools to set personal goals, track their progress, and adjust their learning strategies. This fosters resilience by giving students the confidence and independence to navigate obstacles and continuously grow, both in their academic and personal lives.

Overcoming Resistance to Change: Introducing AI in education can be met with resistance due to fears around job displacement, reliability, or concerns about losing the human touch in teaching. Overcoming this resistance requires addressing these concerns through clear communication, training, and support, ensuring that AI is viewed as an ally that enhances, rather than replaces, the human aspect of education.

Conclusion

The integration of AI in teacher training represents a transformative step toward creating a more efficient, resilient, and ethically grounded educational ecosystem. By combining AI's capabilities with the wisdom of the Indian Knowledge System, a teacher training model can be developed that not only enhances technical proficiency but also fosters emotional intelligence, ethical values, and human resilience.

This convergence of technology and tradition offers immense potential to shape the educators of the future—those who are not only technologically adept but also firmly rooted in the moral and philosophical wisdom that has long been the cornerstone of India's educational heritage. As we work toward a sustainable future, it is essential to strike a balance between AI and human qualities, ensuring that future educators are equipped to meet the challenges of a rapidly evolving world while upholding the enduring values of wisdom, compassion, and resilience.

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**AI AND MODERN EDUCATION: IMPLEMENTING NEP 2020 FOR FUTURE
LEARNING****Dr. Ashish Sharad Gurav***Ashoka International Centre for Educational
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Abstract:

Artificial Intelligence has entered in Human life and education is no exception for it. AI has both the sides – positive and negative when it comes to implementation. Education is a continuous and life long process but when it starts the students age group is very small to handle, balance and manage the AI consequences with respect to values, physical as well as mental health. AI is extending as per the requirements of human being means it developed towards the fulling the needs of people. As we search, type or find any new concept on Google. The same thing is done by AI tools. What did people search on different sites the same content or material related to it is developed.

Key words: AI, Modern education, future learning:**Artificial intelligence**

(AI) refers to intelligence demonstrated by machines, especially computer systems, in its most general form. It is a domain of study within computer science that creates and examines techniques and software allowing machines to sense their surroundings and apply learning and intelligence to perform actions that enhance their likelihood of reaching specified objectives. These devices might be referred to as AIs. Notable applications of AI encompass sophisticated web search engines (like Google Search); recommendation systems (employed by YouTube, Amazon, and Netflix); virtual assistants (such as Google Assistant, Siri, and Alexa); self-driving cars (e.g., Waymo); generative and creative software (like ChatGPT and AI art); and enhanced play and analysis in strategic games (e.g., chess and Go). Many AI applications are not recognized as AI: "Much of the advanced AI has integrated into everyday applications, frequently without being identified as AI, since once something becomes sufficiently useful and widespread, it no longer bears the AI label."

Various subfields of AI research are centred around particular goals and the use of particular tools. The traditional goals of AI research include reasoning, knowledge representation, planning, learning, natural language processing, perception, and support for robotics.[a] General intelligence—the ability to complete any task performed by a human on an at least equal level—is among the field's long-term goals. To reach these goals, AI researchers have adapted and integrated a wide range of techniques, including search and mathematical optimization, formal logic, artificial

neural networks, and methods based on statistics, operations research, and economics.[b] AI also draws upon psychology, linguistics, philosophy, neuroscience, and other fields. Artificial intelligence was founded as an academic discipline in 1956 and the field went through multiple cycles of optimism throughout its history, followed by periods of disappointment and loss of funding, known as AI winters. Funding and interest vastly increased after 2012 when deep learning outperformed previous AI techniques. This growth accelerated further after 2017 with the transformer architecture and by the early 2020s many billions of dollars were being invested in AI and the field experienced rapid ongoing progress in what has become known as the AI boom. The emergence of advanced generative AI amid the AI boom and its ability to create and modify content exposed several unintended consequences and harms in the present and raised concerns about the risks of AI and its long-term effects in the future, prompting discussions about regulatory policies to ensure the safety and benefits of the technology.

Modern Education, formerly known as Intel Education, is a cram school located in Hong Kong. In 1988, Ken Ng Kam-Lun founded it. The Education Bureau claims that at its height, there were 14 branches spread throughout the New Territories, Kowloon, and Hong Kong Island. After being liquidated in 2020, it only has one branch in Tsuen Wan as of 2024. Primary and secondary students pursuing the Hong Kong Diploma of Secondary Education are the target audience for the school's curriculum. When the school listed on HKEx in 2011, it became the first of its kind to go public. Ken Ng Kam-Lun, an English teacher at Modern Education, is the group's founder and largest shareholder.

Cars with sophisticated software can adapt their guidance systems to changing road conditions, driving conditions, and weather by learning from the experiences of other vehicles on the road. Policy, regulatory, and ethical issues These examples from a variety of sectors demonstrate how AI is transforming many walks of human existence. The increasing penetration of AI and autonomous devices into many aspects of life is altering basic operations and decision making within organizations, and improving efficiency and response times. At the same time, though, these developments raise important policy, regulatory, and ethical issues. For example, how should we promote data access? How do we guard against biased or unfair data used in algorithms? What types of ethical principles are introduced through software programming, and how transparent should designers be about their choices? What about questions of legal liability in cases where algorithms cause harm?

AI depends on data that can be analysed in real time and applied to real-world problems; having data that are "accessible for exploration" in the research community is a prerequisite for successful AI development. A McKinsey Global Institute study found that countries that support open data sources and data sharing are the ones most likely to see AI advancements.

Legal responsibility: There are questions concerning the legal responsibility of AI systems. If in the case of driver -free cars, there are damage or violations (or dead, algorithm operators will probably be online with the rules of product quality. A set of case law shows that facts and circumstances of the situation determine liability and influence the type of sanctions imposed. These become important cases of legal liability, from civil fines for serious damages related to Uber in Arizona to imprisonment. The state actively recruited Uber to test its autonomous vehicles and gave the company considerable latitude in terms of road testing. It remains to be seen if there will be lawsuits in this case and who is sued: the human backup driver, the state of Arizona, the Phoenix suburb where the accident took place, Uber, software developers, or the auto manufacturer. Given the multiple people and organizations involved in the road testing, there are many legal questions to be resolved.

In areas without transportation, digital platforms often take limited liability for what is happening on the site. For example, in the case of Airbnb, the company "requires people to waive their right to present court or to participate in arbitration of class or class action lawsuits." By requesting users to donate basic rights, the company limits consumer protection and therefore limits its ability to deal with discrimination arising from unfair algorithms, but the principles of neutral networks in many sectors have not yet been decided extensively.

There may be state private partnerships that combine government sets with commercial data to increase the efficiency of the system. For example, cities could integrate information from ride-sharing services with its own material on social service locations, bus lines, mass transit, and highway congestion to improve transportation. That would help metropolitan areas deal with traffic tie-ups and assist in highway and mass transit planning.

According to the promoters of the law, city officials want to know how these algorithms work and ensure that IA is fully transparent and responsible. Furthermore, he was concerned about the fairness and bias of AI algorithms, so the working group was responsible for analyzing these issues and making recommendations for future use. By the end of 2019, he is expected to have to report to the mayor on many IA policy issues, legal and normative actions. Some observers are already afraid that the target group will not progress well and are following responsible algorithms. For example, Julia Powles of Cornell Tech and the University of New York argues that the bill originally obliged companies to put the source code of the AI available to the public for inspection, and that there are simulations of its decision by using real data. However, after criticizing these provisions, former city councilor James Vacca abandoned the requirements in favor of a student working group these questions. He and other city officials were concerned that the release of their own information about the algorithm would slow down, making it difficult to find AI suppliers working with the city. It remains to be seen how this local target group will balance the issue of innovation, confidentiality and transparency.

Yet, most experts, regardless of whether they are optimistic or not, expressed concerns about the long-term impact of these new tools on the essential elements of being human. All the respondents of this non-sceniusaginte were invited to clarify why they considered that AI would leave people better or not. Many have shared deep concerns, and many have also proposed means of decisions. The main themes they have struck on threats and remedies are described in the table that accompanies it. In Higher Education, NEP, 2020 provides valuable insights and recommendations on various aspects of education that include moving towards multidisciplinary and holistic education, institutional autonomy, promotion of quality research through establishment of National Research Foundation, continuous professional development of teachers, integration of technology, internationalization of higher education, restructuring of governance and regulatory architecture, multidisciplinary curricula, engaging blended, pedagogy, valid reliable and blended assessment and availability of content in Indian languages. The policy is expected to bring long-lasting positive impact on the education system and making India a global hub of skilled manpower during the 'Amrit Kaal', the next 25 years leading up to Developed India in 2047. Its implementation requires collective efforts of the Center, state, UTS, EIS, institutional/regulatory organisations and all other relevant parties.

There is also the introduction of the Academic Bank of Credit Bank (ABC), which serves as a digital repository for credits. As part of this system, students can save credits earned during their academic journeys. If you decide to get out of the program after completing a certain period, the credits will be retained by them. And if they decide to return to study after a break, they can start from where they left with saved credits. The ABC also facilitates the transfer of these credits between the various facilities. This means that students can now reach from an institution, from one university to another. ABC is in line with the international credit system. This helps students advance their credits won at foreign universities abroad and allows students to adapt their study programs to meet their own needs. This flexibility will help students discover their true potential. Vocational training and skill development According to National Enterprise Skills Development (NSDC), students' vocational training increases employment levels by 50% to 70% after completion of the programme. This is a much higher percentage compared to employment levels after traditional programs are completed.

Industrial cooperation in these specialized programs also contributes to the employment of a skilled workforce. According to the National Employment Report (2019), over 55% of graduates who have been trained with a professional diploma or industrial cooperation find work within six months of the end of the course. In India, only 5% of the total number of students aged 19 to 24 years old receive some kind of vocational training or education. This speed is much higher in developed countries. Germany has over 75% of students receiving specialized education.

To eliminate this skill gap, Medhavi University Skills (MSU) was created to work with industry partners to introduce integrated higher education skills to help young people across India better employment. It is the first skill university in India to offer an immersive industrial research programme in the overall development of NEP 2020. Currently, as part of MSU's SAGE initiative, students who prefer manufacturing and want to start their own business have access to a specialized diploma program. These programs are organized in collaboration with industrial partners to provide students with practical training in industrial facilities. Focus on overall development: NEP 2020 focuses on training the wealthy people. This promotes overall development, promoting physical training, mental health and creative activities. For example, now a student can choose to take fine arts as a major but also choose to go for sports as a minor subject. This gives students the opportunity to express themselves. This can also increase their confidence and increase them much overall.

Educational technology: Technology plays a key role in NEP 2020. It aims to integrate technology into education systems. Online courses, digital resources, mixed approaches to training, and smart classrooms are currently part of the educational environment. Students can now study better thanks to video and interactive content. Thanks to a greater number of technological resources, they can access the set of information. This makes your training more attractive and comfortable. Furthermore, NEP 2020 focuses primarily on overcoming the digital sector that exists in the country. Thanks to initiatives such as Swayam, Diksha and NEP 2020, we aim to expand our electronic training capabilities and create more digital content libraries.

Inclusive education: Inclusivity is another important aspect of NEP 2020. This policy aims to ensure that all students have access to quality education regardless of their background. For example, students with hearing impairment face problems to understand traditional class concepts can easily learn and implement as part of the new NEP 2020 teaching format. There are now more resources and support systems for students with disabilities. This means more accessible classrooms and tailored learning materials for everyone. A quick look at how the National Education Policy 2020 (NEP 2020) has changed the higher educational landscape in India:

NEP 2020 brings on the table something for every stakeholder within the education domain. It offers flexibility to students, more autonomy for teachers and universities, fill the gap between the academic world and industry. Education for professionals working under NEP 2020 NEP 2020 encourages continuous learning and uses opportunities to enhance or reskill yourself through flexible short courses, diplomas and degree programs that can be pursued without career breaks. Through collaboration between universities and industry, these programs are more relevant to career growth. One of these programs is the MBA (A-MBA) acceleration ability as part of the University of Medhavi, the Center for Giving Skilling & Extension (Crux). This program is developed in accordance with the Guiding Principles of NEP 2020. It has a futuristic curriculum combining

the best features of top online MBA programs, traditional MBA programs and executive MBA programs. It also takes into account work experience and converts it into credits through evaluation. This allows experts to find better online or executive MBA programs to complete their MBA in 15 months. It is a UGC recognized work integrated, regular, full-time and fast-track MBA for working professionals which is equivalent to any other 2-year MBA program in India offering two Government of India recognized skill certificates.

The Road Ahead

So, how will the NEP 2020 impact higher education in the near future? NEP 2020 offers many exciting opportunities, but challenges remain. Implementing such a complete policy in a vast country like India requires time and effort. Schools, universities and universities need to adapt quickly. But politics offers a promising vision. This promotes creativity, flexibility, inclusion and education with a focus on skill development. NEP 2020 opens the door for students to explore their passion and develop future skills. This represents a change in the way we think about education. It's no longer about degrees.

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SIMILARITIES AND DIFFERENCES BETWEEN NATIONAL EDUCATION POLICY 2020 AND GURUKUL'S TEACHING METHODOLOGY

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Abstract

Education has always been a cornerstone of societal development, evolving overtime to adapt to changing needs and technological advancements. The National Education Policy (NEP) 2020, introduced by the Government of India, aims to overhaul the existing education system by emphasizing holistic learning, flexibility, and skill development. Interestingly, several aspects of NEP 2020 align with the traditional Gurukul teaching methodology, which was prevalent in ancient India. This paper explores the similarities and differences between these two educational approaches, highlighting their core philosophies, teaching methods, and outcomes.

Both NEP 2020 and the Gurukul system emphasize holistic education, integrating moral values, critical thinking, and experiential learning. The Gurukul system followed a teacher-centric, immersive learning approach where students lived with their guru and learned through real-life experiences, discussions, and practical application of knowledge. Similarly, NEP 2020 encourages experiential learning, multidisciplinary education, and critical thinking, promoting an education system that moves beyond rote memorization.

Another key similarity lies in the emphasis on personalized learning. In the Gurukul system, education was tailored to the individual needs of students, allowing them to learn at their own pace under close guidance. NEP 2020 also advocates for competency-based learning and flexibility in subject selection, ensuring that students can pursue their interests and strengths rather than following a rigid curriculum. Despite these similarities, significant differences exist. The Gurukul system primarily focused on oral transmission of knowledge and was deeply rooted in spiritual and philosophical teachings. It relied on an informal, apprenticeship-like model with a strong emphasis on discipline and the guru-shishya (teacher-student) bond. In contrast, NEP 2020 incorporates modern technological advancements, standardized assessments, and structured curricula while promoting digital learning, which was absent in the traditional Gurukul system. Furthermore, the Gurukul system was largely limited to a specific demographic, often excluding marginalized communities, whereas NEP 2020 aims for inclusivity, ensuring universal access to education irrespective of socio-economic backgrounds. It integrates modern scientific advancements and vocational training, preparing students for contemporary global challenges while retaining cultural and ethical values. In conclusion, while NEP 2020 and the Gurukul teaching methodology share common goals of holistic and

value-based education, their approaches differ significantly due to historical and contextual changes. NEP 2020 modernizes traditional principles by integrating technology, inclusivity, and flexibility, making education more accessible and aligned with the needs of the 21st century.

Keywords: Gurukul system, NEP 2020, competency-based learning.

Introduction

The National Education Policy (NEP) 2020 and the traditional Gurukul teaching methodology both emphasize holistic education, focusing on the overall development of a student rather than just academic learning. Both systems value experiential learning, with NEP advocating for interactive, student-centric methods and Gurukuls emphasizing learning through oral transmission, discussions, and practical experiences. However, the NEP 2020 aims to modernize education by incorporating technology, digital resources, and a more structured, formalized curriculum that can be standardized across the country. In contrast, Gurukuls followed a more informal, personalized approach, often centered around a guru-student relationship, with education deeply rooted in cultural and spiritual teachings. While NEP advocates for an inclusive, flexible approach suited to the diverse needs of contemporary India, Gurukuls operated on a smaller, more localized scale, often focusing on specific disciplines such as philosophy, scriptures, and the arts. Despite these differences, both share a common goal of nurturing well-rounded individuals who contribute meaningfully to society.

One key similarity lies in their focus on the holistic development of students. NEP 2020 advocates for the integration of skills, arts, and physical education alongside academic subjects, aligning with the Gurukul system's emphasis on well-rounded growth, including moral, intellectual, and spiritual development. Both systems seek to foster creativity, critical thinking, and emotional intelligence rather than a narrow focus on examinations or traditional metrics of academic success. However, the differences between the two systems are also notable. NEP 2020 is a response to the global educational landscape, introducing standardized frameworks, digital learning tools, and inclusive approaches to accommodate India's vast and diverse population. It envisions a more formal, structured, and scalable education model that can be implemented across the country. On the other hand, the Gurukul system was highly personalized and context-specific, often adapted to local needs and traditions. It was based on a close-knit teacher-student relationship, where learning was individualized, deeply rooted in oral traditions, and often confined to specific knowledge domains, such as Vedic scriptures, philosophy, and arts.

Additionally, NEP 2020 incorporates technological advancements, digital literacy, and a broader, more formal curriculum designed to cater to a modern, globalized world, while the Gurukul system was largely informal and based on face-to-face interactions. The Gurukul system's methods were often oral and experiential, with minimal written materials, whereas the NEP 2020

introduces the use of modern textbooks, online resources, and digital platforms for learning.

In summary, while both the National Education Policy 2020 and the Gurukul teaching methodology emphasize a holistic, student-centered approach to learning, they differ significantly in their structure, use of technology, and adaptability to the modern world. NEP 2020 seeks to blend the best of traditional wisdom with contemporary educational practices, aiming for a more inclusive, flexible, and globally competitive education system, whereas the Gurukul system was more localized, informal, and spiritual in its approach.

Information about Gurukul

A **Gurukul** was an ancient Indian educational institution where students (shishyas) lived and learned under the guidance of a teacher (guru). Typically situated in serene, remote locations such as forests or the outskirts of villages, these schools fostered a close relationship between the teacher and student. The curriculum in a Gurukul was diverse, covering subjects like Vedic studies, philosophy, mathematics, arts, music, and moral values. The learning process was oral, with students memorizing and reciting texts, engaging in discussions, and performing rituals. Discipline, respect for the guru, and a focus on holistic growth—spiritual, intellectual, and physical—were central to the system. Students also contributed to daily chores, helping to maintain a self-sustaining community. While the Gurukul system began to decline with the advent of foreign rule, there has been a modern resurgence of interest in it, with some schools incorporating its principles of personalized learning, ethics, and spiritual development. The Gurukul remains a symbol of India's traditional approach to education, emphasizing the integration of knowledge with moral and spiritual growth.

Teaching Pedagogy in Gurukul

The **teaching pedagogy** in a **Gurukul** was a highly distinctive and comprehensive approach to education, blending academic learning with personal, moral, and spiritual growth. The educational process in the Gurukul was not just about acquiring knowledge but also about cultivating wisdom, ethical values, and self-discipline. Here's a detailed breakdown of the key elements of the Gurukul pedagogy:

1. Guru-Shishya (Teacher-Student) Relationship

At the core of the Gurukul pedagogy was the **guru-shishya** relationship. The *guru* (teacher) was not only a provider of knowledge but also a mentor, guide, and spiritual leader. The bond between the guru and shishya was deep and personal, often lasting many years. The guru was seen as a living embodiment of knowledge and moral wisdom. In return, the student respected the guru as a guide for both academic and ethical development.

The shishya (student) would not only receive formal instruction but also learn through direct interaction, daily service (*seva*), and by observing the guru's actions. The student's education was

tailored to his or her unique needs, interests, and intellectual capacities, ensuring personalized attention and a more profound connection to the material being taught.

2. **Experiential and Immersive Learning**

Unlike modern education, which often follows a rigid curriculum and structured classes, the Gurukul system was far more experiential. The learning process was immersive, often conducted in a natural and serene environment, fostering an atmosphere conducive to deep reflection and concentration. Students learned directly from their surroundings, observing nature, engaging in daily activities, and learning through practical experience.

This experiential learning was especially critical in subjects like **philosophy, astronomy, Ayurveda, and spiritual practices**, where real-world observation and practical application were essential. For example, in Ayurvedic studies, students might learn about medicinal plants by personally observing, identifying, and using them in practical contexts. Similarly, in spiritual practices, meditation and yoga were not just taught as theories but were practiced regularly.

3. **Oral Tradition and Memorization**

One of the central aspects of Gurukul pedagogy was the emphasis on **oral transmission** of knowledge. Texts, particularly the Vedas and other sacred scriptures, were passed down **verbally**, and students were required to **memorize** large portions of these texts. The process of memorization was not just mechanical; it was considered a way of internalizing knowledge. Repetition, recitation, and chanting were central practices that helped students imbibe the meaning and rhythm of the texts.

In addition to memorizing sacred texts, students were taught the **art of discourse**. They engaged in discussions, debates, and dialogues with the guru and fellow students to deepen their understanding and sharpen their intellectual faculties. Through such conversations, students would learn how to think critically, argue effectively, and explore multiple perspectives on a given subject.

4. **Holistic Development: Intellectual, Moral, and Physical Growth**

Education in a Gurukul wasn't limited to intellectual development alone. The system was designed to cultivate the student as a **whole person**, nurturing their body, mind, and spirit.

- **Intellectual Development:** Subjects such as **Vedic studies, philosophy, mathematics, astronomy, logic, ethics, and languages** were core to the curriculum. Philosophical discussions were central, and students learned to apply logic and reasoning to unravel abstract concepts.
 - **Moral and Ethical Development:** Alongside intellectual subjects, students were deeply immersed in **moral teachings**. This included learning the virtues of **truth, non-violence (ahimsa), compassion, and humility**. These lessons were not taught in isolation but were integrated into the student's everyday life through their behaviour, interactions, and service to the community.
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NEP 2020

The **National Education Policy (NEP) 2020** is a transformative framework designed to overhaul India's education system, focusing on inclusivity, quality, and holistic development. It emphasizes **universal access to education**, particularly through **early childhood education** (ages 3-6) and the **universalization of foundational literacy and numeracy** by Grade 3. The policy promotes **multidisciplinary learning**, enabling students to choose subjects across disciplines, thus encouraging creativity, critical thinking, and flexibility. It emphasizes the importance of **mother tongue** as the medium of instruction, especially in early education, and encourages the integration of **vocational training** from Grade 6 onwards. NEP 2020 advocates for a shift from rote learning to **competency-based assessments** and aims to reduce the curriculum load while promoting **experiential learning**. Additionally, it stresses the need for **teacher training** and **continuous professional development** to ensure high-quality education delivery. The policy envisions **digital integration** in education through technology-driven platforms, aiming for inclusive and accessible education, especially in rural areas. By introducing a more flexible and accessible approach, NEP 2020 seeks to prepare students for the challenges of a rapidly changing world while retaining India's cultural diversity and values.

Teaching Pedagogy in NEP 2020

The **teaching pedagogy** in the **National Education Policy (NEP) 2020** is designed to be **student-centric, flexible, and holistic**, focusing on the development of critical thinking, creativity, and problem-solving skills. The policy aims to move away from rote memorization and instead foster a more **engaging, experiential, and multidisciplinary learning environment**. Key elements of the pedagogy outlined in NEP 2020 include:

1. **Holistic and Multidisciplinary Approach:** NEP 2020 emphasizes a shift towards **multidisciplinary education** that allows students to choose subjects from a variety of fields (science, arts, social sciences, vocational courses), thereby promoting intellectual flexibility and exploration. This approach encourages students to integrate knowledge from different domains and think critically across disciplines.
 2. **Focus on Conceptual Understanding:** The policy stresses the importance of moving beyond memorization to **deep learning**. Pedagogy under NEP 2020 is aimed at enhancing **conceptual understanding** and **application of knowledge** rather than rote memorization. Teachers are encouraged to use **interactive teaching methods**, project-based learning, and discussions that help students understand the "why" and "how" behind concepts.
 3. **Experiential Learning:** NEP 2020 advocates for **experiential learning**, where students engage directly with the subject matter through activities, hands-on projects, real-world problem-solving, and field visits. This pedagogy encourages active participation, making learning more relevant and enjoyable.
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4. **Critical Thinking and Creativity:** The policy calls for an education system that nurtures **critical thinking, creativity, and problem-solving** abilities. Teachers are encouraged to adopt teaching methods that encourage **questioning, debates, discussions, and collaborative learning**, fostering a spirit of inquiry among students.

5. **Assessment Reforms:** NEP 2020 proposes a shift from traditional exams that focus on memorization to **competency-based assessments**. These assessments will focus on a student's ability to **apply knowledge and demonstrate skills**, such as through **project work, continuous formative assessments, and peer reviews**.

6. **Technology Integration:** The policy envisions the use of **technology** in classrooms to support **personalized learning**. Teachers will integrate digital tools to enhance teaching methods, making learning more interactive and accessible, particularly in remote areas. The **National Educational Technology Forum (NETF)** will help facilitate the adoption of technology across schools.

Similarities in Gurukul and NEP 2020

The **Gurukul system** and the **National Education Policy (NEP) 2020** share several fundamental principles despite being rooted in vastly different historical contexts. Both emphasize **holistic education, individualized learning, and the development of moral, intellectual, and social values**. Below are the key similarities between the two:

1. **Holistic and All-Round Development**

- **Gurukul:** The education system in the Gurukul was designed to develop not just intellectual abilities, but also physical, moral, and spiritual aspects of a student's life. It nurtured a balanced development of body, mind, and spirit.
- **NEP 2020:** Similarly, NEP 2020 promotes **holistic education**, emphasizing the development of **critical thinking, creativity, emotional intelligence, and life skills**. It advocates for an interdisciplinary approach that nurtures students' cognitive, emotional, and physical growth, focusing on **well-rounded individuals**.

2. **Personalized Learning**

- **Gurukul:** In the Gurukul system, the relationship between the guru and shishya (teacher and student) was highly personal. The education was individualized, with students receiving focused, one-on-one attention based on their unique needs and capabilities.
- **NEP 2020:** NEP 2020 stresses **personalized and flexible learning**. It allows students to choose subjects and pathways according to their interests, promotes learning at their own pace, and integrates **technology** to tailor education to individual learning styles and abilities.

3. **Emphasis on Ethical and Moral Values**

- **Gurukul:** The Gurukul system placed a strong emphasis on teaching **moral values, ethics, and character development** alongside academics. Values like **truth, humility, compassion, and**
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non-violence were integral parts of the curriculum.

- **NEP 2020:** NEP 2020 also stresses the need to cultivate **ethical, moral, and social values** in students. It promotes **inclusive education**, ethical conduct, and values like **respect for diversity, empathy, and social responsibility** as essential aspects of a well-rounded education.

4. Experiential Learning and Practical Application

- **Gurukul:** Learning in the Gurukul was experiential. Students learned by **doing**, engaging in daily activities like farming, cooking, and serving the guru (seva). This hands-on approach integrated learning with real-life experiences and practical skills.
- **NEP 2020:** NEP 2020 advocates for **experiential learning**, where students engage in project-based learning, **field visits**, internships, and real-world problem-solving activities. This focus on application-based learning is similar to the Gurukul tradition of integrating knowledge with practical skills.

Differences in Gurukul and NEP 2020

- Here's a comparison of **Gurukul** and **NEP 2020**.

Aspect	Gurukul	NEP 2020
Structure and Organization	Informal, community-based, no standardized curriculum	Formal, structured, with curriculum frameworks and regulatory bodies
Medium of Instruction	Primarily Sanskrit or regional languages	Mother tongue and regional languages in early grades; includes English and multilingualism
Curriculum	Focused on Vedic studies, spirituality, moral education, and practical skills	Broad, multidisciplinary curriculum including science, humanities, arts, vocational education, and technology
Assessment and Evaluation	No formal exams; progress assessed through observation, recitations, and practical application	Competency-based assessments, continuous evaluation, and project work ; focus on learning outcomes
Teacher-Student Relationship	Mentorship-based ; strong personal connection between guru and shishya	Professional, but emphasizes teacher as a facilitator ; large group settings with some focus on personalized attention
Technology Integration	No technology; entirely traditional, oral transmission of knowledge	Technology-driven education; integration of digital tools, online platforms , and multimedia resources
Access and Inclusivity	Limited to a select group (mainly boys from certain castes/families)	Focus on universal access and equity for all students, including marginalized groups and differently-abled students
Vocational Training	Informal integration of practical skills like farming, crafts and daily work	Formal vocational education from an early age, with pathways for skills-based learning

Conclusions

In conclusion, while the National Education Policy (NEP) 2020 and the Gurukul teaching methodology differ in their approach, they both share a common goal of nurturing students into well-rounded individuals capable of contributing meaningfully to society. The NEP 2020, through its emphasis on inclusivity, flexibility, and the integration of technology, seeks to modernize India's education system while ensuring that it is accessible and relevant to today's diverse, globalized world. On the other hand, the Gurukul system, with its focus on personalized, experiential, and spiritual learning, fostered a deeper connection between the teacher and the student, encouraging a sense of discipline, ethics, and wisdom.

Though the methods, tools, and structures of these two systems differ significantly, they both underline the importance of a comprehensive education that extends beyond academics to include values, skills, and emotional intelligence. The NEP 2020 can be seen as an attempt to blend the strengths of the traditional Gurukul system—such as individualized attention, moral development, and holistic learning—with the needs of the contemporary world, which demands adaptability, critical thinking, and global awareness. Ultimately, both educational paradigms aim to cultivate not just knowledgeable individuals, but responsible, compassionate citizens capable of thriving in a rapidly changing world.

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AI AS A TOOL FOR EDUCATORS TO IDENTIFY STRENGTHS AND WEAKNESSES IN STUDENTS

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Abstract

In recent years, Artificial Intelligence (AI) has become an invaluable tool in education, offering new methods for improving the quality of instruction and student outcomes. This paper explores the potential of AI to assist educators in identifying students' strengths and weaknesses, thereby enabling personalized learning. The study reviews various AI tools and their impact on educational practices, focusing on how they provide actionable insights for both teachers and students. Through a comprehensive analysis, the paper aims to present an evaluation of AI's effectiveness as a diagnostic tool in identifying areas for improvement and fostering a tailored educational experience.

Keywords: Artificial Intelligence, Educational Tools, Strengths and Weaknesses, Personalized Learning, Diagnostic Assessment, AI in Education

Introduction

The role of educators has always been multifaceted, from delivering curriculum to assessing and supporting students. However, traditional assessment methods can be time-consuming, limited in scope, and often fail to capture a comprehensive picture of each student's unique abilities and challenges. With the rise of AI technologies, educators now have the opportunity to utilize data-driven tools that can provide more granular and dynamic insights into students' strengths and weaknesses. By analyzing student performance data, AI can offer tailored recommendations, adjust learning paths, and even predict potential outcomes based on previous trends. This paper aims to investigate how AI tools can support educators in identifying students' strengths and weaknesses. By examining AI's impact on assessment techniques, feedback mechanisms, and personalized learning pathways, this study seeks to demonstrate how these technologies can transform educational practices.

Aim of the Study

The aim of this study is to evaluate how AI tools can help educators in identifying the academic strengths and weaknesses of students. Specifically, the paper focuses on:

1. Understanding how AI-based diagnostic tools can detect patterns in student learning.
 2. Assessing the effectiveness of AI-driven feedback and recommendations in guiding personalized learning.
-

3. Analyzing how AI tools can improve overall educational outcomes by providing more targeted support for students.

Words Stuart Russell and Peter Norvig – AI as a Rational Agent

Stuart Russell and Peter Norvig's textbook *"Artificial Intelligence: A Modern Approach"* (first published in 1995) has become one of the most influential books in AI education. They describe AI systems as rational agents that perceive their environment, reason about it, and take actions to achieve specific goals. Their work emphasizes the importance of creating systems that can adapt to new environments and situations, offering a formal model for AI behavior that continues to guide research today.

Geoffrey Hinton, Yann LeCun, and Yoshua Bengio – The Deep Learning Revolution

In the late 2000s, the advent of deep learning marked a paradigm shift in AI, largely driven by the work of Geoffrey Hinton, Yann LeCun, and Yoshua Bengio. These scholars are often referred to as the "Godfathers of AI" due to their pioneering contributions to neural networks, specifically deep learning techniques that mimic the human brain's structure. Their work enabled breakthroughs in image and speech recognition, natural language processing, and autonomous systems. In 2018, they were awarded the Turing Award for their contributions to AI, solidifying their central role in shaping the field's modern trajectory.

Objectives of the Study

The primary objectives of this research paper are:

To explore AI-driven diagnostic tools – Investigate how artificial intelligence can analyze student performance and identify strengths and weaknesses across different subjects.

To assess the effectiveness of AI in personalized learning – Evaluate how AI-generated insights contribute to tailored learning experiences that support student development.

To examine AI's role in enhancing assessment methods – Analyze how AI tools improve the accuracy, efficiency, and effectiveness of student evaluations compared to traditional assessment techniques.

To study the impact of AI on educators' decision-making – Understand how AI assists teachers in making data-driven decisions to support student progress.

To identify challenges and limitations of AI in education – Address potential barriers, including ethical concerns, data privacy, and the need for teacher training in AI integration.

To propose recommendations for AI implementation in classrooms – Provide insights into best practices for incorporating AI tools to optimize teaching strategies and student learning outcomes.

Methodology : Research Design

This study uses a mixed-methods approach, combining both qualitative and quantitative data. The quantitative aspect involves an analysis of educational performance data from AI-based tools, while the qualitative component consists of interviews with educators and students who have

used AI technologies in their learning environments. This study adopts a **mixed-methods research design**, integrating both **quantitative and qualitative approaches** to obtain a comprehensive understanding of AI's role in identifying student strengths and weaknesses. The mixed-methods approach allows for a more **holistic analysis**, combining numerical performance data with personal experiences and perceptions from educators and students. The **quantitative** aspect of the study focuses on analyzing data collected from AI-driven educational tools. This includes:

- **Student performance analytics:** AI-generated reports on student progress, test scores, learning patterns, and completion rates.
- **Adaptive learning outcomes:** Evaluation of how AI-personalized learning recommendations influence students' improvement in different subjects.
- **Pre- and post-intervention assessments:** Comparing student performance before and after AI tool implementation to measure effectiveness.
- **Engagement metrics:** Analysis of time spent on AI-driven platforms, completion rates, and frequency of student interactions with AI-based learning resources.

To analyze the data, **descriptive and inferential statistical methods** will be used. Statistical tests such as **t-tests, ANOVA, and regression analysis** will help determine correlations between AI tool usage and academic performance improvements.

Qualitative Component

The **qualitative** part of the study involves collecting insights from **educators and students** who have used AI-based tools. Data collection methods include:

- **Semi-structured interviews:** Conducted with **educators** to explore their perceptions of AI's effectiveness, usability, and challenges in integration. Semi-structured interviews are a **flexible qualitative research method** that allows for **guided yet open-ended discussions** with participants. In this study, they will be conducted with **educators who use AI tools** in their teaching practices. The goal is to **understand their perspectives, experiences, and challenges** regarding AI's role in identifying student strengths and weaknesses.
- **Focus groups with students:** Group discussions to understand their experiences, motivation, and challenges while using AI tools.
- **Open-ended survey responses:** Students and teachers will provide written feedback on the impact of AI in their learning environments.

A **thematic analysis** approach will be used to code and categorize qualitative responses, identifying common patterns in the participants' feedback.

Participants

The study includes **100 students** (middle school and high school) and **20 educators** who actively use AI tools in the classroom. Participants are selected to represent diverse academic backgrounds and varying levels of AI exposure in education. Participants in the study include a

sample of 100 students from middle school and high school levels, as well as 20 educators who use AI tools in their teaching practices. The student participants were selected to represent a diverse set of academic backgrounds, including varying levels of proficiency in different subjects.

AI Tools Utilized

Several AI tools were chosen for the study, including:

Smart Content Systems refer to advanced technologies and platforms that leverage artificial intelligence (AI), machine learning, and automation to create, manage, and deliver personalized and dynamic content. These systems analyze user behavior, preferences, and contextual data to tailor content in real-time, enhancing user engagement and experience. By automating content curation, recommendation, and optimization, Smart Content Systems enable organizations to deliver relevant, high-quality content across various digital channels efficiently. These systems are widely used in areas like marketing, e-commerce, media, and entertainment to improve audience targeting, increase conversion rates, and drive personalized communication strategies.

Learning analytics platforms are specialized tools designed to collect, analyze, and report data on learners' behaviors, interactions, and performance. These platforms leverage advanced technologies such as artificial intelligence, machine learning, and data visualization to provide actionable insights that enhance educational outcomes. By tracking metrics like attendance, engagement, progress, and assessment results, learning analytics platforms enable educators and institutions to identify trends, predict potential challenges, and personalize learning experiences. Additionally, they support data-driven decision-making, ensuring that interventions are timely and effective. Such platforms are widely used across schools, universities, and corporate training environments to optimize learning strategies and improve overall efficiency.

Data Collection

Data collection methods include:

- **AI Performance Metrics:** Automated reports and performance analytic generated by AI tools after student interactions.
- **Surveys:** Pre and post-study surveys conducted with both educators and students to evaluate their perceptions of the AI tools.
- **Interviews:** Semi-structured interviews with educators to gather in-depth feedback on the AI tools' usability, effectiveness, and impact on their teaching practices.

Data Analysis

The data will be analyzed using both descriptive and inferential statistics for the quantitative data (e.g., student performance over time, improvement in test scores) and thematic coding for the qualitative data from interviews and surveys. The aim is to identify correlations between AI tool usage and academic improvement, as well as to capture educators' and students' experiences with these tools.

Results

AI Tool Effectiveness in Identifying Strengths and Weaknesses

Initial findings suggest that AI tools can accurately identify individual students' strengths and weaknesses across various subjects. Adaptive testing platforms were particularly effective in pinpointing areas where students struggled, such as specific mathematical concepts or reading comprehension skills. AI-generated reports were able to highlight these areas within minutes, allowing educators to act quickly and provide targeted interventions.

Impact on Personalized Learning

Data analysis shows a significant improvement in student performance following the introduction of AI-driven personalized learning pathways. Students who interacted with AI-based tools demonstrated more engagement, higher retention rates, and better mastery of challenging topics. For example, students who had difficulty with specific science concepts received customized lessons that helped them improve their understanding, leading to better overall academic performance.

Educators' Perception of AI Tools

Educators reported that AI tools were effective in providing real-time insights into student performance, saving valuable time spent on manual assessments. Teachers expressed a positive outlook on the role of AI in facilitating data-driven instruction and tailored learning experiences. However, some concerns were raised about the initial learning curve associated with integrating AI tools into classrooms and the importance of maintaining a balance between AI-driven insights and human intuition.

Discussion

The results of this study indicate that AI tools can be powerful instruments in identifying students' strengths and weaknesses. They provide a level of granularity and immediacy that traditional assessment methods often lack, enabling teachers to offer timely and targeted support. However, the effectiveness of AI in education is also contingent on its integration into existing teaching frameworks and the ability of educators to interpret and apply AI-generated insights.

While AI can identify areas of weakness, it is crucial to remember that AI tools should supplement—not replace—teacher judgment. Teachers' insights and interpersonal skills remain essential in interpreting data and fostering a holistic understanding of students' needs.

Conclusion

AI has the potential to revolutionize how educators identify and address students' academic strengths and weaknesses. Through its ability to analyze vast amounts of student data in real time, AI provides valuable insights that support personalized learning, improve educational outcomes, and streamline assessment processes. Despite its advantages, the successful implementation of AI

tools in education requires careful consideration of both technical and pedagogical factors. As AI continues to evolve, it will likely play an increasingly significant role in shaping the future of education. AI is poised to transform education by offering educators powerful tools to identify and address students' academic strengths and weaknesses with unprecedented precision. Through advanced data analytics, AI can process vast amounts of student performance data in real time, detecting patterns that may not be immediately apparent to teachers. These insights enable a more personalized approach to education, tailoring instruction to meet the specific needs of individual students.

Personalized Learning and Adaptive Instruction

One of the most significant advantages of AI in education is its ability to support personalized learning. Traditional classrooms often follow a one-size-fits-all approach, making it difficult for educators to cater to the diverse learning paces and styles of students. AI-powered learning platforms, however, can adapt content delivery based on a student's progress, providing customized exercises, real-time feedback, and targeted interventions. For instance, AI-driven tutoring systems can identify concepts a student struggles with and offer additional practice or alternative explanations to reinforce understanding.

Improved Educational Outcomes

By leveraging AI, educators can enhance student engagement and achievement. Intelligent assessment tools can provide continuous formative feedback, helping students track their progress and make necessary adjustments to their learning strategies. Additionally, AI can predict potential learning gaps before they become major obstacles, allowing teachers to intervene proactively. Research suggests that early intervention leads to better long-term academic success, making AI an invaluable asset in fostering student growth.

Streamlined Assessment and Administrative Processes

AI also simplifies the assessment process by automating tasks such as grading assignments, analyzing student responses, and generating performance reports. This automation reduces the administrative burden on teachers, allowing them to focus more on instruction and student engagement. Moreover, AI-powered chatbots and virtual assistants can help answer students' questions, provide study recommendations, and facilitate communication between educators and learners.

Challenges and Considerations

Despite its advantages, integrating AI into education requires careful consideration of both technical and pedagogical factors. Schools and educators must ensure that AI tools are implemented in ways that complement, rather than replace, human instruction. Additionally, concerns related to data privacy, algorithmic bias, and accessibility must be addressed to ensure

that AI-driven education is equitable and ethical. Teacher training is also crucial, as educators need to develop the necessary skills to effectively utilize AI-powered tools in their teaching practices.

As AI technology continues to evolve, its role in education is expected to expand even further. Future developments may include more sophisticated AI tutors, immersive virtual learning environments, and deeper integration of AI-driven insights into curriculum design. If implemented thoughtfully, AI has the potential to create a more inclusive, efficient, and effective educational landscape that empowers both students and educators. By harnessing the power of AI, education can move toward a model that is more responsive to individual learning needs, ultimately improving outcomes and preparing students for an increasingly digital future.

Future studies should explore the long-term impact of AI tools on student learning outcomes and consider the ethical implications of using AI in education, particularly regarding data privacy and equity. Additionally, research should focus on how AI tools can be integrated into teacher professional development to ensure effective usage. This research underscores the promise of AI in enhancing the educational experience, particularly in terms of diagnostic capabilities, personalized learning, and the identification of strengths and weaknesses in students.

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TECHNOLOGY IN EDUCATION: ENHANCING LEARNING, RESEARCH, AND INNOVATION

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Abstract:

Technology has revolutionized education by enhancing learning experiences, facilitating research, and driving innovation. This paper explores the role of technology in education, highlighting its benefits, challenges, and future prospects. It examines how digital tools improve student engagement, research efficiency, and innovative teaching methods. The study also discusses potential barriers such as digital inequality and technological dependence.

Key Words- Technology, Education, Research, Innovation & Artificial Intelligence.

Introduction:

The integration of technology in education has transformed traditional teaching and learning methods. From smart classrooms to artificial intelligence (AI)-driven personalized learning, technology has made education more accessible, interactive, and efficient. This paper analyzes how technology supports learning, research, and innovation, ultimately improving educational outcomes.

Enhancing Learning Through Technology:

- 1. Digital Learning Platforms** - Online learning platforms such as Coursera, Khan Academy, and Google Classroom enable self-paced and remote learning, allowing students to access educational materials anytime, anywhere.
- 2. Interactive and Engaging Tools** - Educational apps, virtual reality (VR), and augmented reality (AR) enhance student engagement by making learning interactive. For instance, VR simulations help medical students practice surgeries in a risk-free environment.
- 3. Personalized Learning** - AI-powered tools like adaptive learning systems tailor content to individual student needs, helping them progress at their own pace. Examples include Duolingo for language learning and Dream Box for mathematics.

Technology In Research:

Technology has transformed academic research by providing advanced tools for data collection, analysis, and collaboration.

- 1. Access to Information** - Digital libraries, open-access journals, and search engines like Google Scholar have made research more accessible, reducing reliance on physical libraries.

2. **Data Analysis and Artificial Intelligence** - Statistical software such as SPSS, R, and AI-driven research tools help scholars analyze large datasets efficiently, improving research accuracy.
3. **Collaboration and Communication** - Cloud computing and online collaboration tools like Google Drive, Zoom, and research networking platforms enable seamless communication among researchers globally.

Driving Innovation In Education:

Technology fosters innovation in teaching methodologies, curriculum design, and educational administration.

1. **Smart Classrooms** - Smartboards, AI tutors, and IoT-enabled classrooms enhance the teaching process by providing real-time feedback and automating administrative tasks.
2. **Gamification and AI in Education** - Gamified learning motivates students through reward-based progress, while AI chatbots assist in answering student queries.
3. **STEM and Robotics Education** - Technological advancements have encouraged STEM (Science, Technology, Engineering, and Mathematics) learning by integrating robotics, coding, and maker labs into curriculums.

Challenges Of Technology In Education:

While technology has significantly improved education by enhancing learning, research, and innovation, it also presents several challenges. These challenges must be addressed to maximize the benefits of educational technology. Below are some key obstacles:

1. **Digital Divide and Inequality** - Not all students and institutions have equal access to technology. This disparity is influenced by:
 - 1.1 **Economic Factors** – High costs of devices, internet access, and digital resources make technology inaccessible to low-income students.
 - 1.2 **Geographical Barriers** – Rural and remote areas often lack proper internet connectivity and technological infrastructure.
 - 1.3 **Disability Accessibility** – Some educational technologies are not designed for students with disabilities, limiting inclusivity.
 2. **Technological Dependence and Reduced Critical Thinking** -
 - 2.1 **Over-Reliance on Technology** – Students may depend too much on digital tools, reducing their ability to think critically or solve problems independently.
 - 2.2 **Automation vs. Creativity** – Excessive use of AI-driven learning tools may limit creativity and problem-solving skills by providing ready-made answers.
 3. **Cybersecurity and Data Privacy Concerns**-
 - 3.1 **Student Data Security** – Online learning platforms collect vast amounts of personal data,
-

which may be vulnerable to hacking or misuse.

- 3.2 **Cyberbullying and Online Safety** – Increased online interactions can expose students to cyberbullying, identity theft, and inappropriate content.
 - 3.3 **Weak Institutional Policies** – Many educational institutions lack proper cybersecurity measures to protect students and staff.
 4. **Teacher Readiness and Training -**
 - 4.1 **Lack of Digital Skills** – Some educators struggle to integrate technology effectively due to insufficient training in digital tools.
 - 4.2 **Resistance to Change** – Traditional educators may be reluctant to adopt new teaching methods, preferring conventional face-to-face instruction.
 - 4.3 **Limited Professional Development** – Many institutions fail to provide continuous training on emerging technologies, leaving teachers behind.
 5. **Cost and Infrastructure Challenges -**
 - 5.1 **High Implementation Costs** – Setting up smart classrooms, providing digital devices, and maintaining software can be expensive.
 - 5.2 **Maintenance and Upgrades** – Schools and universities must frequently update hardware and software, which adds to long-term costs.
 - 5.3 **Power and Connectivity Issues** – In developing regions, unstable electricity and poor internet infrastructure hinder technology adoption.
 6. **Digital Distractions and Screen Time Concerns -**
 - 6.1 **Decreased Attention Span** – Continuous exposure to digital screens may reduce students' ability to focus on complex subjects.
 - 6.2 **Multitasking Challenges** – Students may struggle with distractions from social media, gaming, or non-educational content during online learning.
 - 6.3 **Health Issues** – Prolonged screen time can cause eye strain, poor posture, and mental health concerns such as digital addiction.
 7. **Mismatch Between Technology and Curriculum**
 - 7.1 **Outdated Curriculums** – Some education systems fail to integrate modern technology into the curriculum, making learning less effective.
 - 7.2 **One-Size-Fits-All Approach** – Many EdTech solutions do not consider the diverse learning needs of students, leading to ineffective learning experiences.
 - 7.3 **Rapid Technological Changes** – New technologies emerge quickly, making it difficult for institutions to keep up with necessary updates.
 8. **Ethical and Legal Issues -**
 - 8.1 **Plagiarism and Academic Integrity** – Easy access to online information increases the
-

risk of plagiarism and dishonest academic practices.

8.2 AI and Bias Issues – AI-driven education tools may have built-in biases, leading to unfair assessments or recommendations.

8.3 Copyright and Intellectual Property – Educators and students must navigate legal concerns when using online educational materials.

Role Of Teacher Educators In Technology-

Teacher educators play a crucial role in integrating technology into education to enhance learning, research, and innovation. They not only prepare future teachers but also help in the continuous professional development of current educators. Their role includes adopting new technologies, training teachers, and ensuring technology is used effectively in classrooms. Below are the key responsibilities of teacher educators in technology-enhanced education.

1. Facilitating Digital Pedagogy
2. Training Teachers in EdTech Tools
3. Enhancing Research Through Technology
4. Promoting Digital Literacy and Ethical Use of Technology
5. Supporting Innovation in Teaching and Learning
6. Addressing Challenges in Technology Integration

Future Prospects:

The future of technology in education includes AI-driven learning, blockchain-based certifications, and expanded use of virtual reality for immersive education. Policymakers and educators must ensure equitable access and digital literacy to maximize technology's benefits.

Conclusion:

While technology has revolutionized education, these challenges must be addressed through better policies, infrastructure investment, teacher training, and responsible digital use. Ensuring equitable access, cybersecurity, and balanced technology integration will allow education to fully benefit from digital advancements while minimizing risks. Teacher educators are key to the successful integration of technology in education. By training teachers, promoting research, and fostering innovation, they ensure that technology enhances learning outcomes and prepares students for a digital future. Institutions must invest in continuous professional development for teacher educators to keep pace with evolving educational technologies.

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NEXT GENERATION PHARMACY: EXPLORING FIVE REVOLUTIONARY TECHNOLOGIES

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Abstract

The pharmaceutical industry is undergoing a rapid transformation, driven by technological advancements that promise to revolutionize drug development, delivery, and patient care. This review article explores five emerging technologies poised to reshape the pharmaceutical landscape. These include telemedicine kiosks and medical tricorders, offering remote diagnostics and personalized health monitoring. Medical drones are streamlining drug and medical supply delivery, particularly in remote areas. Blockchain technology is enhancing supply chain transparency and security, combating counterfeiting. Biometric headphones and smart contact lenses are enabling continuous health data collection and personalized treatment. Finally, the review discusses the potential of these technologies to converge, creating integrated solutions that will ultimately improve patient outcomes and transform the future of pharmaceuticals. This article will examine the current state of these technologies, their potential benefits and challenges, and their implications for the pharmaceutical industry and healthcare as a whole.

Keywords : Telemedicine kiosks, medical tricorder, medical drones, blockchain technology, biometric headphones

Introduction

Telemedicine Kiosks: These kiosks offer remote consultations, basic diagnostics, and even medication dispensing in underserved areas. Discussion points include: Accessibility for rural populations, Integration with existing healthcare systems, Data privacy and security concerns, Potential for cost reduction, and Impact on patient-physician relationships. **Medical Tricorder:** This handheld diagnostic device promises rapid, non-invasive health assessments. Key discussion areas involve: Accuracy and reliability of diagnostics, Regulatory hurdles for at-home use, Potential for early disease detection, Impact on healthcare professional roles, and Cost-effectiveness for widespread adoption. **Medical Drones:** Drones offer a swift and efficient solution for transporting medications, samples, and medical supplies, especially in remote or disaster-stricken areas. Discussion should encompass: Regulatory frameworks for drone operation, Logistical challenges and infrastructure requirements, Safety and security of transported goods, Potential for time-sensitive drug delivery, and Scalability and cost effectiveness. **Blockchain:** This technology offers secure and transparent tracking of pharmaceuticals throughout the supply chain, combating

counterfeiting and improving drug traceability. Discussion points include: Interoperability of blockchain systems, Data security and privacy within the blockchain, Potential for streamlining clinical trials data management, Impact on regulatory compliance, and Industry-wide adoption and standardization. Biometric Headphones: These devices collect physiological data like heart rate, temperature, and even brainwave activity. Discussions should focus on: Accuracy and reliability of collected data, Integration with health monitoring apps and wearables, Potential for personalized medicine and drug dosage adjustments, Ethical considerations regarding data privacy, and Clinical validation of biometric data.

Discussion 1. Telemedicine kiosks

Introduction

Computerized health kiosks are standalone units that provide information or services through computer programs. Health kiosks offer public access to a range of healthcare services. These kiosks were primarily used for delivering health information, clinical measurements, and screening (1).

1.1 Working of telemedicine kiosks

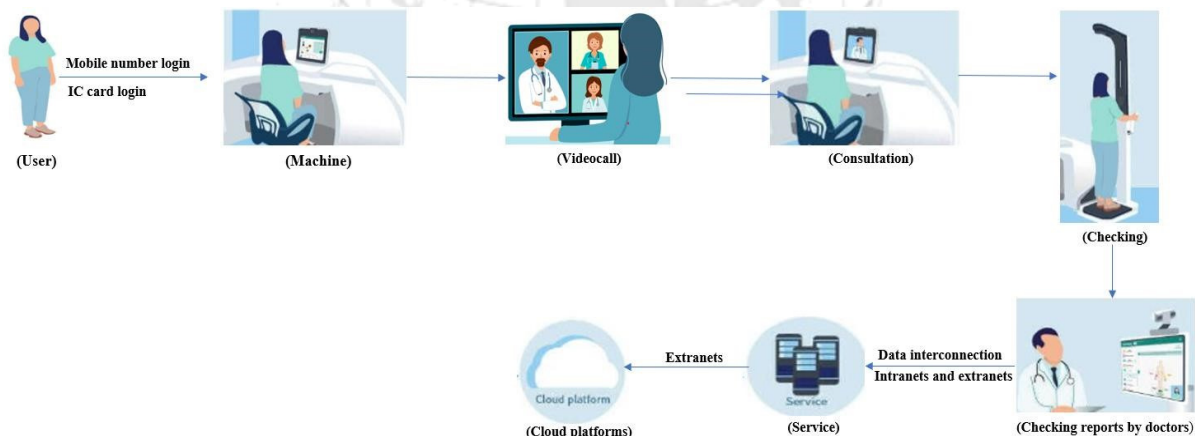


Fig 1.0- Working of telemedicine kiosks

1.2 Uses taking medical histories, health promotion, self-assessment, consumer feedback, patient registration, patient access to records, remote consultations, Health kiosks equipped with connected measurement devices, including stethoscopes, otoscopes, dermatoscopes, pulse oximeters, and blood pressure monitors, can collect clinical data for telemonitoring or synchronous teleconsultations., delivering health information, taking clinical measurements, detection of malaria and tuberculosis, upload of radiology images (1).

1.3 Marketed brands :

MedicSpot, Amwell, RPM Solutions, H4D, elephant kiosks, HealthSpot(1).

1.4 Future opportunities

Sending targeted reminders for specific groups, such as those who require chlamydia

screening or flu vaccination, the practice will install kiosks in all residential care homes and nursing homes to allow for regular patient check-ups, integrating with home telehealth allows patients to transfer their expensive telehealth equipment to another patient and return to regular kiosk usage once they are no longer acutely ill, allowing patients to update their personal information, such as address or phone number, without contacting the receptionist, accessing a patient's EPR allows for personalized questions and avoids asking questions that already have known answers, this would prompt patients for condition-specific check-ups, such as diabetic retinopathy scans, kiosks in workplaces can provide employees with guidance on safe working practices and healthy living options, promoting occupational health (2).

1.5 Market size

USD 114.8 million by 2030 (3).

Medical tricorder

Introduction

A medical tricorder is a handheld portable scanning device that consumers can use to selfdiagnose medical conditions and take basic vital measurements (4).

Working of medical tricorder

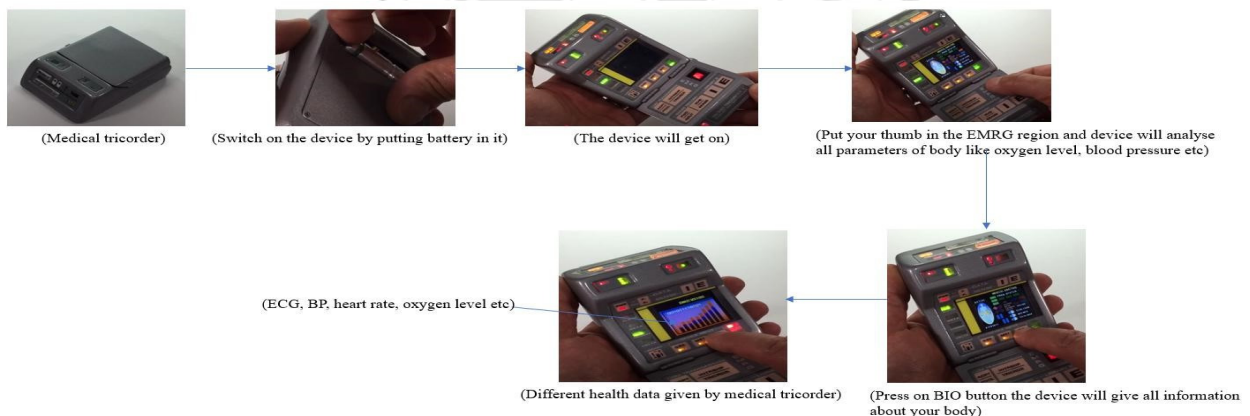


Fig 2.0- Working of medical tricorder

Uses

Rapid diagnostics, chronic disease management, telemedicine and remote monitoring, emergency medicine and first aid, health and wellness monitoring, point of care testing, health data empowerment, public health surveillance, clinical trials and research, pharmaceutical and healthcare access, summarize persons state of health (4,5).

Marketed brands

Basil Leaf Technologies, Scanadu, DxTerity Diagnostics, Butterfly Network, Philips Healthcare,

Eko, Health Canada, Nokia Health, Samsung Healthcare, Cloud DX, QuantuMDx Group,

Ibis Biosciences, TRIMprob, Standoff Patient Triage Tool (SPTT), Berkeley Tricorder, Tricorder. Zero, Ionis Pharmaceutical, Fujikura Ltd, Welfo Fiber Optics (4,5,6).

Future opportunities

AI, wearable sensors, and telemedicine platforms promise to revolutionize healthcare by allowing individuals to monitor their health, receive timely diagnoses, and access medical expertise more conveniently than ever before. Additionally, they optimize clinical workflows, which lessens the workload for medical staff and enhances patient outcomes. Tricorders will undoubtedly have a significant impact on how healthcare is provided in the future, taking us one step closer to a time when health monitoring and diagnoses are easier, more effective, and available to everyone (5).

2.5 Market size

USD 6.98 billion by 2034 (6)

Medical drones

Introduction

Drones are aircraft controlled remotely without a human pilot on board. they can be controlled autonomously using a computer board or remotely via a transmitter and controller (7).

Working of medical drones



Fig 3.0- Working of medical drones

Uses

Delivery of medicine, payload tablet and saline, emergency medical kit delivery, blood sample transportation, organ transportation, urban and rural community health services, medical waste disposal, delivery of salbutamol nebulizer, antidotes, vaccines, I.V antibiotics, tissues, short half-life radionuclide, adrenaline, lidocaine, atropine, epi pen, prothrombin complex concentrate (8,9,10).

Marketed brands

Matternet, DHL Parcel, Zipline, MeDrone, Seattle's Village Reach, Flirtey, EHang, TU Delft, Google Drones, Project Wing, Healthcare Integrated Rescue Operations (HiRO), Vayu

Drones (9,10,11).

Future opportunities

Easy access to remote areas, rapid response in emergencies, data collection and analysis and telemedicine support (13).

3.5 Market size

2.5trillion Indian rupees by 2030 (12).

Blockchain technology

Introduction

A blockchain is a distributed database that stores blocks of information for cryptographically bound transactions through peer-to-peer networks (14).

Working of blockchain technology

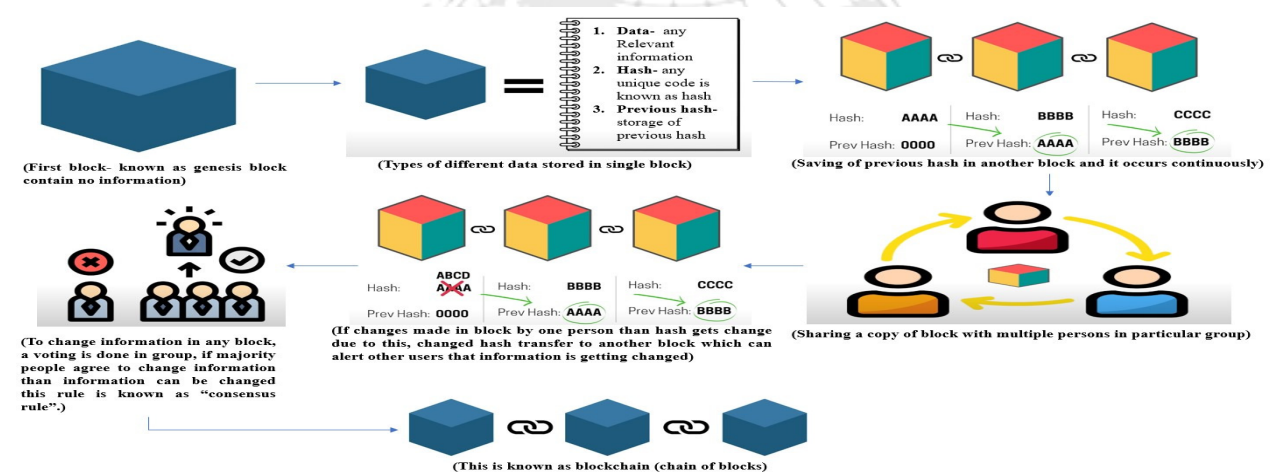


Fig 4.0- Working of blockchain technology

Uses

Improving clinical trials, smart contracts, combating counterfeit drugs, immutable health records, drug trace and traceability, data sharing, blockchain prescriptions, audit trails and accountability (15,16).

Marketed brands

MedChain, BURSTIQ, PATIENTORY, NEBULA GENOMICS, MEDI-CALCHAIN, the 'SmartHub', BlockRx Pharma Ecosystem, MediLedger DSCSA, Medi-chain, IBM Crypto anchors, IBM, KPMG, Merck, Walmart, BlockVerify, Clinical Supply Blockchain Working Group (CSBWG), Pharma Ledger, Anti-counterfeit medicine system (ACMS), BlockchainBased Smart Contract System, Healthcare Data Gateway (HGD), Medlock framework, MeDShare, Blockchain tokens (15,17).

Future opportunities

IoT- enabled supply chain optimization, AI- driven data analysis, streamlined reporting with smart contracts, enhanced transparency for regulatory authorities, secure data sharing,

intellectual property tokenization (18).

4.5 Market size

USD 53,182.9 million by 2030 (19).

Biometric headphones

Introduction

Biometric headphones are a cutting-edge combination of traditional audio equipment and advanced health monitoring technology. These headphones include built-in sensors that collect biometric data from the wearer, allowing for a comprehensive assessment of their physical wellbeing (20).

Working of biometric headphones

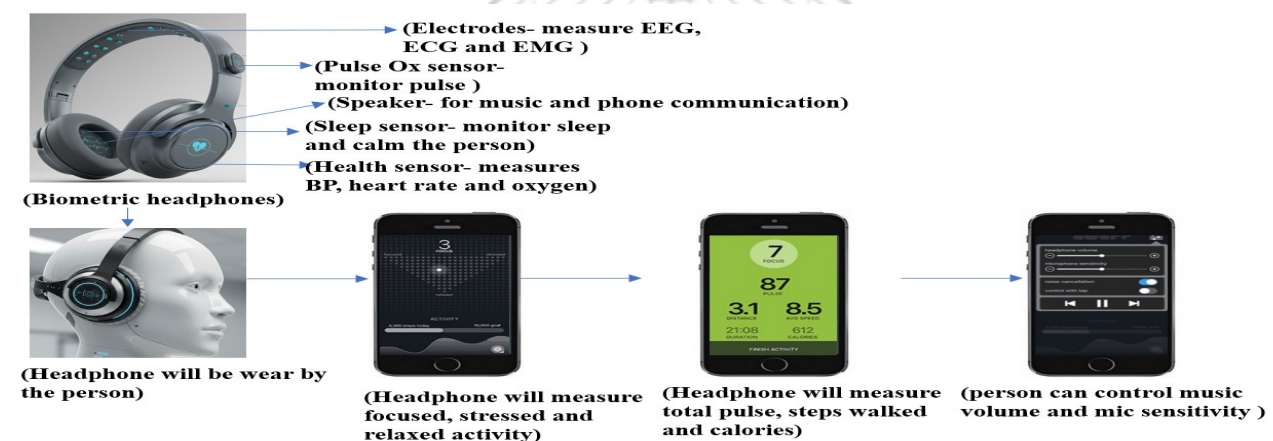


Fig 5.0- Working of biometric headphones

Uses

Measuring blood pressure, heart rate, pulse count, EEG, ECG, EMG, sleep activity and music listening, body temperature (20,23).

Marketed brands

Valencell, Sonion, SMS Audio's BioSport In-Ear Headphones, apples Powerbeats Pro 2 (21,22,25).

5.4 **Future opportunities** : Many modifications can be made.

5.5 **Market size** : USD 150 billion by 2030 (24).

Conclusion

In conclusion, the pharmaceutical industry stands on the precipice of a transformative era, driven by the convergence of technological innovation and evolving healthcare needs. The five emerging technologies explored in this review – telemedicine kiosks, medical tricorders, medical drones, blockchain, biometric headphones represent a powerful wave of change poised to reshape drug development, delivery, patient care, and overall industry efficiency. Successfully integrating these advancements will require collaborative efforts between pharmaceutical companies,

technology developers, regulatory bodies, and healthcare providers. Addressing challenges related to data security, patient privacy, regulatory frameworks, and cost-effectiveness will be crucial for realizing the full potential of these innovations. Ultimately, the successful implementation of these technologies promises a future of more personalized, accessible, and effective healthcare, leading to improved patient outcomes and a more robust pharmaceutical industry. Further research and development, coupled with strategic partnerships and a patient-centric approach, will be essential for navigating this exciting landscape and ushering in a new era of pharmaceutical care.

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LONARI SALT: RESTORATION OF ANCIENT INDIAN SALT INDUSTRY**Dr. Pramod Akaram Ganganmale***Associate Professor and Head**Department of English:**Karmaveer Bhaurao Patil College, Urun-Islampur*

This paper is a part of the research project funded by Government of India's Indian Knowledge System Division entitled "Restoration of Lonari Salt."

Introduction:

Salt has been proved as primary and fundamental component of Indian cuisine. There are a few milestones of its existence in Indian history. India is a great source of various knowledge however due to certain reasons many Indian technologies, arts, and skills are being moribund during the Islamic and British powers in the India.

Indian cuisine and medicine through several eatables are one of them. Salt plays important role in Indian traditional medicine system of Ayurveda and daily cuisine of all cultures. Salt is used for several other reasons also. The Charakh Rushi has explained the roles and importance of different kinds of salts in Charakh Samhita. We may understand the importance of the salt as it is mentioned for more than 100 times in the above scripture. Salt has various plays to play in different procedures of medicine, cuisine and technologies to preserve the food and other items. Many Indian and Modern medicines have salt as one of the major sources.

The importance of salt as mentioned in The Sushruta Samhita:

THE SUSHRUTA SAMHITA. [Chap. XLVi.] explains the The Salt Group:
The Salt Group (Lavana Varga) :—The different varieties of salt such as the Saindhava, the Samudra, the Vida, the Sauvarchala, the Romaka and the Audbhidam (prepared from vegetable alkali), etc., should be successively deemed as more heat, Vayu, Kapham, and Pittam making, and more demulcent, sweeter and more purgative and diuretic, considered in the inverse order of enumeration. Saindhava salt is beneficial to the eyes, palatable, relishing, light, appetising, demulcent, slightly sweet in digestion, spermatopoietic and cooling in its potency. It is one of the most potent auxiliaries in combating the action of the deranged humours of the body. The variety called the Samudram (sea-brine) is sweet in digestion, and not inordinately neat-making in its potency. It is not indigestible, but purgative, slightly demulcent, and does not inordinately generate the Pittam, and is good in attacks of colic pain (Shula). The variety known as Vida salt is a little alkaline (in its taste) and is appetising. It tends to produce a condition of dryness in the organism, and proves beneficial in cases of colic (Shula,) and in diseases affecting the heart. It imparts a relish to food, is sharp and heat-making in its potency, and restores the deranged bodily Vayu to its normal state (restoring or setting aflow the nerve-current by removing any obstruction).

Sauvarchala salt is light of digestion, heat-making in its potency, and pungent in taste. It is appetising, has an agreeable aroma, removes any viscidness from the internal organism, and proves curative in cases of abdominal glands, colic pain and incarceration of scybala in the bowels. Romaka salt is sharp and intensely heat-making. Its action permeates the whole system immediately after its use, and is pungent and light of digestion. It subdues the Vayu, tends to increase the secretion of the internal organs, enters into the minutest capillaries of the body, and is purgative and diuretic. Audbhida salt is light, sharp, and heat- making in its potency.

This explains the kinds of salts along with their uses.

1. Classification and Potency of Salts

- The *Sushruta Sanhita* categorizes different salts into specific types: Saindhava, Samudra, Vida, Sauvarchala, Romaka, and Audbhida, each with distinct characteristics, which reflect the Ayurvedic approach of balancing the bodily humors (Vata, Pitta, Kapha). The way the salts are described according to their heat-producing and cooling properties aligns with the Ayurvedic belief in how substances affect the body's balance of elements.
- The inverse order of enumeration suggests that the salts are discussed starting from those with a cooling effect and moving towards those with heating properties. This methodical approach is significant in Ayurveda, where the balance between heat and coolness in the body is central to maintaining health. The salt varieties are then linked to their effects on digestion, mood, and physical ailments.

2. Individual Salt Characteristics

- Saindhava salt (rock salt) is presented as beneficial to the eyes, relieving colic pain, and cooling in nature. These properties are in line with its common use in Ayurvedic medicine where it is believed to balance Pitta dosha (which governs heat in the body) and promote general health.
 - Samudra salt (sea salt) is described as having a purgative effect and being beneficial in treating colic pain. Its ability to be diuretic and non-indigestible is intriguing, as it suggests that the salt doesn't cause distress in the digestive system but rather helps regulate internal fluid balance and relieve pain associated with gastritis or digestive issues.
 - Vida salt is more alkaline and causes dryness in the body. The focus on it treating heart conditions is notable, reflecting traditional ideas that salts could act to restore balance in the cardiovascular system and nervous system, where salt intake may influence electrolyte balance.
 - Sauvarchala salt is said to have a pungent taste and is heat-making. It is tied to conditions like colic pain and abdominal discomfort, which aligns with its stimulating nature, suggesting it can help to stimulate digestion and relieve blockages in the intestines.
 - Romaka salt is noted for its sharpness, heat-producing properties, and its ability to subdue Vayu (wind element). Its immediate action on the body and effectiveness as a purgative and diuretic reflects its potency in eliminating toxins and promoting internal secretion.
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- Audbhida salt is the least detailed, but its heat-producing nature suggests it has a stimulating effect, likely suited for individuals with a cold constitution or those needing stimulation of bodily processes.

3. Therapeutic Implications

The therapeutic claims made in the text are grounded in Ayurvedic principles, such as restoring balance to the body's humors. While many of these claims are empirical, they lack scientific validation in the modern medical or scientific context. The mention of salts being purgative, diuretic, or beneficial for specific organ systems might reflect centuries of traditional usage but would require clinical research to substantiate their effectiveness.

- The purification and balancing effects of salt in the body are emphasized through traditional descriptions of digestive stimulation and toxins elimination. This aligns with Ayurveda's holistic approach to health, where diet and lifestyle are intricately connected to one's overall well-being.

4. Cultural and Historical Context

The classification of salts in this manner reflects the ancient understanding of the different mineral compositions and natural sources of salt, and their correlation with specific health benefits. In many ancient cultures, salt was not only a preservative and flavor enhancer but also a medicinal substance. The use of salts from different sources, such as sea salt and rock salt, would have been linked to the geographical availability and the unique properties of those salts in Ayurvedic practice.

Salt Production in India:

India was the largest producer of salt in ancient time. Indians used to produce different kinds of salts other than 'sea-salt'. Many Sanskrit scripts has mentioned the salts as the prime object of different kinds of medicines and eatable items.

'Sushruta Samhita' has mentioned 6 major kinds of slats in "Lavana Group": the Saindhava, The Samudra, The Vida, The Sauvarchala, The Romaka and the Aubdhidam.

Lonari community in south India used to produce one of the salts of this Lavana Group from soil. The title of the community Lonari links itself to the ancient word of salt "lona" means "salt".

During the British rule, Britishers destroyed this system of production of salts by imposing heavy tax on the salt production. The entire community producing different kinds of salts was shifted to other occupations for their livelihoods. Thus in the last two centuries, the production of slat from soil is moribund.

However, a few members of the community still know the process of producing the salt from soil. This salt is only produced in south India from Satara to Bellari Districts.

The present research paper aims to research and restore the moribund procedure to produce salts from the soil. This project will help to revive the Indian knowledge of producing salt from the

soil. The project will revive the procedure to produce salt by actual producing the salt. It may further enhance the research of salt in general.

Lonari Salt

Lonari salt as per the history is produced since hundreds of years together in India to enrich the Indian cuisines. It may be called Rock or Romaka salt as mentioned in Sushruta Sanhita. It has a long history of its production in Maharashtra by a community named Lonari.

The technology to prepare salt from soil through a particular procedure is on the threshold to die. A few members of the community know this process. The valuable Indian knowledge may end with these people.

The Lonari Salt (Soil produced from soil) is one the salts mentioned in the Charakh Samhita produced by the Lonari community in south Maharashtra. The technology and scientific procedure to prepare this Lonari salt is destroyed by the British rule. No production is operated anywhere in India of the Lonari salt. The basic infrastructure like 'Modas' and Evaporation pots are in dust in the Lonari farms in present era. No scientific research is done on Lonari salt as it is endangered. Lonari salt is mentioned in different British Gazettes and by many writers in their books like: Vyankatesh Madgulkar, Chintamani Sahastrabudhe, Kamaladevi, Mahadevshastri Joshi, R. E. Enthoven, R. B. Thakare and Edgar Thirstan.

According to Sushruta the sea salt is produced by Aggari people in India and still is has been. Adv. Shankar Nikam has used the word Romika to explain the salt industry related to sea salt. Sociologist P. Dhar has written similar opinions on the salt produced at Lonar Lake in Maharashtra. The several references from ancient history to contemporary modern researchers' opinion show that Maharashtra or India were the rich sources of several kinds of salts that were used for different purposes.

In 1805 British rule imposed heavy duties on the salts that were produced from soil. They systematically destroyed the salt small industries in India through imposing different taxes and other rules and regulations.

The Procedure to Produce the Lonari Salt:

The entire procedure to produce and prepare Lonari salt from the soil particularly in South Maharashtra as it was produced here for more than one thousand years. There is need to recreate the entire procedure of producing the salt from the soil with the help of oral knowledge of a few people. No text and research are explored by any research institution on this process as it is endangered through the period of British. There are different aspects to produce the salt including collecting a particular soil from particular fields, collecting it at a place and to follow a particular process to make the soil leave the salty water out of it, to collect this muddy water and boil it at particular place at a particular heat point, to follow a particular and delicate process to separate water and soil, to boil the water separated from soil again, to preserve the water at a particular

place to make it cool, to collect and cut the cakes of salts etc. This entire process and knowledge system has to be revived through a particular research and technological process.

Decline of Lonari Salt:

For over 5,000 years, salt has been a staple in Indian cuisine, with the country producing it domestically (Rathi). Taxation on salt dates back to the Mauryan and Mughal periods, starting around 300 BC. However, these early taxes were relatively modest compared to the harsh and widespread salt taxes later imposed by the British, which were also much more strictly enforced. The British began exerting control over salt production in India during the mid to late 1700s after the East India Company defeated the Mughal princes. As the 18th and 19th centuries progressed, the East India Company increasingly sought ways to profit from salt production. They auctioned off wholesale salt to inflate prices for sellers, while also passing the **Bombay Salt Act** and **Indian Salt Act of 1882**, which granted the British government sweeping powers to seize contraband salt, regardless of quantity. Additionally, the Company raised taxes on Indian salt, making imported British salt cheaper, and annexed Orissa to eliminate salt smuggling and gain control over the region's salt production.

In 1915, Mahatma Gandhi returned to India from South Africa to begin working toward the country's independence. On March 2, 1930, he informed Viceroy Lord Irwin that he would begin the Salt March in ten days. Gandhi and his followers would march to the coastal town of Dandi to produce their own salt from seawater, defying the Salt Act. The Act made the production of any salt without a license illegal, and the British authorities were determined to stop the protest. This peaceful defiance sparked the **Civil Disobedience Movement**. As Gandhi was arrested and police violently beat other protesters, the international media spotlighted the brutal treatment of Indians by the British.

During this civil disobedience movement started to oppose the taxes and other oppressive operations of salt, the Lonari community produced the soil salt at the geographical places like Sangli, Jath and at a few other places of south Maharashtra however the history notes only the production of salt at Gujrat.

Research Findings: 1. Historical and Cultural Significance of Salt in India

- Salt has been an essential component of Indian cuisine and traditional medicine (Ayurveda) for centuries.
- Texts like the *Charakh Samhita* and *Sushruta Samhita* highlight the medicinal value of different types of salt.
- India was historically a major producer of various salts, including those derived from soil.
- The British colonial rule imposed heavy taxes on indigenous salt production, leading to the decline of traditional salt-making industries, such as the Lonari salt industry in Maharashtra.

2. Ayurvedic Classification and Uses of Salt

The *Sushruta Samhita* categorizes six primary types of salt under the "Lavana Varga" (Salt Group), each with specific properties and health benefits:

- **Saindhava (Rock Salt)** – Cooling, digestive, beneficial for eyes and general health.
- **Samudra (Sea Salt)** – Purgative, helps with colic pain, regulates internal fluids.
- **Vida Salt** – Alkaline, beneficial for digestion and heart health.
- **Sauvarchala Salt** – Pungent, heat-generating, aids digestion.
- **Romaka Salt** – Sharp, immediate impact, purgative, diuretic.
- **Audbhida Salt** – Stimulating, heat-generating.

These salts were traditionally used in Indian medicine, demonstrating Ayurveda's deep understanding of mineral-based therapy.

3. Decline of Traditional Salt Production in India

- The Lonari community in Maharashtra historically produced salt from soil using indigenous techniques.
- British colonial policies, including the *Indian Salt Act of 1882*, imposed high taxes and regulatory barriers, leading to the decline of this traditional industry.
- The Indian independence movement, particularly the *Salt March* led by Mahatma Gandhi, protested against such British-imposed salt laws.
- Today, the knowledge of Lonari salt-making is nearly extinct, with only a few individuals retaining the skills.

4. The Need for Reviving Lonari Salt Production

- The research aims to document and restore the ancient technique of extracting salt from soil.
- The process involves selecting specific soil, extracting saline water, evaporating it at controlled temperatures, and crystallizing the salt.
- There is a significant research gap in studying Lonari salt, its chemical properties, and its potential benefits compared to modern commercial salts.

5. Importance of Salt in Cuisine and Health

- Enhances flavor and balances taste profiles in various cuisines.
- Essential for food preservation, texture modification, and fermentation.
- Plays a key role in cultural and regional culinary traditions.
- Overuse of salt can lead to health issues like hypertension, highlighting the need for balanced consumption.

Conclusion

Salt has played a crucial role in Indian history, cuisine, and traditional medicine, particularly in Ayurveda. The study of different types of salts, as documented in ancient texts like the *Sushruta*

Samhita and *Charaka Samhita*, highlights their medicinal, culinary, and preservative significance. The classification of salts based on their potency and effects on the human body reflects Ayurveda's sophisticated approach to health and wellness.

Among the various salts mentioned in historical texts, Lonari salt stands out as a unique, soil-derived salt produced in Maharashtra for centuries. The knowledge and technique of producing Lonari salt have been nearly lost due to the colonial-era taxation policies imposed by the British, which systematically dismantled India's indigenous salt production industries. This decline not only led to the extinction of a vital cultural and economic tradition but also resulted in the loss of valuable scientific knowledge related to salt extraction from soil.

The present research underscores the urgent need to revive the forgotten technique of Lonari salt production. By documenting and recreating this traditional process, the study aims to bridge the gap in research and technological understanding of this lost practice. Restoring Lonari salt production could have significant implications for culinary heritage, sustainable salt production, and even Ayurveda-based therapeutic applications.

Re-establishing this indigenous knowledge system would not only serve as a tribute to India's rich scientific and cultural history but could also contribute to a broader movement of reviving lost traditional industries. Further interdisciplinary research and collaboration with the remaining knowledge-bearers of the Lonari community are essential to successfully restoring this ancient practice.

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ROLE OF TRIBAL RESIDENTIAL SCHOOLS IN SUSTAINING EQUITY AND SOCIAL JUSTICE

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Introduction

Education transforms lives; it serves as a catalyst for individual empowerment and national empowerment. Recognizing its pivot role, worldwide governments have undertaken various incentives to improve the literacy and remove social gaps. Educational schemes are one of the tools to enhance access, equality, equity. India celebrating diversity but disparities persists, and hence the educational schemes plays crucial role in addressing the socio-economic inequalities and diversities fostering inclusive growth. Chandrapur district in Maharashtra, with its rich tribal history stands as a micro unit of the broader perspective of challenges and issues faced by in tribal communities all over the country.

Against this background, this research paper is designed for STs' in Chandrapur district examines the implementation, effectiveness, and impact of the residential schemes; the study aims to shed light on the significance of educational interventions within the social justice and equality context.

The Scheme for the Establishment of Residential Schools in Tribal Sub-Plan Areas, operational since 1990-91 and revised in 2008-09, stands as a pivotal initiative to enhance educational facilities for scheduled tribe students, including Particularly Vulnerable Tribal Groups (PTGs). The primary objective is to provide residential education in an environment conducive to learning.

Covering Tribal Sub-plan areas in 22 States and 2 Union Territories, the scheme operates on a cost-sharing basis between the Centre and the States. Notably, in naxal-affected areas, the Central Government provides 100% funding for the construction of Girls' Residential Schools and Boys' Residential Schools. Members of Parliament can also contribute funds through the MPLAD scheme.

Salient features include the provision of funds for constructing school buildings from primary to senior secondary stages and upgrading existing Residential Schools. The scheme encompasses the construction of student hostels and staff quarters, with the State Governments providing land. Financial assistance is shared for non-recurring items like furniture, equipment, and library books, with the State Governments covering recurring expenses.

Crucially, only the capital cost is provided under the scheme, with recurring expenses to be met by the State Governments. Decisions regarding the location of new schools and admission policies

rest with the concerned State. The scheme emphasizes completion within a stipulated timeframe, ensuring the timely establishment of Residential Schools to cater to the educational needs of scheduled tribe students in Tribal Sub-plan areas.

Fig (a) Types of Tribal Residential School



The paper explores the role of tribal residential schools in shaping issues of social justice and equity for ST community. The aim of tribal residential school is to provide quality education to marginalized Indigenous communities leading to social justice and equity. It also aims to bridge the historical social, cultural, and educational gap by providing learning opportunities. Through educational schemes like free education, hostel, scholarships, merit based awards and Tribal residential schools government is trying to address socio economic barriers which often obstruct access to education among STs.

The schools are providing educational opportunities but the data from UDISE, ASHIE and other records shows the poor performance of tribes in respect to other social categories. It directly pointed out the poor performance of these schools. The paper will provide evidences to show the unequal performances and opportunities to perform equally with some figures and opinions of students and parents.

Key words: Equity, Social Justice, Inclusive Education, Social Exclusion, Educational Disparities.

Objective-The study has undertaken with the main three objectives, they are as follows:

- i) To study the role of tribal residential schools in maintaining social justice.
- ii) To identify the challenges in promoting sustainable equality by tribal residential schools.
- iii) To suggest potential strategies to improve the social justice and equality for tribal student in education stream.

Methodology-

To serve the purpose tribal district Chandrapur has been considered for the study.

Population of the study-

The quantitative data was collected from all 52 tribal residential schools from the district.

Data collection-

Data was collected from official sites, records and tribal welfare records.

Data processing-

Quantitative data was tabulated and analysed in percentage scale and presented using bar diagrams and line graphs.

Theoretical background-

The paper has followed the CRT critical race theory by Bell in 1995, based on

Structural inequalities, cultural capital, and educational access. This study applies CRT to analyse how tribal residential schools challenge systemic barriers to education for marginalized communities related to inequalities.

Observations-

- The estimated enrolment from age 18 to 23 in different institutions for different social groups for survey 2021-22 is male (22576389), female (20691792), total (43268182) for all categories. Whereas the percentage of SC male (7.67%), female (7.32%), for ST male (3.15%) female (3.11%). All India level, SC enrolment at age 18 to 23 is 15.10% and ST enrolment is reported 6.26%

All Categories			Scheduled Caste			Scheduled Tribe		
Male	Female	Total	Male	Female	Total	Male	Female	Total
22576389	20691792	43268182	3452037	3171276	6623315	1364136	1346149	2710285

- The Gross Enrolment Ratio (GER) in higher education (18-23 years) based on 2011 population is for all categories 28.4 whereas it is 25.9 for SCs and 21.1 for STs.

All Categories			Scheduled Caste			Scheduled Tribe		
Male	Female	Total	Male	Female	Total	Male	Female	Total
28.3	28.5	28.4	25.8	26.0	25.9	21.4	20.9	21.1

- The ST GER is much below all categories GER. The difference observed is 7.4% suggested potential areas for development and targeted interventions.
- There is a gap of about 14 percentage points in literacy rate of STs as compared to the all India literacy rate. As depicted in following table, Gaps in literacy rates of STs as compared to the all India in respect of persons, males and females for the years 1991, 2001 & 2011, show progressive decline. Literacy Rates based on Census 1961 onwards are given below in Table.

Table Gap in literacy rate: census 1991, 2001, 2011

Year	1991	2001	2011
Female	21.1	18.9	15.2
Male	23.4	16.1	12.4
Person	22.6	17.7	14

- The literacy rate by age group according to census 2011, as shown in the following table, there is a gap of 14% for all age group with total person and ST person. For youth it is 11.1%.
- The table suggested decline in the gap over the decades, but the gaps are still persisting and demands improvements.
- In order to bring equality and provide equal opportunities, the continuous efforts are necessary.

- The literacy at various age group is described in the following table as per 2021-22 data, 73% persons are literate (age 10-24) in India whereas only 49.4% are STs are literate.
- The literacy status of ST is very much low than the others. The statistical figures are describing the need of justice and equality and equal opportunities.

Table-The literacy rate by age group

All categories (age groups)	Total			Scheduled Caste			Scheduled Tribe		
	Person	Male	Female	Person	Male	Female	Person	Male	Female
All Ages	73.0	80.9	64.6	66.1	75.2	56.5	59.0	68.5	49.4
10-14	91.1	92.2	90.0	90.3	91.5	89.0	86.4	88.3	84.4
15-19	88.8	91.2	86.2	87.1	89.7	84.1	80.2	85.7	74.6
20-24	83.2	88.8	77.3	79.1	86.2	71.6	69.2	79.6	59.0
Adolescent (10-19)	90.0	91.7	88.2	88.8	90.6	86.8	83.6	87.1	79.9
Youth (15-24)	86.1	90.0	81.8	83.3	88.1	78.0	75.0	82.9	67.1

Source: Office of the Registrar General, India

Table-gross enrolment ration 2021-22 source UDISE+

GER 2021-22	Primary	Upper Primary	Elementary	Secondary	Higher Secondary
All categories	103.39	94.67	100.13	79.56	57.56
SC	113.1	103.79	109.66	84.91	61.49
ST	106.2	97.95	103.35	78.06	52.02

- The statistics show disparities in educational access across all categories, including the ST category. Though at the elementary level the GER (103.35) is close to population, at the secondary (78.06) and higher levels (52.02) the gap persists, and it needs to address the issue.

The dropout rate in school education for ST

Year/ Class	Primary			Upper-Primary			Secondary		
	Girls	Boys	Overall	Girls	Boys	Overall	Girls	Boys	Overall
2015-16	4.18	4.29	4.24	9.64	9.70	9.67	26.28	26.27	26.27
2016-17	3.91	3.96	3.94	8.60	8.69	8.64	27.15	27.85	27.51
2017-18	3.48	3.82	3.66	6.14	5.95	6.04	21.36	22.90	22.14
2018-19	5.23	5.72	5.48	6.46	6.89	6.69	23.38	26.40	24.93
2019-20	3.45	3.90	3.69	5.65	6.15	5.90	22.49	25.51	24.03

Source: Unified District Information System for EducationPlus (UDISE+), Ministry of Education

- The statistic suggest that the dropout rate at primary level is reduced to 3.69 % from 4.24 % while at upper primary level it is reduced to 5.90% from 9.67 % and for secondary it is reduced to

24.03% from 26.27 % from 2015-16 to 2019-20.

- The data shows positive trends in reduction of dropout rate and achievements in the educational retention rate. Sustainable efforts and policy interventions are necessary to foster more inclusivity.
 - For the Ministry of Tribal Affairs for 2022-23, there is a substantial increase of 12.32% in the Budget Outlay of Rs. 8451 Cr. It has disbursed scholarships to 26.37 lakh tribal students through DBT from 1st April 2022 to 31st Dec 2022. Cabinet approves total outlay of Rs. 28,920 Cr for setting up of 452 new Eklavya Model Residential schools, up gradation of existing 211 schools and establishment of 15 Centres of Excellence for Sports for the year 2021-22 to 2025-26
 - The current population of ST in Chandrapur district is 3.89 lakh constitute 17.07% of total population. 68.6% ST population resides in TSP area while 31.4% resides in ATSP area. 34 different types of STs are listed in the Chandrapur district profile among which 80% are Gond tribes.
 - In 1961, The STs population of the district was 1.89 lakh and the percentage of tribes was 14.81% and according to census 2011, the ST population is 3.89 lakh and its percentage for total population is 17. Chandrapur
 - In 1981 the literacy rate of ST in the district was 7.26% only which was 27.43% less than the overall literacy rate. In 2011, the literacy is 73.01% and the overall rate is 81.35% the literacy gap between overall population and ST population is minimized to 8.34% only.
 - In 1961 there were only 4 institutions for higher secondary education in the district, but in 2021. There are 269 various institutions and the 19.61% tribal students are taking education in it. In 2081, there were 12 colleges for higher education in the district and in 2021; there are total 104 colleges with 15.52% ST students taking education in it.
 - In 1981 there was only one polytechnic institution with 5.88 ST Students and only one ITI with 8.24 ST students taking education in it. Currently in 2021, there are 12 polytechnic institutions, 52 ITI centres and 135 vocational education centres in the district with 6.74%, 6.89% and 19% ST students taking education respectively.
 - Currently, the promotion rate at primary level (grade 1st to 5th) of ST is 98.59%, repetition rate is 0.14% and dropout rate is 1.27%.
 - The promotion rate at upper primary level (grade 6th to 8th) of ST is 97.79%, repetition rate is 0.58% and dropout rate is 1.63%.
 - The promotion rate at secondary level (grade 9th to 10th) of ST is 87.33%, repetition rate is 1.14% and dropout rate is 11.42%.
 - Along with the social reformers like Thakkarbappa from Gujarat, reformers in Chandrapur district have started opening education societies, hotels and libraries for Adiwasis were also set up
-

by them. The first tribal ashram school was established in 1972 with classes 8th to 10th, later in the next year 1973, the girls residential school was established in 1981; this is the only one school for ST girls in the district. At the end of 2021-22, there exist 61 Ashram (government and aided) schools in the district.

- Only 5.31% ST students are enrolled in different educational institutions in Chandrapur district. Underrepresentation in Higher Education & Professional Courses is observed at each level.

1. **Engineering (Degree):** Only **1.68%** of students are STs, much lower than their population proportion (17.07%).

2. **Engineering (Diploma):** Even lower, with **0.87%** ST students.

3. **Medical (Degree):** **6.11%** ST students, indicating significant underrepresentation.

4. **Medical (Diploma):** Slightly better at **6.91%**, but still below their population share.

5. **Law:** **4.97%** ST enrolment, showing limited participation in legal education.

6. **Senior Colleges:** Only **10.41%** ST students, reflecting lower participation in general higher education.

7. **Teacher Training:** **8.16%**, indicating fewer ST candidates entering the teaching profession.

- a. **Better Representation in Some Vocational and Training Courses**

8. **Nursing:** **15.71%**, which is close to the population percentage of STs.

9. **ITI (Industrial Training Institutes):** **13.34%**, showing a moderate presence but still below 17.07%.

10. **Vocational education and training centres:** **10.53%**, indicating some access but still lagging.

- **Analysis based on NAS reports-2021**

“It is a system level assessment i.e. it summarize students achievements at National/states/UT, district levels.”-NAS report 2018

Grade wise performance

NAS Subject	Grade wise performance of ST students in %			
	III	V	VIII	X
Language	61	56	51	41
Maths	54	43	39	23
EVS	58	47	34	-

The above table informs about the grade wise performance of ST and general category students. The performance in language falls from 61% to 42% from 3rd grade to 10th grade while

mathematics it falls from 54% to 23% from 3rd grade to 10th grade, whereas in EVS, it falls from 58% to 34% from 3rd grade to 8th grade. The poor performance in mathematics seeks attention.

• **Analysis based on PUPS/PSS/NMMS exams:**

The pre upper primary scholarship (PUP), pre secondary scholarship(PSS) exams are arranged by Maharashtra state council of examination, Pune for 5th grade and 8th students respectively, and the national merit cum scholarship exam is a central government exam conducted in each state or UT for 9th grades students, and support of \$2,000 per annual scholarship is provided to selected students. to categorise the talented students and support them financially with scholarship amount. The appearance of ST students in this competitive exam is less and the achievements are reservation based.

Pre upper primary () scholarship exam learning achievements

Year	PUP		PSS		NMMS	
	District	Residential schools	District	Residential schools	District	Residential schools
2015-16	11	0	7	0	19	0
2016-17	24	0	16	0	17	0
2017-18	22	1	14	0	25	0
2018-19	14	1	15	0	29	0
2019-20	22	1	7	0	21	0
2020-21	35	3	12	0	39	0
2021-22	33	2	17	0	18	0

The above table gives information from the year 2015-16 to 2021-22. The passing percentage of ST category students in PUP exam varies ranging from 11 to 33 in numbers but from residential school it is 0-3 only. In PSS exam the range at district level is 7-17 but for residential school, it is zero. Similarly for NMMS exam the range at district level is 17-39 but for residential school.

This indicated the poor academic performance in residential schools.

Comparison between government schools and aided schools at SSC, HSC level performance:

The learning achievements of the Tribal welfare residential school students

at HSC/SSC level 2015/16 to 2021/22 with district data scoring A grade:

Year	SSC					HSC				
	District	Aided	Gov.	EMRS	REMRS	District	Aided	Gov.	EMRS	REMRS
2015-16	7.07%	1.34%	2.62%	-	-	7%	2%	2%	-	-
2016-17	6.50%	2.00%	2.51%	-	-	7%	1%	1%	-	-
2017-18	8.00%	2.01%	1.25%	-	-	7%	2%	1%	-	-
2018-19	7.00%	4.81%	3.28%	-	-	6%	2%	2%	-	-
2019-20	6.50%	1.98%	3.36%	-	-	9%	1%	2%	-	-
2020-21	3.50%	0.91%	2.30%	2%	4%	10%	1%	2%	-	1%
2021-22	10.00%	2.95%	4.50%	3.33%	2%	9%	2%	2%	2 %	2%
2022-23	5.50%	3.85%	2.45%	3.91%	3%	10%	1%	1%	3 %	1.48%

At SSC level the range of performance varies from 3.50-10%, while aided schools have 1-5% , government schools have 2-5%, EMRS have 2-4%, REMRS have 2-4% only, At HSC level the range of performance varies from 6-10%, while aided schools have 1-2% , government schools have 1-2%, EMRS have 2-3%, REMRS have 1-2% only.

This indicates the poor performance of residential students at all levels.

- **Reviews about residential schools-**

Poor Infrastructure and Facilities- Many tribal residential schools lack proper classrooms, hostels, toilets, libraries, and drinking water, creating an unfavorable learning environment.

Shortage of Qualified Teachers - High teacher vacancies and lack of trained faculty in tribal schools affect student learning. Many teachers are underqualified or unmotivated to work in remote areas.

Language and Curriculum Barriers-Most tribal students struggle with learning in non-native languages (Hindi, English, or state languages) instead of their mother tongue, affecting comprehension and performance.**High Dropout Rates-**Due to economic hardship, migration, family responsibilities, and early marriage, many tribal students drop out before completing school.

Gender Disparities in Education-Tribal girls have higher dropout rates due to safety concerns, domestic work burden, and lack of hostel facilities for girls.

Lack of Digital and Technological Access-Limited access to computers, internet connectivity, and digital resources makes it difficult for tribal students to compete in today's tech-driven education system.**Inconsistent Government Funding and Policy Implementation-**Irregular fund allocation, delays in infrastructure projects, and poor monitoring reduce the effectiveness of tribal school schemes.

Social Discrimination and Isolation-Tribal students often face social discrimination in mixed schools, leading to a lack of confidence and motivation.

Lack of Skill-Based Education and Employment Opportunities-

Most tribal schools do not offer vocational training, making it hard for students to secure jobs or start businesses after schooling.**Health and Nutrition Challenges-**Many tribal school children suffer from malnutrition, anemia, and poor healthcare facilities, affecting their ability to learn.

Tribal residential schools play a crucial role in providing education, but they still face major challenges related to infrastructure, teacher shortages, language barriers, dropout rates, and funding issues. several challenges remain, including teacher shortages, infrastructure gaps, and curriculum adaptation. Strengthening governance, improving vocational training, and ensuring cultural integration can enhance their effectiveness. Addressing these barriers through policy

reforms, better infrastructure, and inclusive curriculum is essential for improving tribal education outcomes

Conclusion:

- Academic performance of the students is also low as compared to all over district level student's performance.
 - Discrimination and Social Exclusion in schools and society. This leads to psychological distress, lower self-confidence, and social exclusion.
 - Drop -out rate of ST student is higher than other category students.
 - Educational inequality: ST students are significantly underrepresented in higher education and technical/professional courses, restricting their opportunities for high-paying careers.
 - Enrolments of tribal students are not found to be according to the population percentage.
 - Gender Inequality in Tribal Education due to early marriage, household work, and lack of separate hostels or toilets, making education less accessible for them.
 - High Dropout Rates Due to Economic Hardships, migration, or family responsibilities, preventing them from gaining equal opportunities in education.
 - Lack of Community Participation in School Governance leading to decisions that do not reflect their needs or aspirations.
 - Lack of Representation in Higher Education and Jobs due to poor career guidance, lack of coaching for entrance exams, and systemic bias.
 - Language Barrier and Cultural Alienation making education difficult to understand and culturally irrelevant. This weakens their connection to their identity and education.
 - Limited access to elite institutions: The low representation in schools like Kendriya Vidyalayas and Sainik Schools suggests barriers in quality education access.
 - Mismatch Between Education and Employment making it hard for tribal students to compete in the job market.
 - Overall the schools are not performing at its designed objective to provide quality education and educational opportunities for higher education.
 - Poor Infrastructure and Resource Gaps creating an unequal learning environment compared to urban and mainstream schools.
 - Poor Quality of Teaching and Staff Shortages and insensitive to tribal cultures, leading to a lower quality of education.
 - Preference for vocational training: ST students have a relatively better representation in Nursing, ITI, and Agriculture education, which are more accessible and skill-based.
 - The educational views and study habits of other students is also not acquired by these students due to exclusion from the society.
 - The fear, shyness, and staying away from developed society attitude preserved.
-

- The gap between the performances is wider in all educational parameters.
- The result is observed in improvements in enrolments in skill education and vocational programs.
- The schools are lacking facilities and the inclusive education term is totally missing in EMRS school and these residential schools. Students don't have opportunities to mingle and learn other cultures and compete with other students. The strength and the willingness to excel in studies are not improved due to lack of competitions with other category students.
- The schools are located in remote areas and like separated from the society and leads to remoteness again improving gaps in inclusion.
- Weak Government Monitoring and Policy Gaps weaken the effectiveness of tribal residential schools.

Suggestions-

- To improve the performance of the residential schools the exclusion needs to be removed. More social inclusive methods need to develop.
- The schools in remote areas should provide more exposures to students using field trips, tours, and visits.
- The modern method of teaching-learning needs to be inculcated and more vocational courses should be started in residential schools from the secondary level.
- Employment opportunities, career guidance, ideal presentations by successful students, virtual visits, practical approaches needs to be implemented in schools.
- Instead of exclusion from social groups inclusion should be promoted.
- More exposures for cultural exchange, competition's and be developed among students and schools.

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THE FUTURE OF AI WITH HUMAN POTENTIAL**Sneha Singh***Students of SSR college of ACS, Silvassa***And****Sunanda Kangane***Assistant Professor**(History), SSR college of ACS, Silvassa*

Abstract

This research paper explores the intersection of artificial intelligence (AI) and human potential, examining how the rapid advancement of AI technologies could augment human capabilities, reshape society, and create new opportunities for personal and collective growth. The paper provides an in-depth analysis of AI's role in enhancing cognitive, emotional, and physical capabilities, as well as its potential to address global challenges such as healthcare, education, and climate change. Furthermore, it highlights the ethical, social, and economic implications of AI, considering issues related to job displacement, privacy, and power dynamics. By investigating the symbiotic relationship between AI and human potential, this paper envisions a future where humans leverage AI to unlock unprecedented levels of creativity, productivity, and well-being, while also addressing the risks and uncertainties associated with these emerging technologies. Through a multidisciplinary approach, the research outlines strategies for ensuring that AI development remains aligned with human values and contributes to the flourishing of humanity in the digital age.

Keywords: - Digital Age, physical capabilities, economic implications, AI, symbiotic relationship

Introduction

AI (artificial intelligence) is a transformative force that is increasingly shaping human life. While it holds the potential to enhance human capabilities and solve critical global challenges. The importance of AI in today's human life is profound and multifaceted, affecting nearly every aspect of society. Here are several key areas where AI is playing a crucial role:

1. Enhancing Productivity and Efficiency

AI automates tasks that were once labor-intensive, leading to significant improvements in efficiency. From virtual assistants like Siri and Alexa to AI-driven tools in workplaces, AI helps streamline processes, reduce errors, and free up time for more complex and creative tasks.

2. Improving Healthcare

AI has revolutionized healthcare by enabling more accurate diagnostics, personalized treatments, and advanced drug discovery. AI-powered algorithms can analyze medical images,

identify diseases such as cancer in early stages, and predict patient outcomes, improving overall healthcare quality and reducing costs.

3. Personalization and Consumer Experience

In today's digital world, AI is used to create personalized experiences for users. Whether it's through recommendations on platforms like Netflix, Amazon, or Spotify, or through targeted ads and content, AI tailors interactions to individual preferences, making services more engaging and relevant.

4. Smart Transportation

AI is a key driver of advancements in autonomous vehicles, improving road safety, reducing traffic congestion, and transforming transportation systems. AI-powered systems are also used in logistics and supply chain management to optimize routes and ensure timely deliveries.

5. Education and Learning

AI is transforming education by providing personalized learning experiences. Adaptive learning platforms, AI tutors, and chatbots offer students tailored content, help with homework, and provide real-time feedback. This is particularly beneficial in ensuring that every learner, regardless of ability, has the tools to succeed.

6. Enhancing Decision-Making

AI tools are used in data analysis, helping businesses, governments, and individuals make better decisions. By analyzing large datasets, AI can identify patterns and trends that humans may miss, providing valuable insights for everything from financial investments to public health policies.

7. AI in Creativity and Arts

AI is also expanding the possibilities in creative fields. Artists, musicians, and writers are using AI to create new forms of art, music, and literature. AI is increasingly seen as a collaborator, generating unique designs, compositions, and even helping in the creation of films and games.

8. Addressing Global Challenges

AI can play a role in addressing some of humanity's most pressing challenges, such as climate change, food security, and poverty. AI is being used to optimize energy consumption, predict climate patterns, develop sustainable agriculture practices, and provide insights for policy development.

9. Improved Security

AI-powered systems are enhancing cybersecurity by detecting anomalies, predicting cyber threats, and responding to breaches in real time. This helps protect sensitive data and maintain security across various sectors, from finance to national defense.

10. Workforce Transformation

While AI automation has raised concerns about job displacement, it also creates new

opportunities by enabling people to focus on higher-level work. As AI handles repetitive tasks, the workforce is increasingly shifting toward roles that require creativity, empathy, and complex problem-solving.

11. Social and Ethical Challenges

Alongside its benefits, AI raises important ethical questions about privacy, bias, fairness, and accountability. As AI systems become more integrated into daily life, society must carefully navigate these challenges to ensure AI serves the collective good without compromising individual rights.

AI and today's education System

AI and today's education are becoming increasingly interconnected, transforming the way we learn and teach. One of the key ways AI is revolutionizing education is through personalized learning. AI-powered adaptive learning systems assess students' strengths, weaknesses, and learning styles, tailoring lessons and content to meet their individual needs. This ensures that students receive a more customized and effective learning experience. Additionally, intelligent tutoring systems, driven by AI, offer real-time assistance to students, helping them with difficult concepts and promoting independent learning outside of the classroom.

AI is also making the grading process more efficient. Automated grading systems can handle assignments, quizzes, and exams, allowing teachers to focus more on interacting with students. Moreover, AI can analyze student performance data to predict future outcomes, enabling educators to intervene early and provide extra support to students who may be at risk of falling behind. In terms of engagement, AI is being integrated into gamified learning experiences and augmented reality (AR) or virtual reality (VR) tools, making learning more immersive and enjoyable.

Beyond teaching, AI helps streamline administrative tasks such as scheduling, enrollment, and communication. This automation frees up time for educators and staff to focus on more meaningful interactions with students. AI is also improving language learning by providing smart apps that assist with pronunciation, feedback, and adjusting lessons based on proficiency levels. Furthermore, AI promotes accessibility in education by offering tools like speech-to-text, text-to-speech, and translation services, ensuring that all students, regardless of their needs, can benefit from the learning process. AI is reshaping education by making it more personalized, efficient, and inclusive. As AI technologies continue to advance, they will further enhance how we teach, learn, and interact with educational content, creating a more engaging and effective educational experience for everyone.

Challenges of use AI

The use of AI presents a range of challenges, both technical and ethical, that must be addressed to ensure its responsible and effective integration into society. Some of the key

challenges include:

1. Bias and Fairness

AI systems can unintentionally perpetuate or amplify biases present in the data they are trained on. If AI is trained on biased data, it can produce biased outcomes, leading to unfair decisions in areas like hiring, law enforcement, or healthcare. Ensuring fairness and avoiding discrimination in AI systems is a major challenge that requires careful attention to data quality and algorithmic design.

2. Privacy and Security Concerns

AI systems often rely on vast amounts of personal data to function effectively, raising significant privacy concerns. There is a risk of misuse or unauthorized access to sensitive data, especially as AI is used in fields like healthcare, finance, and surveillance. Ensuring that AI systems are secure and that individuals' privacy is respected is crucial to building trust in these technologies.

3. Job Displacement

The automation of tasks through AI has the potential to displace many jobs, especially those that involve repetitive or manual labor. While AI can create new opportunities, there are concerns about the economic impact on workers and industries, particularly those that may be left behind without proper reskilling programs or social safety nets.

4. Ethical Dilemmas

AI presents a variety of ethical challenges, such as determining how to program machines to make decisions in morally complex situations (e.g., self-driving cars in accident scenarios). Questions about accountability—who is responsible when an AI makes a mistake—are also central to the ethical use of AI.

5. Lack of Transparency (Black Box Problem)

Many AI algorithms, particularly deep learning models, operate as "black boxes," meaning their decision-making process is not easily interpretable by humans. This lack of transparency can make it difficult to understand why an AI made a certain decision, leading to issues of accountability and trust, especially in high-stakes areas like healthcare and criminal justice.

6. Regulation and Governance

As AI continues to evolve, there is a lack of comprehensive regulations and policies that govern its development and use. Governments and organizations are still working to establish guidelines to ensure AI is developed ethically and safely. Balancing innovation with regulation is a challenge that will require collaboration between policymakers, technologists, and ethicists.

7. Data Quality and Availability

AI systems require vast amounts of high-quality, diverse data to be effective. In many cases, access to the necessary data is limited, or the data available is incomplete or biased.

Ensuring the availability of high-quality data while maintaining ethical standards around data collection and usage is a significant challenge.

8. Human-AI Collaboration

For AI to be most effective, it must complement human abilities rather than replace them entirely. However, finding the right balance between human and AI collaboration, especially in fields like healthcare, education, and creative industries, can be difficult. Ensuring that AI tools are user-friendly and augment human skills without dehumanizing or replacing jobs is an ongoing challenge.

9. Misinformation and Manipulation

AI has the potential to be misused for creating deepfakes, spreading misinformation, or manipulating public opinion, especially on social media. Addressing the ethical implications of AI in media and communications is critical to prevent the spread of false information and ensure that AI is used for positive purposes.

10. Dependency and Over-reliance

As AI systems become more integrated into everyday life, there is a risk of over-reliance on these technologies. Over-dependence could lead to a lack of critical thinking or reduce human autonomy in decision-making, particularly if people start trusting AI blindly in important areas like healthcare or finance.

Human Potential & AI

This partnership allows AI to provide data-driven insights that help humans make more informed decisions in areas like healthcare, business, and governance. Additionally, in creative fields such as art, music, and literature, AI can generate ideas and patterns, but it is the human touch that adds depth, emotion, and narrative, leading to new realms of creative expression. In education, AI can act as a personalized tutor, adapting lessons to each learner's pace, while human educators provide empathy, mentorship, and guidance, fostering a more holistic learning experience.

AI also plays a significant role in problem-solving, particularly in complex fields like climate change or healthcare. While AI can assist with simulations and data analysis, humans contribute creativity, intuition, and an understanding of societal needs, ensuring that solutions are grounded in real-world considerations. In the workforce, AI automates mundane tasks, freeing humans to focus on higher-level, creative, or complex work that requires emotional intelligence. In healthcare, AI aids doctors by analyzing medical data, helping with diagnostics, but human doctors provide the necessary care, empathy, and contextual knowledge, ensuring holistic patient treatment.

AI's potential in enhancing accessibility for individuals with disabilities is another area where collaboration between AI and human creativity can be transformative. AI-powered tools

such as speech-to-text translation and assistive technologies allow people with disabilities to lead more independent lives, tailored to their unique needs. In mental health, AI-driven tools can monitor mood and offer support, while human caregivers provide the empathy and emotional connection that AI cannot replicate. Similarly, in research and development, AI accelerates the discovery of patterns and hypotheses, but human researchers bring intuition and creativity that drive meaningful research and solutions.

Conclusion

The collaboration between AI and humans also extends to ethical oversight. As AI systems evolve, human intervention is crucial to ensure that AI aligns with ethical standards, avoids bias, and maintains privacy. This partnership between AI developers, ethicists, and human stakeholders helps create responsible AI systems that contribute to societal well-being. Ultimately, combining the strengths of both AI and humans can drive innovation, improve efficiency, and address complex global challenges, ensuring that AI benefits humanity in ways that align with societal values.

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BEYOND EROTICISM: UNVEILING THE KAMASUTRA’S WISDOM ON LOVE AND PLEASURE PRINCIPLE

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Abstract:

This paper seeks to highlight the significance of studying the Kamasutra, a text often misunderstood and misrepresented as merely a guide to erotic pleasure or as pornographic material. The Kamasutra has been wrongly interpreted as a substitute for fulfilling erotic desires, passions, and gratification. In today's context, it is often viewed solely as a tool for enhancing appeal and sensuality. However, the Kamasutra is more than just a work of erotic literature; it is a comprehensive guide to achieving broader goals such as love, pleasure, sanctity, and liberation from physical desires. This paper aims to explore several questions through the lens of this ancient text: How can sex education contribute to a healthier life? What is the true nature of love, and how can it be attained? What is the key to aesthetic pleasure? Is seeking sexual pleasure inherently immoral? How can a person lead a life that culminates in fulfillment? Furthermore, how does the Kamasutra help in realizing the ‘four Purusharthas’—the four goals of human life—for a healthier existence in today’s world of temptations?

Keywords : Kamasutra, art of love, sexual pleasure, moksha, Purusharthas the four stages of life, pleasure principle.

Introduction:-

In his poetry, Chaucer once wrote:

“...Then you compared a woman’s love to Hell,
To barren land where water will not dwell,
And you compared it to a quenchless fire,
The more it burns the more is its desire
To burn up everything that burnt can be.
You say that just as worms destroy a tree
A wife destroys her husband and contrives,
As husband know, the ruin of their lives...” (Edmonds)

In these lines, the terms ‘woman’ or ‘wife’ are not intended to evoke the typical notions associated with female gender or the conventional role of a wife, often symbolized as Eve, the mother of all vices. Instead, Chaucer speaks to the idea of a man and his loyal partner, highlighting how this partnership can illuminate the path toward a fulfilling marital life. When a man entices a

woman with lust or temptation, akin to Satan's deeds, such love can lead him to a metaphorical hell. The fire of 'lust' not only torments physically but also inflicts deep wounds on the soul. This craving for lust is insatiable; the more one tries to satisfy it, the more it grows. Consequently, if a man fails to connect with his wife or beloved emotionally, passionately, and mentally—with true love—then physical intimacy alone will never be enough. She may seek fulfillment elsewhere, leading to disloyalty, and the man will find himself trapped in the misery of dissatisfaction. As José Bergamin aptly puts it, "Sensuality without love is a sin; love without sensuality is worse than a sin" (Deck). Therefore, it is essential for a man to balance his lust and other desires, becoming the leader of his own self first.

Two relevant phrases on this subject are as follows: "Desire, which springs from nature, and which is increased by art, and from which all danger is taken away by wisdom, becomes fixed and safe. A clever man, depending on his ability, and observing the ideas and thoughts of women, and removing the causes of their turning away from men, is generally successful with them" (Vatsyayana). Additionally, some perspectives pertain to the role of a woman as a soul mate. A girl should marry a man she loves and respects because such a man will be loyal and sincere to her, capable of offering pleasure without any conditions. However, when a girl is married off by her parents for wealth, social status, and the prestige of a wealthy man without considering the character or appearance of the groom, the marriage is unlikely to succeed. She may never truly connect with him, even if he possesses noble qualities, is obedient, strong, and strives to please her in every way. Conversely, a man who is self-disciplined, even if he lacks wealth and social standing, is preferable to one who is desirable to many women but shallow. This explains why the wives of wealthy men often do not feel attracted to their husbands and are not loyal to them, despite being provided with all the external pleasures of life. A man with a lowly character, poor reputation, many wives and children, who is obsessed with sports and gambling, who loves to travel, and only seeks his wife's company when it suits him, does not deserve to be married. Such a man is not 'the husband of love.'

Why do we need Erotica/Pornography?

The need for erotica or pornography is deeply intertwined with the history of civilization itself. It has been present in every culture, nation, and throughout the evolution of humanity over the ages. The term 'erotica' is often used to describe situations where physical connections occur without the need for emotional or relational intimacy. However, excessive consumption of pornography is linked to various psychiatric comorbidities, including anxiety, depression, hopelessness, and even sexual dysfunction. The portrayal of fantasies in pornography has the potential to alter the pleasure centers of the brain, refining both its structure and function. These changes can result in significant shifts within the brain, akin to those observed in drug addiction or traumatic experiences.

Why Say No to Erotica/ Pornography:-

In the post-modern era, people are increasingly driven by the pursuit of money, wealth, and luxury in their quest for a lavish lifestyle. However, amidst the daily hustle and bustle, many find themselves feeling isolated and disconnected. Close family ties, respectful and well-mannered children, and a loving, caring life partner often seem out of reach. The anxiety stemming from this sense of isolation pushes individuals towards digital infotainment, where they seek comfort and a sense of peace. Unfortunately, this digital and virtual world of entertainment offers only superficial satisfaction—a false sense of contentment that neither reaches the body nor nourishes the soul, but instead creates a deceptive illusion of fulfillment.

In an age dominated by smartphones and digital technology, resisting the lure of reels, short videos, and other digital temptations has become increasingly difficult. These media stir emotions and passions, often without the individual even realizing it. The post-modern individual finds pleasure in superficial activities—indulging in street food to satisfy the taste buds, using smartphones for entertainment, and breathing in polluted air. The saddest aspect of this situation is the way people derive pleasure in their lives. Today, post-modern men and women often feel disconnected from the surrounding society, suffering from the predicament of being lost in the digital crowd.

The commercialization of all aspects of life has transformed the most intimate human experiences into tools or weapons for acquiring wealth, leading to the rise of lust, human trafficking, body advertising, and the commodification of the human form. One of the most alarming developments is the easy access to pornography and erotic sites on the internet, which claim to offer viewers real physical and sexual knowledge. However, these are merely virtual illusions—nothing more than a waste of time that misleads people from their true life goals, offering no genuine satisfaction.

People often fail to recognize the mental and psychological impact of consuming pornographic and erotic content.

They mistakenly believe that such material provides factual information, knowledge, and education, when in reality, it is nothing but deception. Not a single element of pornography—whether images, posters, gestures, expressions, feelings, gratification, videos, or games—offers genuine knowledge or truth. These products are purely illusory and fictitious, and they disturb and destroy mental, psychological, physical, domestic, and emotional balance entirely. As lead researcher Simone Kuhn suggests, “Regular consumption of pornography more or less wears out your reward system” (Church). The widespread practice of mimicking internet videos and movies, especially among the youth, leads to the false synchronization of fictional erotic content with real-life sexuality, ultimately harming the individual's well-being.

What is Love or Pleasure Principle:-

1. Love Acquired Through Habit: This type of love emerges from the constant and repeated engagement in specific activities. Examples include the enjoyment derived from sexual intercourse, hunting, drinking, and gambling. This love is cultivated through continuous practice and habit.
2. Love Arising from Imagination: This form of love is driven by mental perceptions and fantasies, especially towards things we are not directly familiar with. It is the love or pleasure principle that stems from imagination, such as the attraction some individuals feel towards oral congress, or the affection felt during embracing, hugging, and kissing.
3. Love Based on Mutual Belief: This love is reciprocal, grounded in mutual trust, where both individuals view each other as their own. Scholars recognize this as love resulting from belief, characterized by its authenticity and shared commitment.
4. Love from Sensory Perception: This type of love is evident and widely recognized, as it is based on the perception of external objects and physical attributes.

Among these, aesthetic pleasure is considered superior, as it encompasses the other forms of love and enhances the overall experience. There is a distinct difference between the pleasure principle, which is associated with sensual gratification, and aesthetic pleasure, which engages the deeper senses and emotions. Love is closely aligned with aesthetic pleasure, fostering a more profound connection.

However, exposure to erotic videos and similar content can undermine the genuine pleasure principles by promoting distorted and superficial representations of love and intimacy. This trend poses a significant risk, particularly to the younger generation, by leading them towards self-destructive behaviors and away from understanding and experiencing true, meaningful love.

What Purusharthas stands for:-

In the context of the four Purusharthas (life goals) in Hindu philosophy, Kama is placed just before Moksha, highlighting its importance and significance in the life of an ordinary person. The foundation of the universe itself is rooted in the concept of Kama. The Rigveda describes the emergence of Kama as divine, emphasizing that human beings are born through the act of Kama to fulfill their earthly purposes. The order of the Purusharthas- Dharma, Artha, Kama, and Moksha—is intentional, reflecting the importance of each at different stages of life, from birth to death. While Moksha (liberation) is the ultimate goal, Kama plays a crucial role in helping individuals achieve it, rather than being a hindrance.

Hindu scriptures divide human life into four Purusharthas—Dharma, Artha, Kama, and Moksha. A person should engage in Artha, Kama, and Dharma at appropriate times, in a manner that guides them toward the ultimate goal of Moksha. Artha, Kama, and Dharma are practices, while Moksha is the final objective. Dharma is a vital stage where the teachings of the Shastras

(sacred texts) direct individuals to perform certain actions to overcome worldly temptations, sufferings, and miseries. The principles of Dharmashastra outline the sacrifices related to wealth, power, property, and desires.

Artha represents the stage where a person seeks to acquire wealth, property, prosperity, and social connections. It involves learning how to protect and grow these assets, knowledge that can be gained from government officials, merchants, and experienced businesspeople. Kama is the stage where a person enjoys the sensory pleasures obtained through hearing, touch, sight, taste, and smell, with the active involvement of the mind to satisfy the soul. When the senses interact with their respective objects, the resulting pleasure is known as *Kama*. This practice can be learned from the Kamashastra and the experiences of others.

According to Dharma, this world is an illusion, and our body is merely a vehicle to achieve Moksha. To reach this ultimate goal, one must maintain faith, practice charity, and show generosity towards others while detaching from worldly attachments.

It is noteworthy that while people often focus on Artha and Dharma, they tend to misunderstand the true meaning of Kama and overlook the ultimate goal of Moksha. The postmodern individual often feels trapped in a life of endless suffering, similar to the myth of Sisyphus, and views Kama solely as an expression of lust and physical satisfaction. In contrast, Greek erotic art often depicts women as submissive, existing only to please their partners without regard for their own pleasure. This concept contrasts with 'erotica', where both partners engage in and enjoy the act, focusing on mutual sensuality.

In the realm of pure love, Rainer Maria Rilke eloquently describes physical pleasure as a profound sensual experience, akin to the pure joy of seeing or tasting a ripe fruit. He views it as an essential, endless experience that enriches our understanding of the world. However, Rilke also warns that while physical pleasure itself is not inherently bad, its misuse—as a mere stimulant or distraction—can squander its potential to elevate and enrich our lives.

Conclusion:

The Kamasutra stands as one of the most widely recognized yet often misunderstood and misinterpreted texts globally. Today, it continues to draw attention, particularly through modern marketing strategies that emphasize and sensationalize its association with sensuality. However, it is crucial to recognize its true relevance and applicability—not as a source of pornographic or erotic content, but as a guide to understanding sex and the principles of pleasure. Rather than exaggerating the importance of sex or physical pleasure to cater to excessive erotic desires, The Kamasutra serves as a manual offering sexual guidance, instructions, and suggestions that have remained pertinent across various societies throughout history. Vatsyayana sought to balance the principles of pleasure with morality, presenting The Kamasutra as a respected and esteemed guide

not only to physical pleasure but also to divine pleasure, grounded in aesthetic love and mutual respect.

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GOEIJR

BUILDING INCLUSIVE COMMUNITIES: DIVERSITY, EQUITY AND SOCIAL JUSTICE**Mrs. Rupali Manish Kute***Dhule***Komal Ashish Kute***Nashik*

Introduction

Diversity, Equity and Inclusion (DEI) are concepts that promote fairness and respect for all people. Diversity, Equity and Inclusion these three concepts are interconnected concepts that aim to create a fair and inclusive environment where every one feels valued and has the opportunity to thrive, encompassing differences and ensuring equal access to opportunities.

The concept of Diversity :- It refers to the presence of variety within a group or organization encompassing differences in characteristics like race, ethnicity, gender, religion, sexual orientation etc.

The Concept of Equity :-

It focuses on fairness and justice, ensuring that every one has the resources and opportunities, they need to succeed, recognizing that people may have different starting points and require different support to achieve equal outcomes.

The Concept of Inclusion :- It creates welcoming and supportive environment where every one feels valued, respected and able to participate fully, regardless of their background or identity, it involves actively inviting and supporting diverse perspectives and contributions.

Aims of DEI :-

DEI aims to Recognise and value differences, acknowledge and celebrate the unique characteristics and experiences of individuals.

It promotes fairness and justice :- It ensures that every one has equal access to opportunities and resources.

Foster a sense of belongingness :- It creates an environment where every one feels welcome, respected and every one is able to contribute.

Eliminate barriers and discriminations :- It addresses systematic and structural barriers that may prevent under represented groups from achieving their full potential.

There are four pillars of DEI :-

- 1) Educator Growth :- It promotes professional Development, training, hiring practices.
- 2) Classroom and Climate :- Culturally, Responsive and Inclusive Practices and Curriculum.
- 3) Student Belonging :- Identity, Empathy, Inclusion
- 4) Community Cohension :- पॅरेंट, guardian's Education and involvement, Town Partnerships.

DEI encompasses people of different ages, races, ethnicities, abilities, disabilities, genders, religions, cultures and sexual orientations. It also covers people with diverse backgrounds,

experiences, skills and expertise. Diversity, Equity and Inclusion are three different but interconnected Concepts.

Many Researchers have studied of these concepts. It shows DEI has the potential to increase sales revenue, increases customer base and ultimately increase profits. So DEI is not only the right thing to do, it also makes good business sense, backgrounds, identities and experiences collectively and as individuals.

There are four C s of DEI :-The four C s are Careers, Connections, Community and Capital As Black Candidates and employees, we run into roadblocks to meet these four goals, be it due to a lack of success to opportunity, support or unconscious biases, creating a more diverse, inclusive and equitable company starts with what these four Cs.

In addition, four pillars code are utilized. They are very important. They are Abstraction, Encapsulations, Inheritance and Polymorphism. These four pillars code are of Object Oriented programming.

The Importance of DEI :-

An organization continue to embrace DEI principles, they foster an environment where every individuals voice is heard, valued and respected. DEI is crucial for building talented teams of engaged, motivated employees and organizations with diverse, inclusive teams that have an advantage over their less education, empathy, engagement and accountability are the four pillars which serve as a foundation for creating a more diverse, equitable and inclusive organizational culture.

Building Inclusive Communities require intentional efforts, dedication, willingness to listen, learn and adapt.

There are four Principles of Inclusive Community :-

- 1) Respect and Empathy:-It foster an environment where every one feels valued, respected and heard.
- 2) Diversity and Representation :-It encourages diverse perspectives, experiences and backgrounds.
- 3) Equity and Fairness :-It addresses systematic inequalities and ensure equal access to resources and opportunities.
- 4) Accessibility and accommodations :-It provides Physical, social and emotional accessibility for all members.

Strategies for building Inclusive Communities :-

- 1) Establish clear values and goals :-Define and communicate your communities commitment to inclusivity.
 - 2) Conduct Community Assessments :-Identify Areas for improvement and develop strategies to address them.
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- 3) Foster Open Communication :-Encourage active listening, feedback and constructive dialogue.
- 4) Provide Education and Training :-Offer workshops, training sessions and resources to promote inclusivity and address biases.
- 5) Create Safe Spaces :-Establish designated areas for marginalised groups to share these experiences and concerns.
- 6) Celebrate Diversity :-Organize events, festivals and activities that promote cultural awareness and appreciation.
- 7) Address Microaggressions and Biases :-Develop strategies to address and prevent microaggressions and biases.
- 8) Foster Partnerships and collaborations :-Build relationships with organizations, community groups and individuals to promote inclusivity.

Initiatives for Inclusive Community :-following activities help for creating Inclusive Community.

- 1) Mentorship Programs :-Pair Individuals from under represented groups with mentors who can provide guidance and support.
- 2) Language access programs :-Provide language interpretation and translation services to ensure equal access to resources.
- 3) Cultural Competency Training :-Offer training sessions to help community members, understand and appreciate diverse cultural backgrounds.
- 4) Accessibility Initiatives :-Implement initiatives to improve physical and social accessibility, such as Wheel chair, ramps or Accessible rest rooms.

Thus building Inclusive Community is an ongoing Process that requires Effort, Commitment, Dedication, Faith, Positive attitude,, open Communication and willingness to learn and adapt all skills, knowledge and maintain relationships.

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PHYSICO CHEMICAL PARAMETERS AND ISOLATION OF POTENTIAL FUNGI FOR BIOREMEDIATION OF PAER AND PULP EFFLUENT FROM PAPER MILLS

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Abstract

The physico chemical characteristics of waste water from the paper industry which is using waste paper as a raw material were analysed. The waste water from the paper industry is characterized by color, extreme quantities of COD, BOD, TDS,DO and SS. Waste water samples were collected from the inlet and outlet of the effluent treatment plant of paper mill. The volume and pollution load of the generated wastewater depends upon different combinations of unit processes involved in the production, type of raw materials and chemicals consumed, types of paper products and the degree of water recovery. The pollutants discharge from the paper industry affect aquatic and land ecosystem. The studies recorded toxic effects on various fish species due to the exposure of pulp and paper industrial waste water. The samples were analyzed and compared with Indian standards of effluent discharges as well as with the CPCB.

Keywords : Physico Chemical, Bioremediation, Potential Fungi, Pulp, Effluent

Introduction

One of the world most polluting sectors is the pulp industry. One of the reasons for the contamination is that woody and non woody lignocellulosic compounds are used as a raw material by the industry. Huge amounts of inorganic compounds are used during pulp preparation which react with the lignin in such as lignocellulose compounds and form toxic organic compounds in Pulp and paper mill effluents. To extract Lignin different Chemicals are used during the cooking process. Delignification of wood pulp is necessary step to improve the quality of paper because Lignin causes paper to turn yellow. Fungi are effective in cellulose hydrolysis for the degradation of this compound. Nevertheless bacteria are the biggest contributor to the microorganisms involved in the depuration of waste water. In the past bacteria with the ability to hydrolyze proteins, starch and lipids have been used for waste water treatment. Paper industries are the sixth largest toxic effluent generating industries of the world. Effluents generated by factories are one of the main causes of environmental pollution and the major public health risk, particularly in developing countries. These units produce the significant volumes of waste water correspondingly, generating approximately 150-200 ml effluent of paper.

Materials and methods :-

Samples were collected from the inlet and outlet of the effluent treatment plant of dyestuff

industry. The samples were collected using grab sampling technique. Water samples from the effluent Lagoon of a pulp and paper mill were collected. The samples were collected in a plastic container and were brought to the laboratory and immediately stored in the refrigerator at four degree Celsius until used for isolation of fungi. The physico chemical analysis of the samples was carried in the laboratory as per the standard methods.

Sample handling and preservation :-

Sample is collected in glass bottles. Use of plastic containers is a permitted if it is known that there is no organic contaminants present in it. Biologically active samples should be tested as soon as possible. Samples containing material should be well mixed preferably homogenized, to permit removal of representative aliquots. Sample should be preserved with sulphuric acid to a pH less than two and maintain at four degree Celsius until analysis. The samples not allowed preserving.

Precautions:-

The following precaution should be observed while performing the experiment.

- (1) Chlorides are quantitatively oxidized by dichromate and represent a positive interference.
- (2) Mercuric sulphate is added to the digestion tubes to complex the chlorides so that it does not interfere in the determination.
- (3) Nitrates also interfere in the determination of COD and hence during the determination of samples with high concentration of nitrides, few ml of sulphuric acid is added to the potassium dichromate solution.
- (4) Traces of organic material either from the glassware or atmosphere may cause a positive error.
- (5) Extreme care should be exercise to avoid inclusion of organic materials in the distilled water used for reagent preparation or sample dilution.

Isolation of Potential Fungi :

Isolation refers to the process of separating and identifying individual fungal species from a mixed culture or environmental sample. In the context of your research, the goal is to isolate potential fungi that can be used for bioremediation of paper and pulp effluent from paper mills.

Why Isolation is Important

Isolation is a crucial step in microbiological research, as it allows for the identification and characterization of individual microorganisms. In the case of fungal isolation for bioremediation, it is essential to identify and isolate fungi that have the potential to degrade specific pollutants.

Methods for Fungal Isolation

There are several methods that can be used for fungal isolation, including:

1. Serial Dilution: This method involves diluting the environmental sample or mixed culture

in a series of tubes, and then plating the dilutions on a solid medium. This allows for the isolation of individual fungal colonies.

2. Spread Plate Method: This method involves spreading a small amount of the environmental sample or mixed culture onto a solid medium, and then incubating the plate. This allows for the growth of individual fungal colonies.
3. Streak Plate Method: This method involves streaking a small amount of the environmental sample or mixed culture onto a solid medium, and then incubating the plate. This allows for the isolation of individual fungal colonies.
4. Enrichment Culture: This method involves creating an enrichment culture that favors the growth of specific fungi. This can be done by adding specific nutrients or pollutants to the culture medium.

Media Used for Fungal Isolation

A variety of media can be used for fungal isolation, including:

1. Potato Dextrose Agar (PDA): This is a general-purpose medium that supports the growth of a wide range of fungi.
2. Sabouraud Dextrose Agar (SDA): This medium is specifically designed for the isolation and cultivation of fungi, particularly those that are pathogenic to humans.
3. Malt Extract Agar (MEA): This medium is used for the isolation and cultivation of fungi, particularly those that are involved in the degradation of organic matter.

Challenges in Fungal Isolation

There are several challenges that can be encountered during fungal isolation, including:

1. Contamination: This can occur when unwanted microorganisms are introduced into the culture medium.
2. Overgrowth: This can occur when one fungal species grows more rapidly than others, making it difficult to isolate individual colonies.
3. Slow Growth: This can occur when fungi grow slowly, making it difficult to isolate individual colonies.

Importance of Fungal Isolation in Bioremediation

Fungal isolation is a critical step in bioremediation, as it allows for the identification and characterization of fungi that have the potential to degrade specific pollutants. By isolating and characterizing these fungi, researchers can develop new bioremediation technologies that are more effective and efficient.

Bioremediation of potential fungi :-

Bioremediation is the use of living organisms, such as fungi, to degrade or transform pollutants into less toxic or harmless compounds. Fungi have been shown to be effective in bioremediating a wide range of pollutants, including:

Heavy metals: Fungi can accumulate and transform heavy metals, such as lead, mercury, and arsenic, into less toxic compounds.

Pesticides: Fungi can degrade pesticides, such as DDT and atrazine, into less toxic compounds.

Polycyclic aromatic hydrocarbons : Fungi can degrade PAHs, such as benzo(a)pyrene and anthracene, into less toxic compounds.

Industrial dyes: Fungi can decolorize and degrade industrial dyes, such as azo dyes and anthraquinone dyes.

Mechanisms of Fungal Bioremediation

Fungi use a variety of mechanisms to bioremediate pollutants, including:

Enzymatic degradation: Fungi produce enzymes, such as lactase and peroxidase, that can break down pollutants into less toxic compounds.

Bio sorption: Fungi can absorb pollutants onto their cell surfaces, reducing the availability of the pollutant in the environment.

Bioaccumulation: Fungi can accumulate pollutants within their cells, reducing the availability of the pollutant in the environment.

Potential Fungi for Bioremediation

Several species of fungi have been identified as having potential for bioremediation, including:

Aspergillus flavus: This fungus has been shown to be effective in degrading pesticides and heavy metals.

Penicillium chrysogenum: This fungus has been shown to be effective in degrading industrial dyes and PAHs.

Phanerochaete chrysosporium: This fungus has been shown to be effective in degrading pesticides, heavy metals, and PAHs.

Factors Affecting Fungal Bioremediation:-

Several factors can affect the effectiveness of fungal bioremediation, including:

- (1) Temperature: Temperature can affect the growth and activity of fungi, with optimal temperatures ranging from 20-30°C.
 - (2) pH: pH can affect the growth and activity of fungi, with optimal pH ranges varying depending on the species.
 - (3) Nutrient availability: Nutrient availability can affect the growth and activity of fungi, with optimal nutrient levels varying depending on the species.
 - (4) Pollutant concentration: Pollutant concentration can affect the effectiveness of fungal bioremediation, with higher concentrations potentially inhibiting fungal growth and activity.
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Applications of Fungal Bioremediation

Fungal bioremediation has a wide range of applications, including:

- (1) Soil remediation: Fungal bioremediation can be used to remediate contaminated soil, reducing the availability of pollutants in the environment.
- (2) Water remediation: Fungal bioremediation can be used to remediate contaminated water, reducing the availability of pollutants in the environment.
- (3) Industrial waste treatment: Fungal bioremediation can be used to treat industrial waste, reducing the availability of pollutants in the environment.

* **Potato Dextrose Agar (PDA) for fungal isolation :-**

Potato Dextrose Agar (PDA) is a type of agar medium used for the isolation and cultivation of fungi. It is a nutrient-rich medium that supports the growth of a wide range of fungal species.

Composition of PDA :-

Potato infusion: A mixture of boiled and filtered potatoes, which provides a rich source of nutrients, including carbohydrates, amino acids, and vitamins.

Dextrose: A type of sugar that serves as a carbon source for fungal growth.

Agar: A polysaccharide derived from red algae, which acts as a gelling agent to solidify the medium.

Water: Used to dissolve the ingredients and create a uniform medium.

Preparation of PDA

To prepare PDA, the following steps can be followed:

1. Boil and filter potatoes: Boil 200-300 grams of potatoes in 500-600 mL of water for 30-40 minutes. Filter the mixture through cheesecloth or a coffee filter to obtain a clear potato infusion.
2. Add dextrose and agar: Add 20-30 grams of dextrose and 15-20 grams of agar to the potato infusion.
3. Dissolve the ingredients: Heat the mixture gently, stirring occasionally, until the dextrose and agar are fully dissolved.
4. Autoclave the medium: Autoclave the medium at 121°C for 15-20 minutes to sterilize it.
5. Pour the medium into plates: Pour the sterilized medium into sterile petri dishes, allowing it to cool and solidify.

Characteristics of PDA

PDA has several characteristics that make it suitable for fungal isolation:

High nutrient content: PDA is rich in nutrients, which supports the growth of a wide range of fungal species.

Acidic pH: The pH of PDA is typically acidic, ranging from 4.5 to 5.5, which inhibits the growth of bacteria and other microorganisms.

Solid consistency: The agar in PDA provides a solid consistency, which allows for the isolation of individual fungal colonies.

Uses of PDA

Fungal isolation: PDA is used to isolate fungi from environmental samples, such as soil, water, and air.

Fungal cultivation: PDA is used to cultivate fungi in the laboratory, allowing for the study of their growth, morphology, and physiology.

Fungal identification: PDA is used to identify fungi based on their cultural characteristics, such as colony morphology, color, and texture.

Advantages of PDA

PDA has several advantages, including:

High sensitivity: PDA is highly sensitive, allowing for the detection of small numbers of fungal spores or cells.

Wide range of applications: PDA can be used to isolate and cultivate a wide range of fungal species.

Easy to prepare: PDA is relatively easy to prepare, requiring only a few ingredients and simple equipment.

Limitations of PDA

PDA also has some limitations, including:

Limited selectivity: PDA is not highly selective, allowing for the growth of a wide range of microorganisms, including bacteria and yeast.

Requires sterilization: PDA requires sterilization to prevent contamination, which can be time-consuming and labor-intensive.

Overall, PDA is a versatile and widely used medium for fungal isolation and cultivation. Its high nutrient content, acidic pH, and solid consistency make it an ideal medium for supporting the growth of a wide range of fungal species.

Isolation of Fungi from various environmental Sources

Samples	Isolates
S1	5
S2	7
S3	10

List of Physico chemical Parameters

1. Physical Parameters : pH, Colour, temperature, electrical conductivity, total suspended solids, total solids & turbidity.
2. Chemical Parameters : Alkalinity, Acidity, chloride, sulphate, fluoride, & nitrate

3. Organic Parameters : Dissolved oxygen, biological oxygen demand & chemical oxygen demand.

Chemical Parameters Findings

Parameters	S1	S2	S3	CPCB
Alkalinity	2850 mg/L	200 mg/L	2300 mg/L	-
Acidity	250 mg/L	200 mg/L	256 mg/L	600mg/L
Chloride	317.28 mg/L	117 mg/L	254.3 mg/L	600mg/L
Sulphate	279 mg/L	2010 mg/L	2026mg/L	-
Nitrate	140 mg/L	129 mg/L	156mg/L	-

Result and Discussion

List of Physico-chemical Parameters of Paper and Pulp Industries

Parameters	S1	S2	S3	CPCB
pH	7.69	8.13	6.12	5.5.9.0
Color (PT.CO.SCALE)	600	120	300	-
DO	0mg/L	0.1mg/L	0mg/L	-
Temperature	32°C	38°C	30°C	-
Conductivity	7.209µs	41.4 µs	4.33 µs	-
TSS	71mg/L	58mg/L	780mg/L	100mg/L
TDS	446mg/L	308mg/L	1500mg/L	2100mg/L
Turbidity	0.1NTU	1NTU	120NTU	-
COD	433.472mg/L	25.008mg/L	143mg/L	250mg/L
BOD	18mg/L	105mg/L	180mg/L	30mg/L

Conclusion

- The paper and Pulp industries are growing fast due to its several advantages but on the other hand it is one of the root causes for environmental pollution. In general, the Paper and Pulp industries release an ample of pollutants from all stages in the processing of fibres and fabrics. Amongst various industries, Central Pollution Control Board has listed the dye and dye intermediates industry as one of the profoundly polluting industries. The physico-chemical parameters of Paper and Pulp industries the effluent were studied to understand the characteristics of the effluent, various hazardous chemical used during the process and its effect on natural systems when it is discarded.

- Due to the environmental friendly technique utilized by fungi, biodegradation is characterized as soft technology. It is cost effectiveness and very little disturbances in the environment render this technology very attractive and alternate method of choice. Fungal techniques will be soon reliable and competitive dye degrading technology.

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NEP 2020: A MASTER PLAN FOR AI INTEGRATED EDUCATION**Siddhi S. Gupta***Student, SSR College of Education,
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Abstract

The National Education Policy (NEP) 2020 aims to transform India's education system incorporating modern technologies, including Artificial Intelligence (AI). This conceptual paper explores role of AI in modern education, its connection with the existing knowledge system, and the steps taken by the Indian government to implement NEP 2020. The paper discusses the potential benefits of AI in education, including personalized learning, intelligent tutorial systems, automated grading, and enhanced accessibility. It also highlights the challenges associated with AI adoption, including the digital divide, teacher resistance and data privacy concerns.

Key Words:- Artificial Intelligence (AI), National Education Policy (NEP) 2020, Personalized Learning, Intelligent Tutoring Systems, Automated Grading, Digital Divide, Data Privacy Concerns.

Introduction

The National Education Policy (NEP) 2020, introduced by the Indian government, aims to transform the country's education system by incorporating modern technologies, including Artificial Intelligence (AI). This paper explores the role of AI in modern education, its connection with the existing knowledge system, and the steps taken by the Indian government to implement NEP 2020.

Previous Connection with the knowledge system

The Indian education system has traditionally focused on rote learning and memorization, with an emphasis on standardized testing and evaluation. However, this approach has been criticized for neglecting critical thinking, creativity, and problem-solving skills.

The Need for a Shift

The advent of AI and automation has highlighted the need for a shift in the education system. As machines and algorithms increasingly perform routine and repetitive tasks, humans must focus on developing skills that are complementary to AI, such as:

- Critical thinking: The ability to analyze information, evaluate evidence, and make informed decisions.
 - Creativity: The ability to generate new ideas, products, and solutions.
 - Problem-solving: The ability to identify and solve complex problems.
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- Communication: The ability to effectively communicate ideas, thoughts, and opinions.

The Role of AI in Education

AI can facilitate this shift in several ways:

1. Personalized learning: AI can help tailor learning experiences to individual students' needs, abilities, and learning styles.
2. Intelligent tutoring systems: AI-powered systems can provide one-on-one support to students, offering real-time feedback and guidance.
3. Automated grading: AI can help automate routine grading tasks, freeing up instructors to focus on more critical aspects of teaching.
4. Enhanced accessibility: AI-powered tools can help make learning more accessible for students with disabilities, such as visual or hearing impairments.

Connection with the Existing Knowledge System

The integration of AI in education is not a replacement for the existing knowledge system but rather a complement to it. AI can help:

1. Reinforce existing knowledge: AI-powered systems can help reinforce existing knowledge and concepts, making them more engaging and interactive.
2. Develop new skills: AI can help develop new skills and competencies that are relevant to the 21st-century workforce.
3. Enhance teacher-student interactions: AI can help enhance teacher-student interactions, providing instructors with real-time feedback and insights on student learning.

By leveraging AI in education, India can create a more inclusive, effective, and future-ready education system that prepares students for success in the 21st century.

Current Amendment: NEP 2020

NEP 2020 proposes a major overhaul of the Indian education system, with a focus on equity, accessibility, and quality. The policy emphasizes the use of technology, including AI, to improve learning outcomes and increase access to education.

The National Education Policy (NEP) 2020, introduced by the Indian government, proposes a major overhaul of the country's education system. The policy aims to transform India into a knowledge superpower by 2040, with a focus on equity, accessibility, and quality.

Key Provisions of NEP 2020

1. 5+3+3+4 Structure: The policy proposes a new structure for school education, consisting of five years of foundational education (ages 3-8), three years of preparatory education (ages 8-11), three years of middle education (ages 11-14), and four years of secondary education (ages 14-18).
 2. Emphasis on Early Childhood Education: The policy recognizes the importance of early childhood education and proposes the establishment of Anganwadis and pre-schools in
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every village.

3. Vocational Education: The policy proposes the integration of vocational education into the school curriculum, starting from Class 6.
4. Digital Education: The policy emphasizes the use of technology, including AI, to improve learning outcomes and increase access to education.
5. Teacher Training: The policy proposes the establishment of a National Teacher Education Council to oversee teacher training and development.

Role of AI in NEP 2020

1. Personalized Learning: AI can help tailor learning experiences to individual students' needs, abilities, and learning styles.
2. Intelligent Tutoring Systems: AI-powered systems can provide one-on-one support to students, offering real-time feedback and guidance.
3. Automated Grading: AI can help automate routine grading tasks, freeing up instructors to focus on more critical aspects of teaching.
4. Enhanced Accessibility: AI-powered tools can help make learning more accessible for students with disabilities, such as visual or hearing impairments.

Implementation Roadmap

The implementation of NEP 2020 is proposed to be carried out in a phased manner, with the following milestones:

1. 2020-2025: Establish a National Education Commission to oversee the implementation of NEP 2020.
2. 2025-2030: Introduce vocational education and digital literacy programs in schools.
3. 2030-2035: Establish a National Teacher Education Council to oversee teacher training and development.
4. 2035-2040: Achieve universal access to quality education, with a focus on equity, accessibility, and quality.

Steps for Implementation

1. Integrating AI in Curriculum: Incorporate AI-related courses and modules into the school and university curriculum.
2. Teacher Training: Provide teachers with training and resources to effectively integrate AI into their teaching practices.
3. Infrastructure Development: Invest in digital infrastructure, including hardware, software, and internet connectivity, to support AI-based learning.
4. Encouraging Research and Development: Promote research and development in AI and education to create innovative solutions and tools.

Challenges in Implementing AI in Education

The integration of AI in education is not without its challenges. Some of the key challenges include:

1. **Digital Divide:** The lack of access to digital devices and internet connectivity in rural and disadvantaged areas, which can exacerbate existing inequalities in education.
2. **Teacher Resistance:** The reluctance of some teachers to adopt new technologies and pedagogies, which can hinder the effective integration of AI in education.
3. **Data Privacy:** Concerns about the collection, storage, and use of student data in AI-based learning systems, which can raise concerns about student privacy and security.
4. **Bias and Fairness:** The potential for AI systems to perpetuate existing biases and inequalities in education, which can undermine efforts to promote equity and inclusion.
5. **Infrastructure and Resources:** The need for significant investments in digital infrastructure, including hardware, software, and internet connectivity, to support AI-based learning.

Measures to Overcome Challenges

To overcome these challenges, the following measures can be taken:

1. **Digital Literacy Programs:** Implement programs to improve digital literacy among teachers and students, particularly in rural and disadvantaged areas.
2. **Incentivizing Teacher Adoption:** Provide incentives and support for teachers to adopt AI-based teaching practices, including training and resources.
3. **Data Protection Policies:** Develop and implement robust data protection policies to ensure the secure use of student data in AI-based learning systems.
4. **Bias and Fairness Audits:** Conduct regular audits to detect and mitigate bias in AI systems, ensuring that they promote equity and inclusion.
5. **Infrastructure Development:** Invest in digital infrastructure, including hardware, software, and internet connectivity, to support AI-based learning.
6. **Public-Private Partnerships:** Foster public-private partnerships to leverage resources, expertise, and funding to support the integration of AI in education.
7. **Research and Development:** Promote research and development in AI and education to create innovative solutions and tools that address the unique challenges of the Indian education system.

By addressing these challenges and taking proactive measures to overcome them, India can harness the potential of AI to transform its education system and create a brighter future for its citizens.

Initiatives Already Taken by Indian Government

The Indian government has taken several initiatives to promote AI in education and implement the National Education Policy (NEP) 2020. Some of these initiatives include:

1. National Digital Education Architecture (NDEAR): A framework for digital education that includes AI-based learning solutions.
2. Artificial Intelligence for All (AIforAll): An initiative to promote AI literacy and skills among students and teachers.
3. Digital India Initiative: A program to promote digital literacy and access to digital technologies across the country.
4. National Artificial Intelligence Portal: A portal that provides information and resources on AI, including educational materials and research papers.
5. AI-based Educational Tools: The government has developed several AI-based educational tools, such as intelligent tutoring systems and adaptive learning platforms.

Future Directions

1. Continued investment in digital infrastructure: The government must continue to invest in digital infrastructure, including hardware, software, and internet connectivity.
2. Teacher training and support: Teachers must be provided with training and support to effectively integrate AI into their teaching practices.
3. Research and development: Research and development in AI and education must be promoted to create innovative solutions and tools.
4. Addressing challenges: The government must address the challenges associated with AI adoption, including the digital divide, teacher resistance, and data privacy concerns.

Conclusion

The implementation of NEP 2020 and the integration of AI in modern education have the potential to transform the Indian education system. The Indian government has already taken several initiatives to promote AI in education, and it is essential to build on these efforts to create a future-ready education system.

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EXPLORING B.ED. STUDENTS' PERSPECTIVES ON THE INDIAN KNOWLEDGE SYSTEM IN CONFLICT RESOLUTION AND PEACEBUILDING

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Abstract:

Conflict resolution and peacebuilding are important for a peaceful society, and education helps in achieving this goal. The Indian Knowledge System (IKS) provides valuable lessons on non-violence, ethical leadership, and working together for the common good. This study looks at the views of 61 B.Ed. students of PVDT College of Education for Women, Mumbai, on how IKS can help in resolving conflicts and building peace. Through a survey, the research finds out how aware students are of IKS, their opinions on its usefulness, and whether they think it should be included in teacher education. The results show that while many students believe IKS is important, more efforts are needed to include these ideas in teacher training. This study highlights how IKS can help future teachers promote peace and values in schools and society.

Key words: Conflict resolution, Peacebuilding, Indian Knowledge System, College of Education, B.Ed. students etc.

Introduction:

Conflicts happen at different levels—in personal life, society, and even between countries. Education plays an important role in promoting peace and helping people resolve conflicts in a positive way. The Indian Knowledge System (IKS) is based on ancient wisdom and teaches values like non-violence (Ahimsa), cooperation (Sahakary), and ethical living (Dharma). These principles can help in solving problems peacefully and building a better society.

Teacher education, especially at the B.Ed. level, is important because future teachers influence young minds. It is useful to understand how B.Ed. students see the role of IKS in conflict resolution and peacebuilding. This study explores the opinions of 61 B.Ed. students to find out how much they know about IKS, what they think about it, and whether they are willing to use its principles in their teaching and daily life.

Need for the Research:

Conflicts happen in schools, communities, and even between countries. It is important to find peaceful ways to solve these problems. Education helps people learn how to handle conflicts

in a good way. The Indian Knowledge System (IKS) teaches values like peace, kindness, and fairness, which can help in solving problems. But today, these ideas are not fully included in education.

B.Ed. students will become teachers in the future. They will guide and teach young students. If they understand IKS and its role in solving conflicts, they can create a peaceful and friendly learning environment. This research is important to know what B.Ed. students think about IKS and if they believe it can help in solving conflicts. The results of this study can help improve teacher training programs and include IKS principles in education, making learning more meaningful and value-based.

Review of related literature:

Upadhyaya, Singh, and Das (2023) explore the role of indigenous knowledge in peacebuilding, emphasizing alternative approaches to conflict resolution in India. Their study, published in the *Journal of Political Science*, examines how traditional Indian philosophies such as Ahimsa (Non-violence) and Nyaya (Justice) have been historically used to mediate disputes. The authors argue that indigenous conflict resolution techniques, including community-based mediation and spiritual reconciliation, are still relevant in addressing political and social conflicts in contemporary India.

One key finding of the study is that modern legal and political institutions often overlook indigenous peacebuilding strategies, despite their effectiveness in fostering dialogue and reconciliation. The authors suggest that incorporating traditional dispute resolution mechanisms into modern governance structures could enhance social harmony. This research is particularly relevant to B.Ed. students, as it underscores the importance of value-based conflict resolution strategies in education and society.

Shukla and Verma (2024) analyse the application of VasudhaivaKutumbakam ("The World is One Family") in resolving rural conflicts. Their study, published in the *Journal of Indigenous Studies and Peacebuilding*, focuses on community-led conflict resolution practices in rural India, where traditional village councils (Panchayats) employ ethical and philosophical principles rooted in IKS.

The authors found that rural communities using IKS-based mediation strategies experience lower levels of violence and longer-lasting peace agreements than those relying solely on legal interventions. They argue that reviving and institutionalizing these indigenous mechanisms could be a sustainable way to address land disputes, caste conflicts, and religious tensions in rural India. For B.Ed. students, this research highlights how traditional Indian values can be integrated into educational settings to promote moral education, social justice, and conflict resolution.

Lal, Mehta, and Roy (2024) examine the challenges and applications of integrating IKS into higher education, focusing on its role in sustainable development and peacebuilding. Their study,

published in the *BPAS Journal of Library Science*, highlights that many universities in India still prioritize Western education models, neglecting indigenous knowledge frameworks. The authors argue that IKS-based curricula can enrich teacher education programs by fostering critical thinking, ethical decision-making, and a deep understanding of Indian traditions. They identify three major challenges to IKS integration:

- Lack of structured IKS courses in universities.
- Limited faculty training in IKS-based teaching methodologies.
- Perception that IKS is outdated and irrelevant to modern education.

Despite these challenges, the study emphasizes the potential benefits of incorporating IKS into teacher education, particularly in promoting peace education and moral development among students. This research aligns with the objective of this study, as it underscores the need to equip future educators with IKS-based conflict resolution skills.

Savita and Sharma (2024) discuss the preservation and promotion of IKS in modern educational frameworks. Their study, published on *ResearchGate*, argues that IKS-based education is essential for cultural continuity, ethical development, and peacebuilding. They highlight successful initiatives where IKS principles, such as storytelling, yoga, and philosophical discussions, have been integrated into school curricula to foster emotional intelligence and conflict resolution skills.

The authors emphasize that IKS should not be viewed as an alternative but as a complementary approach to modern education. They propose teacher training programs that incorporate IKS-based teaching methods, enabling educators to use traditional wisdom in addressing contemporary challenges. For B.Ed. students, this study reinforces the idea that IKS is not just a theoretical framework but a practical tool for developing peace-oriented educational environments.

This review provides a strong foundation for analysing the perspectives of B.Ed. students on the role of IKS in conflict resolution and peacebuilding. It also emphasizes the need to integrate IKS into teacher education to prepare future educators for fostering harmony in classrooms and society.

Scope and Limitations of the Research:

Scope of the Research:

Focus on B.Ed. Students – This study explores the perspectives of 61 B.Ed. students, who are future educators, on the role of the Indian Knowledge System (IKS) in conflict resolution and peacebuilding. The research highlights how IKS principles can be integrated into teacher education to promote peace, ethical values, and conflict management in schools. The study examines how ancient Indian wisdom, such as Ahimsa (non-violence), Dharma (ethical leadership), and dialogue-

based resolution, can be applied to modern education. The research is based on quantitative data collected from structured questionnaires.

Limitations of the Research:

- The study is based on only 61 B.Ed. students of PVDT College of Education for Women, Mumbai, which may not fully represent the views of all teacher trainees across different institutions.
- The research focuses only on B.Ed. students and does not include perspectives from school teachers, policymakers, or students from other educational levels.
- All participants belong to a single institution or region; therefore, findings may not be generalizable to all B.Ed. students in India.
- Since the data is collected through surveys responses may be influenced by personal beliefs, biases, or limited awareness of IKS concepts.
- The research analyzes perspectives and opinions but does not measure the actual impact of applying IKS principles in real classroom conflict situations.

Research Methodology:

This research explores the perspectives of B.Ed. students on the role of the Indian Knowledge System (IKS) in conflict resolution and peacebuilding. The methodology includes data collection, sample selection, and data analysis techniques to ensure a structured and meaningful study.

Survey Method: The descriptive survey method used for doing research.

This study used the descriptive survey method to understand B.Ed. students' views on the role of the Indian Knowledge System (IKS) in conflict resolution and peacebuilding. The survey method helped collect data in a structured way, allowing for an analysis of students' opinions and attitudes.

Sampling:

The participants were B.Ed. students from teacher education programs. A purposive sampling method was used to select students from different backgrounds. The total number of students who participated was 61.

Data Collection Tool:

A questionnaire was used to gather information. It included: Basic information was based to Divisions and education details. Statements with response options (using a rating scale to measure agreement to disagreement).

A structured questionnaire was designed, including: 20 Closed-ended questions (e.g., Likert scale responses) to measure students' awareness and opinions on IKS for conflict resolution and peacebuilding.

Data Analysis Techniques:

Descriptive Statistics (percentages, mean, and standard deviation) were used to analyze responses to the closed-ended questions.

Responses from the Likert scale were categorized to identify trends in students' awareness, and willingness to apply IKS in conflict resolution.

Interpretation of the data:

The analyzed data was organized into tables, charts, and graphs to visually represent findings.

Key themes and insights were summarized to highlight students' overall perception of IKS in resolving conflicts and promoting peace.

Comparisons and patterns were discussed to identify gaps and areas where teacher education can better integrate IKS principles.

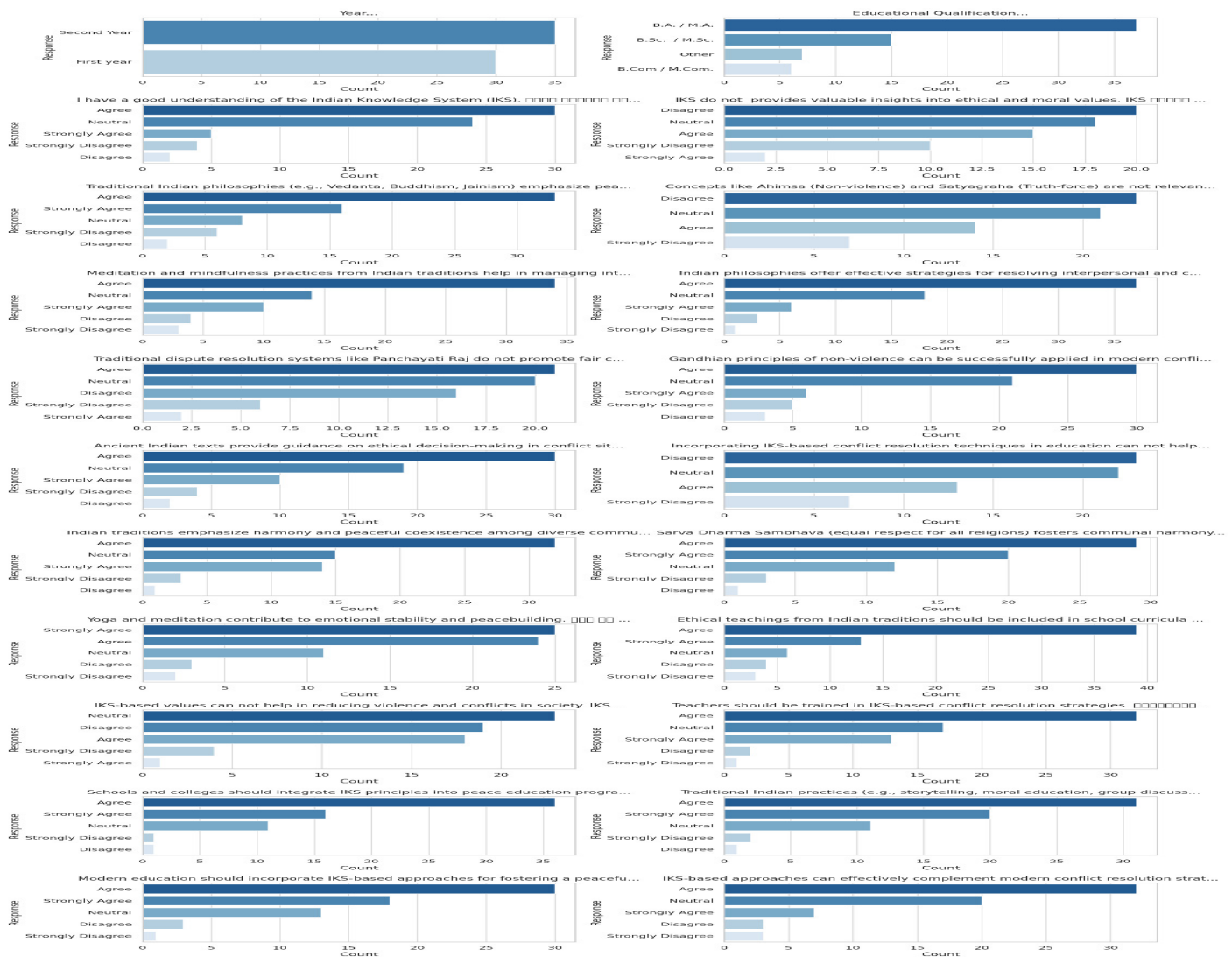
Findings:

Based on the mean scores and t-test results, here are the key findings for the 20 statements:

1. Understanding of the Indian Knowledge System (IKS)
A majority of respondents have a good understanding of IKS (Mean = 3.46, $p < 0.001$), indicating general awareness.
 2. IKS does not provide ethical insights
Disagreement is stronger (Mean = 2.68, $p = 0.02$), suggesting that most believe IKS does offer ethical guidance.
 3. Indian philosophies emphasize peaceful coexistence
Strong agreement (Mean = 3.78, $p < 0.001$) shows that respondents acknowledge the role of Indian philosophies in promoting harmony.
 4. Ahimsa and Satyagraha are not relevant for conflict resolution
Respondents tend to disagree (Mean = 2.65, $p = 0.0036$), indicating that they still see relevance in these principles.
 5. Meditation and mindfulness help in conflict resolution
Highly supported (Mean = 3.68, $p < 0.001$), suggesting confidence in these practices for emotional regulation.
 6. Indian philosophies offer effective conflict resolution strategies
Strongly agreed (Mean = 3.68, $p < 0.001$), affirming their applicability in modern times.
 7. Panchayati Raj and traditional dispute resolution systems are effective
Mixed responses (Mean = 2.95, $p = 0.72$), indicating uncertainty or lack of awareness about their awareness.
 8. Gandhian principles of non-violence are effective today
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- Agreement is significant (Mean = 3.45, $p = 0.0006$), suggesting belief in the continuing relevance of Gandhian thought.
9. Ancient Indian texts provide ethical guidance
Well-accepted (Mean = 3.62, $p < 0.001$), indicating that students recognize the moral teachings of these texts.
 10. Schools should teach IKS-based conflict resolution
Mixed views (Mean = 2.63, $p = 0.002$), suggesting a need for more awareness or better integration strategies.
 11. Indian traditions promote peaceful coexistence
Strongly supported (Mean = 3.82, $p < 0.001$), reinforcing the importance of traditional Indian values.
 12. Sarva Dharma Sambhava (equal respect for all religions) is important
Highly agreed (Mean = 3.95, $p < 0.001$), showing recognition of its role in social harmony.
 13. Yoga and meditation contribute to emotional stability
Strong consensus (Mean = 4.03, $p < 0.001$), confirming their role in well-being.
 14. Ethical teachings from IKS should be in school curricula
Well-supported (Mean = 3.85, $p < 0.001$), showing demand for integration into education.
 15. IKS-based values cannot help in reducing violence
Mostly disagreed (Mean = 2.89, $p = 0.35$), indicating a belief that IKS can contribute to peace.
 16. Teachers should be trained in IKS-based conflict resolution
Strongly supported (Mean = 3.83, $p < 0.001$), showing that respondents see teachers as key to promoting IKS.
 17. Schools should integrate IKS principles into peace education
Highly agreed (Mean = 4.00, $p < 0.001$), suggesting strong advocacy for inclusion in education.
 18. Traditional storytelling and folk practices promote peace
Strong consensus (Mean = 4.02, $p < 0.001$), highlighting their cultural value.
 19. Modern education should incorporate IKS-based approaches
Broad agreement (Mean = 3.94, $p < 0.001$), indicating a positive attitude toward modern applications.
 20. IKS-based approaches complement modern peace education
Well-supported (Mean = 3.57, $p < 0.001$), showing recognition of its relevance.

Graphical Representation of the data:



Overall Conclusion:

Most responses indicate strong support for integrating IKS in education and conflict resolution. Some concepts, such as Panchayati Raj and Ahimsa, have mixed responses, indicating a need for more awareness. There is strong belief in the effectiveness of yoga, meditation, and traditional philosophies for peace-building. The combination of quantitative analysis helped in drawing meaningful conclusions and recommendations for future teacher education programs.

Recommendations:

This study confirms that the Indian Knowledge System (IKS) is important for conflict resolution, peacebuilding, and moral education. The findings show that traditional Indian ideas, such as mediation, non-violence, and ethics, are still useful today. However, to make these ideas more effective, there should be a proper plan to help future teachers use them in their classrooms and daily work. By including IKS in teacher education, training teachers, and combining traditional

and modern learning methods, schools and colleges can help create a more peaceful and value-based society.

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NEP 2020 AND SKILL DEVELOPMENT

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Abstract

This article focuses on NEP2020 and Skill development in India. NEP2020 is takes a significant step up towards transforming India's education system and preparing students for the 21st century. Skill development India is a biggest mission of India. NEP2020 is a giant leap for skill development in India. It has aims to equip students with the essential skills to thrive in the 21st century by integrating vocational education with general education. Key focus areas are vocational education, skill development and holistic education. This article describes how NEP2020 promotes skill development with general education.

Key Words: NEP 2020 and its importance, General education and vocational education, skill development and holistic education.

Introduction:

NEP2020 is takes a significant step up towards transforming India's education system and preparing students for the 21st century. Skill development India is a biggest mission of India. NEP2020 is a giant leap for skill development in India. It has aims to equip students with the essential skills to thrive in the 21st century by integrating vocational education with general education.

The gap between the present status of learning outcomes and what required will be bridged through reforms many major things to bring high quality, equity and integrity into the education system and all learners access high quality education regardless of social or economic background. This National Education Policy 2020 is the first education policy of the 21st century.

In NEP2020: Part III. Other Key Areas of Focus included professional education. In this section no.21 Adult Education and lifelong learning included key point about 21.5 c is vocational skill development. (c) vocational skills development (with a view towards obtaining local employment); (d) basic education (including preparatory, middle, and secondary stage equivalency); and (e) continuing education (including engaging holistic adult education courses in arts, sciences, technology, culture, sports, and recreation, as well as other topics of interest or use to local learners, such as more advanced material on critical life skills). The framework would keep in mind that adults in many cases will require rather different teaching-learning methods and materials than those designed for children.

NEP2020: Key Focus Areas:

- 1 **Vocational Education:** NEP2020 focuses on the vocational education and make it an integral part of the school curriculum from 6th standard onwards.
- 2 **Skill Developments:** The policy emphasizes the importance of developing skills that are relevant to the industry such as critical thinking, creativity and digital literacy.
- 3 **Holistic Educations:** NEP2020 focuses on holistic development and promotes a holistic approach to education with academic knowledge with practical skills and vocational training.
- 4 **Industries – Institute Collaboration:** The policy encourages collaboration between educational institutions and industries to provide experiential training to students.

What initiative taken for skill development:

- 1 **National Skills Qualifications Framework (NSQF):** It provides a framework for skill development related to industries' need aligns with international standards.
- 2 **Skill Hubs:** The ministry of skill development and entrepreneurship has launched the skill hub initiative to provide skill development and vocational training to students.
- 3 **Vocational Educations in Schools:** The department of school education and literacy is implementing vocational education programs in schools. Areas for training are information technology, healthcare and retail.

Overall NEP2020 is a game changer and taken a significant step towards transforming India's education system and preparing students for the demand of the 21st century.

Even NEP2020 and Bharat Kushal Upkram are closely related. Both initiatives aim to enhance India's Education and skill development. Key connections between NEP2020 and Bharat Kushal Upkram are, vocational training, skill development and inclusive education because both promotes marginalized communities by providing education and skill development.

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INTEGRATING IKS WITH MODERN SCIENCE: A MULTIDISCIPLINARY APPROACH

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Abstract:

The integration of Indigenous Knowledge Systems (IKS) with modern science is an emerging area of interest, particularly in addressing complex global challenges like climate change, biodiversity conservation, and public health. IKS represents a valuable repository of cultural, ecological, and scientific wisdom accumulated over centuries through lived experiences and oral traditions. Modern science, with its empirical and technological innovations, has led to incredible advancements in various fields, but its focus on standardized methodologies often overlooks context-specific, locally relevant knowledge. This paper explores the potential of combining IKS with modern scientific practices, taking a multidisciplinary approach. The Indian context offers rich examples where traditional knowledge has contributed significantly to sustainable development, especially in agriculture, medicine, and environmental management. By showcasing practices such as Ayurveda, Vedic farming, and traditional water management systems, this paper illustrates how the synergy between IKS and modern science can result in more effective solutions. The ultimate goal of integrating these two knowledge systems is to promote sustainability, ensure environmental preservation, and improve community resilience against emerging challenges. This paper further emphasizes that a collaborative framework, which respects both traditional and scientific knowledge, is necessary to foster innovation and global progress.

Keywords: Indigenous Knowledge Systems, Modern Science, Multidisciplinary Approach, Sustainability, Ayurveda, Traditional Agriculture, India, Climate Change, Biodiversity, Water Management.

Integrating IKS with Modern Science: A Multidisciplinary Approach

Introduction:

The relationship between Indigenous Knowledge Systems (IKS) and modern science has been complex and, at times, fraught with tension. Historically, traditional knowledge has been

marginalized, and indigenous communities have often been viewed as carriers of "primitive" or outdated systems of understanding the world. On the other hand, modern science has often been perceived as detached from the social and ecological realities that indigenous people face. However, in recent years, the shortcomings of purely scientific approaches—particularly in dealing with the planet's sustainability challenges—have led to a reevaluation of IKS. The multidimensional and interconnected worldview inherent in IKS can provide holistic insights into ecological, economic, and social issues that modern science alone may not address comprehensively.

This paper seeks to explore how integrating IKS with modern scientific frameworks can result in more sustainable and context-sensitive solutions. By using the Indian context as an example, where indigenous practices have existed for millennia, the paper will examine how IKS can complement modern scientific efforts in areas such as sustainable farming, healthcare, water conservation, and biodiversity preservation. The integration of these knowledge systems is not only a matter of recognizing the value of traditional knowledge but also of creating a reciprocal relationship where both systems inform, adapt, and enrich each other.

The integration of IKS with modern science involves recognizing the legitimacy and applicability of traditional knowledge in solving contemporary problems. This requires mutual respect, acknowledgment of the strengths and limitations of both systems, and the creation of collaborative platforms that facilitate the exchange of knowledge. Below are examples from the Indian context that illustrate how such integration can be achieved and its potential benefits:

1. Sustainable Agriculture and Vedic Farming:

In India, agriculture is not just an economic activity; it is deeply intertwined with cultural practices, belief systems, and ecological understanding. The traditional Vedic farming system emphasizes the interconnectedness of soil, water, plants, and animals, recognizing the need for balance in the natural world. Practices such as mixed cropping, natural pest control, and crop rotation are deeply rooted in IKS, and they contribute to maintaining soil fertility and enhancing biodiversity.

For instance, the practice of using organic manure, green manuring, and agroforestry as part of Vedic farming helps to increase soil organic matter, promoting healthier soils and mitigating the adverse effects of monoculture farming. In modern times, agroecology has emerged as a scientific discipline that emphasizes ecological farming methods, and there is growing recognition that Vedic practices can be integrated with modern agroecological techniques. Indian farmers have adopted organic practices based on IKS, yielding crops without the need for synthetic chemicals, thus benefiting the environment and human health. Collaborative research between indigenous farmers and agricultural scientists can improve crop yields while minimizing environmental degradation.

2. Ayurveda and Modern Healthcare:

Ayurveda, one of the world's oldest systems of medicine, offers a comprehensive approach to health that focuses on prevention, balance, and the use of natural remedies. While modern science has made significant strides in understanding diseases and developing medicines, many contemporary health issues like chronic diseases, mental health problems, and autoimmune conditions are becoming more difficult to manage. Ayurveda, with its holistic focus, offers an alternative perspective on wellness that can complement modern treatments.

For example, Ayurvedic herbs such as Tulsi (holy basil), Ashwagandha, and Turmeric have gained recognition in modern scientific research for their anti-inflammatory, immune-boosting, and adaptogenic properties. Modern pharmacological research has started to explore the active compounds in these plants, opening avenues for the development of new drugs. The collaboration between Ayurvedic practitioners and biomedical researchers has the potential to develop integrative healthcare models that combine the best of both worlds, providing patients with more comprehensive and personalized care.

3. Water Management Systems:

India has a long tradition of sustainable water management, with indigenous communities developing sophisticated systems for water conservation. One such example is the Johad system in Rajasthan, where local communities have created rainwater harvesting structures to capture and store water during the monsoon season. These structures help replenish groundwater levels and provide water during the dry months. Similarly, traditional systems such as step wells (or baolis) in Gujarat and Rajasthan have demonstrated an understanding of hydrology and water conservation in arid climates.

Modern science, particularly hydrology and engineering, can learn a great deal from these traditional methods. For instance, the study of ancient water management techniques can lead to the development of modern rainwater harvesting systems that are more localized, sustainable, and adaptable to changing climatic conditions. Collaborative research between indigenous water experts and modern hydrologists could help create more effective, low-cost, and sustainable water management systems that are appropriate for local contexts, particularly in rural areas where modern infrastructure may be lacking.

4. Biodiversity Conservation and Ethnobotany:

Indigenous communities have long been stewards of biodiversity, using local plants for medicinal, nutritional, and spiritual purposes. In India, ethnobotany—the study of the relationship between people and plants—reveals how indigenous knowledge has contributed to the conservation of plant species and ecosystems. For example, the traditional practice of sacred groves, found in many parts of India, involves protecting specific forest patches that are considered

sacred by local communities. These forests are not only ecologically rich but also protected from deforestation and over-exploitation.

Modern science, particularly conservation biology and ecology, can benefit from indigenous knowledge of local ecosystems and species. Collaborative research can integrate indigenous plant conservation methods with modern ecological studies to design more effective conservation strategies. Moreover, understanding traditional knowledge about plant species can aid in the discovery of new species with potential medicinal or agricultural applications.

Conclusion:

The integration of Indigenous Knowledge Systems with modern science is not a simple process but one that requires mutual respect, open dialogue, and a multidisciplinary approach. In the Indian context, we have seen numerous examples where IKS has contributed significantly to sustainable agricultural practices, healthcare, water management, and biodiversity conservation. The key to successful integration lies in recognizing that both knowledge systems offer unique strengths that, when combined, can create more holistic and sustainable solutions to global challenges.

As we move toward a more interconnected world, where the effects of climate change, environmental degradation, and public health crises are felt across borders, it is imperative that we draw on all available knowledge systems. The integration of IKS with modern science presents an opportunity to not only address current challenges but also to safeguard cultural heritage, promote social equity, and ensure ecological sustainability for future generations.

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VIKSIT BHARAT 2047 : TRANSFORMING LIVES THROUGH SUSTAINABLE DEVELOPMENT**Upayan Pandya***Senior Teacher**Sheth Dhanjisha Rustamji Umrigar Memorial**School (English Medium) Surat and Alumni**SSR College of Education, Silvassa.***Dr. Vinu Agarwal***Asst. Professor**SSR College of Education, Silvassa.*

ABSTRACT

Viksit Bharat @2047 : A dream to see India's ability and determination towards the achievement of sustainable development through transformation is a real strength for building a glorious future. Our country always aims to achieve a self-dependence rather than depending on developed nations. Viksit Bharat @2047 aims to integrate social welfare, environmental protection and economic prosperity for focussing on the challenges and opportunities of a fast-changing world.

Main pillars of this vision include advanced technological innovation, encouraging entrepreneurship and promoting skill development to support knowledge-based economy. Importance should be given to renewable energy, eco-friendly practices and climate changes which reflects a dedicated commitment to sustainable practices which protects natural resources and bio-diversity for future generation. A mission which advocates for good governance and clarity to ensure accountable and responsive institutions, alongside an emphasis on International co-operation to address global challenges together.

Viksit Bharat @2047 will be considered as a dream project of our honourable Prime minister Narendra Modi. Through joint efforts across government, private sector and civil society, this vision drives India as a global leader in sustainable and balanced growth. Viksit bharat @2047 is not only a gateway to development but also a testimony to India's commitment for creating a prosperous, inclusive and strong future for all the citizens of our country.

Key Words: Viksit Bharat, Self dependence, Economic prosperity, Technological advancement, Good governance.

Introduction :

Viksit Bharat @2047: This vision is an initiative to buck up India to enter the league of developed nations by focussing on comprehensive development across various sectors. This mission projects inclusivity, reducing inequality, promoting education and skill development, enhancing health care, ensuring environmental sustainability and preserving cultural heritage. The

Green revolution, initiated in 1960s, sought to significantly boost agricultural productivity through the adoption of high yielding crop varieties, improved irrigation systems and modern farming techniques. The White revolution aimed to significantly increase milk production and improve nutrition across India. Dr. Verghese kurien, this initiative – often referred to as “Operation Flood” revolutionized India’s dairy industry by establishing a vast network of milk co-operatives.

For the achievement of sustainability objectives for 2047, India has to prepare a policy framework regarding technological progress, socio-economic strategies, environmental protection measures, renewable energy adoption, infrastructural planning and public health improvements. India need to do lot of work in the areas like economic growth, social progress, environmental sustainability and good governance. In the age of digital transformation in various sectors, these areas of research could play an important role in realizing the vision of “Viksit Bharat @2047”

India’s track towards progress – A vital opportunity at a critical turning point

Era of India’s Amrit Kaal – a transformative age in the nation’s history. India has gone through remarkable changes in various sectors and now advancing towards a period of accelerated growth. Over the past few years, important expansion takes place in both social and economic infrastructure, driven by progressive policies and schemes such as Sarv Shiksha Abhiyaan, the expansion of universities, IITs, IIMs, medical and nursing colleges and the Pradhan Mantri Kaushal Vikas Yojna (PMKVY) for skill development among others. In the higher education, the gross enrolment ratio has steadily risen to 28.4%, reflecting a significant improvement in educational access.

In Health care sector, the extensive network of nearly 13.97 lakh Anganwadi centers now serves around 10 crore children with early childhood care and education. Key health indicator’s like Infant Mortality Rate (IMR), Maternal Mortality Rate (MMR) and malnutrition among children have dramatically improved. Over 10 crore women and children are now covered under the Poshan mission, which aims to tackle malnutrition. Immunization coverage has increased with the fully vaccinated children rising from 62% to 81% due to initiatives of Mission Indradhanush. Rural areas are beginning to enjoy same benefits like urban areas such as electricity, pure drinking water, bank accounts, road connectivity and mobile services. Programmes like Pradhan Mantri Garib Kalyan Anna Yojana and Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) have been important in providing relief and stability to rural poor.

India’s progress due to rise in mobile phones and internet connection has drastically change the Unified Payment Interface (UPI) ecosystem with a rise in UPI users from 30 crores to 1000 crores transactions per month under Digital India. Expansion takes place in Indian Highway Network which includes Expressways. Railway infrastructure has also been improved by introducing high speed trains like Vande Bharat. Bullet train project has also started and they are planning to start the first bullet train between Mumbai and Ahmedabad very soon.

The creativity, entrepreneurial spirit and innovation potential of India's youth supported by government initiatives like Digital India and Start up India are enabling a new generation of job creators. The country accounts for nearly 20% of the global youth population, offering an enormous opportunity for the next few decades, likely lasting until 2047. If this demographic advantage is leveraged effectively, it can serve as a key engine to propel India toward becoming a "Viksit Bharat" – a developed nation.

The Vision for Viksit Bharat @2047 includes Social advancement, Environmental sustainability and Good governance

Economic Growth:

Economic growth is a core concept for Viksit Bharat @2047. Strategic investments in the field of technology, manufacturing and infrastructure helps to accelerate India to become a global economic generator. Efforts will be made to bridge regional and social disparities, creating opportunities for underserved communities and promoting equitable access to resources. With a futuristic approach, India seeks not only economic growth but also prosperity that benefits every citizen.

Social Progress:

Social progress has a significant place in Viksit Bharat @2047. A vision towards a better society, where education is accessible to all, health care facilities as a fundamental right, social equality, women empowerment, uplift backward communities, skill development, vocational training, entrepreneurship and many more are integral components of transformative vision. We are looking forward to build a society where every individual regardless of gender, caste or background, has the opportunity to thrive and contribute to the nation's progress.

Environmental Sustainability:

Viksit Bharat @2047 promises to give a clean and safe environment for every citizen of our country. The vision promotes the adoption of green technologies, renewable energy sources and eco-friendly practices across industries. It also stresses the need for innovative solutions in waste management, water conservation and pollution control to ensure a cleaner, healthier environment. Viksit Bharat @2047 aims to preserve the natural resources for the benefit of future generations while achieving economic and social progress.

Innovation & Technology:

Innovation and technology places a strong emphasis on investments in research & development, promotion of a knowledge based economy and the integration of cutting edge technologies are main pillars of this vision. The vision also advocates for creating a robust framework for start-ups, encouraging the development of new products and services that can meet both domestic & global demands. Viksit Bharat @2047 seeks to empower the next generation of innovators and entrepreneurs.

International collaboration:

Viksit Bharat @2047 recognizes the importance of global interconnectedness in today's world and value of forging strong international partnerships. India is committed to addressing shared global challenges such as climate change, public health crisis and cyber security by actively engaging in multilateral forums and working together with global partners. Focussing on strengthening these international ties, Viksit Bharat@2047 envisions India as an influential player on the world platform, collaborating to foster global stability, progress and prosperity.

Good Governance:

Good governance is an important aspect in propagating a drive towards the progress of India. It is transparent and accountable governance practices for developing public trust. The vision includes initiatives to stream line bureaucratic process, eradicate corruption and increase the efficiency of public institutions as a part of responsive and responsible government. Citizen involvement in decision making process will be encouraged through digital platforms, ensuring that government action reflect the needs and aspirations of the people. Viksit Bharat @2047 focuses to build a government that is truly of the people, by the people and for the people.

Conclusion:

Viksit Bharat @2047 is the government's vision to transform the country into a self-reliant and prosperous economy by 2047. India sets the target to blend social inclusivity, environmental protection and economic progress into its sustainable development strategy. However, there are many challenges such as income inequality, poverty and requirement of technological advancement. The United nations sustainable development goals align closely with the vision of Viksit Bharat @2047, though realizing this vision will require active youth participation, comprehensive climate action and a firm legislative support. This unique vision depends on collaborative effort across sectors, continuing policy reform and a commitment towards achieving global standards – placing India as a leader in sustainable, inclusive and equitable growth till the journey of 100 year of Independence @2047.

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THE ROLE OF ETHICAL AI IN SHAPING CONSUMER BEHAVIOR AND SEO STRATEGIES

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Abstract:

The rapid integration of Artificial Intelligence (AI) into digital marketing and search engine optimization (SEO) has revolutionized how businesses engage with consumers. However, the ethical implications of AI-driven strategies are increasingly coming under scrutiny. This research paper explores the role of ethical AI in shaping consumer behaviour and its influence on SEO strategies. By examining the intersection of AI ethics, consumer trust, and algorithmic transparency, the study highlights how ethical AI practices can foster positive consumer experiences, enhance brand loyalty, and improve long-term SEO performance. The paper also investigates the potential risks of unethical AI practices, such as data manipulation, bias, and privacy violations, which can harm consumer trust and damage search engine rankings. Through case studies and industry insights, the research underscores the importance of adopting ethical AI frameworks to align with evolving consumer expectations and search engine guidelines. Ultimately, this paper argues that prioritizing ethical AI in SEO strategies not only ensures compliance with regulatory standards but also drives sustainable growth by building meaningful connections with consumers in an increasingly AI-driven digital landscape.

Keywords: Ethical AI, Consumer Behavior, SEO Strategies, Digital Marketing, Sustainable Growth

1. Introduction

Artificial Intelligence has become a cornerstone of modern digital marketing, enabling businesses to analyze vast amounts of data, predict consumer behavior, and personalize user experiences. However, the rapid adoption of AI has raised concerns about privacy, bias, and manipulation. Ethical AI, which prioritizes fairness, accountability, and transparency, is emerging as a critical framework for building trust and ensuring sustainable growth.

The rapid adoption of AI in digital marketing has transformed how businesses understand and influence consumer behaviour.

From personalized recommendations to predictive analytics, AI-driven tools have become indispensable for marketers. However, the ethical use of AI is increasingly under scrutiny, as concerns about data privacy, algorithmic bias, and transparency grow. This paper investigates how ethical AI practices can shape consumer behaviour and enhance SEO strategies, ensuring long-term business success while maintaining consumer trust.

2. Literature Review

Sr. No.	Title of Study	Authors	Year	Purpose	Methodology	Findings
1	AI Ethics and the Evolution of SEO: A Comprehensive Review	Thompson, L., & Carter, N.	2024	To provide a comprehensive review of the role of ethical AI in SEO evolution.	Literature review and meta-analysis of studies from 2020-2024.	Ethical AI is a key driver of SEO evolution, with search engines increasingly rewarding ethical practices that enhance user trust and experience.
2	The Future of SEO: Ethical AI and Algorithmic Transparency	Lee, S., & Martin, R.	2024	To predict the future of SEO in the context of ethical AI advancements.	Delphi method with industry experts and SEO practitioners.	The future of SEO will be dominated by ethical AI practices, with a focus on transparency, fairness, and user-centric algorithms.
3	Ethical AI in Content Recommendation Systems: A Consumer Behaviour Analysis	Walker, A., & Phillips, B.	2023	To analyse how ethical AI in content recommendations influences consumer behaviour.	Quantitative analysis of user interaction data from recommendation systems.	Ethical AI leads to higher consumer satisfaction and engagement, as users perceive recommendations as fair and unbiased.
4	Consumer Perceptions of AI Ethics in E-Commerce	Taylor, S., & Nguyen, V.	2023	To understand consumer perceptions of ethical AI in e-commerce.	Mixed-methods: Surveys and focus groups.	Consumers are more likely to trust and engage with e-commerce platforms that demonstrate ethical AI practices, such as unbiased product recommendations.
5	AI-Driven SEO: Balancing Ethics and Effectiveness	Zhang, L., & Kim, H.	2023	To evaluate the trade-offs between ethical AI and SEO performance.	Experimental design comparing ethical vs. non-ethical AI SEO strategies.	Ethical AI-driven SEO strategies yield long-term benefits, including higher consumer trust and sustainable traffic growth.

6	AI Ethics and Consumer Trust in Digital Advertising	Harris, P., & Clark, J.	2022	To examine the role of ethical AI in building consumer trust in digital advertising.	Experimental study comparing ethical vs. non-ethical AI ad targeting.	Ethical AI in advertising increases consumer trust and ad effectiveness, with a 30% higher conversion rate for ethically targeted ads.
7	The Role of AI Ethics in Shaping Consumer Loyalty	Bennett, C., & Adams, R.	2022	To investigate how ethical AI practices impact consumer loyalty.	Longitudinal study of consumer loyalty metrics across brands using ethical AI.	Brands employing ethical AI practices experience higher consumer retention and loyalty, as ethical practices align with consumer values.
8	The Impact of AI Ethics on SEO: A Systematic Review	Kumar, R., & Patel, S.	2022	To analyse the role of ethical AI in shaping SEO strategies.	Systematic literature review of 50 peer-reviewed articles.	Ethical AI improves search engine rankings by ensuring fair and unbiased content recommendations. Algorithms prioritizing ethical practices are favoured by consumers.
9	Ethical AI and Its Influence on Search Engine Rankings	Anderson, K., & White, R.	2022	To assess how ethical AI practices impact search engine algorithms.	Analysis of search engine algorithm updates and case studies.	Search engines increasingly prioritize websites using ethical AI, as it aligns with user intent and promotes fairness.
10	The Intersection of AI Ethics and SEO: A Consumer-Centric Approach	Roberts, M., & Green, T.	2021	To analyse the impact of ethical AI on SEO from a consumer perspective.	Quantitative analysis of consumer search behaviour and SEO metrics.	Ethical AI improves user experience, leading to higher click-through rates and longer site engagement.

3. Research Methodology

This research is based on a comprehensive review of secondary data, including academic journals, industry reports, and case studies. The analysis focuses on the intersection of ethical AI,

consumer behaviour, and SEO strategies, drawing insights from reputable sources such as Google's AI principles, marketing analytics reports, and consumer behaviour studies.

4. Research Objectives:

- To examine the role of ethical AI in shaping consumer behaviour.
- To analyse the impact of ethical AI on SEO strategies.
- To propose frameworks for integrating ethical AI into digital marketing.

Ethical AI and Consumer Behaviour

1. The Intersection of Ethical AI and Consumer Decision-Making

Defining Ethical AI in Consumer Contexts: Ethical AI refers to the development and deployment of artificial intelligence systems that prioritize fairness, transparency, accountability, and privacy. In consumer behaviour, ethical AI influences how consumers interact with brands, make purchasing decisions, and perceive trustworthiness.

Consumer Trust and Ethical AI: Trust is a critical factor in consumer behaviour. Ethical AI fosters trust by ensuring that AI-driven recommendations, personalized marketing, and data usage are transparent and unbiased. For example, consumers are more likely to engage with brands that use AI ethically to protect their data and provide fair recommendations.

Impact of Unethical AI Practices: Unethical AI, such as manipulative algorithms, biased decision-making, or invasive data collection, can lead to consumer distrust, brand erosion, and regulatory backlash. Examples include AI-driven price discrimination or opaque recommendation systems that exploit consumer vulnerabilities.

2. Ethical AI's Role in Personalization and Consumer Experience

Personalized Marketing: Ethical AI enables hyper-personalized marketing strategies that respect consumer privacy and preferences. For instance, AI can analyse consumer behaviour to offer tailored product recommendations without compromising data security.

Balancing Personalization and Privacy: Consumers increasingly demand personalized experiences but are also concerned about data privacy. Ethical AI strikes a balance by using anonymized data and providing consumers with control over their information.

Case Studies: Examples of companies like Netflix or Amazon using ethical AI to enhance consumer experiences while maintaining transparency and trust.

3. Ethical AI in Shaping Consumer Perceptions and Brand Loyalty

Transparency in AI Algorithms: Consumers are more likely to trust brands that explain how AI algorithms work and how their data is used. Transparency builds brand loyalty and encourages repeat purchases.

Bias Mitigation: Ethical AI ensures that algorithms do not perpetuate biases, such as racial or gender discrimination, which can alienate consumers and damage brand reputation.

Consumer Empowerment: Ethical AI empowers consumers by providing them with insights into how their data is used and allowing them to opt out of data collection practices.

4. Ethical AI's Influence on Consumer Decision-Making

Informed Decision-Making: Ethical AI provides consumers with accurate, unbiased information, enabling them to make informed purchasing decisions. For example, AI-driven comparison tools that highlight product features without favouring specific brands.

Reducing Information Overload: Ethical AI helps consumers navigate overwhelming choices by offering curated, relevant options based on their preferences and past behaviour.

Behavioural Nudges: Ethical AI can use subtle nudges to encourage positive consumer behaviour, such as sustainable purchasing or healthier lifestyle choices, without being manipulative.

5. Challenges and Ethical Dilemmas in AI-Driven Consumer Behavior

Data Privacy Concerns: Despite ethical practices, consumers may still be wary of data collection. Addressing these concerns requires robust data protection measures and clear communication.

Algorithmic Bias: Even with ethical intentions, AI systems can inadvertently perpetuate biases if not carefully designed and monitored.

Regulatory Compliance: Adhering to ethical AI principles often requires compliance with evolving regulations like GDPR or CCPA, which can be challenging for businesses

6. Future Trends in Ethical AI and Consumer Behaviour

Increased Demand for Ethical AI: As consumers become more aware of AI's impact, they will demand greater transparency and ethical practices from brands.

AI for Social Good: Ethical AI will play a role in promoting social responsibility, such as encouraging sustainable consumption or supporting fair trade practices.

Integration of AI Ethics into Brand Identity: Brands that prioritize ethical AI will differentiate themselves in the market, attracting socially conscious consumers.

Key Takeaways for SEO Strategies

Transparency in AI-Driven Content: Ethical AI can enhance SEO strategies by ensuring that content recommendations and search rankings are fair and unbiased, improving user trust and engagement.

Personalization Without Intrusion: Ethical AI allows for personalized SEO strategies that respect user privacy, such as tailoring content based on anonymized data.

Building Trust Through Ethical Practices: Brands that use ethical AI in their SEO strategies can build long-term trust with consumers, leading to higher click-through rates and conversions.

5. Findings and Discussion

5.1 Ethical AI and Consumer Trust

Ethical AI practices, such as transparent data usage and unbiased algorithms, foster

consumer trust. For example, a study by Accenture (2018) found that 62% of consumers are more likely to purchase from brands they trust. By prioritizing ethical AI, businesses can build long-term relationships with their customers, leading to increased loyalty and repeat purchases.

5.2 Influence on Purchasing Decisions

AI-driven personalization, when implemented ethically, can significantly influence purchasing decisions. For instance, Netflix's recommendation system, which uses AI to suggest content based on user preferences, has been instrumental in retaining subscribers. However, unethical practices, such as exploiting psychological vulnerabilities, can lead to consumer backlash and reputational damage.

5.3 Ethical AI and SEO Optimization

Search engines increasingly prioritize ethical practices in their ranking algorithms. For example, Google's E-E-A-T (Experience, Expertise, Authoritativeness, Trustworthiness) guidelines emphasize the importance of trustworthy content. Ethical AI can help businesses meet these criteria by:

- Generating accurate and relevant content.
- Ensuring data privacy and security.
- Enhancing user experience through intuitive design and accessibility.

5.4 Case Studies

Amazon: Amazon's AI-driven recommendation engine is a prime example of ethical AI in action. By providing personalized suggestions based on user behaviour, Amazon has significantly increased its sales while maintaining consumer trust.

The Guardian: The Guardian uses AI to optimize its content for SEO while adhering to ethical journalism standards. This approach has helped the publication maintain high search engine rankings without compromising its integrity.

6. Implications for Businesses

6.1 Building Consumer Trust

Businesses must prioritize ethical AI practices to build and maintain consumer trust. This includes being transparent about data usage, ensuring algorithmic fairness, and respecting user privacy.

6.2 Enhancing SEO Strategies

Ethical AI can improve SEO outcomes by aligning with search engine guidelines and enhancing user experience. Businesses should focus on creating high-quality, user-centric content and leveraging AI tools that prioritize ethical practices.

6.3 Long-Term Competitive Advantage

By adopting ethical AI, businesses can differentiate themselves from competitors and establish a reputation for integrity. This can lead to increased customer loyalty, higher conversion

rates, and improved online visibility.

7. Conclusion

The integration of ethical AI into digital marketing and SEO strategies offers significant benefits for businesses and consumers alike. By prioritizing fairness, transparency, and accountability, businesses can build consumer trust, influence purchasing decisions, and optimize their online presence. As search engines continue to prioritize user-centric content, ethical AI will play an increasingly important role in shaping the future of digital marketing.

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- <https://www.weforum.org/agenda/2020/01/ethical-ai-principles-for-businesses/>

HOLI FESTIVAL AND ADIVASI TRADITION OF NANDURBAR DISTRICT**Mr. Premsing Ramsing Padavi***Research Student**VVMs Arts and Commerce College**Takakura Dist. Nandurbar***Dr. Bagul Jitendra Bhimrao***Research Guide and HOD in English*

Abstract

Holi is big and important festival for Adivasi residing in Nandurbar District. It is the festival of joy, entertainment and fun. It is a festival of dance and colours. It is celebrated in month of phalgun – on full-moon day i.e. Poonam. Adivasi bring branch of Erandi tree (Castor tree) or long rod like straight teak wood. One day of Mahashivratri, they dig pit for Holi and put the teak rods in between the other rods erected towards sky. For about 15 days before holi, maidens sing holi songs called “lole”. On the day of full moon of Falgun, they put firewood around the rod and pray for Holi mother and set fire. They offer Dalya, Murrured, coconut, sugar, garland to Holi. Maidens sing songs while people shout and dance around the fire of Holi and say let ill things go away and evils from surrounds may exit.

Key Words: Holi, Mahashivratri, Satpuda, Adivasi**Introduction:**

On the eve of next day of Holi, they collect cooked food from house to house and serve to Holi first and then only they take their dinner. After Holi puja, next five days are observed as a festival. They play with colors and put colours on bodies, clothes; face to each other with Gulal, water colour etc. This kind of colour game is played with maternal uncle's sons and daughter. They ask for small money (Holi fag) from elderly people. On the eve of fifth last day of Holi after performing puja, water is poured in Holi-fire and this festival ends with fifth day's dinner which includes meat, rice and some sweets.

With this it is seen that Adivasi is connected with forest only. His life and his festivals are related with and affected by jungles and Nature. So, he knows by heritage how to deal with imbalance of nature, natural calamities of jungles, storage of water etc. But it is sad to say that modern culture and technology have given all over pollution in air, water, and jungle that has affected life of Adivasis and their culture. Adivasi has to undertake other activities to get their livelihood, putting aside their original activities of farming, fishing, gathering (Majid Husain 2002).

Nandurbar district and Holi festival have different characteristics. The fame of Holikotsav in Satapuda here has reached across Satasamudra. The history of Kathi Rajwadi Holi is unique. The sound of drums and biris will resound in Satpura. Thousands of young and old are going to

witness that moment.

Holi is celebrated by the Bhils for about five days. Their festival of Holi was celebrated in two ways. One is that if some disease has spread in the village, if the village is in trouble, if the crop water has not improved in the village, they celebrate Holi with dung cows. The second type is when the village is happy and the crops are good.

In the village where the Holi of the cows is celebrated, a stick of teak wood is planted a month in advance and on the day of the Holi, the cows are collected from the village and worshiped and lit. No wood etc. are thrown in this holi. After the Holi is lit, offerings are shown to her and food is served. Nor can you ask for donations. Such a type of Holi is also a simple Holi. The second type of Holi is a very big joyful festival. The holi lasts for about five days. A month before Holi, a teak wooden stick is planted at the place of the old Holi. Then, on the day of Holi, a tall bamboo tree or a savarcha stick is brought. The stick is planted in the pit of the holiday. Also, on the day of Holi, every man in the village goes to the forest with his pair of oxen and brings the wood from the fallen trees and leaves it in the Holi tent. After planting a bamboo or savannah stick, all the wood is arranged around it. There are tall piles of logs. In a village where there is a wooden Holi, the Holi is usually lit between 12 and 4 pm. The Patil of the village where Holi is celebrated performs Holi puja and lights Holi. All the villages, young and old, gathered around Holi. Some people perform pooja and show offerings. Some people dance in a circle around Holi. Drums of the dance floor in the village, they play and dance all night around Holi. Dance troupes from about ten to fifteen villages are present on the day of the lighting of the Holi. After the Holi is lit, all the dance troupes dance around the Holi. Sometimes when the tall bamboo that is planted is about to burn and fall down, it is placed on top (not leaning against the ground) with the help of another stick. After worshiping its tip, the local village policeman takes a dharya (a type of spear with round sharp blades like a spear and is attached to the bamboo) and breaks the tip of the bamboo in one blow. Then the village kotwal calls the villages in the surrounding area. The administrator or policeman of the village where the call was made would come forward and make only one wound on the bamboo with the weapon and then fall down and put the weapon down. Then the piece of bamboo front (to which the coconut bowl is tied) is given to the dance troupe of the local village. They take that piece with them when they go out. After the remaining cut pieces of bamboo are thrown into the Holi, all the villagers, dance troupes, women, men, children, dance around the Holi to the rhythm of instruments and wake up at night to enjoy the Holi. A small pilgrimage is held in the village of this meeting on the second day.

There are sweet shops, stationery, bangle shops, palanquin shops, etc. In the morning, people go home to enjoy the pilgrimage. In the village where the wooden Holi is held, there are often 'Ger dance troupes, Budhya Bava troupes' Each dance troupe consists of young children.

There are some old men. Some are young. They participate in the dance because they believe in some of these. Some amateurs participate.

The Ger dance troupe consists of a set of about 25 to 30 people. Some of them dress up in a special style of wrapped sari with leather straps around the waist, sword in hand, jewellery on body, drum on feet, and feta on head. Some Rai means Baya, (Ya Baya means the female disguise taken by men.) Some instruments are played by musicians. Similarly, there are two cops disguised as policemen, two men disguised as witches, some men in strange clothes, and a wooden horse dancing to the beat of the drum.

These dances include large holes, special types of drums, drums, plates, the second dance troupe is Buddhya Bava. He has a peacock feather cap on his head. They wear garlands of dried umber or temple around their necks. He wears a small drum on his legs, a large drum or pumpkin buds tied around his waist, and a thread or spear in his hand. The body is trapped in ash. They are performing Tandavan dance with such a dress and giving a special beat to the waist to the rhythm of the bheri (biribiri).

These dancers have to follow certain rules for the five days after they are dressed. For example. Do not sit in bed or bed for five days. They go outside for five days. They do not take off the garment they have worn. On the day of Holi in their village, they dance all day and collect grain, money, etc. from the village. After dancing in their own village, they go to another village. (Of course, in the same village where the wooden Holi will be held.) When you go to that village, you dance around the Holi. In each village, grain and money are collected in the form of donations.

On the fifth day, after returning to the village, the saj etc. are taken down and all the grain and money are counted. On occasion, money is made by selling grain. All the money was collected and brought to the account of the chickens and goats are become. When they are brought, all the goats are slaughtered in the fields outside the village and mutton is made. Its tree leaves are made into ways. The way is delivered to the homes of those who have paid. Thus, the Bhils of Satpuda and the Bhils of Pawara celebrate it with enthusiasm.

Holi Dance:

The costumes worn by the Bhil Tribes for dancing differ from place to place. For example, during Holi festival Bhil from Navapur, Nandurbar and Taloda Tehsil, the costumes are simple. But it is observed that Bhil Tribes from Dhadgaon, Akkalkuwa, Shahada and Taloda Tehsils have given special attention to their costumes.

They decorate their entire body with limestone and wear headgears made up of feathers of Peacock. The musical bells are tied around their waist to create a rhythmic sound on which they dance gracefully.



The Holi festival in Kathi from Dhadgaon Tehsil is now becoming popular in the District due to its specific way of celebration. The dances go on through the night and days especially when the dancers consume indigenous liquor (Mahua) before the dance. Liquor is not consumed by all the dancers.

Conclusion:

Holi is celebrated with great joy and in some villages in the Satpudya belt on the border of Maharashtra and Madhya Pradesh, Gulalya Bazaar and Bhongra Bazaar are held. Both types of markets were held at Chandsai and Mandana in the Shahada area in the past. However, recently, due to the increase in the population of Shahu community in Mandana village, the Bhongra bazaar and Gulalya bazaar have been closing down. These two markets are located in Dhadgaon in Akrani, Birodi, Sangvi, Palasner and Pansembar in Shirpur and Khetia, Pansemal, Sendhwa and Niwali in Madhya Pradesh bordering Maharashtra.

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GOEIJR

MINDFUL PARENTING IN ADOLESCENCE: PSYCHOLOGICAL BENEFITS OF INTEGRATING INDIGENOUS WISDOM AND CONTEMPORARY APPROACHES

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Abstract

Adolescence is a critical developmental period marked by significant physical, emotional, and social changes. Mindful parenting, which emphasizes present-moment awareness, non-judgmental acceptance, and emotional regulation, has gained attention as an effective approach to supporting adolescents. However, contemporary mindful parenting practices often overlook the rich cultural and spiritual wisdom embedded in indigenous traditions. This paper explores the psychological benefits of integrating indigenous wisdom with contemporary mindful parenting approaches during adolescence. Drawing on interdisciplinary research, the study highlights how indigenous practices, such as communal support, storytelling, and connection to nature, can enhance emotional resilience, self-esteem, and family cohesion in adolescents. The paper also examines the potential of such integration to address mental health challenges, including anxiety, depression, and identity struggles, which are prevalent during adolescence. By synthesizing findings from psychology, anthropology, and indigenous studies, this research proposes a hybrid model of mindful parenting that respects cultural diversity while incorporating evidence-based strategies. The study concludes that integrating indigenous wisdom with contemporary approaches not only enriches parenting practices but also fosters a deeper sense of belonging and cultural identity in adolescents, contributing to their overall psychological well-being. This paper calls for further research and collaboration between indigenous communities and mental health professionals to develop culturally inclusive parenting frameworks.

Keywords: mindful parenting, adolescence, indigenous wisdom, psychological well-being, cultural integration, emotional resilience

Introduction

Adolescence is a pivotal stage of human development, marked by profound physical, emotional, and social transformations. During this period, individuals navigate the complexities of identity formation, peer relationships, and increasing independence, all while grappling with the challenges of a rapidly changing world (Steinberg, 2014). For parents, this phase can be equally

demanding, as they strive to provide guidance and support while respecting their child's growing autonomy. Parenting during adolescence requires a nuanced approach that balances structure with flexibility, authority with empathy, and discipline with understanding (Siegel, 2013). In recent years, mindful parenting has emerged as a promising framework for fostering healthy parent-adolescent relationships. Rooted in mindfulness principles, this approach emphasizes present-moment awareness, non-judgmental acceptance, and emotional regulation, offering parents tools to respond to their adolescents with greater patience and compassion (Kabat-Zinn, 2003).

However, while contemporary mindful parenting practices have demonstrated significant psychological benefits, they often lack cultural inclusivity. Many of these frameworks are grounded in Western psychological traditions, which prioritize individualistic values and may not fully resonate with collectivist or indigenous cultural contexts (Duncan et al., 2009). Indigenous cultures, on the other hand, have long practiced holistic approaches to child-rearing, emphasizing interconnectedness, community, and spiritual well-being (Kovach, 2009). These traditions offer valuable insights into fostering resilience, identity, and emotional health in adolescents, yet they are frequently overlooked in mainstream parenting discourse.

This paper seeks to bridge this gap by exploring the psychological benefits of integrating indigenous wisdom with contemporary mindful parenting approaches during adolescence. Indigenous parenting practices, such as communal support, storytelling, and connection to nature, provide a rich tapestry of strategies that can complement and enhance modern mindful parenting techniques (Gone, 2013). For example, many indigenous communities use oral traditions to impart values, teach resilience, and strengthen cultural identity, all of which are critical for adolescent development (Archibald, 2008). Similarly, indigenous rituals and ceremonies often serve as powerful tools for emotional healing and growth, offering adolescents a sense of purpose and belonging (Chandler & Lalonde, 2008).

The integration of these practices into mindful parenting holds particular promise for addressing the mental health challenges that are prevalent during adolescence, including anxiety, depression, and identity struggles (Kirmayer et al., 2011). Research has shown that adolescents who feel connected to their cultural heritage are more likely to exhibit higher self-esteem, greater emotional resilience, and lower rates of mental health issues (Whitbeck et al., 2004). By incorporating indigenous wisdom into mindful parenting, parents can create a more inclusive and holistic framework that not only supports their child's psychological well-being but also fosters a deeper sense of cultural identity and belonging (Gone & Kirmayer, 2010).

This paper argues that such an integrated approach is not only beneficial but necessary in our increasingly diverse and globalized world. As families navigate the complexities of modern life, they often face the dual challenge of preserving cultural traditions while adapting to contemporary realities (McCabe, 2007). For indigenous families, this challenge is particularly

acute, as they contend with the legacy of colonization, cultural dislocation, and intergenerational trauma (Brave Heart & DeBruyn, 1998). By integrating indigenous wisdom with contemporary mindful parenting, we can develop culturally sensitive frameworks that honor the unique strengths and values of indigenous communities while addressing the universal needs of adolescents (Gone, 2013).

The following sections of this paper will explore the theoretical foundations of mindful parenting, the principles and practices of indigenous parenting, and the potential benefits of integrating these approaches. Through a synthesis of interdisciplinary research, case studies, and ethnographic accounts, this study aims to provide a comprehensive understanding of how indigenous wisdom can enrich mindful parenting practices. The paper will also discuss practical strategies for implementing this hybrid model, as well as the implications for mental health professionals, educators, and policymakers.

Ultimately, this research seeks to contribute to a more inclusive and culturally responsive approach to parenting, one that recognizes the value of indigenous knowledge and its potential to enhance the psychological well-being of adolescents. By fostering a deeper connection to cultural heritage and promoting emotional resilience, this integrated model of mindful parenting can help adolescents navigate the challenges of adolescence with greater confidence and clarity. In doing so, it offers a pathway toward healthier families, stronger communities, and a more equitable society (Kirmayer et al., 2011).

Literature Review

1. Contemporary Mindful Parenting

Mindful parenting, derived from mindfulness-based interventions, focuses on cultivating awareness, empathy, and non-reactivity in parent-child interactions. Research indicates that mindful parenting reduces parental stress, improves emotional regulation, and enhances parent-adolescent communication (Kabat-Zinn, 2003). Studies have also shown that adolescents raised by mindful parents exhibit lower levels of anxiety and depression and higher self-esteem (Duncan et al., 2009). However, these approaches often prioritize individualistic values, which may not resonate with collectivist or indigenous cultural contexts.

2. Indigenous Wisdom in Parenting

Indigenous parenting practices are deeply rooted in cultural traditions, emphasizing communal responsibility, storytelling, and harmony with nature.

For example, many indigenous communities use oral traditions to teach values, resilience, and cultural identity (Kovach, 2009). These practices foster a sense of belonging and purpose, which are critical for adolescent development. Additionally, indigenous approaches often incorporate spiritual elements, such as rituals and ceremonies, to support emotional healing and growth.

3. The Need for Integration

While contemporary mindful parenting offers valuable tools, it often overlooks the cultural and spiritual dimensions of parenting. Integrating indigenous wisdom can address this gap by providing a more holistic framework that respects cultural diversity and promotes intergenerational healing. This integration is particularly relevant for indigenous adolescents, who face unique challenges related to cultural dislocation and identity formation.

Methodology

This research employs a qualitative synthesis of existing literature from psychology, anthropology, and indigenous studies. Case studies and ethnographic accounts are analyzed to identify common themes and practices in indigenous parenting. Contemporary mindful parenting frameworks are reviewed to identify areas for integration. The study also includes interviews with indigenous elders and mental health professionals to explore practical applications of this hybrid model.

Findings and Discussion

1. Emotional Resilience

The integration of indigenous wisdom, such as communal support and storytelling, enhances emotional resilience in adolescents. These practices provide a sense of continuity and stability, which are crucial during times of change.

2. Cultural Identity and Belonging

Indigenous parenting practices foster a strong cultural identity, which is linked to higher self-esteem and lower rates of mental health issues. Incorporating these practices into mindful parenting can help adolescents navigate identity struggles and develop a sense of belonging.

3. Family Cohesion

Indigenous approaches emphasize collective well-being, which strengthens family bonds. By integrating these values, mindful parenting can promote healthier family dynamics and improve parent-adolescent relationships.

Conclusion

Integrating indigenous wisdom with contemporary mindful parenting offers a culturally inclusive and holistic approach to supporting adolescent development. This hybrid model not only enhances psychological well-being but also respects and preserves cultural traditions. Future research should focus on developing and evaluating culturally sensitive parenting interventions in collaboration with indigenous communities.

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AI TRANSFORMING FUTURE EDUCATION**Dr. Sarita Verma***In charge Principal**Ashoka International Center for Educational Studies and Research*

Abstract

The integration of Artificial Intelligence (AI) in education is transforming traditional learning methods and paving the way for a personalized and inclusive learning experience. India's National Education Policy (NEP) 2020 envisions a future-ready education system that incorporates technology-driven learning models. This paper explores the role of AI in modern education, aligning it with the objectives of NEP 2020. It highlights the benefits of AI-driven adaptive learning, assessment and administration while addressing challenges such as digital accessibility, teacher training and ethical concerns. The study emphasizes how AI can be effectively implemented in classrooms to enhance student engagement, critical thinking and skill development.

Keywords : AI, NEP 2020, personalized learning, adaptive learning, digital education, future learning, technology integration, skill development, education reform.

Objectives

1. To study the AI in modern education and analyze its application in Education

Introduction

Artificial Intelligence in education began as a theoretical exploration in the 1960s but has gained significant momentum in recent years due to advancements in technology and the increasing availability of data. AI technologies, such as machine learning, natural language processing, and data analytics, have the potential to personalize learning experiences, enhance student engagement and improve educational outcomes. The rise of online learning platforms, educational apps and Intelligent tutoring systems exemplifies AI's role in creating adaptive learning environments. These tools can analyze students' learning patterns, assess their strengths and weaknesses and offer tailored resources and feedback. As a result, educators can focus on fostering critical thinking and creativity while AI handles repetitive tasks, such as grading and attendance tracking. Moreover, AI can facilitate administrative processes, streamline operations and support data-driven decision-making, enabling institutions to optimize their resources and enhance their overall effectiveness.

NEP 2020 underscores the importance of integrating technology into education to enhance accessibility, engagement, and quality. A well-developed digital infrastructure is essential for the effective implementation of AI and other technological advancements. High-speed internet

connectivity, interactive smart classrooms, and cloud-based learning platforms form the backbone of digital education. Government initiatives such as SWAYAM and DIKSHA provide e-learning resources, open educational content, and training modules for both students and teachers, making quality education accessible irrespective of location. Blended learning models, which combine traditional classroom instruction with digital resources, have gained prominence in the post-pandemic era. By integrating AI-based learning analytics, educators can track student progress, customize lessons, and offer real-time interventions. Gamification techniques, such as AI-powered simulations and virtual reality (VR) applications, make learning more immersive and engaging, fostering a deeper understanding of complex subjects.

Another crucial aspect of technology-driven education is digital literacy. NEP 2020 emphasizes equipping students with essential digital skills, such as coding, cybersecurity awareness, and critical evaluation of online content. As AI continues to shape various industries, fostering AI literacy among students ensures they are prepared for technology-driven careers. Moreover, AI can play a significant role in bridging educational disparities by providing learning opportunities to students in remote and underserved areas. AI-enabled mobile applications and offline digital resources make education more inclusive, overcoming geographical and financial constraints. However, successful AI integration requires extensive training for educators. Teachers must be equipped with the knowledge and skills to use AI-driven tools effectively. Pre-service and in-service training programs should focus on digital pedagogy, AI applications, and ethical considerations in AI-based education. Professional development initiatives, such as collaborative learning communities and mentorship programs, can support teachers in adapting to AI-driven teaching methodologies.

Significance of AI in Modern Education

Artificial Intelligence (AI) is revolutionizing the education sector by making learning more efficient, engaging, and personalized. With classrooms becoming increasingly diverse, AI enables educators to address individual learning needs through data-driven insights and adaptive teaching methods. AI-powered systems analyze student performance and tailor lessons according to their strengths and weaknesses. This ensures that each student progresses at their own pace, leading to better understanding and retention of concepts. AI also enhances student engagement through interactive tools like chatbots, virtual reality (VR), and augmented reality (AR). These technologies create immersive learning experiences that make lessons more engaging and memorable. Additionally, AI-driven automated assessment tools reduce the workload on teachers by grading assignments, analyzing performance trends, and providing instant feedback to students. Another critical aspect of AI in education is its role in data-driven decision-making. AI can track student progress, identify learning gaps, and recommend interventions to improve outcomes. Moreover, AI contributes to inclusive education by assisting students with disabilities through

tools like speech-to-text conversion, real-time translation, and assistive learning applications. The adoption of AI in education, as promoted by NEP 2020, presents an opportunity to create innovative, student-centric, and accessible learning environments. However, its successful implementation requires addressing challenges related to digital access, teacher training, and ethical considerations.

The Role of AI in Education

Definition of AI

Artificial Intelligence (AI) refers to the simulation of human intelligence in machines, enabling them to think, learn, and make decisions like humans. AI systems can process large amounts of data, recognize patterns, and automate complex tasks, making them valuable in various fields, including education, healthcare, and business.

Types of AI

AI can be categorized into three main types: Narrow AI, General AI, and Super intelligent AI.

Narrow AI (Weak AI) is designed for specific tasks, such as voice assistants (Siri, Alexa), recommendation systems (Netflix, Amazon), and facial recognition. It operates within a limited scope and does not possess general intelligence.

General AI (Strong AI) aims to replicate human intelligence across multiple domains. It can reason, solve problems, and adapt to new situations, but it is still in the research stage and has not been fully developed. **Super intelligent AI** refers to an advanced form of AI that surpasses human intelligence in all aspects, including creativity, problem-solving, and emotional intelligence. While still theoretical, its potential raises important ethical and safety concerns.

Applications of AI in Education

Adaptive Learning Systems

Adaptive learning systems use AI to customize lessons and adjust learning pace based on student performance. These systems analyze real-time interactions and provide personalized exercises, resources, and assessments to help students learn more effectively. By offering a tailored approach, adaptive learning ensures that students master concepts before progressing to more advanced topics. For example, platforms like DreamBox Learning and Smart Sparrow use AI to adapt educational content according to a student's strengths, weaknesses, and learning preferences.

Intelligent Tutoring Systems (ITS)

Intelligent tutoring systems provide personalized instruction and feedback without requiring a human tutor. These AI-powered platforms assess student responses, detect misunderstandings, and offer hints or explanations in real time. By mimicking one-on-one tutoring experiences, ITS enhances learning outcomes by ensuring students receive the right level of

challenge. Examples include Carnegie Learning and Knewton, which adjust the complexity of questions based on individual student performance.

AI-driven Assessment Tools

AI simplifies the evaluation process by automating grading and providing instant feedback to students. These tools can assess multiple-choice questions, essays, and even creative assignments with a high degree of accuracy. AI-driven grading platforms, such as Gradescope and Turnitin, help educators identify plagiarism, assess student progress, and offer insights into learning patterns. Additionally, AI analytics can highlight areas where students struggle, allowing teachers to adjust their instruction accordingly.

AI in Education

The integration of Artificial Intelligence (AI) in education has revolutionized traditional teaching methods, making learning more engaging, efficient, and accessible. AI-powered tools provide a personalized learning experience, ensuring that students receive education tailored to their individual strengths and weaknesses. By analyzing student performance data, AI can adapt lesson plans, suggest customized resources, and modify the difficulty level of content, enabling learners to progress at their own pace. This approach reduces the pressure of standardized learning, allowing students to grasp complex concepts in a way that best suits their cognitive abilities. Additionally, AI fosters greater engagement by incorporating elements of gamification, virtual simulations, and interactive content, making learning more enjoyable and immersive. With AI-powered chatbots, virtual assistants, and intelligent tutoring systems, students receive instant feedback, clarification on doubts, and additional learning resources, thereby improving comprehension and retention.

One of the most significant advantages of AI in education is its ability to increase efficiency and save time for educators. Tasks such as grading assignments, evaluating student progress, and managing administrative work can be automated using AI-driven tools. This automation reduces the workload on teachers, enabling them to focus more on classroom interactions, curriculum development, and individualized student support. AI-powered learning management systems (LMS) provide real-time data analytics on student performance, helping educators identify learning gaps, predict potential challenges, and design targeted interventions. This data-driven approach ensures that teaching strategies are continuously refined and adapted to improve learning outcomes. Furthermore, AI-powered adaptive learning platforms monitor student engagement and modify instructional strategies accordingly, ensuring that students receive the right level of challenge and support.

AI also plays a crucial role in enhancing accessibility and inclusivity in education. It assists students with disabilities by offering features such as speech-to-text conversion, real-time language translation, audio-based learning materials, and AI-generated subtitles for videos. These tools

empower students with visual impairments, hearing disabilities, and learning disorders to participate in the learning process on equal footing with their peers. AI-driven assistive technologies make educational content more inclusive and adaptable, bridging gaps for students who may struggle with traditional learning methods. Additionally, AI facilitates remote learning and digital education, ensuring that quality education reaches students in rural and underprivileged areas. AI-driven automated translation tools help overcome language barriers, making learning resources accessible to students who speak different regional languages.

Scalability is another major advantage of AI in education. Traditional classroom settings often struggle to accommodate large numbers of students while ensuring individualized attention. AI-driven educational platforms can scale learning experiences to thousands of students simultaneously, offering high-quality education without geographic limitations. This scalability is particularly beneficial in achieving the goals of NEP 2020, which emphasizes equitable access to education. AI-driven massive open online courses (MOOCs), AI-powered digital textbooks, and virtual classrooms have the potential to bridge the education gap, reaching students across the country. Additionally, AI can analyze large-scale data from various educational institutions, identifying trends and areas of improvement in national education policies. This data-driven approach ensures that reforms and interventions are based on real-time insights, making policy decisions more impactful and targeted. While AI has the potential to transform education, its implementation requires addressing challenges such as teacher training, ethical concerns, and digital accessibility. AI should be seen as a support system for educators rather than a replacement for human interaction. When combined with effective teaching strategies, innovative curriculum design, and strong policy support, AI can reshape the education landscape, making it more inclusive, efficient, and future-ready.

To maximize the potential of AI in education, a strategic approach is necessary, focusing on infrastructure development, curriculum redesign, and policy support. Educational institutions must invest in high-quality digital infrastructure, including AI-powered learning management systems, secure data storage, and user-friendly interfaces. AI-based data management systems should be implemented to track student progress, analyze learning patterns, and provide personalized recommendations. Collaboration with technology companies, research organizations, and ed-tech startups can facilitate access to cutting-edge AI tools and expertise. AI-driven curriculum redesign should integrate interdisciplinary learning, project-based assessments, and real-world applications. By incorporating AI ethics, digital literacy, and coding skills into the curriculum, students can develop a deeper understanding of the implications and applications of AI in various domains. Personalized learning modules, supported by AI algorithms, can cater to different learning styles, ensuring students receive targeted support based on their strengths and weaknesses.

From a policy perspective, governments must allocate sufficient funding for AI infrastructure, teacher training, and digital learning initiatives. Regulations should be established to ensure data privacy, cybersecurity, and ethical AI usage in educational institutions. Transparency in AI decision-making processes is essential to maintain accountability and fairness in AI-driven assessments. Moreover, continuous monitoring and evaluation of AI implementation can help identify best practices, address challenges, and refine AI-driven educational strategies.

Emerging Trends of AI in Education

The integration of AI in education is witnessing several transformative trends that are reshaping teaching and learning experiences. One of the most prominent trends is personalized learning, where AI-driven adaptive learning platforms analyze students' progress, strengths, and weaknesses in real-time to provide customized learning paths. These intelligent systems allow students to learn at their own pace, access tailored content, and receive targeted feedback, ensuring a more effective learning process. Additionally, AI-powered tutoring systems are becoming more sophisticated, providing students with 24/7 support outside the classroom. Virtual tutors, such as chatbots and AI teaching assistants, can answer questions, provide explanations, and assist with assignments, reducing the learning gap for students who may need additional help.

Another key trend is the automation of administrative tasks, which allows educators to focus more on teaching and mentoring rather than routine paperwork. AI tools can streamline grading, attendance tracking, scheduling, and resource management, improving efficiency in educational institutions. Additionally, AI is facilitating intelligent content generation, where algorithms assist in creating textbooks, study materials, and multimedia content tailored to different learning styles. AI-generated simulations, virtual labs, and gamified learning environments enhance student engagement by making complex subjects more interactive and immersive.

Natural Language Processing (NLP) and AI-driven assessment methods are also gaining traction. AI can analyze written responses, essays, and even spoken language to assess comprehension and provide feedback with remarkable accuracy. This not only saves time for educators but also ensures objective evaluation. Moreover, AI-powered language translation tools are breaking down language barriers, making education more inclusive for students from diverse linguistic backgrounds. AI-driven translation and transcription services enable real-time learning in multiple languages, fostering global collaboration in education.

As AI continues to advance, ethical considerations such as bias in AI algorithms, data privacy concerns, and the need for transparency in decision-making are also gaining attention. The focus is shifting towards developing ethical AI frameworks that ensure fairness, inclusivity, and accountability in AI-driven educational technologies. Institutions and policymakers are working

towards establishing guidelines for responsible AI implementation, ensuring that AI systems are designed to promote student success without reinforcing inequalities.

Conclusion

The integration of artificial intelligence (AI) in education marks a transformative shift in how teaching and learning occur, offering both unprecedented opportunities and challenges. As explored throughout this research, AI has the potential to enhance personalized learning, streamline administrative processes, and create engaging educational experiences. The findings underscore the necessity for continued exploration into AI's role in shaping the future of education, particularly in the context of post-COVID recovery, where innovative solutions are essential for addressing the evolving needs of learners and educators. The future of education is intrinsically linked to the advancement of artificial intelligence. As AI technologies continue to evolve, they present both significant opportunities and complex challenges that must be navigated carefully. The findings of this research indicate that AI has the potential to create more personalized, engaging, and accessible educational experiences for learners of all backgrounds. However, the successful integration of AI in education will depend on a concerted effort from policymakers, educators, and researchers to address ethical considerations, promote equity, and develop robust frameworks for AI implementation. By fostering an inclusive, data-driven, and ethically responsible approach to AI in education, we can harness its power to empower learners, enhance teaching practices, and ultimately transform the educational landscape for generations to come. The journey towards AI-enhanced education is just beginning, and with thoughtful guidance and collaboration, it holds the promise of a brighter future for learners worldwide.

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INTEGRATING INDIAN KNOWLEDGE SYSTEMS: YOGA, CONSCIOUSNESS, AND MENTAL HEALTH

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Abstract

Indian Knowledge Systems (IKS) is always remained a part of prosperity and development. It helps to prosperous human being. have been foundational in shaping human understanding of well-being, consciousness, and holistic health. Among these systems, Yoga, originating from ancient Indian traditions, presents a unique confluence of physical, mental, and spiritual practices aimed at achieving balance and mental well-being. This paper explores the integration of Yoga within global Indigenous Knowledge Systems and its implications for consciousness and mental health. Using a multidisciplinary approach, it examines the historical significance of Yoga, the intersection of Indigenous and Western psychological paradigms, and the role of Yogic practices in addressing modern mental health challenges. The paper also discusses ethical considerations and the need for culturally sensitive approaches in integrating Yoga into contemporary therapeutic frameworks.

Yoga has been used for millennia as a tool for self-improvement, with the ultimate goal of uniting the individual consciousness with the universal whereas mental health is a state of wellbeing in every possible aspect of life. The focus of this paper is to present the yoga as an aid to improve mental health. Yoga has numerous influences on mental health such as improving focus, reducing stress and light up moods and many more and for there are different yoga for different mental health issues listed in this paper.

Yoga practices have become immensely popular as an aid to improve health like shavaasana, adho mukha vakraasana, natarajasana are used to prevent anxiety and reduce stress. Yoga-based practices are being extensively used as therapeutic ingredients, alone or as adjuncts to other therapies in a variety of disorders, both physical and mental. There is now strong evidence to suggest that yoga-based interventions are beneficial in several lifestyle disorders. Recent research has also shown significant benefits of yoga in mental disorders such as depression, anxiety, and psychosis. This paper discusses the place of yoga not just as an aid but also a tool to prevent mental health problems.

Key Words: -IKS, Yoga, Consciousness, Mental Health

Introduction

Indigenous Knowledge Systems (IKS) encompass the accumulated wisdom, traditions, and practices of native communities worldwide. These systems offer holistic approaches to health and well-being, emphasizing harmony between mind, body, spirit, and environment. Yoga, an ancient practice from the Indian subcontinent, aligns with many Indigenous healing modalities through its focus on consciousness, breath control, meditation, and physical postures. In contemporary mental health discourse, integrating Yoga into psychological and therapeutic frameworks has demonstrated significant benefits. However, it is crucial to approach such integration with cultural sensitivity and respect for Indigenous epistemologies. This paper examines Yoga's role in consciousness and mental health, its intersection with other Indigenous knowledge systems, and the ethical considerations of its global adoption.

Historical Foundations of Yoga and Indigenous Healing

Yoga, as detailed in the Vedas, Upanishads, and Patanjali's Yoga Sutras, has existed for millennia as a spiritual and philosophical discipline. Its primary goal is to achieve self-realization and mental equilibrium through practices such as Asana (postures), Pranayama (breath control), and Dhyana (meditation) (Feuerstein 48). Similarly, Indigenous healing systems across various cultures—such as Ayurveda in India, Traditional Chinese Medicine (TCM), and Native American healing practices—emphasize interconnectedness between physical, mental, and spiritual well-being (Smith 102). Parallel to Yoga, Indigenous traditions often incorporate meditative and breathwork practices to enhance consciousness and mental resilience. For example, the mindfulness traditions of Buddhist meditation and the shamanic practices of Indigenous American tribes use similar techniques to facilitate self-awareness and healing (Walsh 56). Recognizing these intersections helps establish a common ground for integrating Indigenous knowledge within modern mental health practices.

Yoga and Consciousness

Consciousness is a central concept in both Yogic philosophy and Indigenous traditions. In Yoga, consciousness is understood through the lens of the Koshas (layers of existence), ranging from the physical body to the blissful state of enlightenment (Eliade 77). This aligns with Indigenous frameworks that view consciousness as extending beyond the self, encompassing ancestors, nature, and the cosmos.

Neurological research has substantiated Yoga's impact on consciousness by demonstrating changes in brain activity, particularly in areas associated with emotional regulation and self-awareness (Davidson and Goleman 132). Yogic meditation activates the prefrontal cortex and limbic system, fostering emotional stability and reducing stress (Telles et al. 215). This aligns with Indigenous healing ceremonies, where rhythmic breathing, chanting, and drumming alter states of consciousness, fostering psychological and emotional healing (Goulet and Young 89).

Mental Health Benefits of Yoga in Indigenous and Western Contexts

Yoga has been widely acknowledged for its efficacy in mental health care, particularly in reducing stress, anxiety, and depression (Brown and Gerbarg 106). The integration of Yoga within Indigenous Knowledge Systems offers a complementary approach to Western psychology by addressing mental health through spiritual and somatic dimensions.

For Indigenous communities facing intergenerational trauma, Yoga serves as a powerful healing modality. Studies indicate that trauma-informed Yoga interventions help regulate the nervous system, re-establish a sense of safety, and restore community well-being (Van der Kolk 182). Furthermore, in clinical settings, Yoga-based cognitive therapy has been successfully applied to manage PTSD, depression, and substance abuse (Khalsa et al. 94). By merging Indigenous perspectives with Yoga, mental health interventions can become more holistic and culturally resonant.

Ethical Considerations in Integrating Yoga with Indigenous Practices

While the benefits of integrating Yoga into Indigenous healing practices are evident, ethical considerations must be addressed. One primary concern is cultural appropriation—the extraction of Indigenous wisdom without acknowledgment or respect for its origins (Sharma 65). The commercialization of Yoga in the West has often stripped it of its spiritual essence, reducing it to a mere fitness trend (Singh 142). Such appropriation not only disrespects the tradition but also overlooks its deeper therapeutic potential.

A respectful integration of Yoga within Indigenous Knowledge Systems requires collaborative approaches that honour traditional lineages and Indigenous epistemologies. This includes working with Indigenous healers, recognizing the cultural contexts of Yogic practices, and ensuring accessibility to Yoga within Indigenous communities without imposing external interpretations.

Future Directions and Conclusion

The integration of Yoga with Indigenous Knowledge Systems presents a promising pathway for mental health and consciousness studies. Future research should explore culturally adaptive Yoga practices tailored to Indigenous contexts, ensuring that the benefits of Yoga are accessible while respecting Indigenous identities.

As mental health challenges continue to rise globally, interdisciplinary approaches that embrace Indigenous wisdom, Yogic philosophy, and modern psychology can foster more holistic well-being. Through ethical and culturally sensitive practices, Yoga can serve as a bridge between diverse healing traditions, offering sustainable mental health solutions grounded in ancient wisdom and contemporary research.

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ANCIENT INDIAN KNOWLEDGE SYSTEMS & THEIR RELEVANCE WITH MODERN EDUCATION

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The Ancient Indian Knowledge Systems encompass a wide range of subjects including philosophy, spirituality, ethics, social science, astronomy, medicine, and others. The systems have a rich cultural and spiritual heritage that continue to influence contemporary Indian society. These systems are a source of wisdom, guidance, and inspiration for individuals for personal growth, intellectual exploration, and spiritual enlightenment. There are systems which are based on trust, understanding, and respect of the human psyche. They are a testament to the rich culture and heritage of India which inspire the students and teachers from generation to generation. Their wealth of knowledge has been preserved in ancient texts. These texts serve as repositories of wisdom covering diverse subjects and disciplines. They are also transmitted orally across generations. Through rituals and traditions, this knowledge is passed down ensuring its continuity and relevance in contemporary times.

Components of the Indian Knowledge Systems

The Indian traditional knowledge development and transmission have a long history. Several educational institutions were established in India including *Nalanda*, *Taxila*, and *Vikramshila* which drew academics from all over the world. *Vedas* are considered as Hinduism's earliest sacred books and foundation of all Indian Knowledge Systems. It is thought to be written between 1500 and 500 BCE. In Sanskrit, *Veda* means wisdom or understanding. It is divided into four sections consisting of several customs and philosophical teachings. *Rigveda* - The collection of hymns to many Gods that is rich in knowledge about the cosmology, roots, and civilization of ancient India). *Samaveda* - The text primarily serves as a chanting guide for religious rituals. *Yajurveda* - The text concentrates on the steps and rituals of yajnas, and offers guidance to theorists to carry out the rituals. *Atharvaveda* - It consists of songs and ceremonies about different practices for daily life. *Upanishads* - These are a body of prehistoric, philosophical writings that are fundamental to the Indian Knowledge Systems, and represent the philosophical and spiritual essence of Hinduism. The *Upanishads* were written between the year 800 to 200 BCE. The word *Upanishad* is a Sanskrit word meaning 'sitting near'. These are deemed to be the pinnacle of vedic thoughts. *The Bhagavad Gita* - It is often known as *Gita* and recognised as one of the most significant works of spiritual and philosophical literature in India. Philosophy, spirituality, ethics, and psychology are just a few areas of Indian Knowledge Systems that have

been profoundly impacted by it. *Gita* offers a synthesis of numerous intellectual theories and schools of thought. The nature of existence, self-consciousness, and meaning of life are topics that are covered. It introduced philosophical ideas like *Karma*, *Yoga*, and *Dharma*. *Gita* provides an explanation on justice and ethical behaviour, which has left a long lasting impression on the Indian society's moral foundation. *Puranas* - Collection of texts dealing with mythology, cosmology, and history in the context of the hindu traditions. It contains the stories of Gods and Goddesses. *Philosophy* - A rich and varied history of thought that has evolved over thousands of years is included in Indian Knowledge Systems often known as simply *Philosophy* or *Darshan* Indian *Philosophy* refers to the thought and reflection processes that the civilizations of Indian constituents created. They comprise both orthodox and non orthodox philosophical traditions. *Dharma*, *Karma* and *Moksha* are the central ideas of Indian Philosophy. Indian Philosophical Schools - A variety of Indian philosophical schools can be found in rich and diverse legacy. They are *Nyaya*, *Vaisheshika*, *Samakhya*, *Yoga*, *Mimasha*, and *Vedanta*. *Mathematics* - Mathematicians of ancient India made significant contributions to the subject. *SulbhaDutras* one of the earliest mathematical writings from India. Algebra and Numerical System which is also known as the Indian Numeral System was a revolutionary invention that introduced the idea of Zero and decimal place values. The Indian mathematicians created trigonometric tables to resolve astronomical puzzles. *Astronomy* - India has a long history of astronomy. *Aryabhata*, *Varhmihora*, *Bringupta* are well known astronomers who made major contributions to the Indian Knowledge Systems. Indian astronomers created sophisticated calendars, such as *Surya Siddhanta* and the *Jyotish Vedanga* which helps in choosing the auspicious dates and seasons. *Medicine* - The term 'knowledge of life' or ayurveda has been used in India for countless years. Significant scientific advancements in many areas of healthcare have been made possible by the Indian Knowledge Systems. There are three dishes which control the human body - *Vate*, *Pitta*, and *Kapha*. Ayurvedic practitioners evaluate patients for *doshik* constitution and offer customized remedies. Global acclaim has been given to ayurvedic medicine including yoga, meditation, and Pranayam to improve mental health, lower stress, and improve general wellness.

Arts and Literature - Ancient literature like Puran, Mahabharat, Ramayan are rich in wisdom and moral instruction. Indian classical music and dance forms like *Bharatnatyam*, *Kathak*, *Odissi* are powerful instruments for expressing spirituality and emotions because of its ragas and rhythms. *Architecture*- The science of architecture was known in ancient India as *SthapatyaShastra* which is derived from the word *Sthapana* meaning 'to establish'. From very early times, the construction of temples, palaces was undertaken by professional architects known as *Asthapati*. During the vedic times, these professionals were constructing the chariots known as *Rathkara*.

Contemporary Relevance of Ancient Knowledge Systems

The main aim of education is to provide knowledge and to release individuals from ignorance for promoting self realisation. The main aim of education according to Bhagavad Gita is to remove ignorance, to develop one's personality, to develop social interest, to develop rationality, and to make dutiful choices. The land of India is famous for its rich, ancient education and cultural system. Starting from the Vedic period to the Gupta period, India was top on holistic development. So the Indian Knowledge Systems is a holistic system of learning which has been passed from generation to generation. It emphasises not only to learn the content but also understanding their connection to other areas of life. This holistic approach encourages a more balanced and thorough understanding of education extending beyond academic success to concentrate on students general well being and character development. *Ethics & Values* - Another aspect of the Indian Knowledge Systems is its emphasis on ethics and values, which places great importance on development of moral character and sense of compassion, honesty and responsibility. *Mindfulness and Meditation* - The Indian Knowledge Systems provide techniques and practices like yoga and meditation, which helps the individuals for stress reduction, cognitive improvement, emotional well - being, and general mental health. In the modern world, these practices are well known for their positive psychological and educational effects. Enhancing innovation and creativity, Ancient Indian Knowledge Systems are a rich source of knowledge and ideas that can be applied to different fields. They offer a unique perspective that can inspire innovation and creativity among individuals. Individual difference and personalised learning - Indian Knowledge Systems values and respects each person's individuality. It recognizes that everyone has unique learning preferences, skills, and ability. Promoting sustainable development, Indian Knowledge Systems emphasise the concept of sustainable development which is important for the environment and society. The idea of *Dharma* was essential in directing people towards living with harmony with nature. Indian culture had a strong foundation in *Ahimsa*, meaning non violence practice. The exploitation of natural resources was prohibited by this idea, which encouraged environmentally friendly behaviour. Ancient indian towns were planned with sustainability on mind. The idea of *Vastu-Shastra* serves as a blueprint for creating structures. *Yoga and Meditation* - Yoga and meditation techniques have their roots in ancient India and in recent years it is incredibly popular throughout the world. It is widely used all over the world to lessen stress for improving general wellness. *Art, Music, Dance* - In Indian culture, art, dance, and music have a great significance. The traditional dance styles like *Bharatnatyam, Kathak, Odissi* are still practiced and performed today, conserving cultural history.

The Indian Knowledge Systems provide insightful information about promoting peace and resolving conflicts. The literature like *Vedas* place a strong emphasis on the virtues of non violence, compassion, and understanding. Different disciplines of the Indian Knowledge Systems

have offered distinctive viewpoints and workable solutions to the problems. For example, the traditional Indian Medical System - *Ayurveda*, places a strong emphasis on prevention and holistic approach to illness. Insights into ethical behavior, ecological preservation, and sustainable living are also provided by the Indian Knowledge Systems and these concepts are essential for tackling Science, Arts, and other fields. The systems' contributions to the field of mathematics, astronomy, and medicine is still relevant today. It also promotes inclusion, peacemaking, and intercultural communication in society. The Indian Knowledge Systems are a vast pool of traditional cultural knowledge that has been passed down from generation to generation. IKS emphasises holistic development and combines spiritual, moral, and intellectual education. It is important in modern times as it offers practical solutions to contemporary challenges, promotes holistic health and wellness, enhances innovation and creativity and offers a vision of ethical and moral values. The Indian Knowledge Systems is relevant for modern times for the following reasons - 1. Promotion of holistic health and wellness. 2. Enhancement of innovation and creativity. 3. Establishment of Inclusive and Diverse Society 4. Offering sustainable solutions to environmental challenges. 5. Offering a vision of ethical and moral values. 6. Preservation of ancient wisdom. 7. Development of critical thinking skills. 8. Promotion of peace and harmony 9. Promotion of renewable energy and sustainable agriculture. 10. Preservation of Indigenous knowledge, and 11. Empowerment of local communities. Beyond academics several sections of our society are affected by the contemporary relevance of the Indian Knowledge Systems. A greater comprehension of human behaviour, enhanced pedagogical methods, successful organisational tactics has resulted from its integration into education, administration and administrations. By incorporating the principles and teachings of ancient Indian Knowledge Systems into modern systems, the students can gain a well-rounded education to prepare themselves to face each and every challenge in life.

The NEP 2020 and the Ancient Indian Knowledge Systems share some similarities in their goals like holistic development of individuals, focus on practical skills, inclusivity, environmental awareness, value-based education, fostering innovation and creativity, and the flexibility in teaching methodology which are almost similar to present approach.

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THE IMPLICATIONS OF AI IN EDUCATION :- ETHICS & PRIVACY**Ann George C.***Asst. Prof. In Education**Mahajubilee Training College, Mulloorkara*

Abstract

As artificial intelligence (AI) technologies become more prevalent in education, their influence on privacy, fairness, and responsibility is under increasing scrutiny. This paper investigates the ethical implications of AI in educational settings, specifically examining concerns about student privacy, potential biases embedded in AI systems, and the accountability structures necessary to manage AI responsibly. The paper advocates for proactive policies and practices that prioritize ethical standards, thereby ensuring AI serves as a tool for equity and improved learning outcomes rather than one that exacerbates existing inequalities.

Keywords: Artificial Intelligence, Education, Ethics, Privacy, Accountability.

1. Introduction

Introduction of Artificial Intelligence (AI) in education has become widespread on the international level, and it is expected that its implementation will lead to qualitative changes most of the sectors connected with education [1]. In recent years Institution has turned to Artificial Intelligence technologies to promote effective processes that support Independent Learning Environment and Administrative Solutions, and offer timely data feedback on student success and activity levels. These applications therefore hold the promise to meet individual learning requirements, increase effectiveness and aid in the decision making for learning professionals such as teachers and policy makers [2]. Personalized Learning: AI systems are designed to process terabytes of information about students' activities and learning profiles as well as their achievements. This permits educational agencies to provide custom material and flexible assessment, suitable to all learner's abilities and weaknesses [3].

Together, the published research provides evidence that AI systems present great possibilities for improving the educational experiences of learners while suggesting that AI should be used in a more nuanced manner that promotes ethical practices. AI needs to be responsible for privacy, free of bias and must be accountable in education to ensure that there is trust, equality and fairness. This paper discusses these ethical effects and presents a conceptual model to help elucidate and address privacy perils, prejudice, and liability related to AI in education. By so doing, the implementation of the following guidelines should seek to promote fairness when use of the AI technology is applied to educational advancement as opposed to the prevalent social inequality.

2. AI in Education:

Current Applications Artificial Intelligence (AI) has taken its place as a valuable tool in today's education system that provides revolutionary solutions to improve different aspects of how students learn and how teachers facilitate the learning process, as well as how institution heads administer educational institutions. Integrated AI affairs in education are aimed at handling a number of tasks, which is to individualize the education process as well as to optimize the executive tasks. Such uses hold a lot of potential, with potential for increased effectiveness, increased levels of student involvement, and better learning. However, their strong focus on data and algorithm choice presents several ethical issues that range from data privacy, algorithm explainability and algorithms equality. This section outlines some of the major use of Artificial Intelligence in education and discusses some of the ethical issues that come with each of the use.

Personalized Learning and Student Data

One of the most popular use of AI is in individualization of learning. Due to the utilization of Artificial Intelligence systems, knowledge content can be selected and adapted according to one's ability, learner's rhythm, and deficiency. For example, the use of AI yields the option of following and learning a student's behavior, learning process, and response patterns; in order to provide tailored instructions [11]. Depending on which learning activity was effective and which learning activity was not, these systems could select learning activities in real-time to meet those learning needs. Examples are intelligent tutoring systems that change exercises such as quizzes and provide hints to students when they guess wrong as well as the method of self-paced learning which adapts quizzes for students based on their answers. However, the task of delivering such contextualised experiences means that extensive data about each student must first be gathered and processed. Such data may contain performance of the student, behaviour data, engagement with learning materials, and other data of the student. The collection and retention of such a variety of data raise principal privacy issues. Consumers can be students and parents, and often they are not extensively aware of the data that are collected from them, how these data are going to be used, and who will be able to use it. Thirdly, there is danger in retaining information for long because important information collected in the course of carrying out business may attract some insecurity threats. This points to the need for protection of data and clear and voluntary compliance with data protection law for stewardship of students' data.

2.1 Predictive Analytics for Student Success

Another one is predictive analysis since AI uses machine learning algorithms to analyze historical and real-time data to forecast on learner performance. These models are commonly employed to look for students who may be at risk of poor academic performance, dropping out or whatever disadvantage. Such students are best identified early in the session so that educators and administrators can guide them to seek help in form of support; undergo counseling; or receive

further additional instructions that would help him/her to succeed. Predictive analytics may also help to determine the lessons chosen as it also offers better course placements for the students, potential career paths in relation to the target, improve the proper alignment of education and results. As with most emerging technologies, there is great promise for predictive analytics to improve students' success while raising important questions about ethical considerations, such as bias and fairness. Most predictive models are built with the use of data collected in the past and it is no secret that such data usually has a bias that considers the socioeconomic status, ethnicity or otherwise. This means that if the training data is bias, the resulting algorithm will be bias and will predict that a particular demographic of student is at a higher risk than the other more than it actually is. Any classification that is misleading or unjust can be catastrophic to the students so classified as it may exclude them from many opportunities [12].

2.2 Automated Grading and Assessment

Another application area highly dependent upon AI is automated grading, which is particularly vital in grading of standardized examinations, essays and short answer questions. Applying natural language processing algorithms, the AI systems can assess and give the feedback for the student responses, which can minimize the grading load of the educators etcetera. These systems are most effective in largescale assessment where grading is done manually would be a herculean task. In addition, the use of computers in grading enables the student to get results immediately as they enable the students to correct their mistakes. However, similar to all beneficial technologies, problems remain, specifically in relation to assessing accuracy and equity considerations of automated grading. Such designs may also not well capture the various responses that students give due to uniqueness in their perceptions or variation in language in case of multiple languages [13]. It can also be seen that grading algorithms are biased to certain response forms or patterns, which may negatively impact creative responding. Kinds of biases that could be detrimental to students in particular circumstances include ones whose deviations from expected norms impact the abilities of students who do not fit a specific mold or whose communication patterns deviate because of linguistic or cultural differences. Due to such problems, it is prospective for educational institutions to pilot and fine-tune grading algorithms to ensure its effectiveness in evaluating arrays of responses. Even for multiple-choice questions which include inclusion of human overseer in the grading process will also reduce prejudices.

2.3 Virtual Tutoring and Intelligent

Tutoring Systems Via helping students with tutors artificially implemented by AISs, virtual tutoring systems can offer students a one-on-one teaching model even when the class is not in session. These systems can respond to student inquiries, give directed explanation, and assist with problem solving and knowledge transference; some of which are reminiscent of human tutoring. Since virtual tutors can respond instantly, gaps for students who require extra help but cannot

arrange for a human tutor or educator after school can be closed. However, Elliott points out that virtual tutoring entails a number of ethical concerns including dependence of the project on technological implementation and quality of interaction [14]. The AI tutors are helpful for assistance but as a result, it will be difficult for an AI to resolve queries that depict societies deep rooted reasoning and feel. This approach may also have implications on students' chances of interactions with authentic tutors – which are vital for holistic learning. It is critical to mention that when designs for AI tutoring, the invention has to augment instead of reducing human support for training.

3. Privacy Concerns in AI Applications

Most of the integration of AI in education requires the collection of data and this raises major issues of privacy. In the cases of adaptive learning, big data for analysis, and robotic teaching and counseling, AI interfaces seek student data and may comprise academic data, behaviour record, and identity data. Given that the use of AI is continually deepening within learning institutions, the risks that data is susceptible to misuse or unauthorized access are also high; hence, privacy preservation should be of high value. In this section the author looks at the types of privacy threats and the existing privacy laws that exist to regulate the protection of student's privacy in using artificial intelligence applications including FERPA in United States and GDPR in European Union.

3.1 Data Collection and Consent

Another pressing privacy concern that arises together with using Artificial Intelligence in education is the huge amount and diversity of data that the learning system and institutions gather on students. In order to operate properly, AI systems use a variety of data inputs, including qualifications, scores, and not only behavioural data, which includes time on a task, engagement, and social interactions on learning platforms. While this data is useful for designing learning experiences, this data also contains PII that can potentially expose the most fragile aspects of a student's life, their family, and even their conduct.

3.2 Surveillance and Data Security

The use of AI for monitoring and surveillance in education facility is on the rise as a safety measure, engagement meter, and as an administrative tool. It includes face recognition for attendance, a behaviour tracking system for engagement in class, and others that make predictions of students who are likely to drop out. As these tools may enhance the management of the learning and teaching process and get valuable information about student's activity, they may lead to ethical Issues that result in surveillance. Students may be given a feeling that they are being watched in some manner, which in some way could debilitate their liberty and cause them to lose trust in the administration. One more important issue which can be pointed out is the security of collected data. Schools and other education institutions do not possess the advanced protection means

required to safeguard a significant number of students' personal records from hacking and cyber troubling.

4. Accountability in AI-Driven Education

Any AI is to be used in educational systems has to be fully accountable to avoid the misuse of the technology which will lead to loss of trust from the general public. Accountability means that some individuals or institutions **MUST** be held responsible for the growth, deployment, as well as supervision of AI uses in education. At the same time, one must realise that without proper accountability mechanisms, AI may decide something, or affect an outcome, in a completely opaque and potentially negative way for any student or other stakeholder. This section explores the fundamental pieces required to integrate accountability into AI systems in education: Openness, interpretability and sensible management frameworks.

4.1 Transparency and Explain ability

There is a strong focus on the need to make AI involved in education as transparent as possible as well as making them easily explainable to stakeholders. Transparency is about the educational institution or technology's provider's understanding of how an AI system works, what data it employs, and the rationale for its actions. In other words, explain ability entails offering clear rationales for decision making power by an AI. For example, if an AI system assigns a student a poor grade of 'at risk' or puts a student in a particular learning stream, the users, whether students, parents, and teachers, should be able to understand how and why the AI system arrived at such decisions. This paper asserts that explain ability must occur so that stakeholders can ask for reasons, demand change, and demand further understanding of decisions made by AI systems. It also helps institutions do an outlook of the system and correct any errors or bias that might be there. For example, if a grading AI gives certain grades that are not normal, educators should be able to know why this AI has graded like that, so that they can counter check the algorithms, with a view of correcting the wrong results generated by those algorithms. secondly, explain ability enhances accountability through traceability to make sure that the AI system is not only serving its educational purpose but is also not causing harm where it is not wanted. Interpretable machine learning models that provide information on feature inputs that affect outputs, and AI tools developed for educators and administrators can reduce opacity of AI systems in learning environments.

4.2 Ethical AI Governance in Education

In order to maintain basic ethical values of AI in educational processes, institutions should establish the governance structures that would regulate AI designing and using. Ethical AI management can include defining rules and frameworks within which the AI system will operate, this can also involve measures that have to be taken in order to ensure that all forms of AI applications run in accordance with standard norms of ethical practices as well as in compliance

with legal requirements. There are various aspects to efficient governance structure; these are; engagement of stakeholders, legal requirements/regs and Audit. Another important aspect of governance is to establish committees or ethics squads for analysing the applications of artificial intelligence in educational organisations. These boards can weigh probability of risk, check algorithm for bias and consult on the most appropriate use of it.

5. Ethical Guidelines and Recommendations

For AI in education to meet the ethical benchmark, institution and technology provider ought to adhere to the following seven principles of ethical guidelines. These guidelines should include protection of confidentiality, non-discriminatory language and authorising responsibility for work produced. Below are key recommendations to help guide the responsible use of AI in educational environments:

- **Implement Strong Privacy Protections and Transparent Consent Processes:** Institutions' educational data must minimize data collection to retain privacy, encrypt data and adhere to privacy acts. The consent procedures must be clear to indicate to the students and the guardians, the data that is being collected, why it is being collected, and how it is going to be utilized. This is by ensuring they make it easier to opt out of sharing the data and respecting the rights of students and parents to choose exactly what data will be shared.
- **Develop Bias-Detection Protocols and Regularly Audit AI Algorithms for Equity:** Schools should periodically analyze their AI driven algorithms for bias that may prejudice one particular group of students over the others. Facial recognition technologies along with bias-detection protocols such as fairness metrics and representative training datasets can help mitigate discriminative outcomes. They should be fully disclosed; results and recommendations ought to be publicly disclosed to prevent the building of a culture of mistrust regarding the functional efficacy of AI systems as well as maintaining this equitable recognition.

6. Conclusion

Future of artificial intelligence in education is quite promising and has to do with personalized learning, using data analysis to anticipate student needs, use of intelligent administrative systems and intelligent approaches to test, assessment, and evaluation. Nevertheless, these advantages cannot be obtained without a number of ethical imperative obligations. To guarantee that the AI applications function for the public benefit of promoting equality, inclusion, and transparency in education, privacy risks, biases and accountability need to be found and mitigated. As this paper shows, there is a significant lack of discussion as to what exactly is ethical within the setting of AI in education, how practices should be conducted, and what principles should underpin AI governance. By affording priority to privacy protections, also sensing and accountability, educational institutions can harness the AI to facilitate students a fair

and ethical learning environment and opportunities. Overall, it is crucial to remember that with the proper levels of monitoring and compliance with proper ethical requirements, AI can become an instrument in the formation of better education for every learner.

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**A STUDY OF AWARENESS OF "AI IN TEACHER TRAINING:
REVOLUTIONIZING PEDAGOGY FOR FUTURE EDUCATION"**

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Abstract:

The digital age has significantly transformed literature consumption, redefining access, engagement, and perception of literary works. It has enriched and challenged our traditional understanding of literature, changing our daily interactions with the internet and cutting-edge technologies.

This study explores the use of Artificial Intelligence (AI) in teacher training programs, focusing on its impact on pedagogical skills, classroom management, and adaptive learning techniques. It evaluates the effectiveness of AI-driven tools in improving teaching competency and engagement.

Introduction:

Future teachers must critically evaluate AI technology, practice, and reflect on its quality. They should apply course knowledge to evaluate AI responses, with faculty guiding for accuracy and appropriateness. The faculty must ensure pedagogically sound activities.

Instructors should provide a comprehensive orientation on AI-generated content, establish clear criteria for activities, and provide a framework for evaluation. The faculty should also regularly review AI outputs to align with course objectives and instructional strategies, ensuring that candidates acquire the necessary expertise.

AI can significantly improve a teacher's job by providing personalized learning experiences, enhancing productivity and efficiency, and allowing teachers to focus on teaching and student interaction. AI-driven analytics provide valuable insights into student performance and trends, enabling teachers to instantly adapt learning materials. Additionally, AI tools can automate or streamline tasks, allowing teachers to spend more time with their students. Furthermore, AI-powered platforms allow teachers to curate educational resources, such as lessons, activities, assessments, and presentations, with generative AI enabling quick content creation.

Literature review:

AI in teacher education is gaining attention, with teacher educators facing similar challenges as K -12 teachers. College faculty should connect with teacher candidates' experiences and future classrooms. Schools must ensure foundational understanding of AI, effective instruction, and AI literacy. However, preservice programs, particularly in elementary, have not adequately integrated AI concepts.

A study on AI in teacher education found that AI significantly impacts problem-solving and helps create specialized lesson plans and assessments. It saves time, improves learning plans, provides essential support, and adjusts lesson time to accommodate learners' needs, enabling personalized lessons tailored to individual student needs. Jamal (2023) highlights AI's potential to enhance teacher education by providing tailored resources, knowledge gaps identification, and feedback, thereby enhancing teachers' teaching skills and enhancing their overall learning experience.

A study reveals that a three-stage professionalism improvement program, including AI literacy education, AI-linked subject education, and micro-teaching for preservice teachers, significantly improves AI awareness. To enhance teachers' readiness to incorporate AI knowledge into their curriculum, preparation programs should ensure they are aware of learning standards, curriculum guidelines, and resources. Teachers must understand their roles are not changing, and their intuition is crucial for adjusting curricula. AI lacks the creativity, experience, and critical perspective of teachers. Integrating AI in education has opened new avenues for teacher training, offering **personalized learning experiences, automated feedback, and data-driven instruction.**

- **Research Problem:** Traditional teacher training methods often lack adaptability and fail to address **individualized learning needs**. AI-driven approaches offer **innovative solutions** to bridge this gap.

- **Objectives:**

- 1) To analyze the awareness of the impact of AI on teacher training.
- 2) To suggest the use of AI for the Lesson Plan Personalised Learning Experiences.
- 3) To evaluate the awareness of the student teachers' use of AI.

- **Research Questions:**

1. How does AI enhance the training and development of student teachers?
2. What AI tools are most effective in improving pedagogical skills?
3. What are the challenges in integrating AI into teacher training programs?

Methodology –

In the Present research, the Experimental Method was used. Research Design: Pre-test and post-test experimental single groups: Uses AI-driven teaching tools (e.g., ChatGPT, AI lesson planners, automated grading systems).

Personalised learning:

AI-driven analytics enable educators to provide personalized learning experiences by analyzing student performance and trends, enabling instant adaptation of learning materials to each student's strengths, weaknesses, and learning pace.

Productivity and efficiency: AI can enhance productivity and efficiency for educators by automating or streamlining clerical tasks such as communicating with students, grading assessments, and providing feedback. This enables teachers to concentrate on instruction and engage directly with students, allowing them to spend more quality time together.

Content Creator: AI-powered platforms enable teachers to curate educational resources, particularly generative AI, by creating lessons, activities, assessments, discussion prompts, and presentations with short keywords.

The study involves a pre-test and post-test experimental study with student teachers using AI-driven teaching tools. The pre-test assesses initial teaching skills and technology familiarity, while the intervention uses AI for lesson planning, student engagement, assessment automation, and classroom simulations. Post-test measures improvements in teaching effectiveness and adaptability.

1. Lesson Planning tool:

LessonUp- helps students design digital lessons with quizzes, videos, and Discussion prompts

Curipod- Helps to create Interactive lessons and presentations.

MagicSchool – provides AI-generated lesson plans and discussion questions to different subjects,

ChatGPT& Bard - help students generate lesson outlines, activities, and content ideas.

2. Interactive content creation:

- Canva for Education: This tool creates visually appealing lesson slides, worksheets, and infographics.
- Interactive questions are integrated into videos for enhanced learning.
- Creates interactive, student-centered lessons with quizzes, polls, and simulations.

3. Assessment & Feedback Tools Overview

- Formative: Real-time, AI-generated feedback.
- Quizz& Kahoot: Gamifies learning with quizzes and interactive assessments.
- Socrative: Facilitates instant polling, quizzes, and formative feedback.

Analysis:

LessonUp, a digital lesson creation tool, was chosen by only 9.1% of students, indicating a need for clearer communication and reinforcement. Curipod's function was unclear, with 91% believing it generates lesson plans or infographics. ChatGPT was the main tool for AI-generated lesson plans, but MagicSchool is specifically designed for this function. Students had a strong understanding of Canva's role in visual content creation, with 81.8% correct answers. Some students identified other real-time tools, but not the exact answer expected. Quiz and Kahoot had a strong understanding, with 72.7% correct answers.

Challenges:

Students face challenges in distinguishing between AI tools with overlapping functionalities, generalizing tools for multiple tasks, and exposing them to specific features. Some misinterpret tools as performing broader functions, defaulting to well-known tools instead of exploring specialized platforms. AI literacy is limited to widely used tools, leading to gaps in understanding newer, education-specific AI applications. Students also struggle to distinguish between assessment tools and feedback tools.

Conclusion:

AI tools improve teaching competency by enhancing lesson planning, assessment efficiency, and student engagement, while personalized learning is achieved through AI-driven analytics. The rapid evolution of AI capabilities necessitates a shift in teacher education. Students and faculty are eager to explore AI's potential in teaching and learning. Educators should explore AI with students in teacher preparation courses, engaging in both AI-based and non-AI activities and preparing AI-literate teachers.

AI is transforming teacher training, but a balanced approach is needed to support and adapt to a technology-driven classroom environment.

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**DIGITAL TECHNOLOGY AND WELLBEING FOR TEACHERS’
PROFESSIONAL DEVELOPMENT**

Rejina K. C.

Abstract

Due to the rapidly evolving educational landscape, digital technology has become an integral part of the teaching and learning process which also leads to teachers’ professional development. Basically, the post COVID era has pressured teachers to be connected with various sources of digital tools which has definitely brought both opportunities and challenges related to teacher wellbeing. Excessive use of technology for bringing innovative teaching strategies can pose challenges like digital fatigue, busy work-life from home and office, high expectations in the performance can impact on teachers’ personal and professional wellbeing (Passey, 2021). This session opens up the relational significance between digital technology and teacher wellbeing that intersects the impact of these factors on teachers’ professional development. For this, I will also share the experience of three teacher participants as a source of evidence which posits how they experienced their digital journey after COVID. The most importantly the session highlights both merits and demerits of using digital technology in teachers’ professional development is based on three key points such as;

1. Digital Technology and Wellbeing
2. Enhancing Teachers’ Professional Development through Digital Platform
3. Collaborative Digital Culture for maintaining wellbeing

At the end of this session, participants will comprehend the practical usage of technology ensuring an effective teaching and learning process. While prioritizing teachers’ wellbeing, that leads to a sustainable and fulfilling professional career.

Keywords: Digital tools, teacher wellbeing, effective teaching, professional development,

**EXPLORING STUDENTTEACHERS' AWARENESS OF THE INDIAN
KNOWLEDGE SYSTEM IN CONFLICT RESOLUTION AND PEACE BUILDING:
BRIDING TRADITIONS AND HARMONY**

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Abstract:

The Indian knowledge system, rooted in Hinduism, Buddhism, and Jainism, promotes nonviolence, tolerance, compassion, and dialogue in conflict resolution and peace building. Mahatma Gandhi and Emperor Ashoka exemplified this. The Indian knowledge system is a foundation for peacebuilding, focusing on nonviolence, ethical conduct, truth force, dialogue, and community cohesion. Ahimsa, a fundamental approach to conflict resolution, advocates for peaceful means to address grievances. Dharma, a morally responsible concept, encourages ethical behaviour and moral accountability. Satyagraha, a non-violent resistance based on truth and justice, was popularized by Gandhi. Open communication and mediation are also crucial in facilitating peaceful resolution. The concept of "Vasudhaiva Kutumbakam" promotes interconnectedness and shared responsibility, encouraging cooperation and understanding across communities. The Indian knowledge system is applied in community-based initiatives, yoga, meditation, and educational curriculums to promote peace and tolerance. However, challenges arise in effectively applying these principles to complex conflicts, especially when dealing with deep-rooted social and political issues. Contextualization is crucial to ensure their relevance and effectiveness in addressing diverse conflicts.

India's role as a proactive mediator in global conflict resolution has evolved, with a focus on fostering closer international relationships and mediation in regional conflicts. India's 5-S approach, which represents its independent foreign policy, positions it uniquely to mediate peace. It has also actively pursued conflict resolution under its G20 presidency, highlighting the devastating war outcomes. India's ancient philosophy of Vasudhaiva Kutumbakam and rich history of peace make it a unique mediator and conciliator in world affairs. Its experience in addressing both internal and regional conflicts positions it as a potential peacemaker.

India's role as a mediator in global conflict resolution faces obstacles such as historical alignments, regional rivalries, economic priorities, limited global influence, and domestic challenges. These factors restrict perceived neutrality, complicate potential mediation, and hinder India's ability to present itself as a model of peace.

Importance of Indian Knowledge System (IKS) and Conflict Resolution

The NEP 2020 acknowledges the ancient Indian knowledge systems, including Jnan, Vignan,

and Jeevan Darshan, which have influenced various aspects of life, including education, arts, administration, law, justice, health, manufacturing, and commerce. This "Knowledge of India" encompasses ancient India's successes and challenges.

The policy encourages learners to learn about India's diverse culture and traditions through activities like tours. Under 'Ek Bharat Shrestha Bharat', educational institutions will identify 100 tourist destinations and send students to study their history, scientific contributions, traditions, and indigenous literature to enhance their knowledge.

India's cultural heritage promotes peace, harmony, and nonviolence. Influenced by Mahatma Gandhi and Buddha's teachings, India has played a significant role in peace talks and conflict resolution. This paper analyses Indian perspectives on peace and conflict resolution.

Buddha, also known as Siddhartha Gautama, founded Buddhism and believed in nonviolence and peace. His teachings reflect these values, emphasizing the importance of compassionate action over empty rhetoric. True peace can only be achieved through compassionate action, and actions rooted in compassion can make a real difference. Buddhism promotes peace through the integration of diversity and ideals of compassion. India has a long tradition of supporting a world order based on these principles, viewing peace as an essential aspect of life and society.

India's rich cultural heritage promotes peace, harmony, and coexistence, with ancient scriptures emphasizing nonviolence. The Ashoka Chakra, a symbol of peace inspired by Emperor Ashoka, is prominently featured on the Indian national flag, symbolizing nonviolence and universal brotherhood.

Gandhi emphasized the importance of non-violence for achieving peace, arguing that other methods are incompatible with human nature. He stressed the gift of the almighty and the need for peaceful conflict resolution. Gandhi emphasized personal responsibility and morality in promoting peace and nonviolence.

Objectives:

- To assess student teachers' awareness of IKS in conflict resolution.
- To explore the influence of traditional Indian philosophies on conflict resolution.
- To examine IKS principles' applicability in modern educational settings.
- To evaluate teachers' perceptions of IKS-based conflict resolution techniques.
- To Suggest pedagogical approaches for IKS principles in teacher education programs

Research Methodology

In the Present study, the researcher used a mixed method to identify the present status of students' awareness of the Indian Knowledge System (IKS) and, with the help of IKS, how we can obtain conflict resolution techniques and a peace building approach.

This Program on 'Indian Perspectives on Peace and Conflict' enables the learners to understand the numerous facets of peace and conflict.

The Research Design for this Single Group Pre-test and Post-test Experimental Design.

Population: All the student teachers enrolled in Programs.

Sample: Incidental student teachers from the S.N.D.T. College of Education, Pune

Data Collection tool: structured questionnaire (MCQ questions).

Data Analysis: Percentage analysis

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Indian Perspectives on Peace-Building

Ahimsa (Non-Violence)

- Central principle of Indian philosophy used for peacebuilding.

- Based on belief in nonviolence as the most powerful way to achieve peace.
- Used by Mahatma Gandhi to achieve Indian independence and inspire social justice movements.

Sarvodaya (Welfare of All)

- Prioritizes community needs over individual well-being.
- Promotes interdependence of individual and societal well-being.

Swaraj (Self-Rule)

- Emphasizes individual empowerment and autonomy.
- Recognizes true peace and justice through individual freedom.

Shanti (Peace)

- Emphasizes inner peace as a means of achieving outer peace.
- Recognizes peace must be pursued on multiple levels.

Satyagraha (Truth-Force)

- A non-violent resistance method developed by Mahatma Gandhi.

Indian Perspectives on Peace and Conflict Resolution

- Metta (Loving-Kindness): Emphasizes cultivating loving-kindness and compassion towards all living beings.
- Anatta (Non-Self): Recognizes the impermanence and interdependence of all things.
- Karuna (Compassion): Cultivates compassion towards all living beings.
- Both approaches emphasize nonviolence, empathy, compassion, and collective action for peace and justice.

Big powers' actions can significantly contribute to global instability and violence, with military interventions, local group arming, economic interests, and support for authoritarian regimes being the main causes. These countries must recognize their role and take steps to promote peace and stability, such as supporting democratic processes and economic development and respecting other nations' sovereignty. The United Nations (UN) plays a crucial role in international peace building but has been criticized for its ineffectiveness.

Analysis:

The following is an analysis of each question based on the response distribution.

The responses provide insightful data on the participants' understanding of Indian philosophical traditions, conflict resolution, and peacebuilding. Indian philosophical traditions primarily emphasize non-violence (Ahimsa) in conflict resolution. 60% of students gave the correct response. Jainism is widely recognized for its strict adherence to non-violence (Ahimsa), which aligns with the majority response. The 40% who chose Vedanta might have associated it with broader philosophical discussions on peace, though it does not emphasize Ahimsa as strongly

as Jainism.

The overwhelming majority correctly identified "non-violent truth-force" as the core principle of Gandhi's Satyagraha. The 10% who chose "Passive resistance" may have confused it with Satyagraha, though Gandhi's concept is more proactive and transformative.

The majority correctly associated the Panchsheel Principles with Jawaharlal Nehru(60%). Some responses for Tagore (20%) and Ambedkar (10%) suggest confusion regarding their contributions to diplomacy and peacebuilding.

The Bhagavad Gita promotes duty (Dharma) and detached action (60%) as a means to resolve conflicts, making the majority response accurate. However, 20% chose "renunciation of all actions," possibly due to a misunderstanding of renunciation (Sannyasa) in the Gita's context. Most respondents correctly identified Dharma as ethical guidance. The 10% who chose "rigid caste system" may have been influenced by later misinterpretations of Dharma.

The Gurukul system was based on holistic education, including moral and ethical training (80%). The 10% who chose Colonial Education likely misunderstood its primary focus on Western curricula. The Upanishads focus on self-realization and spiritual enlightenment, making the majority (70%) response correct. The 20% who selected "ritualistic practices" might have confused them with the Vedas. The majority correctly identified that both epics provide teachings on Dharma and conflict resolution (77.85%). Some may have assumed only one of the two epics due to a partial understanding. Four Noble paths and Eight-Fold Path the majority correctly identified Buddhism (80%). The 20% who selected Hinduism may have been confused by shared philosophical elements.

Conclusion:

The study reveals a strong understanding of Indian Knowledge Systems (IKS) in non-violence, Dharma, and conflict resolution. Participants identified key concepts like Ahimsa in Jainism, Satyagraha as non-violent truth-force, and the Bhagavad Gita's role in promoting righteous action. They also recognized the Gurukul system's emphasis on moral education and the Upanishads' focus on self-awareness. However, some confusion was observed regarding the Panchsheel Principles, Dharma's relation to caste, and the Upanishads' focus. Strengthening conceptual understanding through comparative analysis could improve knowledge retention and application in real-world contexts.

The world's peace and conflicts depend on various factors, agencies, and institutions. International organizations can contribute, but interference from big powers is a significant challenge. Peace-building is a complex process requiring cooperation from governments, international organizations, and civil society. India's approach, based on nonviolence, collaboration, and mutual respect, has made a significant difference in peace efforts worldwide.

India should also actively participate in peacekeeping missions and address the root causes of conflict.

The United Nations faces challenges in maintaining peace due to limited resources, differing interests among member states, and a limited mandate. A comprehensive, coordinated, and all-inclusive approach addresses conflict's root causes and promotes lasting peace and stability.

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THE ROLE OF INDIGENOUS KNOWLEDGE SYSTEMS (IKS) IN CONFLICT RESOLUTION AND PEACE BUILDING: A STUDY BASED ON THE BHAGAVAD GITA

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1. Introduction

Conflict has been an inherent part of human societies, and its resolution requires strategic wisdom, ethical considerations, and cultural sensitivity. Indigenous Knowledge Systems (IKS), particularly those rooted in ancient scriptures like the Bhagavad Gita, offer profound insights into conflict resolution and peace building. This paper seeks to explore how the Bhagavad Gita provides a framework for addressing conflicts at individual, societal, and global levels.

2. **Indigenous Knowledge Systems and Their Role in Conflict Resolution** IKS refers to traditional wisdom, customs, and problem-solving approaches passed down through generations. These systems are often embedded in cultural, religious, and philosophical traditions, offering holistic solutions to conflicts. In many indigenous communities, conflict resolution involves mediation, ethical negotiations, and moral responsibilities rather than purely legal mechanisms. The Bhagavad Gita, as a foundational text of Hindu philosophy, embodies such indigenous wisdom.

3. **The Bhagavad Gita: A Source of Indigenous Knowledge for Conflict Resolution** The Bhagavad Gita, composed over 2,500 years ago, is a dialogue between Lord Krishna and Arjuna on the battlefield of Kurukshetra. This sacred text addresses dilemmas of duty, righteousness, and moral decision-making in times of conflict. The following aspects highlight its relevance to modern conflict resolution:

- **Dharma (Righteous Duty):** The Gita emphasizes adhering to one's duty without selfish motives. This principle can guide leaders and mediators in ethical conflict resolution.
- **Detachment from Ego and Outcomes:** Krishna advises Arjuna to act without attachment to personal gains, a concept that aligns with impartial mediation and justice.
- **Self-Discipline and Inner Peace:** The text teaches that self-mastery and inner balance are crucial for effective leadership and conflict management.
- **Non-Violence and Strategic Action:** While advocating righteous action, the Gita also emphasizes non-aggression and thoughtful decision-making, reflecting principles of sustainable peace building.

4. Case Studies and Practical Applications

This section explores historical and contemporary cases where the teachings of the

Bhagavad Gita have influenced conflict resolution:

- **Mahatma Gandhi's Non-Violence Movement:** Gandhi drew inspiration from the Gita to lead India's independence struggle through non-violent resistance.
- **Corporate and Organizational Conflicts:** The principles of detached leadership and ethical decision-making from the Gita are applied in business management and dispute resolution.
- **Community Dispute Mediation:** Traditional village councils in India use similar ethical frameworks inspired by the Gita to resolve disputes peacefully.

5. Challenges and Limitations of Applying IKS in Modern Conflict Resolution

While the Bhagavad Gita provides valuable insights, its application in modern conflict resolution faces challenges such as:

- **Interpretation Differences:** Various philosophical schools interpret the Gita's teachings differently, which may lead to varied applications.
- **Contextual Adaptation:** Modern legal and political frameworks may not always align with indigenous approaches.
- **Global Acceptance:** While effective in culturally connected societies, indigenous methods may face resistance in globalized conflict mediation settings.

6. Conclusion and Recommendations

The Bhagavad Gita, as part of Indigenous Knowledge Systems, offers profound lessons in ethical leadership, conflict resolution, and peacebuilding. Integrating these teachings with modern conflict management strategies can enhance sustainable peace efforts. Future research should focus on bridging traditional wisdom with contemporary legal and diplomatic frameworks.

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राष्ट्रीय शिक्षा नीति (NEP) 2020 के तहत ग्रामीण शिक्षा में चुनौतियाँ और समाधान

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साहय्यक प्राध्यापक

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अक्कलकुवा

राष्ट्रीय शिक्षा नीति (NEP) 2020 - एक परिचय

प्रस्तावना (Introduction)

शिक्षा किसी भी देश की प्रगति का आधार होती है, और भारत में ग्रामीण शिक्षा को सशक्त बनाना सतत विकास के लिए आवश्यक है। NEP 2020 ने प्रारंभिक बाल्यावस्था शिक्षा से लेकर उच्च शिक्षा तक महत्वपूर्ण सुधारों का प्रस्ताव रखा है। हालांकि, ग्रामीण क्षेत्रों में इसकी प्रभावी कार्यान्वयन के लिए कई बाधाएँ बनी हुई हैं। यह पेपर इन चुनौतियों की गहन समीक्षा करता है और उनके समाधान के लिए सुझाव प्रस्तुत करता है। राष्ट्रीय शिक्षा नीति (NEP) 2020 भारत की शिक्षा प्रणाली में व्यापक सुधार लाने के उद्देश्य से बनाई गई नीति है। इसे 29 जुलाई 2020 को भारत सरकार द्वारा मंजूरी दी गई थी। यह नीति 1986 की राष्ट्रीय शिक्षा नीतिको बदलकर लाई गई है और 34 वर्षों के बाद शिक्षा में बड़े बदलाव की दिशा में एक महत्वपूर्ण कदम है। राष्ट्रीय शिक्षा नीति (NEP) 2020 भारत में शिक्षा प्रणाली में व्यापक सुधार लाने के उद्देश्य से बनाई गई है। हालांकि, इसे लागू करने में विशेष रूप से ग्रामीण शिक्षा क्षेत्र में कई चुनौतियाँ सामने आ सकती हैं। कुछ प्रमुख चुनौतियाँ निम्नलिखित हैं:

राष्ट्रीय शिक्षा नीति 2020 के प्रमुख उद्देश्य:

1. गुणवत्तापूर्ण और समावेशी शिक्षाप्रदान करना।
2. स्कूली शिक्षा से लेकर उच्च शिक्षातक सुधार लाना।
3. मल्टी-डिसिप्लिनरी दृष्टिकोणको बढ़ावा देना।
4. डिजिटल और तकनीकी शिक्षाको प्रोत्साहित करना।
5. शिक्षा प्रणाली को अधिक व्यावहारिक और कौशल-आधारित बनाना।

NEP 2020 के प्रमुख प्रावधान:

1. स्कूली शिक्षा में बदलावनई5+3+3+4 संरचना:

पारंपरिक 10+2 प्रणाली को बदलकर इसे 5+3+3+4 में विभाजित किया गया है 5 साल:नींव स्तर (3-8 वर्ष) - आंगनवाड़ी और कक्षा 1-2, 3 साल:प्रारंभिक स्तर (8-11 वर्ष) - कक्षा 3-5, 3 साल:मध्य स्तर (11-14 वर्ष) - कक्षा 6-, 4 साल:माध्यमिक स्तर (14-18 वर्ष) - कक्षा 9-12 ,मातृभाषा में शिक्षा:कक्षा 5 तक (या संभव हो तो कक्षा 8 तक) शिक्षा मातृभाषा या क्षेत्रीय भाषा में देने की सिफारिश।,व्यावसायिक शिक्षा:कक्षा 6 से ही व्यावसायिक शिक्षा और इंटरनशिप की शुरुआत।,कोडिंग शिक्षा:कक्षा 6 से कोडिंग सिखाने का प्रावधान।,बोर्ड परीक्षाओं में सुधार:बोर्ड परीक्षाओं को अधिक व्यावहारिक और विश्लेषणात्मक बनाया जाएगा।

2. ग्रामीण शिक्षा की वर्तमान स्थिति

ग्रामीण भारत में शिक्षा की स्थिति को निम्नलिखित बिंदुओं के माध्यम से समझा जा सकता है:

- भारत में लगभग 65% जनसंख्या ग्रामीण क्षेत्रों में निवास करती है।
- सरकारी रिपोर्टों के अनुसार, ग्रामीण विद्यालयों में शिक्षकों और बुनियादी सुविधाओं की भारी कमी है।
- ग्रामीण क्षेत्रों में डिजिटल संसाधनों की सीमित उपलब्धता के कारण ऑनलाइन शिक्षा को अपनाना कठिन है।
- बालिकाओं की शिक्षा में सामाजिक और आर्थिक बाधाएँ अब भी बनी हुई हैं।

ग्रामीण शिक्षा में चुनौतियाँ

ग्रामीण भारत में शिक्षा की स्थिति में सुधार के लिए कई प्रयास किए जा रहे हैं, लेकिन अभी भी कई चुनौतियाँ बनी हुई हैं। राष्ट्रीय शिक्षा नीति (NEP) 2020 के लागू होने के बावजूद, ग्रामीण क्षेत्रों में शिक्षा प्रणाली को मजबूत करने के लिए कई समस्याओं का समाधान करना जरूरी है।

1. आधारभूत ढांचे की कमी

- * कई ग्रामीण स्कूलों में पर्याप्त भवन, शौचालय, पीने का पानी, लाइब्रेरी और प्रयोगशालाएँ नहीं हैं।
- * कई स्थानों पर स्कूल बहुत दूर होते हैं, जिससे छोटे बच्चों के लिए स्कूल जाना मुश्किल हो जाता है।
- * बिजली और इंटरनेटकी उपलब्धता का अभाव डिजिटल शिक्षा को प्रभावित करता है। ग्रामीण क्षेत्रों में कई स्कूलों में पर्याप्त कक्षाएं, शौचालय, पुस्तकालय और प्रयोगशालाएं नहीं हैं।
- * डिजिटल शिक्षा को बढ़ावा देने के लिए आवश्यक इंटरनेट और बिजली की कमी।

2. शिक्षकों की कमी और प्रशिक्षण

- योग्य और प्रशिक्षित शिक्षकों की संख्या सीमित है।
- डिजिटल शिक्षा को अपनाने के लिए शिक्षकों को तकनीकी प्रशिक्षण देने की जरूरत है।

3. डिजिटल शिक्षा और इंटरनेट कनेक्टिविटी

- ऑनलाइन शिक्षा के लिए जरूरी स्मार्टफोन, टैबलेट और कंप्यूटर की उपलब्धता ग्रामीण क्षेत्रों में कम है।
- तेज़ और सुलभ इंटरनेट कनेक्शन की कमी से डिजिटल लर्निंग बाधित होती है।

4. भाषा की बाधा

- ग्रामीण क्षेत्रों में प्राथमिक शिक्षा मातृभाषा में देने की सिफारिश की गई है, लेकिन उच्च शिक्षा के लिए हिंदी और अंग्रेजी का ज्ञान आवश्यक होता है, जिससे ग्रामीण छात्रों को कठिनाई होती है।

5. सामाजिक और आर्थिक बाधाएँ

- कई ग्रामीण परिवार आर्थिक रूप से कमजोर हैं, जिससे बच्चों की पढ़ाई के बजाय उन्हें काम करने के लिए मजबूर होना पड़ता है।
- बाल विवाह और लैंगिक असमानता जैसी समस्याएं लड़कियों की शिक्षा में बाधा डालती हैं।

6. पारंपरिक सोच और जागरूकता की कमी

- कुछ ग्रामीण समुदायों में शिक्षा को लेकर जागरूकता की कमी है, जिससे नई शिक्षा नीति का सही

से क्रियान्वयन कठिन हो सकता है।

- स्थानीय समुदायों को नई नीति के लाभों के बारे में जागरूक करना आवश्यक है।
- 7. **व्यावसायिक शिक्षा और कौशल विकास**
 - नीति के तहत व्यावसायिक शिक्षा को बढ़ावा दिया गया है, लेकिन ग्रामीण क्षेत्रों में इसके लिए प्रशिक्षकों और संसाधनों की कमी है।
- 8. **नीति का सही क्रियान्वयन और निगरानी**
 - सरकार द्वारा घोषित नीतियों और योजनाओं का सही तरीके से क्रियान्वयन करना एक चुनौती है।
 - निगरानी के लिए संसाधनों और पारदर्शिता की आवश्यकता है।
- 9 **लड़कियों की शिक्षा में बाधाएँ**

ग्रामीण क्षेत्रों में कई स्थानों पर लड़कियों की शिक्षाको प्राथमिकता नहीं दी जाती।

बाल विवाह, घरेलू कामों की जिम्मेदारी और सामाजिक व सांस्कृतिक मान्यताएँ लड़कियों की पढ़ाई में बाधा डालती हैं।

सुरक्षित स्कूलों, अलग शौचालय और परिवहन की कमी भी लड़कियों की शिक्षा पर असर डालती है।

संभावित समाधान

- सरकारी और गैर-सरकारी संगठनों (NGOs) की भागीदारी बढ़ाकर शिक्षा के बुनियादी ढांचे में सुधार किया जा सकता है।
- डिजिटल संसाधनों और इंटरनेट कनेक्शनको ग्रामीण क्षेत्रों तक पहुँचाने के लिए विशेष योजनाएँ लागू की जानी चाहिए।
- स्थानीय भाषा में पाठ्यक्रम और शिक्षण सामग्री विकसित कर ग्रामीण छात्रों को बेहतर शिक्षा दी जा सकती है।
- शिक्षकों का नियमित प्रशिक्षण और उनकी संख्या बढ़ाने पर ध्यान देना आवश्यक है।
- आर्थिक सहायता योजनाएँ लागू कर कमजोर वर्गों के बच्चों को शिक्षा से जोड़ा जा सकता है।

सिफारिशें

- 1 **बुनियादी ढांचे का विकास**
 - विद्यालयों में आधारभूत सुविधाओं का विस्तार, जैसे कि स्मार्ट क्लासरूम, पुस्तकालय और स्वच्छता सुविधाएँ।
 - ग्रामीण विद्यालयों में बिजली और इंटरनेट की सुविधा सुनिश्चित करना।
- 2 **शिक्षकों की गुणवत्ता में सुधार**
 - शिक्षकों के लिए नियमित प्रशिक्षण कार्यक्रम आयोजित करना।
 - ग्रामीण क्षेत्रों में शिक्षकों को आकर्षित करने के लिए प्रोत्साहन योजनाएँ लागू करना।
- 3 **डिजिटल संसाधनों की उपलब्धता**
 - प्रत्येक स्कूल को डिजिटल लर्निंग सामग्री से लैस करना।
 - सरकारी और निजी भागीदारी से ग्रामीण क्षेत्रों में इंटरनेट कनेक्टिविटी को मजबूत करना।

4 बालिका शिक्षा को बढ़ावा देना

- लड़कियों के लिए विशेष छात्रवृत्ति और निःशुल्क शिक्षा योजनाएँ लागू करना।
- विद्यालयों में सुरक्षित और अनुकूल वातावरण तैयार करना।

5 मातृभाषा में शिक्षा को सुगम बनाना

- शिक्षकों को मातृभाषा में शिक्षण के लिए प्रशिक्षित करना।
- स्थानीय भाषाओं में पाठ्यपुस्तकों और डिजिटल संसाधनों की उपलब्धता सुनिश्चित करना।

6 सामाजिक और आर्थिक बाधाओं को दूर करना

- माता-पिता को शिक्षा के महत्व के प्रति जागरूक करने के लिए अभियान चलाना।
- कमजोर वर्गों के बच्चों को आर्थिक सहायता प्रदान करना।

7 व्यावसायिक शिक्षा को सशक्त बनाना

- ग्रामीण विद्यालयों में व्यावसायिक शिक्षा को बढ़ावा देने के लिए विशेष पाठ्यक्रम तैयार करना।
- स्थानीय उद्योगों और व्यवसायों के साथ साझेदारी स्थापित करना।

निष्कर्ष

- 1 NEP 2020 ग्रामीण शिक्षा में बदलाव लाने की दिशा में एक महत्वपूर्ण कदम है। हालाँकि, इसे प्रभावी ढंग से लागू करने के लिए सरकार, शिक्षाविदों, समुदायों और निजी क्षेत्र के संयुक्त प्रयासों की आवश्यकता है।
- 2 यदि बुनियादी ढांचे, शिक्षकों की गुणवत्ता, डिजिटल संसाधनों और बालिका शिक्षा पर ध्यान दिया जाए, तो ग्रामीण भारत की शिक्षा प्रणाली को सशक्त बनाया जा सकता है। इस संशोधन पत्र में वर्णित समाधान भारत के ग्रामीण शिक्षा तंत्र को मजबूत करने में सहायक हो सकते हैं।
- 3 ग्रामीण शिक्षा में कई चुनौतियाँ हैं, लेकिन सही योजनाओं और प्रयासों से इन्हें दूर किया जा सकता है।
- 4 सरकार, समाज और गैर-सरकारी संगठनों को मिलकर काम करना होगा ताकि ग्रामीण बच्चों को भीगुणवत्तापूर्ण और समावेशी शिक्षामिल सके।
- 5 NEP 2020 का प्रभावी क्रियान्वयन इन समस्याओं का समाधान करने में मदद कर सकता है, जिससे ग्रामीण भारत भी शिक्षा और विकास की मुख्यधारा में शामिल हो सकेगा।
- 6 राष्ट्रीय शिक्षा नीति 2020 भारत की शिक्षा प्रणाली में क्रांतिकारी बदलाव लाने की दिशा में एक बड़ा कदम है। यह नीति छात्रों को समावेशी, लचीली, रोजगारोन्मुख और गुणवत्तापूर्ण शिक्षा प्रदान करने पर केंद्रित है।
- 7 हालाँकि, इसके प्रभावी कार्यान्वयन के लिए सरकार, शिक्षकों, छात्रों और समाज को मिलकर काम करने की आवश्यकता होगी।
- 8 राष्ट्रीय शिक्षा नीति 2020 को सफलतापूर्वक लागू करने के लिए सरकार, शिक्षण संस्थानों और समाज को मिलकर काम करने की आवश्यकता है ताकि ग्रामीण भारत के बच्चों को गुणवत्तापूर्ण शिक्षा मिल सके।

सारांश (Abstract)

राष्ट्रीय शिक्षा नीति (NEP) 2020 भारतीय शिक्षा प्रणाली में व्यापक सुधारों का खाका प्रस्तुत करती है। यह नीति समावेशी, न्यायसंगत और गुणवत्तापूर्ण शिक्षा प्रदान करने पर बल देती है। हालांकि, ग्रामीण क्षेत्रों में इसे लागू करने में कई चुनौतियाँ हैं, जैसे कि बुनियादी ढांचे की कमी, शिक्षकों की अनुपलब्धता, डिजिटल डिवाइड, बालिका शिक्षा में बाधाएँ और सामाजिक-आर्थिक समस्याएँ। यह संशोधन पेपर इन चुनौतियों का विश्लेषण करता है और उनके समाधान के लिए संभावित उपायों की सिफारिश करता है।

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राष्ट्रीय शिक्षा नीति 2020 कार्यान्वयन : एक अध्ययन

प्रा. जमीला बी वळवी

साहय्यक प्राध्यापक

आर.एफ.एन.एस.शिक्षणशास्त्रा

महिला महाविद्यालय अक्कलकुवा

प्रस्तावना :

राष्ट्रीय शिक्षा नीति 2020 (NEP 2020) को 29 जुलाई 2020 को भारत के केंद्रीय मंत्रिमंडल द्वारा अनुमोदित किया गया था।

आज का युग प्रतिस्पर्धा एवं सूचना प्रौद्योगिकी का युग है। आज के सूचना प्रौद्योगिकी के युग में समय-समय पर पाठ्यक्रम में बदलाव होता रहता है ताकि विद्यार्थी भविष्य में हर क्षेत्र में अग्रणी बनें और उनका सर्वांगीण विकास हो सके। छात्रों के समय विकास के लिए शिक्षा प्रणाली में नई विचारधारा के साथ-साथ बदलाव लाना समय की मांग है। इसीलिए छात्रों को स्वतंत्र अभिव्यक्ति का मौका देने, उनकी छिपी प्रतिभा और नवाचार को प्रोत्साहित करने के लिए उचित समय पर पाठ्यक्रम में बदलाव किया जाता है और यह समय की मांग भी है।

विषय प्रवेश :

तत्कालीन प्रधान मंत्री साल 1668 में इंदिरा गांधी की सरकार ने देश की पहली शिक्षा नीति पेश की। उक्त शिक्षा नीति 1664 के कोठारी आयोग की सिफारिशों पर आधारित थी। इस शिक्षा नीति में 10+2+3 शिक्षा प्रणाली को अपनाया गया। इसके साथ ही इस शिक्षा नीति में त्रिभाषी फार्मूला अपनाया गया। इसने पहली भाषा के रूप में मातृभाषा, दूसरी भाषा के रूप में राष्ट्रीय भाषा (हिंदी) और तीसरी भाषा के रूप में अंग्रेजी को अपनाया।

इसके अलावा, इन सिफारिशों के आधार पर, 1686 में तत्कालीन प्रधान मंत्री द्वारा दूसरी शिक्षा नीति बनाई गई थी। इसका प्रस्ताव राजीव गांधी की सरकार ने रखा था। नीति में शैक्षिक अवसर की समानता और समाज में असमानताओं को खत्म करने पर विशेष जोर दिया गया, विशेषकर महिलाओं, अनुसूचित जनजातियों (एसटी) और अनुसूचित जातियों (बी) के लिए। इसके बाद इन नीतियों में 1662 ई. के तत्कालीन प्रधानमन्त्री स्व. नरसिम्हा राव सरकार ने कुछ बदलाव सुझाये और कुछ सुधार भी किये। इसके अलावा, 1955 में संविधान में 86वें संशोधन ने मौलिक अधिकारों के अनुच्छेद 21-ए के तहत शिक्षा का अधिकार दिया।

वर्तमान में, 6 से 14 वर्ष की आयु के सभी बच्चों को प्राथमिक शिक्षा प्रदान करने के लिए निःशुल्क और अनिवार्य बाल शिक्षा का अधिकार अधिनियम 2006 लागू किया गया है। यह अधिनियम सर्व शिक्षा अभियान, मध्याह्न भोजन योजना, नवोदय विद्यालय, केंद्रीय विद्यालय जैसी सरकारी पहलों में समाज के वंचित वर्गों के लिए 25% आरक्षण भी प्रदान करता है।

राष्ट्रीय शिक्षा नीति 2020 में निम्नलिखित पांच स्तंभों पर विशेष जोर दिया गया है।

- 1) Access (सभी के लिए आसान शिक्षा)
- 2) Equity (समानता)
- 3) Quality (गुणवत्ता)
- 4) Affordability (सस्ती शिक्षा)
- 5) Accountability (उत्तर दायित्व)
- 1) **Access (सभी के लिए आसान शिक्षा)**

ऐसा देखा गया है कि इस राष्ट्रीय शिक्षा नीति में इस सिद्धांत को अपनाया गया है कि शिक्षा जाति, धर्म, पंथ, लिंग जैसे किसी भी भेदभाव के बिना सभी के लिए आसानी से उपलब्ध होनी चाहिए।

२) **Equity (समानता)**

इस राष्ट्रीय शिक्षा नीति में लड़के और लड़कियों की समान शिक्षा को विशेष महत्व दिया गया है। सभी जाति और धर्म के बालक-बालिकाओं को समान शिक्षा मिले, यह अपेक्षा इस राष्ट्रीय शिक्षा नीति से पूरी होगी

३) **Quality (गुणवत्ता)**

गुणवत्तापूर्ण शिक्षा समय की मांग है। इसी सूत्र पर चलते हुए इस राष्ट्रीय शिक्षा नीति में गुणवत्तापूर्ण शिक्षा पर विशेष जोर दिया गया है।

4) **Affordability (सस्ती शिक्षा)**

राष्ट्रीय शिक्षा नीति का सुझाव है कि वित्तीय पहलू को ध्यान में रखते हुए शिक्षा सभी के लिए सुलभ और सस्ती होनी चाहिए।

५) **Accountability (उत्तर दायित्व)**

शिक्षा प्राप्त करने के बाद समाज के प्रति हमारा कुछ दायित्व है, इसकी जिम्मेदारी का भाव भी इस राष्ट्रीय शिक्षा नीति में महत्वपूर्ण होगा। इसीलिए इस राष्ट्रीय शिक्षा नीति में जवाबदेही के स्तंभ को भी विशेष महत्व दिया जाता दिख रहा है। नई शिक्षा नीति के बारे में कुछ महत्वपूर्ण बातें

- 1) नई राष्ट्रीय शिक्षा नीति 2020 का अंतिम लक्ष्य भारत को वैश्विक ज्ञान महाशक्ति बनाना है।
- 2) भारत की आजादी यानी 1647 के बाद से भारत में शिक्षा प्रणाली के पाठ्यक्रम में यह तीसरा बड़ा बदलाव है।
- 3) स्कूली शिक्षा में निवेश को उल्लेखनीय रूप से बढ़ाने और नई पहलों को लागू करने के लिए इन 6 स्तंभों पर विशेष जोर दिया जाएगा।
- 4) 2025 तक, यह राष्ट्रीय शिक्षा नीति कक्षा V और उससे आगे के प्रत्येक छात्र के लिए बुनियादी साक्षरता और प्रौद्योगिकी हासिल करने के लिए महत्वपूर्ण होगी।
- 5) स्कूली शिक्षा के लिए 5+3+3+4 संरचना पर बौद्धिक विकास और शिक्षाशास्त्र संरचना विकसित करने पर जोर दिया गया है।

नई शिक्षा नीति भविष्य की गति निर्धारित करने वाली नीति बनने जा रही है। यह भी आशा है कि इसमें शामिल शिक्षा प्रणाली इतिहास में भारतीयों की अभूतपूर्व उपलब्धियों से परिचित कराएगी।

राष्ट्रीय शिक्षा नीति में शिक्षा का पहलू

1) प्रथम चरण

इस प्रथम चरण में एचवीए कक्षाएं हैं। इसके पहले तीन साल बच्चों की शिक्षा और पहली व दूसरी कक्षा के होंगे। दूसरे चरण तक, बच्चे से पढ़ना, बातचीत और सरल अंकगणित सीखने की उम्मीद की जाती है। इस स्तर का पाठ्यक्रम खेल, अन्वेषण और क्रिया पर आधारित शिक्षा प्रदान करेगा। पाठ्यक्रम को इस प्रकार डिज़ाइन किया जाएगा कि छात्र कक्षा 3 में प्रवेश करते समय समझपूर्वक पढ़ने और लिखने में सक्षम हो सकें

2) दूसरा चरण

इस दूसरे चरण में कक्षा तीन से कक्षा पांच तक तीन प्राथमिक शिक्षा कक्षाएं होंगी। एक बच्चे को पाँचवीं कक्षा तक साक्षरता और संख्यात्मक कौशल हासिल कर लेना चाहिए। एक्शन और गेम आधारित इंटरैक्टिव पाठ्यक्रम विकसित करके छात्रों के बौद्धिक विकास पर विशेष जोर दिया जाएगा।

3) तीसरा चरण-

इस तीसरे चरण में कक्षा छह से आठवीं तक तीन कक्षाएं होंगी। एक्शन आधारित व्यावहारिक पाठ्यक्रम तैयार करके छात्रों को पेशेवर शिल्प और कौशल विकसित करने के लिए सशक्त बनाया जाएगा।

4) चौथा चरण

इस चौथे चरण में माध्यमिक कक्षा यानी नौवीं से बारहवीं तक की चार कक्षाएं होंगी। इन चार सालों में छात्रों को 40 अलग-अलग विषयों की पढ़ाई का मौका मिलेगा। आपको अपनी रुचि के अनुसार विषय लेने का अवसर मिलेगा। वर्तमान में 10वीं और 12वीं बोर्ड परीक्षा का अवास्तविक महत्व कम हो जाएगा। उच्चतर माध्यमिक कक्षा में, कला, विज्ञान और वाणिज्य जैसी शाखा की परवाह किए बिना रुचि के विषयों को चुना जा सकता है। रुचि के अन्य विषयों को डिग्री स्तर पर भी चुना जा सकता है।

वर्तमान में छात्रों को 10वीं पास करने के बाद 11वीं और 12वीं में कला, वाणिज्य और विज्ञान जैसे विषय चुनने की आजादी है। लेकिन अब से नौवीं से बारहवीं तक के सभी विषयों को समान दर्जा मिलेगा। इस शिक्षा नीति में छात्र रसायन विज्ञान, जीव विज्ञान जैसे विषयों के साथ-साथ संगीत, चित्रकला जैसे रुचि के विषयों को भी चुन सकते हैं।

आज हमारे देश में व्यावसायिक शिक्षा लेने वाले विद्यार्थियों की संख्या 5% है। अन्य देशों की तुलना में यह आंकड़ा बेहद चिंताजनक है। नई शिक्षा नीति में सुझाव दिया गया है कि हमारे देश में भी यह संख्या बढ़ाई जानी चाहिए।

इस नई शिक्षा नीति के अनुसार छात्रों को छठी कक्षा से व्यावसायिक शिक्षा लेना अनिवार्य होगा। नई शिक्षा नीति के अनुसार प्रत्येक छात्र से कम से कम एक व्यावसायिक कौशल सीखने की अपेक्षा की जाती है। उच्च शिक्षा तक पहुंच इसी व्यावसायिक शिक्षा पर निर्भर करेगी। इस नीति में यह भी प्रावधान किया जाएगा कि यदि किसी छात्र ने व्यावसायिक शिक्षा नहीं ली है तो वह उच्च शिक्षा नहीं ले पाएगा।

राष्ट्रीय शिक्षा नीति 2020 के प्रभावी कार्यान्वयन के लिए निम्नलिखित पहलुओं को प्राथमिकता दी गई है

- 1) पाठ्यक्रम
- 2) मूल्यांकन
- 3) शिक्षक शिक्षण प्रशिक्षण
- 4) प्रशासनिक जिम्मेदारी
- 5) अन्य विभाग के साथ सहयोग

1) पाठ्यक्रम

पाठ्यक्रम भार, खेल, गतिविधियों आदि को कम करके इस नीति के प्रभावी कार्यान्वयन के लिए शोध-आधारित पाठ्यक्रम डिजाइन पर जोर दिया गया है। पाठ्यक्रम संचार, समझ, अनुप्रयोग, गणितीय दृष्टिकोण, वैज्ञानिक दृष्टिकोण, रचनात्मक और चिंतनशील सोच, संचार कौशल, सहसंबंध अध्ययन के आधार पर तैयार किया जाएगा। इस पाठ्यक्रम का जोर केवल उच्चारण के माध्यम से परीक्षा में प्राप्त अंकों के अनुचित महत्व को कम करके कौशल और क्षमता विकास पर होगा। शैक्षणिक परिणाम के आधार पर बच्चों की गुणवत्ता की जांच की जाएगी। केवल अंक दर्ज करके समग्र विकास प्रक्रिया को बढ़ावा देने के लिए योग्यता एवं कौशल विकास की स्थिति को प्रगति पुस्तिका में दर्ज किया जाएगा। बहुविषयक पाठ्यक्रम बनने से विद्यार्थियों को विषय चयन की आजादी मिलेगी।

2) मूल्यांकन

इस राष्ट्रीय शिक्षा नीति में मूल्यांकन बहुआयामी होने वाला है। मूल्यांकन में अंकों के महत्व को कम करके बहुआयामी मूल्यांकन की अवधारणा को अपनाया गया है। स्व-मूल्यांकन, सहकर्मी मूल्यांकन, सीखने के मूल्यांकन के साथ-साथ छात्रों की भावनात्मक, सामाजिक, संज्ञानात्मक और कार्यात्मक प्रगति के आधार पर निरंतर मूल्यांकन किया जाएगा।

3) शिक्षक शिक्षण प्रशिक्षण

राष्ट्रीय शिक्षा नीति 2020 के प्रभावी कार्यान्वयन के लिए छात्रों के साथ-साथ शिक्षकों को भी उनकी प्रगति और विकास के अनुरूप सशक्त बनाने के लिए नियमित प्रशिक्षण प्रदान किया जाएगा। इस नीति में योग्य शिक्षकों को पदोन्नति का अवसर मिलेगा। बहुविषयक पाठ्यक्रम शामिल होने से शिक्षकों को समय-समय पर प्रशिक्षण मिलेगा।

4) प्रशासनिक जिम्मेदारी

राष्ट्रीय शिक्षा नीति 2020 के प्रभावी क्रियान्वयन के लिए देश एवं राज्य स्तर पर जिम्मेदारी "सार्थक" पुस्तिका में दी गई है। राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद और राज्य शैक्षिक अनुसंधान और प्रशिक्षण परिषद, महाराष्ट्र पुणे नया पाठ्यक्रम बनाने के लिए जिम्मेदार होंगे। शिक्षक प्रशिक्षण के लिए राज्य शिक्षा जिम्मेदार है अनुसंधान एवं प्रशिक्षण परिषद महाराष्ट्र पुणे संस्थान द्वारा संचालित किया जाएगा। स्कूल शिक्षा एवं खेल विभाग राज्य के सभी स्कूलों में प्रभावी क्रियान्वयन के लिए समन्वय तंत्र (नोडल) के रूप में कार्य कर रहा है।

5) अन्य विभाग के साथ सहयोग

राष्ट्रीय शिक्षा नीति 2020 के प्रभावी क्रियान्वयन के लिए स्कूली शिक्षा के साथ-साथ अन्य विभागों

का सहयोग भी महत्वपूर्ण होगा। राज्य में कुछ स्कूलों का प्रशासनिक नियंत्रण स्कूल शिक्षा विभाग के साथ-साथ अन्य विभागों के अधीन है, अतः इस नीति के प्रभावी क्रियान्वयन के लिए सभी विभागों में समन्वय, समन्वय एवं मार्गदर्शन आवश्यक है।

निष्कर्ष :

1. आज का युग प्रतिस्पर्धा एवं सूचना प्रौद्योगिकी का युग है। आज के सूचना प्रौद्योगिकी के युग में समय-समय पर पाठ्यक्रम में बदलाव होता रहता है ताकि विद्यार्थी भविष्य में हर क्षेत्र में अग्रणी बनें और उनका सर्वांगीण विकास हो सके।
2. नई शिक्षा नीति के अनुसार छात्रों को छठी कक्षा से व्यावसायिक शिक्षा लेना अनिवार्य होगा। नई शिक्षा नीति के अनुसार प्रत्येक छात्र से कम से कम एक व्यावसायिक कौशल सीखने की अपेक्षा की जाती है।
3. इस नीति के प्रभावी कार्यान्वयन के लिए पाठ्यक्रम के बोझ को कम करके खेल, गतिविधियों और खोज पर आधारित पाठ्यक्रम बनाने पर जोर दिया गया है। पाठ्यक्रम संचार, समझ, अनुप्रयोग, गणितीय दृष्टिकोण, वैज्ञानिक दृष्टिकोण, रचनात्मक और चिंतनशील सोच, संचार कौशल, सहसंबंध अध्ययन के आधार पर तैयार किया जाएगा।
4. इस राष्ट्रीय शिक्षा नीति में मूल्यांकन बहुआयामी होने वाला है। मूल्यांकन में अंकों के महत्व को कम करके बहुआयामी मूल्यांकन की अवधारणा को अपनाया गया है। स्व-मूल्यांकन, सहकर्मी मूल्यांकन, सीखने के मूल्यांकन के साथ-साथ छात्रों की भावनात्मक, सामाजिक, संज्ञानात्मक और कार्यात्मक प्रगति के आधार पर निरंतर मूल्यांकन किया जाएगा।
5. कार्यान्वयन की प्रक्रिया चरण दर चरण चल रही है। शासन स्तर से इस नीति के क्रियान्वयन की सारी प्रक्रिया ठीक से की गयी है। आशा है कि जल्द ही यह राष्ट्रीय शिक्षा नीति शिक्षा प्रक्रिया में लागू होगी और छात्रों को कुशल शिक्षा का अवसर मिलेगा।
6. नई शिक्षा नीति 2020 एक भविष्योन्मुखी नीति होने जा रही है। यह भी आशा है कि इसमें शामिल शिक्षा प्रणाली इतिहास में भारतीयों की अभूतपूर्व उपलब्धियों से परिचित कराएगी।

संदर्भ:

1. नई शिक्षा नीति-2020 के मुख्य बिंदु एक नजर में। 30 जुलाई 2020. 30 जुलाई 2020.
2. आइए जानते हैं कि देश की शिक्षा व्यवस्था में बदलाव के लिए नई राष्ट्रीय शिक्षा नीति क्यों जरूरी थी। दैनिक जागरण। 30 जुलाई 2020.
3. नई शिक्षा नीति 2020 5वीं तक की पढ़ाई अब मातृभाषा में, डिग्री तक प्रवेश के लिए परीक्षा। अमर ज्योति. 31 जुलाई 2020
4. नई शिक्षा नीति. नवभारत टाइम्स. 31 जुलाई 2020
5. नई शिक्षा नीति 2020 स्कूली शिक्षा, बोर्ड परीक्षा, ग्रेजुएशन डिग्री में बड़े बदलाव, जानें 20 खास बातें हिंदुस्तान लाइव। 30 जुलाई 2020

6. सिंह, प्रोफेसर दिनेश (29 जुलाई 2020). नई शिक्षा नीति स्कूली और उच्च शिक्षा के द्वार खोलेगी। क्विंट. 30 जुलाई 2020
7. नई शिक्षा नीति: अब छात्र केमिस्ट्री के साथ संगीत, फिजिक्स के साथ फैशन डिजाइनिंग की पढ़ाई भी कर सकेंगे। आज तक. 30 जुलाई 2020
8. नई शिक्षा नीति से शिक्षा व्यवस्था में कितना बदलाव आएगा? जानिए क्या कहते हैं विशेषज्ञ. आज तक. 31 जुलाई 2020
9. नई शिक्षा नीति का समर्थन करते हुए.

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GOEIIRJ

राष्ट्रीय शिक्षा नीति (NEP) 2020 का उच्च शिक्षा पर प्रभाव और कार्यान्वयन में चुनौतियाँ

प्रा. कुसुंबा व्ही गावीत

साहय्यक प्राध्यापक

आर.एफ.एन.एस.शिक्षणशास्त्र महिला महाविद्यालय अक्कलकुवा

प्रस्तावना

राष्ट्रीय शिक्षा नीति 2020 (NEP 2020) को भारतीय शिक्षा प्रणाली में समग्र परिवर्तन लाने के उद्देश्य से लागू किया गया है। यह नीति 1986 की शिक्षा नीति का स्थान लेती है और वैश्विक स्तर पर भारत की उच्च शिक्षा को प्रतिस्पर्धात्मक बनाने के लिए कई सुधार पेश करती है।

उच्च शिक्षा में NEP 2020 के प्रमुख प्रावधान

- * **बहु-विषयक शिक्षा प्रणाली** : उच्च शिक्षा संस्थानों (HEIs) को बहु-विषयक (Multidisciplinary) बनाया जाएगा। सिंगल-स्ट्रीम कॉलेजों को चरणबद्ध तरीके से बहु-विषयक संस्थानों में परिवर्तित किया जाएगा।
- * **लचीली डिग्री संरचना**: स्नातक पाठ्यक्रम में प्रवेश और निकास (Multiple Entry and Exit) की सुविधा दी गई है।, 1 वर्ष पूरा करने पर सर्टिफिकेट, 2 वर्ष पर डिप्लोमा, 3 वर्ष पर डिग्री और 4 वर्ष पर रिसर्च आधारित डिग्री का विकल्प।
- * **शोध एवं नवाचार को बढ़ावा**: राष्ट्रीय शोध फाउंडेशन (National Research Foundation - NRF) की स्थापना HEIs को शोध के लिए अधिक स्वतंत्रता और वित्तीय सहायता।
- * **संस्थागत स्वायत्तता और नियामक सुधार** : विश्वविद्यालय अनुदान आयोग (UGC) को प्रतिस्थापित कर एकल नियामक संस्था - "हायर एजुकेशन कमीशन ऑफ इंडिया" (HECI) की स्थापना। HECI के अंतर्गत चार स्वतंत्र निकाय: <राष्ट्रीय उच्चतर शिक्षा नियामक परिषद (NHERC) , उच्च शिक्षा अनुदान परिषद (HEGC), राष्ट्रीय प्रत्यायन परिषद (NAC), सामान्य शिक्षा परिषद (GEC)
- * **तकनीकी शिक्षा और डिजिटल लर्निंग**: ऑनलाइन और डिजिटल शिक्षा को बढ़ावा। राष्ट्रीय डिजिटल शिक्षा आर्किटेक्चर (NDEAR) और राष्ट्रीय शैक्षिक तकनीकी मंच (NETF) की स्थापना।
- * **गुणवत्ता सुधार और समावेशन** : विदेशी विश्वविद्यालयों को भारत में परिसर स्थापित करने की अनुमति। स्थानीय भाषा में शिक्षा को बढ़ावा।, सामाजिक एवं आर्थिक रूप से पिछड़े वर्गों (SEDCs) के लिए छात्रवृत्ति एवं वित्तीय सहायता।

1. NEP 2020 के प्रभावों का विश्लेषण

* सकारात्मक प्रभाव

१) उच्च शिक्षा की गुणवत्ता में सुधार।

उच्च शिक्षा की नई संरचना

अब तक की 10+2 प्रणाली को समाप्त कर 4-वर्षीय स्नातक डिग्री प्रोग्राम को लागू किया गया है। उच्च शिक्षा के लिए एकाधिक प्रवेश और निकास (Multiple Entry & Exit System) की सुविधा दी गई

है।

चार वर्षीय स्नातक (UG) प्रोग्राम के तहत:

- 1 साल बाद सर्टिफिकेट
- 2 साल बाद डिप्लोमा
- 3 साल बाद डिग्री
- 4 साल बाद अनुसंधान-आधारित डिग्री

मास्टर डिग्री के लिए 1 या 2 साल का विकल्प होगा (4-वर्षीय UG करने वालों के लिए 1 वर्ष और 3-वर्षीय UG करने वालों के लिए 2 वर्ष)। MPhil (Master of Philosophy) को समाप्त कर दिया गया है। अब स्नातकोत्तर (PG) के बाद सीधे PhD की जा सकती है।

2. बहुविषयक (Multidisciplinary) शिक्षा और लचीला पाठ्यक्रम

- * अब छात्र विभिन्न विषयों को जोड़ सकते हैं, जैसे -
- * भौतिकी (Physics) के साथ संगीत (Music)
- * गणित (Mathematics) के साथ साहित्य (Literature)
- * पारंपरिक संकाय (Arts, Science, Commerce) की सीमाओं को समाप्त कर विषयों को लचीले तरीके से चुनने की स्वतंत्रता दी गई है।

3. शैक्षणिक बैंक ऑफ क्रेडिट (Academic Bank of Credit - ABC)

- * ABC सिस्टम के तहत छात्रों के अकादमिक क्रेडिट को डिजिटली स्टोर किया जाएगा।
- * यदि कोई छात्र बीच में पढ़ाई छोड़ देता है तो वह बाद में अपनी संचित क्रेडिट का उपयोग करके अपनी शिक्षा पूरी कर सकता है।
- * इससे आजीवन सीखने (Lifelong Learning) की अवधारणा को बढ़ावा मिलेगा।

4. ऑनलाइन और डिजिटल शिक्षा को बढ़ावा

- * ऑनलाइन शिक्षा को बढ़ावा देने के लिए नेशनल एजुकेशनल टेक्नोलॉजी फोरम (NETF) की स्थापना की जाएगी।
- * डिजिटल विश्वविद्यालयों की स्थापना और ऑनलाइन पाठ्यक्रमों की संख्या में वृद्धि होगी।
- * ग्रामीण और दूरस्थ क्षेत्रों के छात्रों को डिजिटल शिक्षा से जोड़ा जाएगा।

5. अनुसंधान और नवाचार पर बल

- * राष्ट्रीय अनुसंधान फाउंडेशन (National Research Foundation - NRF) की स्थापना की जाएगी।
- * शोध (Research) को बढ़ावा देने के लिए विश्वविद्यालयों को अधिक स्वतंत्रता और धनराशि प्रदान की जाएगी।
- * भारतीय संस्थानों को वैश्व स्तर के अनुसंधान केंद्रों के रूप में विकसित किया जाएगा।

6. उच्च शिक्षा के लिए एकल नियामक प्राधिकरण

- * पहले UGC, AICTE और NCTE जैसी कई संस्थाएँ उच्च शिक्षा को नियंत्रित करती थीं।

* अब सभी उच्च शिक्षा संस्थानों के लिए एक ही नियामक निकाय - "राष्ट्रीय उच्च शिक्षा नियामक प्राधिकरण (NHERC)" बनाया जाएगा।

* इससे नीतियों का क्रियान्वयन सरल और पारदर्शी होगा।

७. अंतरराष्ट्रीयकरण और विदेशी विश्वविद्यालयों की स्थापना

* शीर्ष 100 विदेशी विश्वविद्यालयों को भारत में अपने परिसर खोलने की अनुमति दी जाएगी।

* इससे भारतीय छात्रों को गुणवत्तापूर्ण अंतरराष्ट्रीय शिक्षा अपने ही देश में मिलेगी।

* भारतीय उच्च शिक्षा संस्थानों को भी विदेशों में अपने कैंपस खोलने की छूट दी गई है।

८. व्यावसायिक शिक्षा (Vocational Education) का समावेश

* NEP 2020 के तहत व्यावसायिक शिक्षा को मुख्यधारा में लाया गया है।

* सभी कॉलेजों को 2030 तक मल्टी-डिसिप्लिनरी शिक्षा प्रदान करनी होगी।

* छात्रों को इंटरशिप और व्यावसायिक कौशल से जोड़ा जाएगा ताकि वे उद्योगों के लिए तैयार हो सकें।

९. शिक्षक प्रशिक्षण और मूल्यांकन में सुधार

* शिक्षकों को नियमित प्रशिक्षण और डिजिटल संसाधन उपलब्ध कराए जाएंगे।

* कॉलेज और विश्वविद्यालयों में शिक्षकों की भर्ती योग्यता और अनुभव के आधार पर की जाएगी।

* छात्रों के मूल्यांकन प्रणाली में सुधार किया जाएगा, जिससे रटने (rote learning) के बजाय तार्किक और विश्लेषणात्मक सोच को बढ़ावा मिलेगा।

१०. वैश्विक मानकों के अनुरूप पाठ्यक्रम।

अंतरराष्ट्रीय सहयोग और विदेशी विश्वविद्यालयों का प्रवेश, शीर्ष 100 विदेशी विश्वविद्यालयों को भारत में अपने परिसर खोलने की अनुमति दी, गई है। भारतीय संस्थानों को भी विदेशों में अपने कैंपस स्थापित करने की छूट दी गई है।, इससे भारतीय शिक्षा प्रणाली अंतरराष्ट्रीय मानकों के अनुरूप होगी और छात्रों को वैश्विक अवसर मिलेंगे। छात्रों को विभिन्न विषयों का चुनाव करने की आजादी होगी, जिससे वे अपने कौशल और रुचि के अनुसार पढ़ाई कर सकें। विज्ञान, प्रौद्योगिकी, कला, मानविकी, खेल और कौशल-आधारित शिक्षा को एकीकृत किया जाएगा। विश्व के शीर्ष विश्वविद्यालयों (जैसे MIT, Harvard, Oxford) में अपनाई जाने वाली लचीली शिक्षा प्रणाली को लागू किया जा रहा है।

१२. शोध और नवाचार को बढ़ावा।

राष्ट्रीय अनुसंधान फाउंडेशन (NRF) की स्थापना की गई है, जिससे अनुसंधान गतिविधियों को प्रोत्साहित किया जाएगा। छात्रों को समस्या-समाधान और नवाचार (Innovation & Problem-Solving) आधारित शिक्षा दी जाएगी।, भारतीय विश्वविद्यालयों को वैश्विक अनुसंधान संस्थानों से जोड़ा जाएगा, जिससे वे अंतरराष्ट्रीय स्तर पर प्रतिस्पर्धा कर सकें।

१३. डिजिटल शिक्षा को सशक्त बनाना।

नेशनल एजुकेशनल टेक्नोलॉजी फोरम (NETF) की स्थापना की गई है, जिससे ऑनलाइन शिक्षा को बढ़ावा मिलेगा। डिजिटल विश्वविद्यालय और MOOCs (Massive Open Online Courses) को

शिक्षा का हिस्सा बनाया जाएगा। भारत के विश्वविद्यालयों को विदेशी विश्वविद्यालयों के साथ कोर्स साझा करने और संयुक्त डिग्री (Joint Degrees) प्रदान करने की अनुमति दी गई है।

१४ स्थानीय भाषाओं में उच्च शिक्षा की सुविधा।

मातृभाषा में उच्च शिक्षा देने की पहल की गई है, जिससे अधिक छात्रों को वैश्विक शिक्षा से जोड़ा जा सके। पाठ्यक्रम को बाईलिंगुअल (Bilingual) और ट्रांसलेशन तकनीकों के माध्यम से विकसित किया जाएगा, जिससे विदेशी छात्रों को भी भारतीय शिक्षा प्रणाली से जोड़ा जा सके।

१५ कौशल विकास और उद्योग-आधारित शिक्षा

छात्रों को व्यावसायिक शिक्षा (Vocational Education) और कौशल-आधारित पाठ्यक्रम से जोड़ा जाएगा। इंटरशिप और इंडस्ट्री-एकेडेमिया सहयोग को बढ़ावा दिया जाएगा, जिससे छात्र उद्योग की आवश्यकताओं के अनुरूप तैयार हो सकें। कई विकसित देशों (जैसे जर्मनी, अमेरिका, जापान) में अपनाई जाने वाली "Dual Education Model" को लागू किया जा रहा है।

२) चुनौतियाँ और नकारात्मक प्रभाव

राष्ट्रीय शिक्षा नीति (NEP) 2020 उच्च शिक्षा में सुधार और वैश्विक प्रतिस्पर्धा लाने के लिए बनाई गई है, लेकिन इसके क्रियान्वयन में कई चुनौतियाँ और संभावित नकारात्मक प्रभाव भी हो सकते हैं। इन चुनौतियों को हल किए बिना इस नीति के लाभ पूरी तरह नहीं मिल पाएंगे।

१ कार्यान्वयन में प्रशासनिक बाधाएँ।

NEP 2020 एक महत्वाकांक्षी नीति है, लेकिन इसे ज़मीनी स्तर पर लागू करना कठिन होगा। राज्य सरकारों, शिक्षण संस्थानों और शिक्षकों को प्रशिक्षित करने में समय लगेगा। देश में असमान शिक्षा प्रणाली (ग्रामीण बनाम शहरी, सरकारी बनाम निजी) के कारण इसे समान रूप से लागू करना मुश्किल होगा।

2. वित्तीय समस्याएँ (Lack of Funds)

NEP 2020 के तहत शिक्षा पर GDP का 6% खर्च करने का लक्ष्य रखा गया है, लेकिन अभी यह लगभग 3% के आसपास है। उच्च शिक्षा संस्थानों को संसाधनों, अनुसंधान सुविधाओं और डिजिटल बुनियादी ढांचे के लिए अधिक धनराशि की जरूरत होगी। यदि सरकार पर्याप्त बजट आवंटित नहीं करती, तो संस्थानों को शुल्क बढ़ाना पड़ सकता है, जिससे गरीब और मध्यम वर्ग के छात्रों के लिए उच्च शिक्षा कठिन हो जाएगी।

3. डिजिटल और ऑनलाइन शिक्षा की चुनौतियाँ

ग्रामीण और पिछड़े क्षेत्रों में इंटरनेट और डिजिटल संसाधनों की कमी है। सभी छात्रों के पास स्मार्टफोन, लैपटॉप या हाई-स्पीड इंटरनेट नहीं है, जिससे डिजिटल शिक्षा से जुड़ना मुश्किल होगा। डिजिटल लर्निंग को बढ़ावा देने से शिक्षा का निजीकरण बढ़ सकता है, जिससे आर्थिक रूप से कमजोर छात्र पिछड़ सकते हैं।

४ विदेशी विश्वविद्यालयों के प्रवेश से प्रतियोगिता

NEP 2020 के तहत शीर्ष 100 विदेशी विश्वविद्यालयों को भारत में अपने कैंपस खोलने की अनुमति दी गई है। इससे भारतीय विश्वविद्यालयों को प्रतिस्पर्धा का सामना करना पड़ेगा, जिससे वे

गुणवत्ता सुधारने के लिए दबाव में आ सकते हैं। विदेशी विश्वविद्यालयों की महंगी फीस के कारण यह केवल अमीर छात्रों तक सीमित रह सकता है, जिससे आर्थिक असमानता बढ़ेगी।

५ मल्टी-डिसिप्लिनरी प्रणाली की व्यवहारिक कठिनाइयाँ

छात्रों को विषयों को लचीले तरीके से चुनने की स्वतंत्रता दी गई है, लेकिन भारत में अधिकांश विश्वविद्यालय मल्टी-डिसिप्लिनरी मॉडल के लिए तैयार नहीं हैं। इंजीनियरिंग, मेडिकल, लॉ जैसी विशेष शिक्षा के लिए यह मॉडल कितना कारगर होगा, यह स्पष्ट नहीं है। शिक्षकों और छात्रों को इस नए शिक्षा ढांचे को समझने और अपनाने में समय लगेगा।

६. क्रेडिट बैंक और मल्टीपल एंटी-एग्जिट सिस्टम की समस्याएँ

Academic Bank of Credit (ABC) के तहत छात्रों को अलग-अलग समय पर पढ़ाई छोड़ने और दोबारा शुरू करने की सुविधा दी गई है। लेकिन यह मॉडल विकसित देशों में भी पूरी तरह सफल नहीं हो पाया है और भारत में इसे लागू करना और भी कठिन होगा। इससे छात्र बीच में ही पढ़ाई छोड़ सकते हैं, जिससे डिग्री पूरी करने की दर (Graduation Rate) कम हो सकती है।

८ शिक्षक प्रशिक्षण और भर्ती की समस्या

NEP 2020 के तहत शिक्षकों की गुणवत्ता सुधारने की बात कही गई है, लेकिन वर्तमान में कई विश्वविद्यालयों में योग्य शिक्षकों की कमी है। शिक्षकों को नई प्रणाली के अनुसार प्रशिक्षित करने और शिक्षण सामग्री तैयार करने में समय लगेगा। यदि पर्याप्त प्रशिक्षण और वेतन नहीं मिला, तो शिक्षकों की संख्या और गुणवत्ता दोनों पर असर पड़ सकता है।

१०. व्यावसायिक शिक्षा को प्रभावी बनाना चुनौतीपूर्ण

NEP 2020 के तहत व्यावसायिक शिक्षा (Vocational Education) को अनिवार्य किया गया है, लेकिन इसका क्रियान्वयन मुश्किल होगा। कई विश्वविद्यालयों और कॉलेजों में व्यावसायिक पाठ्यक्रमों के लिए प्रशिक्षित शिक्षक और संसाधन नहीं हैं। कंपनियों और उद्योगों के साथ सही तालमेल न होने पर, छात्रों को रोजगार मिलने में कठिनाई हो सकती है।

११. निजीकरण और शिक्षा में असमानता का खतरा

NEP 2020 के तहत निजी विश्वविद्यालयों और स्वायत्त संस्थानों को अधिक स्वतंत्रता दी गई है। इससे शिक्षा का निजीकरण बढ़ सकता है, जिससे उच्च शिक्षा की लागत अधिक हो सकती है।

यदि सरकारी संस्थानों की स्थिति में सुधार नहीं हुआ, तो गरीब और ग्रामीण छात्रों को गुणवत्तापूर्ण शिक्षा नहीं मिल पाएगी।

१२. भाषा नीति से जुड़ी चुनौतियाँ

NEP 2020 के तहत प्राथमिक शिक्षा मातृभाषा में देने की सिफारिश की गई है, लेकिन उच्च शिक्षा में इसका क्रियान्वयन कठिन होगा। अधिकांश वैज्ञानिक और तकनीकी अध्ययन सामग्री अंग्रेजी में उपलब्ध है, जिससे हिंदी और क्षेत्रीय भाषाओं में पढ़ने वाले छात्रों को वैश्विक स्तर पर कठिनाइयों का सामना करना पड़ सकता है। अंतरराष्ट्रीय मानकों से जुड़ने के लिए अंग्रेजी भाषा का ज्ञान जरूरी है, लेकिन सभी छात्रों के लिए यह संभव नहीं होगा।

निष्कर्ष

NEP 2020 उच्च शिक्षा प्रणाली में महत्वपूर्ण सुधार लाने का प्रयास है, लेकिन इसके क्रियान्वयन में कई चुनौतियाँ हैं।

- * नीति के लक्ष्यों को पूरा करने के लिए - शिक्षा का बजट बढ़ाना, संसाधन उपलब्ध कराना, डिजिटल तकनीक का सही उपयोग करना और शिक्षकों को प्रशिक्षित करना बहुत जरूरी है।
- * यदि इन चुनौतियों का समाधान नहीं हुआ, तो यह नीति गरीब और ग्रामीण छात्रों के लिए अवसरों को सीमित कर सकती है और शिक्षा प्रणाली में असमानता बढ़ा सकती है।
- * नीति को सफल बनाने के लिए सरकार, विश्वविद्यालय, शिक्षक और उद्योगों को मिलकर काम करना होगा।
- * NEP 2020 को प्रभावी रूप से लागू किया जाए तो भारत वैश्विक शिक्षा हब बन सकता है, लेकिन यदि सही रणनीति नहीं अपनाई गई, तो यह असमानता और जटिलताओं को बढ़ा सकता है।
- * राष्ट्रीय शिक्षा नीति 2020 भारतीय उच्च शिक्षा प्रणाली के सुधार की दिशा में एक क्रांतिकारी कदम है। हालांकि, इसके सफल कार्यान्वयन के लिए संसाधनों का उचित आवंटन, संस्थागत सहयोग और तकनीकी बुनियादी ढांचे को मजबूत करने की आवश्यकता होगी। यदि प्रभावी रूप से लागू किया जाए, तो यह नीति भारत को एक ज्ञान-आधारित अर्थव्यवस्था में बदलने में महत्वपूर्ण भूमिका निभाएगी।

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AI AND JOB DISPLACEMENT: ADDRESSING THE SOCIAL IMPACTS OF AUTOMATION

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Abstract

The increasing use of Artificial Intelligence (AI) and automation in various industries has raised concerns about job displacement and its social impacts. This paper explores the potential social impacts of AI-driven job displacement, including income inequality, unemployment, and social unrest. It also discusses potential solutions to mitigate these impacts, including education and retraining programs, social safety nets, and basic income guarantees.

Keywords: Artificial Intelligence (AI), Job Displacement, Automation, Social Impacts and Future of Work

Introduction

The growing integration of Artificial Intelligence (AI) and automation across diverse sectors has sparked anxieties regarding the potential for human worker displacement. With increasingly sophisticated machines and algorithms, numerous roles traditionally held by humans now face automation. This situation presents critical inquiries into the societal consequences of automation and the necessary strategies to alleviate its adverse effects on individuals and communities. The replacement of human labour with machines is not a novel issue. Historically, technological progress has frequently resulted in the automation of tasks, leading to job losses and societal disruption. However, the present wave of automation, fuelled by advancements in AI and machine learning, possesses a unique magnitude and breadth. It threatens not only manual labour positions but also professional occupations, including those within the service industry.

The societal ramifications of automation are projected to be extensive and profound. As jobs disappear, workers will be compelled to adapt to evolving technologies and develop new competencies to maintain their employability. This adaptation process, however, will likely be challenging, and many individuals may struggle to successfully transition. Moreover, the advantages of automation, such as enhanced productivity and efficiency, may not be distributed equitably across society, potentially widening existing social and economic disparities.

This paper investigates the societal consequences of automation and explores potential remedies to lessen the detrimental impacts on workers and communities. It emphasizes the necessity of education and retraining initiatives, robust social safety nets, and the implementation of basic income guarantees to support individuals displaced by automation. Crucially, it

underscores the importance of ensuring an equitable distribution of the benefits derived from automation throughout society, while actively mitigating any negative repercussions.

The Societal Repercussions of AI-Induced Job Losses

The rise of artificial intelligence and its subsequent automation capabilities pose significant social challenges stemming from potential job displacement, impacting individuals, communities, and society at large. These potential effects include:

- **Widening Income Disparities:** AI-driven automation could exacerbate the gap between the wealthy, who own and control AI technologies, and those displaced from their jobs, potentially leading to economic hardship for the latter.
- **Elevated Unemployment and Underemployment:** Widespread job losses due to AI automation may result in increased unemployment and underemployment rates, negatively affecting mental and physical well-being and eroding social cohesion.
- **Social Unrest and Dissent:** Perceived inequalities arising from AI-driven job displacement could trigger social unrest and protests, as citizens may believe that the benefits of technological advancement are not being distributed equitably.
- **Shifting Family and Community Structures:** As individuals and families adapt to evolving economic landscapes shaped by AI, family dynamics and community structures may undergo significant transformations.
- **Adverse Effects on Mental and Physical Health:** Job displacement can contribute to increased stress, anxiety, and depression, leading to a decline in overall mental and physical health.
- **Erosion of Purpose and Identity:** For many, work provides a crucial sense of purpose and identity. AI-driven job displacement may lead to a loss of this sense, particularly for those with long-term career investments.
- **Transformations in Community and Social Organizations:** The economic shifts caused by AI-driven job displacement will likely reshape community and social organizations as people adapt to new realities.

Factors Shaping the Social Impact:

The magnitude of these social impacts is influenced by several key factors:

- **Pace and Scope of Automation:** The speed and extent of job displacement directly correlate with the severity of social consequences, with rapid and widespread automation potentially causing greater disruption.
- **Nature of Displaced Roles:** The types of jobs affected by automation matter. Losses in highly skilled or high-paying positions may have a more profound social impact.

- **Availability of Alternative Employment Options:** Regions with limited alternative job opportunities may experience more severe social consequences from AI-driven job displacement.
- **Government Intervention and Support:** Government policies and programs aimed at supporting displaced workers can play a crucial role in mitigating the negative social effects of AI-driven job losses.

Strategies for Mitigation:

To mitigate the adverse social effects of AI-driven job displacement, several strategies can be implemented:

- **Investing in Education and Retraining:** Providing education and retraining programs can equip workers with the skills needed to adapt to evolving job markets and find new opportunities.
- **Strengthening Social Safety Nets:** Robust social safety nets, including unemployment insurance and income support programs, can offer crucial financial support to displaced workers.
- **Exploring Basic Income Models:** Implementing universal basic income programs could provide a safety net for displaced workers, ensuring a minimum standard of living regardless of employment status.
- **Promoting Job Creation and Placement:** Supporting job creation initiatives and placement programs can help connect workers with new employment opportunities and stimulate economic growth.

Addressing Job Displacement Caused by AI: A Multi-Faceted Approach

To mitigate the social impact of AI-driven job displacement, a collaborative effort from governments, businesses, educational institutions, and community organizations is essential. Key strategies include:

I. Investing in Education and Workforce Development:

- **Upskilling and Reskilling Programs:** Offer comprehensive training to help workers acquire new skills and adapt to the evolving demands of the job market.
- **Promoting Lifelong Learning:** Cultivate a culture where continuous learning and skill enhancement are valued and accessible for all workers.
- **Vocational Training Initiatives:** Expand vocational training opportunities focused on developing practical skills needed for in-demand occupations.

II. Strengthening Social Safety Nets:

- **Unemployment Insurance Enhancement:** Bolster unemployment insurance programs to provide adequate financial support to workers displaced by automation.

- **Targeted Income Support Programs:** Implement income support programs designed to ensure a minimum standard of living for displaced workers.
 - **Exploring Basic Income Guarantees:** Evaluate and potentially implement basic income guarantee programs to provide a fundamental safety net for those impacted by job displacement.
- III. Fostering Job Creation and Facilitating Placement:**
- **Enhanced Job Placement Services:** Provide robust job placement services to connect displaced workers with available employment opportunities.
 - **Strategic Job Creation Initiatives:** Launch programs that stimulate job creation in emerging and growing industries.
 - **Support for Entrepreneurship:** Offer resources and support to encourage entrepreneurship, enabling workers to create their own businesses.
- IV. Empowering Communities Through Development Programs:**
- **Community Engagement and Support:** Encourage community engagement and foster strong social connections for displaced workers.
 - **Investing in Local Economic Development:** Support local economic development initiatives that drive job creation and overall economic growth.
 - **Targeted Skills Development for Local Industries:** Develop specialized skills training programs focused on the needs of local industries and job markets.
- V. Government Policies and Programs:**
- **Establishing Clear Regulatory Frameworks:** Develop regulatory frameworks to guide the ethical and responsible development and deployment of AI technologies.
 - **Taxation and Investment Incentives:** Offer tax incentives and benefits to encourage businesses to invest in worker retraining and upskilling initiatives.
 - **Comprehensive Social Protection Policies:** Implement robust social protection policies to provide financial support and essential services to displaced workers.
- VI. Embracing Corporate Social Responsibility:**
- **Company-Sponsored Retraining and Upskilling:** Companies should provide internal retraining and upskilling programs to support their workers facing displacement.
 - **Community Investment Initiatives:** Businesses should invest in local communities and support programs that promote job creation and economic opportunity.
 - **Transparent Communication and Engagement:** Foster open communication with workers and stakeholders about the potential impacts of AI-driven job displacement and the strategies being implemented to address them.
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Case Studies

Sweden's Job Security Councils: In Sweden, Job Security Councils assist workers displaced by automation by providing resources like career guidance, job-specific training, and financial assistance.

Singapore's Professional Conversion Programmes: Singapore's Professional Conversion Programmes facilitate career transitions by equipping workers with new skills through training, mentorship, and job placement services.

Finland's Basic Income Experiment: Finland experimented with a basic income program, providing unemployed individuals with an unconditional monthly payment of €560 to ease their transition into new employment opportunities.

Conclusion

In conclusion, while AI-driven job displacement presents considerable social hardships like income inequality, unemployment, and potential social unrest, proactive solutions can lessen these effects and foster a fairer, more sustainable future. Strategies such as education and retraining initiatives, robust social safety nets, the implementation of basic income guarantees, and the redesign and creation of new job roles offer promising pathways for addressing the societal consequences of AI-driven job displacement.

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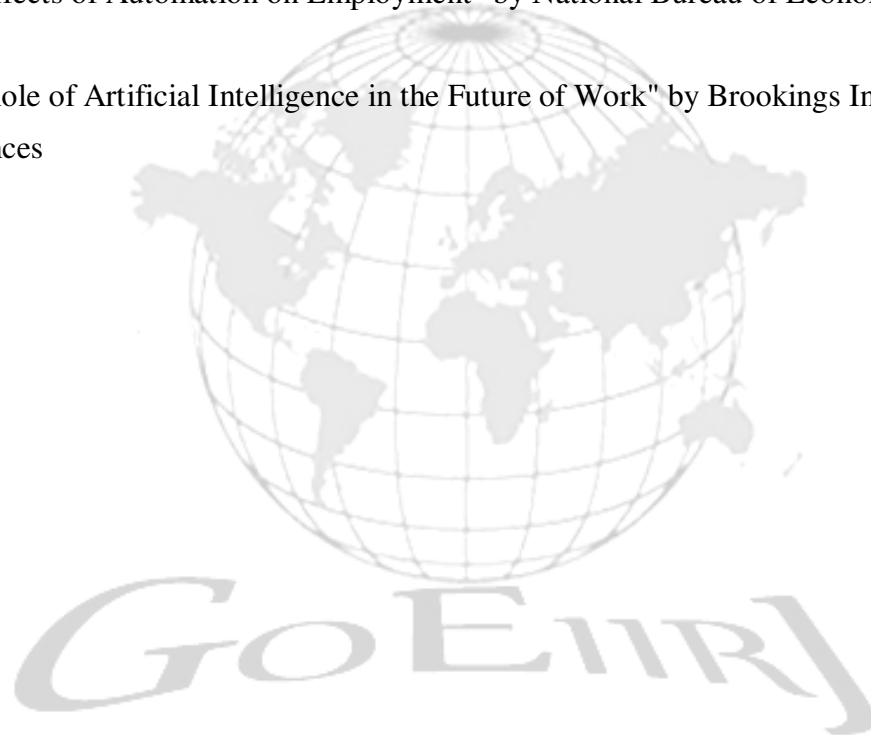
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SOCIAL SCIENCE IN THE CONTEXT OF (IKS)

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Abstract

Social science plays a crucial role in understanding human societies, cultures, and behaviours, yet it has historically been dominated by Western epistemologies. Indigenous Knowledge Systems (IKS) offer alternative, holistic, and community-centered ways of knowing that have sustained indigenous communities for generations. This paper explores the intersection of social science and IKS, highlighting how disciplines such as anthropology, sociology, history, and political science engage with indigenous knowledge. It examines the challenges of integrating IKS into mainstream social science research, including epistemological conflicts, colonial legacies, and ethical concerns. Furthermore, the paper discusses strategies for decolonizing social science through collaborative research, participatory methodologies, and policy reforms. By recognizing and valuing IKS, social science can become more inclusive, fostering culturally relevant and sustainable solutions to global challenges.

1. Introduction

Social Science is a broad field that studies human behavior, societies, and cultures through disciplines such as sociology, anthropology, history, and political science. Traditionally, these disciplines have relied on Western epistemologies, often overlooking Indigenous Knowledge Systems (IKS). IKS refers to the complex, holistic, and community-based ways of knowing that indigenous communities have developed over centuries. These systems encompass knowledge related to agriculture, medicine, governance, and environmental conservation, among other areas. The integration of IKS into social sciences is crucial for decolonizing knowledge, fostering inclusivity, and addressing global challenges such as climate change, social inequality, and sustainable development. This paper explores the role of social sciences in studying IKS, the challenges of integrating these knowledge systems, and possible solutions for an inclusive and interdisciplinary approach.

2. Understanding Social Science and Indigenous Knowledge Systems**2.1 What is Social Science?**

Social science is the study of human societies, cultures, and behaviors. It includes various disciplines such as:

- Anthropology – the study of human societies and cultures
 - Sociology – the study of social structures, norms, and institution
 - History – the study of past events and their impact on societies
 - Political Science – the study of governance, power, and policies
-

2.2 What are Indigenous Knowledge Systems (IKS)?

IKS refers to knowledge that is:

- Oral and experiential – Passed down through generations
- Holistic and community-based – Includes spiritual, environmental, and social aspects
- Adaptive and dynamic – Responds to changing environmental and social conditions
- IKS is evident in areas such as traditional medicine, conflict resolution, sustainable agriculture, and governance.

3. The Role of Social Sciences in Studying IKS

3.1 Anthropology and IKS

Anthropologists study indigenous cultures through ethnographic methods, including participant observation and interviews. They document oral traditions, rituals, and governance structures, helping preserve indigenous heritage.

3.2 Sociology and IKS

Sociologists examine social structures, norms, and values within indigenous communities. They explore how indigenous communities maintain social order, resolve conflicts, and adapt to modernization while preserving their cultural identity.

3.3 History and IKS

Traditional historical narratives often exclude indigenous perspectives. Indigenous histories, passed through oral traditions, storytelling, and artifacts, provide alternative narratives that challenge dominant historical accounts.

3.4 Political Science and IKS

Political scientists explore indigenous governance systems, such as communal land ownership, consensus-based decision-making, and leadership structures. These systems offer alternative models for governance and sustainable development.

4. Challenges in Integrating IKS into Social Sciences

4.1 Epistemological Conflicts

Western scientific methods often prioritize empirical and written knowledge, whereas IKS relies on oral traditions, experiential learning, and spiritual dimensions. This creates challenges in validation and acceptance.

4.2 Colonial Legacies and Knowledge Suppression

Colonial histories have marginalized IKS, labeling indigenous knowledge as unscientific or inferior. Many social science curricula still reflect Eurocentric biases, limiting the recognition of indigenous contributions.

4.3 Ethical Concerns in Research

Exploitation of Indigenous Knowledge – Commercial entities often extract indigenous

knowledge without consent (e.g., biopiracy of medicinal plants).

Representation Issues – Misinterpretation or misrepresentation of indigenous beliefs and practices by researchers who lack cultural understanding.

5. Case Studies on IKS in Social Science Research

• Case Study 1: Ubuntu Philosophy in African Social Science Research

The concept of Ubuntu ("I am because we are") emphasizes community, interconnectedness, and mutual respect. Sociologists and political scientists have studied Ubuntu to understand African governance, conflict resolution, and social cohesion.

• Case Study 2: Indigenous Climate Adaptation Strategies

Indigenous communities worldwide, such as the Maasai in Kenya and Sami in Scandinavia, use traditional ecological knowledge (TEK) to adapt to climate change. Social scientists have documented their practices, such as rainwater harvesting, sustainable grazing, and seasonal migration, to inform global environmental policies.

6. Towards a Decolonized and Inclusive Approach

6.1 Collaborative and Ethical Research

- Researchers should engage in participatory action research (PAR), where indigenous communities are co-researchers rather than subjects.
- Ethical guidelines should ensure free, prior, and informed consent (FPIC) when documenting indigenous knowledge.

6.2 Decolonizing Social Science Education

- Incorporating indigenous perspectives in academic curricula.
- Encouraging bilingual research to preserve indigenous languages and oral traditions.

6.3 Policy Recommendations

- Governments should recognize IKS in national development policies (e.g., using traditional farming methods for food security).
- Academic institutions should fund indigenous-led research and create platforms for indigenous scholars.

Conclusion

The integration of Indigenous Knowledge Systems (IKS) into social sciences offers a more holistic, inclusive, and culturally relevant approach to understanding human societies. By decolonizing research methodologies, engaging in ethical knowledge exchange, and promoting interdisciplinary collaboration, social scientists can bridge the gap between Western and indigenous ways of knowing. Recognizing and valuing IKS is not just an academic pursuit but a necessary step toward social justice, sustainability, and global knowledge equity.

The integration of Indigenous Knowledge Systems (IKS) into social sciences offers a more

holistic, inclusive, and culturally relevant approach to understanding human societies. By decolonizing research methodologies, engaging in ethical knowledge exchange, and promoting interdisciplinary collaboration, social scientists can bridge the gap between Western and indigenous ways of knowing. Recognizing and valuing IKS is not just an academic pursuit but a necessary step toward social justice, sustainability, and global knowledge equity.

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नई राष्ट्रीय शिक्षा नीति 2020 भविष्य और चुनौतियां

प्रा. वर्षा सुभाष वसावे

सहाय्यक

आरएफएनएस, शिक्षणशास्त्र महिला महाविद्यालय अक्कलकुवा,

ता. अक्कलकुवा. जि . नंदुरबार

शिक्षा प्रणाली को अधिक लचीला और गुणवत्तापूर्ण बनाने के लिए आवश्यक बदलाव करने के लिए 2017 में के. कस्तूरीरंगन की अध्यक्षता में एक समिति बनाई गई थी। इस समिति ने 2019 में अपनी रिपोर्ट केंद्र सरकार को सौंप दी। केंद्र सरकार ने इसे मंजूरी देने और 2020 में इसे लागू करने का फैसला किया। इस नई शिक्षा नीति में शिक्षा प्रणाली को बहुभाषी बनाने पर अधिक जोर दिया गया है। नई नीति में शिक्षा के लिए सकल घरेलू उत्पाद का 6 प्रतिशत आवंटित करने का प्रावधान किया गया है।

इस नीति के अवसर पर केंद्र सरकार ने 34 साल बाद देश की शिक्षा नीति को अपडेट करने का काम किया है। केंद्रीय मंत्री प्रकाश जावड़ेकर और केंद्रीय मानव संसाधन विकास मंत्री रमेश पोखरियाल ने प्रेस कॉन्फ्रेंस कर इस नीति के बारे में अधिक जानकारी दी। भारतीय अंतरिक्ष अनुसंधान संगठन (इसरो) के पूर्व प्रमुख के कस्तूरीरंगन की अध्यक्षता वाली समिति ने इस नीति का मसौदा तैयार किया है।

राष्ट्रीय शिक्षा नीति (NPE) भारत सरकार द्वारा भारत में शिक्षा को बढ़ावा देने और विनियमित करने के लिए तैयार की गई नीति है। यह नीति ग्रामीण और शहरी क्षेत्रों में प्राथमिक शिक्षा से लेकर उच्च शिक्षा तक को कवर करती है। पहली NPE की घोषणा भारत सरकार ने 1968 में इंदिरा गांधी द्वारा की थी, दूसरी NEP की घोषणा 1986 में प्रधान मंत्री राजीव गांधी द्वारा की गई थी, और तीसरी NEP की घोषणा 2020 में प्रधान मंत्री नरेंद्र मोदी द्वारा की गई थी।

1947 में देश को स्वतंत्रता मिलने के बाद से, भारत सरकार ने ग्रामीण और शहरी भारत दोनों में निरक्षरता की समस्याओं को दूर करने के लिए विभिन्न कार्यक्रम आयोजित किए हैं। भारत के पहले शिक्षा मंत्री मौलाना अब्दुल कलाम आज़ाद ने एक समान शिक्षा प्रणाली के साथ पूरे देश में शिक्षा पर मजबूत केंद्र सरकार के नियंत्रण की कल्पना की थी।

केंद्र सरकार ने भारत की प्रणाली को आधुनिक बनाने के लिए प्रस्ताव विकसित करने के लिए विश्वविद्यालय शिक्षा आयोग (1948-1949), माध्यमिक शिक्षा आयोग (1952-1953), विश्वविद्यालय अनुदान आयोग और कोठारी आयोग (1964-1966) की स्थापना की। भारत के पहले प्रधानमंत्री जवाहरलाल नेहरू की सरकार ने वैज्ञानिक नीति पर एक प्रस्ताव पारित किया था।

नेहरू सरकार ने भारतीय प्रौद्योगिकी संस्थान जैसे उच्च गुणवत्ता वाले वैज्ञानिक शिक्षा संस्थानों के विकास का बीड़ा उठाया। 1961 में, केंद्र सरकार ने एक स्वायत्त निकाय के रूप में राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद (NCERT) की स्थापना की, जो शैक्षिक नीतियों को तैयार करने और लागू करने में केंद्र और राज्य सरकारों को सलाह देगी।

राष्ट्रीय शिक्षा नीति 1968:

राष्ट्रीय शिक्षा 1968 कोठारी आयोग की सिफारिशों पर आधारित थी। इसने कोठारी आयोग के

कार्यान्वयन के लिए केंद्र और राज्य सरकारों और अधिकारियों को दिशानिर्देश जारी करने की सिफारिश की। इस राष्ट्रीय नीति के अनुसार, भारत सरकार ने देश में शिक्षा के विकास को बढ़ावा देने के लिए कुछ सिद्धांत तैयार किए थे। जिसके अनुसार, भारतीय संविधान के अनुच्छेद 45 के अनुसार, 14 वर्ष की आयु तक सभी के लिए शिक्षा मुफ्त और अनिवार्य होनी चाहिए। इसके अलावा, इस नीति ने देश में भारतीय और विदेशी भाषाओं के विकास पर जोर दिया। साथ ही, माध्यमिक स्तर पर छात्रों को हिंदी, अंग्रेजी और अपने राज्य की क्षेत्रीय भाषा का ज्ञान होना चाहिए। इसके लिए त्रिभाषा फॉर्मूला पेश किया गया। शिक्षा का ढांचा पूरे देश में एक जैसा होना चाहिए। उच्चतर माध्यमिक से लेकर कॉलेज स्तर तक 10+2+3 पैटर्न होना चाहिए। साथ ही, इस 1968 की राष्ट्रीय शिक्षा नीति में यह सिफारिश की गई थी कि शैक्षिक व्यय को राष्ट्रीय आय के छह प्रतिशत तक बढ़ाया जाना चाहिए। नहीं। साथ ही, चूंकि भारतीय अर्थव्यवस्था मंदी में थी, इसलिए फंड की कमी थी। उस समय शिक्षा राज्य सूची में थी। इसलिए, केंद्र की इस योजना को राज्य कैसे लागू करेंगे, इसमें ज्यादा भूमिका नहीं थी। इसके बावजूद, यह राष्ट्रीय शिक्षा नीति कुछ हद तक सफल रही। इसमें 10+2+3 शिक्षा प्रणाली शामिल थी। साथ ही, कई राज्यों ने त्रि-भाषा फॉर्मूला का पालन किया। साथ ही, विज्ञान और गणित को प्राथमिकता दी गई।

राष्ट्रीय शिक्षा नीति 1986 -

1986 की राष्ट्रीय शिक्षा नीति उस समय जारी की गई थी जब राजीव गांधी प्रधानमंत्री थे और 1992 में इसे अद्यतन किया गया था जब पी.वी. नरसिम्हा राव प्रधानमंत्री थे। इस नीति का शीर्षक था 'असमानताओं को दूर करने पर विशेष जोर'। इस नीति का मुख्य उद्देश्य महिलाओं, अनुसूचित जातियों और अनुसूचित जनजातियों सहित सभी को समान शैक्षिक अवसर प्रदान करना था। इस शिक्षा नीति ने विकेन्द्रीकरण और जिला शिक्षा और प्रशिक्षण संस्थानों की स्थापना की सिफारिश की। इसने शिक्षा के लिए पर्याप्त धन उपलब्ध कराने के लिए व्यय को सकल राष्ट्रीय आय के 6 प्रतिशत तक बढ़ाने, देश में शिक्षा के 10 + 2 + 3 पैटर्न को तुरंत लागू करने, प्राथमिक, माध्यमिक और उच्चतर माध्यमिक स्तर पर शैक्षिक कार्यक्रम का पुनर्गठन करने के साथ-साथ स्कूली पाठ्यक्रम का पुनर्गठन करने, प्राथमिक शिक्षा पूरी होने तक मुफ्त और अनिवार्य शिक्षा प्रदान करने की भी सिफारिश की। अनिवार्य स्कूली शिक्षा में भाषा, गणित, विज्ञान, सामाजिक विज्ञान, सांख्यिकी, मनोविज्ञान, इतिहास और नागरिक की राष्ट्रीय और संवैधानिक जिम्मेदारी जैसी कुछ अवधारणाओं को पढ़ाया जाना चाहिए। इस नीति के अंतर्गत सरकार को विषयों को प्राथमिकता देने, निःशुल्क विश्वविद्यालय और दूरस्थ शिक्षा संस्थान खोलकर उच्च शिक्षा का विस्तार करने, यूजीसी द्वारा ऐसी शिक्षा प्रणाली को समान दर्जा और मान्यता देने तथा राष्ट्रीय शिक्षा प्रणाली को आकार देने और राष्ट्र की उभरती मांगों को पूरा करने के लिए यूजीसी, एनसीईआरटी, एनआईईपीए, एआईसीटीई, आईसीएआर, आईएमसी आदि जैसे राष्ट्रीय महत्व के संस्थानों को सशक्त बनाने की सिफारिशें की गईं।

1968 की नीति ने 1968 की नीति से बेहतर प्रदर्शन किया। इसके कई कारण थे। सबसे पहले, यह नीति संविधान में 42वें संशोधन के बाद 1976 में लागू हुई। साथ ही, इस संशोधन में शिक्षा के विषय को राज्य से समवर्ती सूची में स्थानांतरित कर दिया गया। इसलिए, केंद्रों ने अपनी जिम्मेदारी स्वीकार की और कार्यक्रम को कुशलतापूर्वक लागू करने के प्रयास शुरू किए। 1986 की राष्ट्रीय शिक्षा नीति के तहत सर्व

शिक्षा अभियान, मध्याह्न भोजन योजना, नवोदय विद्यालय, केंद्रीय विद्यालय और शिक्षा में अत्याचार वापिस जैसी उत्कृष्ट सरकारी योजनाएं शुरू की गईं। इसे इस नीति की सफलता माना जाता है।

संशोधित राष्ट्रीय शिक्षा नीति:-

प्रधानमंत्री पी.वी. 1992 में नरसिम्हा राव सरकार ने 1986 की राष्ट्रीय शिक्षा नीति में कुछ परिवर्तन किये, जिसके अनुसार नये विशेष विद्यालय खोलने तथा विद्यार्थियों को व्यावसायिक प्रशिक्षण प्रदान करने के लिए गैर सरकारी संगठनों को मैदान में आने का प्रावधान किया गया। साथ ही नवोदय विद्यालयों में गुणवत्ता सुधार पर जोर दिया गया। तथा अन्य सभी विद्यालयों के लिए एक आदर्श स्थापित करने के लिए प्रत्येक राज्य में कम से कम एक मुक्त विश्वविद्यालय की स्थापना की गई। तथा इसे विनियमित करने के लिए इग्नू तकनीकी सहायता एवं दूरस्थ शिक्षा परिषद की स्थापना की गई। देश में सभी व्यावसायिक एवं तकनीकी कार्यक्रमों में प्रवेश के लिए अखिल भारतीय सामाजिक प्रवेश परीक्षा को आधार बनाया गया। साथ ही खेलकूद एवं अन्य शारीरिक गतिविधियों पर जोर दिया गया। इस शिक्षा नीति के अनुसार विद्यार्थियों को एनसीसी और एनएसएस में भाग लेने के लिए प्रेरित करने के निर्देश दिए गए।

राष्ट्रीय शिक्षा नीति 2020:

केंद्रीय मंत्रिमंडल ने नई राष्ट्रीय शिक्षा नीति 2020 को मंजूरी दे दी है, जिसका उद्देश्य स्कूल से लेकर कॉलेज तक भारतीय शिक्षा व्यवस्था में कई बदलाव लाना है। मंत्रिमंडल ने मानव संसाधन विकास मंत्रालय का नाम बदलकर शिक्षा मंत्रालय करने को भी मंजूरी दे दी है। मंत्रिमंडल द्वारा मंजूरी दी गई राष्ट्रीय शिक्षा नीति को आज़ादी के बाद भारत में शिक्षा ढांचे में एक बड़ा सुधार माना जा रहा है।

इन उद्देश्यों को ध्यान में रखते हुए सरकार ने इस नीति को मंजूरी दी। इस नीति का उद्देश्य स्कूल और कॉलेज स्तर पर कई बदलाव करना है। इस नीति के अनुसार, स्कूली शिक्षा में 2030 तक 100 प्रतिशत सकल शिक्षा अनुपात के साथ प्री-स्कूल से माध्यमिक स्तर तक शिक्षा को सार्वभौमिक बनाना और मुफ्त स्कूल प्रणाली के माध्यम से 2 करोड़ स्कूल से बाहर बच्चों को मुख्यधारा में लाना है। वर्तमान 10 + 2 प्रणाली को क्रमशः 3 से 8, 8 से 11, 11 से 14 और 18 वर्ष के आयु समूहों के लिए एक नए 5 + 3 + 3 + 4 पाठ्यक्रम संरचना द्वारा प्रतिस्थापित किया जाएगा। इसमें 3 + 6 वर्ष की आयु के बच्चों को स्कूली पाठ्यक्रम के तहत लाया जाएगा, जिसे वैश्विक स्तर पर बच्चों की मानसिक क्षमताओं के विकास के लिए एक महत्वपूर्ण चरण के रूप में मान्यता प्राप्त है। इसमें 12 साल की स्कूली शिक्षा के साथ-साथ तीन साल की आंगनवाड़ी शिक्षा शामिल होगी

राष्ट्रीय शिक्षा नीति 2020 की मुख्य विशेषताएं हैं कि उच्च शिक्षा में वर्तमान सकल नामांकन अनुपात 26.3 प्रतिशत है। इसे 2035 तक 50 प्रतिशत तक बढ़ाने की योजना है। उच्च शिक्षा में 5 करोड़ नई सीटें बनाई जाएंगी। चिकित्सा और कानूनी शिक्षा को छोड़कर सभी उच्च शिक्षा के लिए एक छत्र के रूप में भारतीय उच्च शिक्षा आयोग की स्थापना की जाएगी। इसके अलावा, उच्च शिक्षा आयोग में निम्नलिखित चार अलग-अलग विभाग होंगे: (1) उच्च शिक्षा के विनियमन के लिए राष्ट्रीय उच्चतर शिक्षा नियामक परिषद (एनएचईआरसी)। (2) ग्रेडिंग के प्रयोजनार्थ सामान्य शिक्षा परिषद (जी.ई.सी.)। (3) उच्च शिक्षा के वित्तपोषण के लिए उच्च शिक्षा अनुदान परिषद (एचईजीसी)। (4) मान्यता के लिए राष्ट्रीय मान्यता परिषद (एनएसी)।

इस नए शैक्षिक दृष्टिकोण के अनुसार, शिक्षा मूल्यांकन योजना, प्रशासन को बढ़ाने के लिए प्रौद्योगिकी के उपयोग पर विचारों के मुक्त आदान-प्रदान के लिए एक मंच प्रदान करने के लिए एक स्वायत्त निकाय, राष्ट्रीय शैक्षिक प्रौद्योगिकी मंच (NETF) बनाया जाएगा। साथ ही, छात्रों का मूल्यांकन करने के लिए एक राष्ट्रीय मूल्यांकन केंद्र "PARAKH" बनाया जाएगा। इससे विदेशी विश्वविद्यालयों के लिए भारत में परिसर स्थापित करने का रास्ता साफ हो गया है। राष्ट्रीय पाली, फारसी और प्राकृत संस्थान, भारतीय अनुवाद और व्याख्या संस्थान की स्थापना की जाएगी। साथ ही, शिक्षा क्षेत्र में सार्वजनिक निवेश को जल्द से जल्द सकल राष्ट्रीय आय के 6 प्रतिशत तक बढ़ाने और कुल सकल घरेलू उत्पाद का 6 प्रतिशत शिक्षा पर खर्च करने का लक्ष्य रखा गया है।

नई शिक्षा नीति की मुख्य विशेषताएं:

- नई शिक्षा नीति के कारण केंद्रीय मानव संसाधन विकास मंत्रालय का नाम बदलकर शिक्षा मंत्रालय कर दिया गया है।
- नई शिक्षा नीति के अनुसार, अलग-अलग विषयों को एक साथ पढ़ाया जा सकेगा। इसमें विषयों को मेजर और माइनर में बांटा गया है, जिससे आर्थिक या अन्य कारणों से पढ़ाई छोड़ने वालों की संख्या में कमी आएगी और जो लोग किसी विशेष विषय में रुचि रखते हैं, उन्हें पढ़ाया जा सकेगा।
- बच्चों को पढ़ाते समय एक ही भाषा के माध्यम से पढ़ाते समय विभिन्न क्षेत्रीय भाषाओं का प्रयोग करना संभव नहीं है।
- अब तक स्कूल की संरचना 10+2 थी, जिसे अब बदलकर 5+3+3+4 कर दिया गया है। इसकी संरचना किंडरगार्टन से दूसरी कक्षा, तीसरी से पांचवीं कक्षा, छठी से आठवीं कक्षा तथा नौवीं से बारहवीं कक्षा तक है।
- 3 से 14 वर्ष की आयु के छात्र शिक्षा के अधिकार अधिनियम के दायरे में आ गए हैं। पहले यह आयु वर्ग 6 से 14 वर्ष का था।
- छात्र 9वीं कक्षा से आगे अध्ययन के लिए एक विदेशी भाषा चुन सकते हैं।
- उच्च शोध शिक्षा प्राप्त करने के इच्छुक छात्रों के लिए चार वर्षीय डिग्री पाठ्यक्रम स्थापित किया गया है।
- चार वर्षीय डिग्री प्राप्त करने वाले छात्र एक वर्ष में अपनी स्नातकोत्तर पढ़ाई पूरी कर सकेंगे और पीएचडी में प्रवेश ले सकेंगे।
- पाठ्यक्रम में छात्र द्वारा संचित शैक्षणिक क्रेडिट को डिजिटल रूप से सुरक्षित करने के लिए अकादमिक बैंक क्रेडिट (एबीसी) की आवश्यकता होगी।
- नई शिक्षा नीति कानून और शिक्षा को छोड़कर सभी उच्च शिक्षा को एक छत के नीचे लाएगी।
- सरकार ने 2035 तक कुल नामांकन दर को 50 प्रतिशत तक बढ़ाने का लक्ष्य रखा है। इसके लिए 3.5 करोड़ नई सीटों को मंजूरी दी जाएगी। सरकार का लक्ष्य शिक्षा पर खर्च को कुल राष्ट्रीय आय का 6 प्रतिशत तक बढ़ाना है, जो 2017-18 में केवल 2.7 प्रतिशत था। * सरकार का लक्ष्य 2030 तक या उसके बाद प्रत्येक जिले में कम से कम एक बड़ी बहुभाषी संस्था स्थापित करना है।

- नई शिक्षा नीति के अनुसार प्रमुख विश्वस्तरीय विश्वविद्यालयों को भारत में अपनी शाखाएं खोलने की मंजूरी दी जाएगी।

नई शिक्षा नीति के समक्ष निम्नलिखित चुनौतियाँ हैं:

- हालांकि सरकार ने नई शिक्षा नीति 2020 को मंजूरी दे दी है, लेकिन इसके क्रियान्वयन को लेकर कई चुनौतियाँ हैं। इन्हें इस प्रकार देखा जा सकता है।
- 2017-18 में भारत सरकार ने शिक्षा पर अपने सकल घरेलू उत्पाद का केवल 2.7 प्रतिशत ही खर्च किया था। कोरोना काल में शिक्षा के लिए आरक्षित धन को अन्यत्र स्थानांतरित कर दिया गया। हालाँकि, नई शिक्षा नीति में शिक्षा पर सकल घरेलू उत्पाद का 6 प्रतिशत खर्च करने का लक्ष्य रखा गया है, लेकिन यह चुनौतीपूर्ण लगता है।
- नई शिक्षा नीति में शोध पर जोर दिया गया है। लेकिन 2017-18 में कुल शिक्षा व्यय में से केवल 0.7 प्रतिशत ही शोध पर खर्च किया गया, जबकि चीन में यह 2 प्रतिशत, अमेरिका में 2.8 प्रतिशत और इजराइल में 4.3 प्रतिशत था। इन देशों की तुलना में भारत को अभी भी शोध पर बहुत अधिक खर्च करने की आवश्यकता है।
- वर्ष 2035 तक एकल अंकीय पंजीकरण की संख्या को 50 प्रतिशत तक बढ़ाने का लक्ष्य रखा गया है। वर्तमान में यह दर 26.3 प्रतिशत है। हालांकि लक्ष्य महत्वाकांक्षी है, लेकिन इस शिक्षा नीति में इस लक्ष्य तक पहुंचने की कोई योजना नहीं दिखती।
- वर्तमान में भारत में प्रति एक लाख जनसंख्या पर शोधकर्ताओं की संख्या केवल 15 है। इसमें उल्लेखनीय वृद्धि की आवश्यकता है।
- सरकार का लक्ष्य यूजीसी, एआईसीटीई, एनसीटीई के स्थान पर एक एकल नियामक निकाय को केंद्रीकृत करना है, लेकिन इन निकायों को केंद्रीकृत करना चुनौतीपूर्ण है।

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**INDIAN KNOWLEDGE SYSTEM AND NEP-2020 : RELEVANCE IN THE
COMMERCE AND MANAGEMENT PERSPECTIVE****Dr. Vilas Sadashiv Epper***Associate Professor**Dr Babasaheb Ambedkar Marathwada University, Chatrapati Sambhajinagar*

Abstract:

Indian Knowledge Ocean of knowledge and this knowledge has providing the guidance to all sectors, like Agriculture, Education, Industry, trade and commerce. However IKS is the asset of our ancestors which has the several theories and practical stories which we are using its as president examples. For instance Entrepreneurship which should have the quality of creativity, its develop by the following the theories of Vedas and Upnishad, however the education and knowledge should be developed by teaching learning process. Commerce is the instruments of the nation for development of all other resources, Management is the arts utilize the available resources have human resources, natural resources, capital and so on. With the help of production and management resources convert into the products and services which fulfill the needs and wants of society. In short the Indian Knowledge System has to provide the creativity and new ideas to develop the qualities among the present Entrepreneurs. The source and instruments of Indian Knowledge System is strongly advocates the development managerial principles which as above mentioned fulfill the needs people, village and group of villages, which is now converting into the global market that is “ Local to Global”. Some goods and services are world famous which are produced and manufactured by small and gig patricians from old age, which had the history of Indian Knowledge System. Therefore in this paper researcher has strived to understand the Indian Knowledge System and its importance in the present global era related to commerce and management point of view..

Key Words: Commerce, Management, Entrepreneurship, Indian Knowledge, Rural economy, Global Market, Industry, Granthas, Upanisads, Bhagwat Geeta, self reliant, resilience, sustainable development.

Introduction:

Indian economy just like a tree, which roots are presented by agriculture, stem by industry, branches and leaves by trade and commerce, according to this proverb we can understand the importance of agriculture sector how is its importance. In short India is an agrarian country, this agriculture occupation occupied with 69 % for their livelihood. So the people still lives in rural areas. The industrial sector of India is also depends on agriculture for its raw materials. The

industrial agricultural goods processing sectoris depends on this sector. In short, agriculture business is a very important which plays vital role in the Indian economy, that's why it said that India is an agrarian country. However, it ranks second in agricultural production in the world. All the above are the part of commerce and management. In this paper researcher has attempted to understand the role of Indian knowledge and its relevance in the commerce and management education and its practices to develop the resources of Indian economy.

Historical background of Indian Knowledge System

India has the its old history of knowledge and its civilization has always attached great value to knowledge, witnessits amazingly large body of intellectual texts, the world's largest collection of manuscripts, its attested tradition of texts, thinkers and schools in somany domains of knowledge. In *Shrimad BhagwatGeeta*is the ocean of knowledge and principles of all sectors including business, administration, politics and governance¹.

In Maharashtra Sant Sahitya is another ocean of knowledge, including Sarth Dnyaneshwari Grantha, Saint Tukaram Gatha, Upanishadaswhich is the knowledge with life experienced about common man and human beings. The principles and knowledge explained by our Saint and sages which is the answer of many questions and problems, which is the source of Indian knowledge.

However three terms are closely connected in all discussions of knowledge *Darsana*, *jfiSna*and *vidyS*. *Dariana*, philosophy is the "system," the point ofview, which yields/leads to *jfi&na*, knowledge. When knowledge gatheredabout a particular domain is organized and systematized for purposes of,say, reflection and pedagogy, it is called *vidys*, "discipline." The entire body of organized knowledge is divided into two sets in the *Mundakopanisad*—*pars vidys*and *aparavidys* (*Mundakopanisad*, 1.1.4), knowledge of the ultimateprinciple, *paramtma*or *Brahman*. Seeing with"mind's eye" is the typical epistemology of Indian thought. The Jaina thinkers,interestingly, define perception as *Htma-pratyaksa*— what is present to theinner self and not as what is present to the senses. To put it in contemporaryvocabulary, Indian mind has depended more on hypothetical-deductivemethodology than on observational inductive methodology².

Objectives of the study.

1. To understand the Indian knowledge system related to trade, commerce and management,
2. To the study of role of commerce and its needs in Indian economy on the global level,
3. To the study of various sectors where the needs to develop trade and international trade,
4. To the study of Indian knowledge to develop the international relation,
5. To the study of problems and challenges of trade and commerce and find the remedies.

Research Methodology.

Being this study is descriptive nature, it has been studied the Indian knowledge system with conceptually and for the purpose of this paper secondary data and information has been collected from the books, internet, website, and the research papers has been reviewed in this

regard. However the ocean of Indian knowledge system is our intellectual property, it has includes, Vedas, Upnishad, Shrimad BhagvatGita, Economics of Kautilya, and such many books and Granthas.

Social Organization of Knowledge in India

Indian knowledge is legacy in many areas in the Indian society and its great values in related to many subjects like such as Medicine, Arithmetic, Agriculture, Grammar, Language, Dance, Music and Astrology, to name just a few, there is wide and extensive knowledge both at the level of the classical texts and the folk traditions. Quite commonly, they are referred to as *iRstra* and *lokaparampari* respectively. This is a significant feature of knowledge formation in India and perhaps no major civilization other than the Chinese has this aspect³.

Indigenous Health Traditions.

Home remedies and cures for common ailments, Knowledge and beliefs regarding foods, Folklore on health, Individuals /families specializing in the treatment of specific diseases, e.g., jaundice, asthma. Knowledge of diagnostic procedures, Knowledge of preventive measures. Knowledge of *rtucaryU* or adaptation of food and regimen to suit the seasons, *Yoga* and other physical cultural practices of a preventive and promotive nature. Special areas such as bone setting, *visa-cikitsU* (treatment for poisons), *paftcakarma* (five purificatory procedures)⁴, etc

Agriculture sector Food security and self reliant villages trade.

Agro sector has providing the foods and vegetables to huge population of our country. The IKS has been providing the old and qualitative and organic foods and vegetables not only to Indian people but also many agro produces to the world. The turmeric has the medicine qualities exported to many country, Grapes, banana, cotton and many such produces has been exported. IKS promotes antrading mindset, creativity, and innovation among the people inspiring them to increase the trade and provide employment opportunities to the rural people. However in the olden days the villages system was self reliant, the people of villages fulfill their basic needs at the local villages. There were bartering system, both consumers have the needs and want to consume the goods. Some time or at weekly some villagers come together at the particular place to exchange their goods, that call as weekly market. Maximum goods are manufactured, produced at the village level by the small artisans. They fulfill the needs of agriculture activities, such artisans traditionally called “Bara Balutedar”, “AtharaPagad Jati”, closely related to each other, there is very good and amicable atmosphere and social environment the old village system, and self reliant nature, and the source of guideline and the knowledge in the Indian knowledge system.

Development of Trade and Commerce and Indian knowledge system

To express the importance of IKS in development of trade in a significant move, India is embarking on a transformational journey to restructure its education system based on the country's rich knowledge traditions, as emphasized by RSS leader Indresh Kumar in Greater Noida in one

program. Kumar highlighted the importance of the Indian knowledge system in inculcating an entrepreneurial mindset in students, encouraging them to take risks, embrace innovation, and become creators rather than mere job-seekers.⁵

Reviving Ancient Traditions and Knowledge

The concept of the Indian knowledge system has gained significant momentum in recent years, with a focus on reviving the ancient traditions and knowledge of India. During an event at the Sharda University, Kumar, a national executive member of the RSS, emphasized the inclusion of tribal knowledge, indigenous and traditional ways of learning, as well as various fields such as mathematics, astronomy, philosophy, yoga, architecture, medicine, agriculture, engineering, linguistics, literature, sports, governance, politics, and conservation under the NEP⁶.

By embracing the wisdom of the past and integrating it with contemporary advancements, India is poised to make significant strides in fostering innovation, entrepreneurship, and well-rounded individuals who can contribute to the nation's progress and global competitiveness⁷.

Trade and Commerce Development needs of today's.

Tremendous resources are available in India, due to the apathetic role of people, policy makers, and due to the more bribery or corruption system we are lagging the behind in the many ways,.

However our old knowledge system has the answer and solution to many questions, which provide the self reliant system. Now a there is the cut throat competition, each and every business man has the strive to obtain the profit, its means there is only profit making objects, which exploit the customers economically, particularly the big business and multinational companies, eventually the trend of capitalism has increasing which is cause to uneven development and emerging the two classes in the economy. However it is necessary to develop the entrepreneurship and small and cottage industries which will provide the employment opportunities.

IKS & Commerce and Management

However from the beginning trade was the instrument of develop the economy of county of all nation of the world. Developed countries always try to their trade to other undeveloped and developing countries. Through the trade developed countries are providing the helop to poor country and develop their international trade. Following some points are give the importance of IKS, AI, and Resilience for a Sustainable Future"related toCommerce and Managementpractices in the present era.

1. Commerce & Management by NEP 2020.
- 1) NEP 2020 emphasizes multidisciplinary education, integrating traditional Indian economic principles with modern management.
- 2) Arthashastraprovide insights into strategic management, ethics, and governance.

- 3) Ancient trade practices, including the guild system (Shreni), barter economy, and sustainable business models, are being re-evaluated in modern business education.
2. AI and Indian Knowledge in Business & Economy
 - 1) AI-driven financial analytics can enhance traditional economic models from Chanakya's Arthashastra.
 - 2) AI-powered supply chain management can incorporate principles from ancient Indian logistics systems (e.g., temple economy, maritime trade).
 - 3) Ethical finance from Indian traditions can shape sustainable banking, microfinance, and fintech solutions.
3. Ethical AI and Indian Management Thought
 - 1) AI needs ethical frameworks, which Indian philosophy (Bhagavad Gita, Upanishads) provides for responsible business decision-making.
 - 2) Dharma-based leadership can guide corporate social responsibility (CSR) and sustainability.
 - 3) "VasudhaivaKutumbakam" aligns with globalization, inclusive growth, and ethical AI in business.
4. Resilience in Business through IKS and AI
 - 1) Yoga and mindfulness can improve corporate resilience and leadership effectiveness.
 - 2) Sustainable entrepreneurship inspired by traditional Indian economic wisdom can promote social impact businesses.
 - 3) AI-driven risk management models can integrate ancient Indian crisis management strategies.
5. Sustainable Business Practices with IKS & AI
 - 1) AI in sustainable finance can enhance traditional ethical banking principles like Sudhi banking (interest-free lending).
 - 2) Circular economy concepts from ancient Indian trade practices can help in modern waste management and green business models.
 - 3) Traditional agricultural financing (Hundi system) can inspire modern fintech solutions.

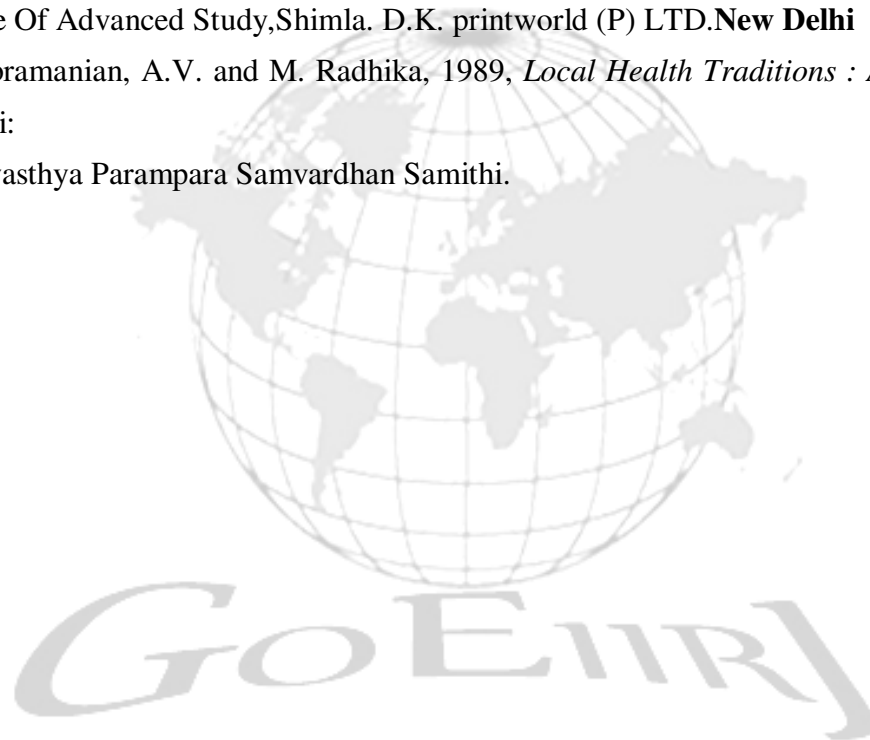
Conclusion.

IKS and AI together can revolutionize commerce and management, making them more ethical, sustainable, and resilient. Ancient wisdom and modern technology must be integrated into business education and leadership. NEP 2020 provides an opportunity to blend tradition with innovation for a sustainable economic future. Marketing development is most important in the agricultural and rural economy as well as in corporate sector which has provide avenue to utilize the available resources, its help to employment opportunities to rural people, the excess load of

human force divert to allied sectors, it will be help to increase the income of the rural people. However in india its witness that the Indian economy was developed in the olden days due to the great knowledge and technology, which maintain the sustainable development and maintain the self reliant economy.

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राष्ट्रीय शिक्षा नीति 2020 और इस नीति में डिजिटल शिक्षा और प्रौद्योगिकी का उपयोग

डॉ. संजय एम मराठे

प्राचार्य

वेस्ट खान्देश भगिनी सेवा मंडळलांचे

शिक्षण शास्त्र महिला महाविद्यालय, नंदुरबार

प्रस्तावना

ज्ञान के मामले में दुनिया तेजी से बदल रही है। बिग डेटा, मशीन लर्निंग, आर्टिफिशियल इंटेलिजेंस जैसे विज्ञान और प्रौद्योगिकी के क्षेत्रों में तेजी से विकास के साथ, दुनिया भर में अकुशल नौकरियां अब मनुष्यों के बजाय मशीनों द्वारा की जा सकती हैं। साथ ही, विशेष रूप से गणित, कंप्यूटर विज्ञान और डेटा विज्ञान में कुशल श्रमिकों के साथ-साथ विज्ञान, सामाजिक विज्ञान और मानविकी में बहु-विषयक क्षमताओं वाले कुशल श्रमिकों की मांग भी बढ़ेगी।

25 जुलाई 2020 को हुई केंद्रीय कैबिनेट की बैठक में नई शिक्षा व्यवस्था को मंजूरी दी गई और आखिरकार 34 साल बाद देश की शिक्षा व्यवस्था में बड़े बदलाव किए गए हैं। मानव संसाधन विकास मंत्रालय से डॉ. कस्तूरिरंगन की अध्यक्षता में नई शिक्षा नीति का मसौदा तैयार किया गया किया गया यह भारत की अब तक की तीसरी शिक्षा नीति है।

नई शिक्षा नीति के महत्वपूर्ण मुद्दे

- 1) नई राष्ट्रीय शिक्षा नीति 2020 का अंतिम लक्ष्य भारत को वैश्विक ज्ञान महाशक्ति बनाना है
- 2) जनशक्ति विकास मंत्रालय का नाम बदलकर शिक्षा मंत्रालय कर दिया गया, जो 1647 में आजादी के बाद भारत में शिक्षा प्रणाली में तीसरा बड़ा बदलाव था।
- 3) यह सुनिश्चित करना कि प्रत्येक छात्र बुनियादी साक्षरता और प्रौद्योगिकी प्राप्त करे।
- 4) नई शिक्षा नीति के अनुसार कक्षा 5 तक की शिक्षा मातृभाषा में उपलब्ध कराने को प्राथमिकता दी जाएगी।

वोकेशनल कोर्स 6वीं कक्षा से सीखे जा सकते हैं, जिसमें छात्र बर्द्ध(कारपेंटर), लॉन्ड्री, क्राफ्ट जैसे विषयों में इंटर्नशिप कर सकते हैं। नए ड्राफ्ट के मुताबिक छात्र कला और विज्ञान की शाखाओं में से कुछ विषय चुनकर डिग्री की पढ़ाई कर सकेंगे।

नई राष्ट्रीय शिक्षा नीति 2020 से पहले 1968 और 1866 में शिक्षा प्रणाली में सुधार किया गया था। अभी तक स्कूली शिक्षा की संरचना 10+2 थी, लेकिन 5+3+3+4 की नई शिक्षा प्रणाली प्रस्तावित की गई है। बोर्ड परीक्षाओं का महत्व कम किया जाएगा और परीक्षाएं वर्ष में दो बार आयोजित की जाएंगी। यह परीक्षा सेमेस्टर पैटर्न में आयोजित की जाएगी। इससे छात्रों पर सही अंक लाने का दबाव कम हो जाएगा, क्योंकि रटने की कोई गुंजाइश नहीं होगी।

पहली से 12वीं कक्षा तक पढ़ाई के दौरान विद्यार्थियों के रिपोर्ट कार्ड पर अंक, ग्रेड और शिक्षक की टिप्पणी का कोई उल्लेख नहीं होगा। विद्यार्थी ने शिक्षा के अलावा क्या सीखा है, इसका भी उल्लेख किया जा सकता है। नये मसौदे के अनुसार, छात्र कला और विज्ञान की शाखाओं से कुछ विषय चुनकर डिग्री की

पढ़ाई कर सकेंगे। इसमें मानविकी, विज्ञान, कला, खेल और व्यावसायिक पाठ्यक्रम जैसे विकल्प शामिल होंगे।

स्नातक की पढ़ाई में छात्र 4 साल तक पढ़ाई करेंगे, अब पीएचडी की पढ़ाई 5 की जगह 4 साल में पूरी की जा सकेगी। नये ढांचे में, डी. U-G-C ने हाल ही में घोषणा की है कि M-Phill को बंद कर दिया गया है, जिसमें पाठ्यक्रम को बंद करने का प्रावधान है।

तकनीकी ज्ञान के मामले में दुनिया तेजी से बदल रही है। विज्ञान और प्रौद्योगिकी के क्षेत्र, जैसे कि बिग डेटा, मशीन लर्निंग और कृत्रिम बुद्धिमत्ता, तेजी से बदल रहे हैं। जब तक हम विद्यार्थियों को नया ज्ञान खोजने का कौशल, नवाचार करने का कौशल और बौद्धिक संपदा के अधिकार नहीं सिखाते, हमें उन्हें पारंपरिक तरीकों के बजाय कंप्यूटर आधारित तरीकों से पढ़ाने की जरूरत है।

कोविड-19 महामारी अचानक फैली और रुकी नहीं है, तथा इसकी दर बढ़ती ही जा रही है। कोविड काल में ऑनलाइन शिक्षा उपलब्ध करानी पड़ी। छात्रों को गूगल क्लासरूम के माध्यम से नोट्स देने थे। छात्र कम लागत पर वड-सपदम पाठ्यक्रम लेने में सक्षम थे।

अध्ययन के उद्देश्य:-

- 1 सभी के लिए गुणवत्तापूर्ण शिक्षा प्रदान करने की वर्तमान और भविष्य की चुनौतियों का सामना करने के लिए, मौजूदा डिजिटल प्लेटफार्मों और उन पर आधारित शैक्षिक पहलों को उन्नत और विस्तारित करने की आवश्यकता होगी।
- 2 ऑनलाइन डिजिटल शिक्षा. छात्रों के एकीकृत और व्यापक विकास के लिए प्रौद्योगिकी का उपयोग एक तकनीकी आवश्यकता है।
- 3 छात्रों को नई राष्ट्रीय शिक्षा नीति के तहत अध्ययन करके बेरोजगारी दर को कम करना चाहिए। यह परिवर्तन हम सभी के लिए नया है, लेकिन इसके साथ गुणवत्तापूर्ण, व्यापक शिक्षा और तकनीकी शिक्षा भी होनी चाहिए।

तथ्य संकलन

इस शोध पत्र में सम्पूर्ण डेटा संग्रह द्वितीयक डेटा से एकत्र किया गया है।

सभी को गुणवत्तापूर्ण शिक्षा प्रदान करके वर्तमान और भविष्य की चुनौतियों का सामना करने के लिए शिक्षकों को ऑनलाइन डिजिटल प्लेटफार्मों पर आईसीटी-आधारित शैक्षिक गतिविधियों की गुणवत्ता बढ़ाने के लिए प्रशिक्षित और प्रोत्साहित करने की आवश्यकता होगी। प्रभावी ऑनलाइन शिक्षण प्रदान करने के लिए शिक्षकों को उचित प्रशिक्षण और विकास की आवश्यकता है। यह नहीं माना जा सकता कि पारंपरिक कक्षा में अच्छा शिक्षक स्वतः ही ऑनलाइन कक्षा में भी अच्छा शिक्षक हो जाएगा।

शिक्षण पद्धति में आवश्यक बदलाव के अलावा ऑनलाइन मूल्यांकन भी आवश्यक है। शिक्षकों को उच्च गुणवत्ता वाली ऑनलाइन सामग्री तैयार करने के लिए ऑनलाइन शिक्षण प्लेटफार्मों और उपकरणों का उपयोग करने के बारे में कठोर प्रशिक्षण दिया जाएगा।

A) वर्चुअल लैब-

स्वयंप्रभा या स्वयंदिवा जैसे ई-लर्निंग प्लेटफॉर्म का उपयोग सभी छात्रों को गुणवत्तापूर्ण व्यावहारिक और व्यावहारिक शिक्षा प्रदान करने के लिए किया जाएगा। एसईडीजी के छात्रों और शिक्षकों को प्री-लोडेड

टैब जैसे उपयुक्त डिजिटल उपकरणों के माध्यम से पर्याप्त सुविधाएं उपलब्ध कराई जाएंगी।

B) ऑनलाइन शिक्षा के लिए पायलट अध्ययन-

पायलट अध्ययनों की एक श्रृंखला आयोजित करने के लिए NETE, CIET, NIOS, IGNOU, IITS, NITS जैसे उपयुक्त संस्थानों की पहचान की जाएगी। इन पायलट अध्ययनों के परिणामों को सार्वजनिक किया जाएगा और निरंतर सुधार के लिए उपयोग किया जाएगा।

C) डिजिटल बुनियादी ढांचा-

भारत के बड़े आकार, विविधता, जटिलता और उपकरणों की उपलब्धता के कारण शिक्षा क्षेत्र में निवेश की आवश्यकता है, ताकि एक खुला, अंतर-संचालनीय, मापनीय, सार्वजनिक डिजिटल बुनियादी ढांचा तैयार किया जा सके, जिसका उपयोग कई प्लेटफॉर्मों पर और विशिष्ट समाधानों के साथ किया जा सके।

D) ऑनलाइन शिक्षण प्लेटफॉर्म और उपकरण।

ऑनलाइन शिक्षण प्लेटफॉर्म और उपकरण आधुनिक शिक्षा प्रणाली में महत्वपूर्ण भूमिका निभा रहे हैं, विशेषकर राष्ट्रीय शिक्षा नीति 2020 के तहत डिजिटल शिक्षा और प्रौद्योगिकी के उपयोग को बढ़ावा देने के संदर्भ में। यहाँ कुछ प्रमुख ऑनलाइन शिक्षण प्लेटफॉर्म और उपकरणों की जानकारी दी गई है गूगल क्लासरूम,कहूट! (Kahoot!),ज़ूम (Zoom),क्लासडोजो (ClassDojo)व फ्लिपग्रिड (Flipgrid)

E) सामग्री निर्माण, डिजिटल संग्रह और प्रसार:

राष्ट्रीय शिक्षा नीति 2020 (NEP 2020) में डिजिटल शिक्षा को सशक्त बनाने के लिए सामग्री निर्माण, डिजिटल संग्रहण और प्रसार पर विशेष ध्यान दिया गया है। इसका उद्देश्य शिक्षण और सीखने की प्रक्रिया को अधिक सुलभ, समावेशी और प्रभावी बनाना है।

मुख्य प्रावधान:

1. डिजिटल सामग्री निर्माण:

○ शिक्षकों और छात्रों के लिए उच्च गुणवत्ता वाली डिजिटल सामग्री विकसित करने हेतु निवेश को प्रोत्साहित किया गया है। यह सामग्री विभिन्न विषयों और कक्षाओं के अनुरूप होगी, जिससे सीखने की प्रक्रिया समृद्ध हो सके।

2. डिजिटल संग्रहण:

○ निर्मित सामग्री को सुरक्षित और सुव्यवस्थित रूप से संग्रहित करने के लिए डिजिटल रिपॉजिटरी की स्थापना की जाएगी। यह संग्रहण प्रणाली शिक्षकों और छात्रों को आवश्यक सामग्री तक आसानी से पहुँच प्रदान करेगी।

3. सामग्री का प्रसार:

○ विभिन्न माध्यमों से डिजिटल सामग्री का व्यापक प्रसार सुनिश्चित किया जाएगा, ताकि अधिक से अधिक शिक्षार्थी इसका लाभ उठा सकें। इसमें ऑनलाइन प्लेटफॉर्म, मोबाइल एप्लिकेशन और अन्य डिजिटल चैनल शामिल हैं।

4. प्रौद्योगिकी इकाई का गठन:

○ डिजिटल अवसंरचना, सामग्री निर्माण और क्षमता निर्माण के समन्वय के लिए एक समर्पित प्रौद्योगिकी इकाई का विकास किया जाएगा। यह इकाई डिजिटल शिक्षा संसाधनों के विकास में महत्वपूर्ण

भूमिका निभाएगी।

5. राष्ट्रीय शैक्षिक प्रौद्योगिकी मंच (NETF):

○ शिक्षण, मूल्यांकन, योजना और प्रशासन में प्रौद्योगिकी के उपयोग को बढ़ावा देने के लिए एक स्वायत्त निकाय के रूप में NETF की स्थापना की जाएगी। यह मंच शिक्षकों को नवीनतम तकनीकों और उपकरणों के बारे में जानकारी प्रदान करेगा।

इन प्रावधानों के माध्यम से, NEP 2020 का उद्देश्य डिजिटल शिक्षा को बढ़ावा देना और शिक्षण प्रक्रिया को आधुनिक तकनीकों के साथ एकीकृत करना है, जिससे शिक्षार्थियों को गुणवत्तापूर्ण शिक्षा सुलभ हो सके।

डिजिटल शिक्षा और प्रौद्योगिकी का उपयोग

राष्ट्रीय शिक्षा नीति 2020 डिजिटल शिक्षा और प्रौद्योगिकी के उपयोग पर विशेष ध्यान देती है ताकि शिक्षा को अधिक प्रभावी, सुलभ और आधुनिक बनाया जा सके।

१ **ऑनलाइन और डिजिटल शिक्षा का विस्तार** राष्ट्रीय शैक्षिक प्रौद्योगिकी फोरम (NETF) की स्थापना की जाएगी, जो डिजिटल शिक्षा को बढ़ावा देने और ऑनलाइन शिक्षा में नवाचारों पर कार्य करेगा। ई-लर्निंग प्लेटफॉर्म जैसे SWAYAM, DIKSHA, e-PG Pathshala आदि का विस्तार किया जाएगा। उच्च शिक्षा संस्थानों में ऑनलाइन डिग्री कार्यक्रमों को मान्यता दी गई है।

२ **स्कूलों में डिजिटल शिक्षा का समावेश:**

अ) **ICT (सूचना एवं संचार प्रौद्योगिकी) आधारित शिक्षा** को बढ़ावा देने के लिए स्मार्ट क्लासरूम और डिजिटल उपकरणों का उपयोग किया जाएगा।

ब) **DIKSHA** पोर्टल शिक्षकों और छात्रों के लिए ऑनलाइन संसाधन उपलब्ध कराएगा।

क) **विद्यांजलि योजना** के तहत डिजिटल संसाधनों को साझा करने पर जोर दिया गया है।

3. **बहुभाषीय डिजिटल शिक्षा**

अ) ऑनलाइन पाठ्यक्रम और डिजिटल सामग्री को बहुभाषीय बनाने की दिशा में कार्य किया जाएगा ताकि क्षेत्रीय भाषाओं में भी गुणवत्तापूर्ण शिक्षा उपलब्ध हो सके।

ब) **आर्टिफिशियल इंटेलिजेंस (AI)** और **मशीन लर्निंग (ML)** जैसी तकनीकों का उपयोग अनुवाद और शिक्षा सामग्री के अनुकूलन में किया जाएगा।

4. **समावेशी और सुलभ डिजिटल शिक्षा**

अ) ग्रामीण और दूरदराज के क्षेत्रों के छात्रों के लिए ऑफलाइन और ऑनलाइन शिक्षा का मिश्रण (ब्लेंडेड लर्निंग) उपलब्ध कराया जाएगा।

ब) रेडियो, टेलीविजन और मोबाइल ऐपके माध्यम से शिक्षा सामग्री को अधिक से अधिक छात्रों तक पहुंचाने की योजना बनाई गई है।

5. **उच्च शिक्षा और अनुसंधान में प्रौद्योगिकी का उपयोग**

अ) उच्च शिक्षा में वर्चुअल लैब्स और सिमुलेशन टेक्नोलॉजी का उपयोग बढ़ाया जाएगा।

ब) डेटा एनालिटिक्स और बिग डेटा का उपयोग करके शिक्षा प्रणाली को अधिक प्रभावी बनाया जाएगा।

क) ऑनलाइन असेसमेंट और परीक्षा प्रणाली को विकसित किया जाएगा।

निष्कर्ष:

- १) शिक्षा के सभी स्तरों/पाठ्यक्रम में समावेशन
- २) बहुभाषिकता और विभिन्न भाषाओं में शिक्षण और सीखने की शक्ति को बढ़ावा देना
- ३) कौशल और नई पहल: सीखने के कौशल की कमी के कारण आधुनिक अर्थों में शिक्षा अधूरी रह जाती है।
- ४) भारत में उच्च एवं तकनीकी शिक्षा में सुधार जितना जरूरी कोई सुधार नहीं है।
- ५) राष्ट्रीय शिक्षा नीति 2020 डिजिटल शिक्षा और प्रौद्योगिकी के उपयोग को प्राथमिकता देती है ताकि शिक्षा को अधिक सुलभ, लचीला और प्रभावी बनाया जा सके। यह नीति विशेष रूप से ऑनलाइन शिक्षा, डिजिटल संसाधनों, बहुभाषीय शिक्षा और स्मार्ट कक्षाओं को बढ़ावा देकर भारत की शिक्षा प्रणाली को एक नए आयाम तक ले जाने में सहायक होगी।

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4. नई शिक्षा नीति: अब छात्र केमिस्ट्री के साथ संगीत, फिजिक्स के साथ फैशन डिजाइनिंग की पढ़ाई भी कर सकेंगे। आज तक.30 जुलाई 2020
5. नई शिक्षा नीति से शिक्षा व्यवस्था में कितना बदलाव आएगा?जानिए क्या कहते हैं विशेषज्ञ. आज तक. 31 जुलाई 2020

भारतीय ज्ञान परंपरेतील बौद्धकालीन धम्म विषयकविचार व त्याचा आजच्या काळातील समाजासाठी

उपयोग

डॉ. विजय जनार्दन चव्हाण

एस.एन.डी.टी शिक्षणशास्त्र महाविद्यालय, पुणे

And

डॉ. संध्या विजय चव्हाण

एस.एन.टी. कॉलेज ऑफ एज्युकेशन, भोर

भगवान बुद्धाच्या धम्म शिक्षेच्या योजनेत धम्म शिक्षेचे दोन अर्थ प्राप्त होतात. एक संघ या अर्थाने ज्या मध्ये भिखू वर्गाचा सभासद होणे अपेक्षित मानले आहे. दुसरा अर्थ आहे सामान्य अनुयायी किंवा उपासक.

बुद्धांनी आपल्या धम्मात स्वतःसाठी विशेष स्थान राखलेले नाही. बुद्धांनी मोक्ष दानाचे आश्वासन दिलेले नाही. बुद्ध म्हणतात मी मार्गदाता आहे मोक्षदाता नाही. धर्म हा वैयक्तिक असून ज्याने त्याने तो स्वतः पुरताच मर्यादित ठेवावा. सार्वजनिक जीवनात त्याला अवसर देवू नये. धम्म हा सामाजिक आहे मुलतः व तत्त्वतः तो सामाजिक आहे.. धम्म म्हणजे सदाचार म्हणजेच जीवनाच्या सर्व क्षेत्रात माणसा माणसातील व्यवहार उचित असणे होय. मनुष्य एकटा असला तरी तरी त्याला धम्माची गरज आहे. समाज धम्माशिवाय राहू शकत नाही. प्रज्ञा म्हणजे निर्मल बुद्धी खुळ्या समजुतीला जागा राहू नये म्हणून बुद्धांनी प्रज्ञेला आपल्या धम्माच्या दोन कोनशीला पैकी एका कोनशीलाला इतके महत्त्व दिले आहे.

प्रज्ञा आणि करुणेचे अपूर्व मिश्रण म्हणजेच भगवान बुद्धाचा धम्म होय. भगवान बुद्धाच्या नुसार धम्मा नुसार जो आपले आचरण करतो तो आपल्या दुःखाचा परिहार करू शकतो. धर्म आणि नीति या बाबत बुद्धांनी म्हटले आहे की वस्तुतः धर्मात नीतीला स्थान नाही. धर्माचे विषय म्हणजे देव, आत्मा, प्रार्थना, कर्मकांड, विधी एका माणसाचा दुसऱ्या माणसाशी संबंध येतो तेव्हा नीतीला प्रारंभ होतो. शांती आणि सुव्यवस्था राखण्यासाठी धर्मात नीतीचा समावेश होतो. या बरोबरच बुद्धांनी शील मार्गाचाही विचार मांडला बुद्धांनी परिव्रजकांना शीलमार्ग तथा सद्गुणाचा मार्ग समजावून सांगितला आहे.

बुद्धांनी जीवन विषयक विचार पुढील प्रमाणे मांडला आहे.

१	शील	६	शांती
२	दान	७	सत्य
३	उपेक्षा	८	अधिष्ठान
४	नैशक्रम	९	करुणा
५	वीर्य	१०	मैत्री

स्वार्थाची किंवा परतफेडीची अपेक्षा न करता दुसऱ्या च्या भल्यासाठी मालमत्ता, रक्त, आणि देह अर्पण करणे म्हणजे दान.

शांती बाबतचा विचार म्हणजे क्षमाशीलता म्हणजे द्वेषाला द्वेषाने उत्तर न देणे.

या साठी बुद्धांनी अष्टांगिक मार्गातील काही घटक सांगितले आहेत ते पुढील प्रमाणे आहेत.

- १) सम्यक दृष्टी चे महत्त्व सांगताना बुद्ध म्हणतात जग हे अंधार कोठडी असून मनुष्य तिच्यातील एक कैदी आहे.
- २) सम्यक संकल्प : अविद्या नष्ट करण्याचा प्राथमिक प्रयत्न होय.
- ३) सम्यक वाचा : माणसाने जे सत्य असेल तेच करावे
- ४) सम्यक कर्मात : दुसऱ्यांच्या भावना आणि त्यांचे हक्क याचा मान राखून प्रत्येक कृती करावी अशी यांची शिकवण आहे.
- ५) सम्यक आजीविका
- ६) सम्यक व्यायाम : अविद्या नष्ट करण्याचा प्राथमिक प्रयत्न होय.
- ७) सम्यक स्मृती : मनाची सतत जागृती होय .दुष्ट वासनांवरमनाचा पहारा ठेवणे होय.
- ८) सम्यक समाधी : लोभ, द्वेष ,आळस,सुस्ती,संशय,आणि अनिश्चय हे पाच अडथळे होत.हे अडथळे दूर करणे आवश्यक आहे. हे अडथळे दूर करण्याचा मार्ग समाधी हा होय.

बुद्धांनी आपल्या पहिल्या प्रवचनात जीवना बाबतची आत्यंतिक दोन टोके आहेत असे म्हटले आहे.

- १) सुखोपभोगाचा मार्ग - खा प्या मजा करा कारण उद्या आपण असणार नाही.
- २) आत्मक्लेशाचा मार्ग -सर्व वासना मारून टाका कारण त्या पुनर्जन्माचे मूळ आहेत.
हे दोन्ही मार्ग बुद्धांनी नाकारले आहेत.

परिव्रजकांनी आपला धम्म समजावून सांगण्याची विनंती केली ती बुद्धांनी मान्य केली त्यांनी प्रथम विशुद्धी मार्ग समजावून सांगितला. तो पुढील प्रमाणे आहे.

प्राण्यांची हत्या न करणे,चोरी न करणे ,व्यभिचार न करणे ,असत्य न बोलणे , मादक पेय ग्रहण न करणे.

बौद्धकालीन विचार आत्मसात केल्यामुळे आजच्या काळातील समाजासाठी पुढील गोष्टींचा जीवनात उपयोग होईल.

- चिंता आणि निराशा यांना सकारात्मक दृष्टिने विचार करून सामोरे जाता येते.
- ताणतणावाचे चांगले व्यवस्थापन करता येते.
- बौद्ध तत्वज्ञानामुळे आत्मविश्वास आणि आत्म जागृकता निर्माण करता येते.
- समानुभूती वाढते आणि आंतरिक शांततेची भावना निर्माण करता येते.
- वर्तमानावर लक्ष केंद्रित करून मन शांत होण्यास मदद होते.
- व्यसनाधीनते पासून मुक्तता होण्यास मदद होते.
- स्वतःच्या आणि इतरांबद्दल दयेची,करुणेची,क्षमा,संहिष्णुतेची भावना निर्माण होते.

संदर्भ :

- १) भगवान बुद्ध आणि त्यांचा धम्म - डॉ.बी .आर आंबेडकर बुधिष्ट रिसर्च असोसियेशन,नांदेड
- २) शांतता शिक्षण - शैलजा भंगाळे प्रशांत प्रकाशन जळगाव

FLIPPED LEARNING IN SCIENCE EDUCATION: A PEDAGOGICAL INNOVATION FOR ENHANCED STUDENT ENGAGEMENT AND ACHIEVEMENT

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Abstract:

Flipped learning represents a significant innovation in science education, addressing the limitations of traditional lecture-based methods by creating a student-centred, active learning environment. This paper examines the flipped classroom model, which redistributes content delivery to pre-class activities, enabling classroom time for collaborative, inquiry-based learning. Drawing on theoretical frameworks like constructivism, active learning, and cognitive load theory, the paper highlights the pedagogical strengths of flipped learning, including personalized learning, enhanced engagement, improved concept retention, and strengthened teacher-student interactions. The potential of digital tools such as simulations, video lectures, and discussion forums in enriching the learning process is explored. However, the study also identifies challenges, such as technology accessibility, teacher training, and content development requiring strategic interventions. Ultimately, the paper emphasizes flipped learning's transformative potential in revolutionizing science education while recommending further research to address its limitations and optimize its integration across diverse educational contexts.

Keywords: Flipped Learning, Science Education, Active Learning, Student Engagement, Digital Education, Pedagogical Innovation, 21st-Century Learning, Digital Learning.

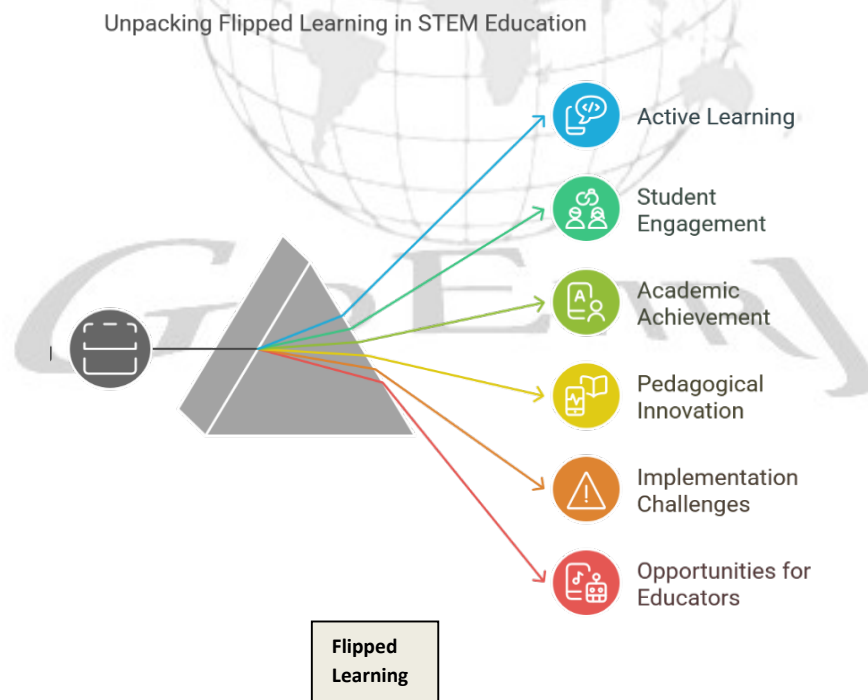
Introduction

The steady decline in student interest in Science, Technology, Engineering, and Mathematics (STEM) fields has become a matter of global concern, prompting the urgent need for innovative, active learning strategies. Traditional lecture-based instructional methods often fail to engage learners effectively, particularly in science education where interactive and experiential learning plays a critical role in fostering understanding and critical thinking. These conventional approaches, while historically dominant, are increasingly misaligned with the demands of 21st-century education, which calls for pedagogical methods that develop not only academic proficiency but also collaborative and analytical skills essential for modern problem-solving.

In this context, flipped learning has emerged as a transformative pedagogical innovation that reimagines the teaching-learning process. Rooted in active, student-centred learning, the flipped

classroom model shifts content delivery outside the classroom through digital and multimedia resources, thereby liberating in-class time for more interactive and application-based activities. This model promotes deeper engagement by encouraging students to engage with content at their own pace before participating in collaborative and experiential learning environments during class. Flipped learning aligns with the evolving needs of contemporary science education, where the focus has expanded from mere content dissemination to developing inquiry-driven, lifelong learners.

The purpose of this study is to explore the potential of flipped learning in enhancing student engagement and academic achievement in science education. By analysing existing research and theoretical frameworks, this study seeks to elucidate the mechanisms by which flipped learning fosters a dynamic and inclusive learning environment. Additionally, it aims to identify the opportunities and challenges associated with its implementation, to provide insights for educators and policymakers to optimize its use in science education. Through this analysis, the study contributes to the broader discourse on pedagogical innovations that address declining interest in STEM fields and promote sustainable educational practices.

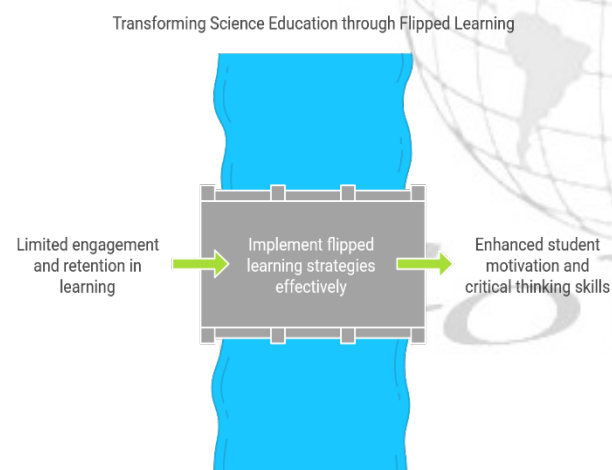


Concept of Flipped Learning

The flipped classroom model represents a pedagogical shift that transforms the traditional instructional approach by redistributing the locus of content delivery and application. In this model, the learning process is divided into three distinct phases: pre-class learning, in-class activities, and post-class reinforcement. During the pre-class phase, students engage with instructional materials such as video lectures, digital readings, or interactive simulations to familiarize themselves with fundamental concepts. This asynchronous mode allows learners to

absorb content at their own pace and revisit materials as needed, accommodating diverse learning preferences. The in-class phase capitalizes on this pre-acquired foundational knowledge by focusing on active learning strategies, including collaborative problem-solving, hands-on experiments, and group discussions. Teachers assume the role of facilitators, guiding students through higher-order cognitive tasks and providing individualized support. Finally, the post-class phase involves reinforcement activities such as reflective assignments, quizzes, or extended projects to consolidate understanding and encourage deeper application of knowledge.

Digital technology lies at the heart of flipped learning, enabling its seamless implementation and broad accessibility. Platforms offering video lectures, multimedia content, and interactive tools play a pivotal role in enriching the pre-class learning experience. These digital resources are often designed to incorporate visual, auditory, and kinaesthetic elements, catering to varied learning modalities. Additionally, tools such as online discussion forums, virtual whiteboards, and real-time polling during class sessions enhance engagement and facilitate collaborative learning. The use of analytics in digital platforms further supports educators in monitoring student progress and tailoring instruction to meet individual needs.



Compared to traditional lecture-based teaching, the flipped model offers several advantages. Traditional classrooms are often teacher-centric, where the primary focus is on content delivery through lectures, leaving limited time for interaction and application. Conversely, flipped learning prioritizes student agency and allocates class time for active engagement, critical thinking, and problem-solving. This approach aligns with contemporary educational goals that

emphasize not only knowledge acquisition but also the development of skills essential for lifelong learning. While the traditional model remains effective for large-scale dissemination of information, its limitations in fostering deeper learning and engagement highlight the growing relevance of flipped learning as a transformative educational strategy.

Theoretical Framework

Flipped learning is rooted in constructivist and active learning theories, which advocate for learner-centred approaches where students actively construct their knowledge through exploration and interaction. Constructivism, as proposed by theorists like Piaget and Vygotsky, emphasizes the importance of experiential learning and social collaboration in building understanding. In the flipped classroom, pre-class activities provide the foundation for individual knowledge acquisition,

while in-class tasks create opportunities for applying and refining this knowledge through social interactions and problem-solving exercises. This alignment with constructivist principles underscores the efficacy of flipped learning in fostering deeper conceptual comprehension.

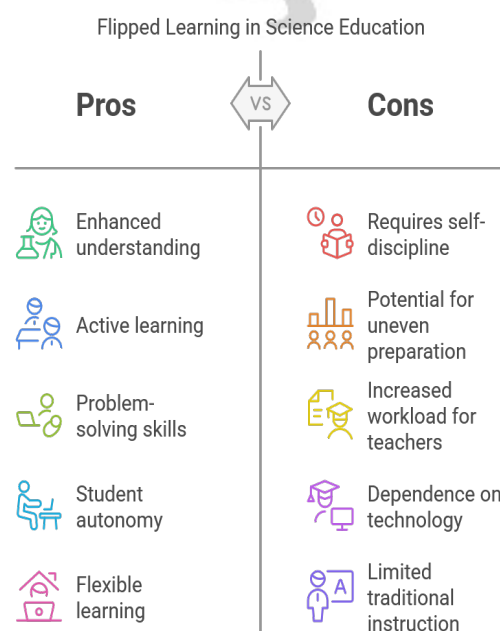
Active learning theories further reinforce the pedagogical framework of flipped learning by highlighting the significance of engaging learners in tasks that require analysis, evaluation, and synthesis. The in-class activities in flipped learning are designed to move beyond passive listening, involving students in discussions, experiments, and case studies that challenge their cognitive abilities and promote higher-order thinking skills. This dynamic approach contrasts sharply with traditional teaching methods, where students are often confined to a passive role during lectures.

The cognitive load theory also plays a critical role in designing the pre-class and in-class components of flipped learning. Proposed by Sweller, this theory emphasizes the need to optimize cognitive processes by balancing intrinsic, extraneous, and germane cognitive loads. In the context of flipped learning, pre-class materials are curated to present essential concepts in manageable chunks, minimizing extraneous cognitive load and allowing students to focus on core ideas. In-class activities are then structured to promote germane cognitive load by challenging learners to apply, analyse, and integrate their knowledge in meaningful ways. By adhering to these principles, flipped learning ensures that students are neither overwhelmed nor disengaged, creating an effective environment for both understanding and application.

This theoretical foundation not only validates the flipped classroom model but also provides a framework for its effective implementation. Together, these theories emphasize the importance of learner autonomy, interactive engagement, and thoughtfully designed instructional strategies in maximizing the potential of flipped learning as a transformative pedagogical approach.

Importance of Flipped Learning in Science Education

Flipped learning holds immense potential for enhancing conceptual understanding in science education by transforming the traditional teaching paradigm. Science subjects often involve complex, abstract concepts that require deep engagement and active exploration to comprehend fully. Through the flipped classroom model, students are introduced to foundational materials, such as video lectures and readings, before class, enabling them to build a basic understanding of the subject matter at their own pace. This pre-class exposure allows classroom time to be dedicated to interactive, application-oriented



activities, such as experiments, discussions, and problem-solving exercises. By shifting the focus to higher-order thinking skills during in-class sessions, flipped learning facilitates a more robust and nuanced understanding of scientific concepts.

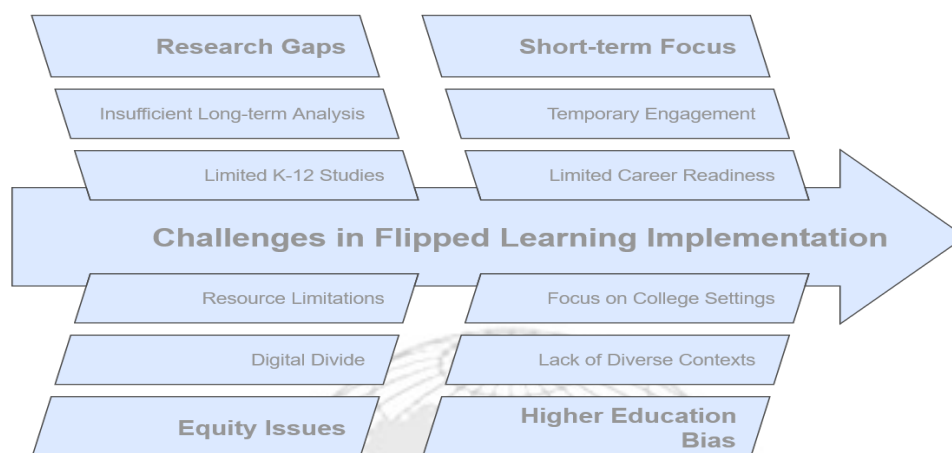
Moreover, the flipped learning approach aligns seamlessly with active learning, problem-solving, and inquiry-based methodologies, all of which are integral to science education. Active learning, which emphasizes student participation in the learning process, is a cornerstone of the flipped classroom. Instead of passively receiving information, students engage in tasks that challenge their analytical and critical thinking skills. For instance, collaborative group work, laboratory experiments, and real-world case studies are frequently employed during in-class activities. Additionally, flipped learning fosters problem-solving skills by encouraging students to apply theoretical knowledge to practical scenarios under the guidance of the instructor. Inquiry-based learning is another key element, as the model promotes curiosity and investigation, encouraging students to ask questions, conduct experiments, and derive conclusions independently.

The impact of flipped learning on student engagement, motivation, and self-directed learning is particularly significant in science education. By providing flexible access to instructional content, flipped classrooms cater to diverse learning needs and empower students to take ownership of their learning journey. This autonomy fosters intrinsic motivation, as students are given the agency to learn at their own pace and revisit challenging concepts. The interactive nature of in-class activities further enhances engagement by transforming the classroom into an environment of active participation and collaboration. Additionally, the pre-class component develops self-directed learning skills, as students are responsible for managing their time and preparing for class. Over time, these skills translate into better academic performance and a sustained interest in scientific inquiry.

Literature Review

The effectiveness of flipped learning in STEM and science education has been the subject of extensive research, yielding promising results. Studies consistently highlight its positive impact on student engagement and academic achievement. For instance, researchers have found that flipped classrooms in science courses improve students' comprehension of complex concepts by allowing for more interactive and hands-on activities during class time. Additionally, flipped learning has been shown to enhance collaboration among students, fostering a sense of community and teamwork essential for scientific problem-solving. Specific case studies in STEM fields, such as physics, chemistry, and biology, provide evidence of increased test scores and deeper understanding of subject material when compared to traditional teaching methods.

Analyzing Flipped Learning Challenges in Education



Despite these advancements, research gaps remain, particularly concerning the broader application and long-term outcomes of flipped learning. Much of the existing literature focuses on higher education settings, leaving a relative dearth of studies on its implementation in K–12 environments, where the developmental needs of learners may differ significantly. Furthermore, while short-term benefits such as increased engagement and improved test performance are well-documented, research on the sustained impact of flipped learning on knowledge retention and career readiness is limited. Another critical area that warrants further exploration is the issue of equity. The reliance on digital tools in flipped learning raises questions about access, particularly for students from underserved communities who may lack the necessary resources, such as devices and reliable internet connectivity. Addressing these research gaps is crucial to understanding the full potential of flipped learning and ensuring its equitable implementation in diverse educational contexts.

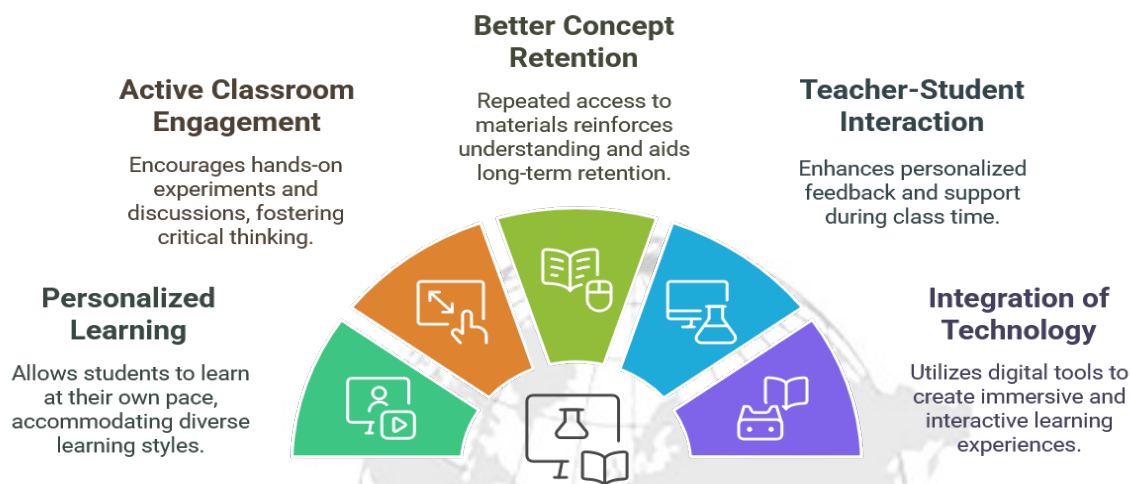
These findings underscore the transformative potential of flipped learning in science education while also highlighting the need for further research to refine its application and address existing limitations. Through continued investigation, flipped learning can be optimized to meet the evolving demands of modern education and foster a more inclusive, engaging, and effective learning environment.

Advantages of Flipped Learning in Science Education

Flipped learning offers several advantages that make it particularly effective in the context of science education, where interactive and inquiry-based methodologies are critical for fostering understanding. Personalized Learning is one of the most significant benefits of flipped learning, as it allows students to learn at their own pace. By engaging with pre-class materials, such as video lessons and readings, students can pause, rewind, or review content as needed, ensuring that they fully grasp foundational concepts before progressing. This flexibility accommodates diverse

learning styles and helps address individual differences in cognitive processing, ultimately promoting more equitable learning outcomes.

Transforming Science Education Through Flipped Learning Techniques



Active Classroom Engagement is another key strength of flipped learning. By shifting content delivery outside the classroom, in-class time is liberated for hands-on experiments, group discussions, and collaborative activities. These practices encourage active participation and critical thinking, as students are directly involved in applying theoretical knowledge to practical problems. The interactive nature of these sessions fosters deeper engagement with the subject matter, making science lessons more dynamic and enjoyable.

Better Concept Retention is facilitated through the repeated access to pre-class materials. Digital resources, such as video lectures and simulations, provide opportunities for students to revisit complex topics as often as necessary, reinforcing their understanding. This iterative learning process helps consolidate knowledge and aids in long-term retention, which is especially beneficial in science education where concepts often build upon one another.

Flipped learning also enhances Teacher-Student Interaction by allowing educators to dedicate more time to addressing individual student needs during class. With routine content delivery taken care of outside the classroom, teachers can focus on clarifying doubts, correcting misconceptions, and providing personalized feedback. This closer interaction strengthens the learning process and helps create a supportive environment that encourages students to ask questions and seek guidance.

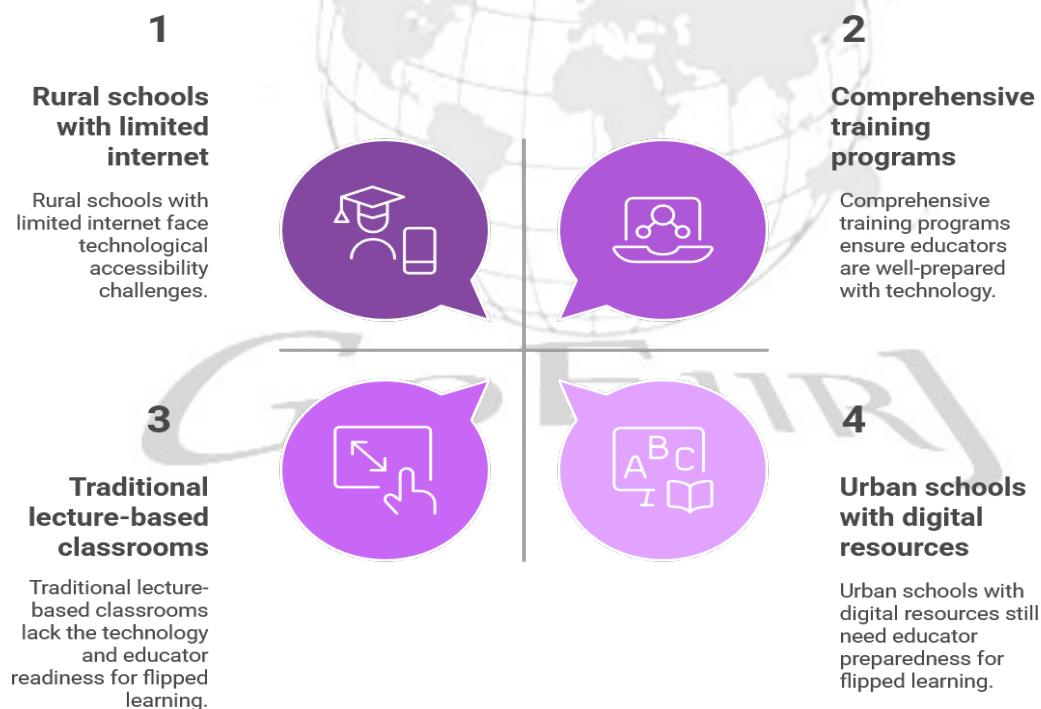
The Integration of Technology is a central feature of flipped learning. Educational platforms, digital simulations, and interactive tools play a crucial role in creating an immersive learning experience. For example, virtual labs and 3D models allow students to explore scientific phenomena that may be challenging to replicate in physical laboratories. These technological

advancements not only enhance the learning experience but also prepare students for the increasing digitalization of scientific research and industry.

In sum, flipped learning transforms science education by fostering a student-centred, interactive, and technologically enriched learning environment. Its capacity to personalize learning, encourage active engagement, and improve teacher-student interactions makes it a powerful tool for addressing the challenges of contemporary education.

Challenges and Limitations of Flipped Learning

While flipped learning offers numerous benefits in transforming the educational landscape, it also presents several challenges and limitations that must be addressed to ensure its effectiveness and equitable implementation. Flipped learning, which inverts traditional teaching by delivering instructional content outside the classroom and using class time for active learning, offers significant benefits. However, its implementation faces several challenges that can hinder effectiveness and equity. Below is an analysis of the key limitations,



1. **Technology Accessibility:** Technology Accessibility remains one of the most significant barriers to the widespread adoption of flipped learning. A considerable portion of students, especially those from underserved or rural areas, lack access to essential digital devices such as laptops or tablets, as well as reliable internet connectivity. This digital divide exacerbates existing educational inequalities, preventing some students from fully benefiting from the flipped classroom model. Without equitable access to technology, the potential of flipped learning to democratize education remains unrealized.

Challenge: Flipped learning relies on students accessing digital resources (e.g., videos, online modules) at home. However, socioeconomic disparities and geographic limitations mean not all students have reliable internet access or personal devices. For example, rural or low-income students may lack broadband connectivity, while others might share devices with family members.

Implications:Equity Issues: Creates a "digital divide," disadvantaging students without resources and exacerbating educational inequalities.

- **Technical Barriers:** Slow internet speeds can make streaming videos frustrating or impossible, leading to incomplete preparation.

- **Workarounds:** Schools may provide devices or offline materials, but these solutions are not always scalable or timely.

2. Teacher Training: Teacher Training is another critical challenge. Implementing flipped learning requires educators to be proficient in creating and curating digital content, as well as facilitating interactive, student-centred activities in the classroom. However, many teachers may lack the necessary technical skills or pedagogical training to effectively transition to this model. Professional development programs are essential to equip educators with the knowledge and tools required to design engaging pre-class materials and manage active learning environments effectively.

Challenge: Effective flipped learning requires educators to design high-quality digital content and manage tech-driven classrooms. Many teachers, especially those accustomed to traditional methods, lack training in video production, interactive tool usage, or LMS (Learning Management System) platforms.

Implications:

- **Poor-Quality Content:** Untrained teachers may create monotonous videos or fail to align content with learning objectives, reducing student engagement.

- **Resistance to Change:** Some educators may resist adopting flipped models due to discomfort with technology or scepticism about its efficacy.

- **Resource Constraints:** Professional development programs for digital skills are time-intensive and often underfunded.

3. Student Adaptability: Student Adaptability also poses a challenge, as not all learners are accustomed to the level of autonomy and self-regulation required in flipped learning environments. Some students may struggle to manage their time effectively, complete pre-class assignments, or grasp content independently. This difficulty may be further amplified for students with limited prior exposure to digital tools or learning resources, necessitating additional support to help them adjust to the flipped model.

Challenge: Flipped learning shifts responsibility for initial content absorption to students, requiring self-discipline, time management, and intrinsic motivation. Not all learners thrive in self-paced environments.

Implications: Procrastination: Students may neglect pre-class work, arriving unprepared for collaborative activities.

- Learning Gaps: Struggling learners, including those with disabilities or limited study skills, may fall behind without immediate teacher support.

- Cultural Factors: In education systems emphasizing teacher-led instruction, students might resist the autonomy flipped learning demands.

4. Content Development: Content Development is a time-intensive process that places additional demands on educators. Designing effective and engaging pre-class materials, such as video lessons and multimedia presentations, requires substantial effort, creativity, and technical expertise. Teachers must ensure that these resources are pedagogically sound and aligned with curriculum objectives, while also being accessible and engaging for diverse learners. This added workload may deter some educators from adopting flipped learning, especially in resource-constrained settings.

Challenge: Creating engaging, pedagogically sound materials (e.g., videos, quizzes) is time-consuming. Teachers must balance content creation with other responsibilities, often without institutional support.

Implications: Burnout: The pressure to produce polished videos or interactive modules can overwhelm educators.

- Quality vs. Quantity: Rushed content may lack interactivity or fail to clarify complex topics, undermining learning outcomes.

- Sustainability: Regularly updating materials to reflect curriculum changes or feedback adds to the workload.

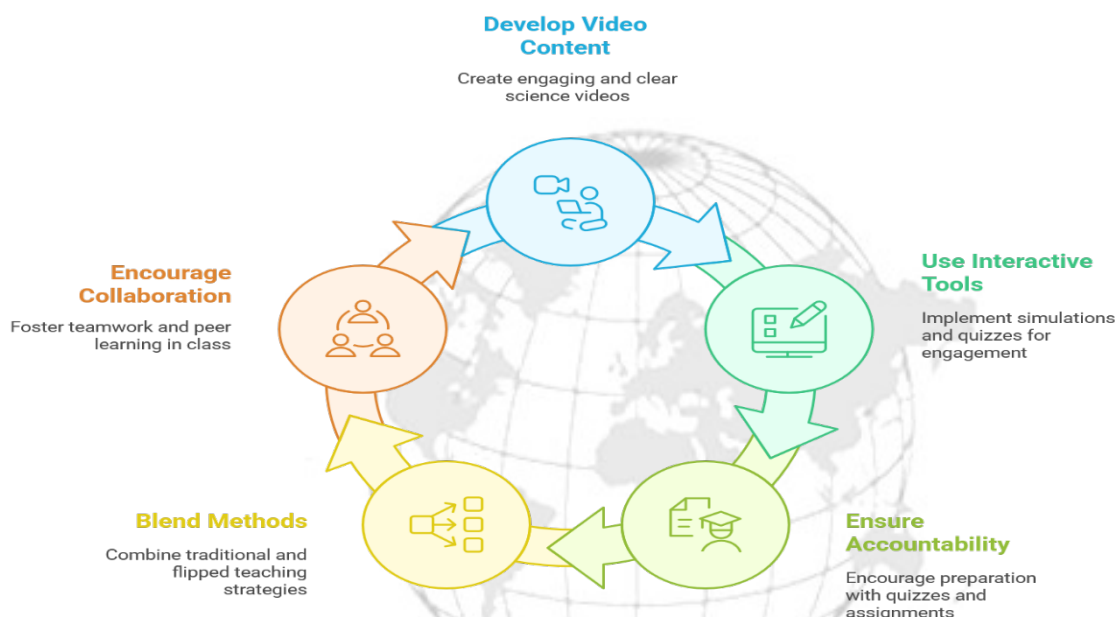
Addressing these challenges requires a multi-pronged approach, including investments in digital infrastructure, professional development for educators, and targeted support for students. By tackling these limitations, flipped learning can be more inclusively integrated into modern education, realizing its potential as a transformative pedagogical innovation.

While flipped learning has transformative potential, its success hinges on addressing these challenges. Institutions must invest in infrastructure to bridge the digital divide, provide robust teacher training, scaffold student autonomy, and allocate resources for sustainable content development. Without systemic support, flipped learning risks becoming an exclusionary or ineffective pedagogy.

Best Practices for Implementing Flipped Learning in Science Education

Flipped learning can revolutionize science education by fostering deeper conceptual understanding and active engagement. However, its success depends on strategic implementation tailored to the unique demands of science curricula. Below are evidence-based best practices, with science-specific considerations,

Flipped Learning Implementation Cycle



1. Developing High-Quality Video Content Central to flipped learning is the provision of pre-class materials, and the quality of video content is crucial for its success. Videos should be clear, concise, and visually engaging, with explanations that are easy to follow. Incorporating real-world examples helps students relate theoretical concepts to practical applications, particularly in science, where phenomena can often be abstract. Visual aids like animations, diagrams, and infographics enhance comprehension and retention, while keeping videos short (typically 10–15 minutes) helps maintain students' attention.

Strategy: Create short, focused videos (5-10 minutes) prioritizing clarity and engagement. Use visuals (animations, diagrams, real-world footage) to simplify abstract concepts (e.g., chemical bonding, cellular processes).

Science-Specific Tips:

- Incorporate Experiments: Film or curate lab demonstrations (e.g., titration, dissection) to pre-teach techniques and safety protocols.
- Link to Real-World Phenomena: Connect topics like climate change or genetics to current events or student interests.
- Use Annotation Tools: Highlight key terms (e.g., "mitosis," "Newton's laws") with on-screen text or pointers.

Tools:

- Screen recording: Loom, Screencast-O-Matic.
- Animation: Canva, BioDigital (for 3D biology models).
- Open-source science videos: Khan Academy, Amoeba Sisters.

2. Using Interactive Tools Interactive tools significantly enhance the flipped learning experience by engaging students and facilitating active participation. Digital simulations allow learners to visualize and experiment with complex scientific processes that might be difficult to replicate in physical classrooms. Quizzes embedded in videos or delivered through educational platforms help reinforce key concepts, while discussion forums provide a space for students to share insights, ask questions, and collaborate outside the classroom. These tools create an enriched, immersive learning environment that complements the core material.

Strategy: Leverage simulations and virtual labs to reinforce pre-class learning and bridge gaps for students without lab access.

Science-Specific Tips:

- Virtual Labs: Platforms like PhET Interactive Simulations (physics/chemistry) or Lobster (biology) allow students to manipulate variables (e.g., enzyme activity, circuit design).
- Quizzes with Immediate Feedback: Use Kahoot! or Ed puzzle to embed questions in videos (e.g., "Predict the outcome of this reaction").
- Discussion Forums: Pose open-ended prompts (e.g., "Debate the ethics of CRISPR") on Padlet or Flip.

3. Ensuring Student Accountability One of the challenges in flipped learning is ensuring that students actively engage with pre-class materials. Incorporating accountability measures such as pre-class quizzes, reflection activities, or brief assignments can motivate students to complete the required preparatory work. These tasks not only encourage consistency but also help teachers gauge students' understanding and readiness for in-class activities. Designing engaging and thought-provoking questions ensures that students critically interact with the content rather than passively consuming it.

Strategy: Design structured pre-class tasks that incentivize preparation and diagnose misconceptions.

Science-Specific Tips:

- Pre-Lab Quizzes: Require students to answer safety questions or hypothesize outcomes before hands-on experiments.
 - Reflection Journals: Ask learners to document observations (e.g., "Describe the phases of the moon this week") or self-assess understanding.
-

- Micro-Assignments: Assign concept maps (e.g., "Map the carbon cycle") or annotated diagrams.

Accountability Boosters:

- Award participation points for completed pre-work.

- Use LMS analytics (e.g., Google Classroom, Canvas) to track engagement.

4. Blending Traditional and Flipped Methods A balanced approach that combines traditional teaching with flipped learning methods often yields the best results. While flipped learning promotes student-centred and active engagement, certain topics may still require guided instruction through traditional lectures to establish a foundational understanding. Balancing these methods ensures that diverse instructional needs are met and provides a flexible framework for both teachers and students to adapt to.

Strategy: Balance self-paced learning with guided instruction to address diverse needs.

Science-Specific Tips:

- Just-in-Time Lectures: Reserve class time to clarify complex topics (e.g., stoichiometry, quantum mechanics) identified via pre-class quizzes.

- Guided Inquiry: Pair flipped content with structured in-class activities (e.g., "Use yesterday's video on DNA replication to model the process with pipe cleaners").

- Differentiated Pathways: Provide tiered resources (e.g., simplified vs. advanced videos on photosynthesis) for varied readiness levels.

5. Encouraging Collaborative Learning Collaborative learning is a cornerstone of flipped classrooms, particularly in science education, where problem-solving and inquiry are integral. Group activities, such as lab experiments, collaborative projects, and peer discussions, encourage teamwork and expose students to diverse perspectives. Teachers should design tasks that require collective input and critical thinking, fostering a supportive and interactive learning community. Collaborative learning not only deepens subject comprehension but also develops essential interpersonal and communication skills.

Strategy: Transform class time into collaborative problem-solving sessions.

To enhance engagement and deepen understanding in science education, integrating active learning strategies with digital collaboration tools can be highly effective. Peer teaching empowers students to solidify their knowledge by assigning groups to explain concepts, such as demonstrating how to balance chemical equations using video examples, fostering collaborative problem-solving. Project-based learning shifts flipped classroom time to research, allowing in-class collaboration on hands-on experiments like designing eco-friendly packaging, while tools like Jam board enable real-time brainstorming of lab designs. Open-ended questions posed during think-pair-share sessions (e.g., "How could you test this hypothesis?") encourage critical thinking after pre-class content, and platforms like Miro support collaborative concept mapping to visualize

connections between ideas. This blended approach not only promotes teamwork and creativity but also bridges theoretical learning with practical application, cultivating both scientific literacy and 21st-century skills.

To ensure equitable and responsive science education, addressing access barriers is critical: supply offline resources like USB drives with videos or printed lab guides for students without reliable internet, and collaborate with community hubs for device lending. Teacher collaboration can reduce workloads through shared video libraries, cross-departmental lesson plans, and interdisciplinary projects (e.g., chemistry-physics units on energy transfer). Finally, embed feedback loops like weekly check-ins (“Was the ionic bonds video clear?”) and exit tickets (“Rate your lab confidence”) to adapt instruction and reinforce student mastery through iterative reflection.

Flipped learning in science education thrives when it combines structured autonomy, interactive experimentation, and collaborative problem-solving. By aligning video content with hands-on inquiry, leveraging simulations, and fostering accountability, educators can transform passive learners into active scientists. Institutional support for teacher training and equitable resource distribution remains critical to sustain this model. By adhering to these best practices, educators can create an effective and engaging flipped learning environment in science education. These strategies leverage the strengths of this innovative pedagogy, promoting active participation, deeper understanding, and better educational outcomes for all learners.

Conclusion

In this paper, we explored the transformative potential of flipped learning in science education, emphasizing its capacity to address the limitations of traditional teaching methods and align with the demands of 21st-century learning. Flipped learning represents a significant pedagogical shift in science education, addressing many of the limitations associated with traditional lecture-based instruction. By enabling personalized learning, fostering active classroom engagement, improving concept retention, enhancing teacher-student interaction, and integrating technology, flipped learning creates a dynamic and student-centred learning environment. The approach aligns with modern educational theories, particularly constructivism and active learning, and has been supported by numerous studies demonstrating its effectiveness in improving student outcomes in STEM education.

However, despite its advantages, several challenges and limitations must be considered. Issues such as technology accessibility, the need for teacher training in digital content creation, student adaptability to self-paced learning, and the time-intensive nature of content development present obstacles to widespread implementation. Addressing these concerns requires institutional

support, investment in professional development, and policies that ensure equitable access to digital learning resources.

Given its potential to revolutionize science education, further research is needed to explore best practices for implementing flipped learning effectively. Future studies should focus on long-term outcomes, their impact on diverse student populations, and strategies to enhance inclusivity and accessibility. Additionally, research into hybrid models that combine flipped learning with other instructional approaches can provide deeper insights into optimizing its effectiveness across different educational contexts.

By overcoming these challenges and refining its implementation, flipped learning can serve as a powerful tool in transforming science education, equipping students with the critical thinking, problem-solving, and inquiry skills necessary for success in the 21st-century scientific landscape. Despite its many benefits, flipped learning presents challenges, including issues of technology accessibility, the need for teacher training, student adaptability to self-directed learning, and the time-intensive nature of content development. These limitations call for innovative strategies to ensure equitable access, comprehensive teacher preparation, and supportive frameworks to assist students in navigating this pedagogical model.

Flipped learning holds immense promise to revolutionize science education by fostering deeper conceptual understanding, promoting active and inquiry-based learning, and enhancing student motivation. However, realizing its full potential requires further research into long-term outcomes, its application across diverse educational settings, and strategies to overcome barriers to its implementation. By addressing these areas, flipped learning can be positioned as a cornerstone of modern science education, paving the way for more engaged, competent, and future-ready learners.

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GOEIIRJ

THE ROLE OF TEACHER EDUCATORS IN SHAPING VIKSIT BHARAT 2047: A STUDY ON BUILDING A KNOWLEDGE-DRIVEN SOCIETY

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Abstract

Education plays a pivotal role in the development of any nation, and teacher educators serve as the backbone of the education system. As India envisions becoming a developed nation by 2047 under the “Viksit Bharat 2047” mission, the role of teacher educators becomes even more crucial in transforming the education sector to meet future challenges and opportunities. This research paper explores the multifaceted role of teacher educators in building a knowledge-driven society by enhancing teacher quality, integrating innovative teaching methods, and fostering a culture of lifelong learning. The paper also examines the challenges faced by teacher educators and proposes strategic interventions to strengthen their contribution to the national development agenda.

Keywords : Viksit Bharat 2047, teacher educators, knowledge-driven society, education reform, professional development, sustainable development.

1. Introduction

India has set a visionary goal to become a developed nation by 2047, marking 100 years of independence. The vision of “Viksit Bharat 2047” emphasizes inclusive growth, technological advancement, and sustainable development. Education forms the foundation of this vision, with teacher educators playing a significant role in shaping the quality of education and preparing future generations to meet global standards. This study aims to analyze the role of teacher educators in driving the educational reforms necessary to achieve the objectives of Viksit Bharat 2047.

Role of Teacher Educators -

Teacher educators play a key role in shaping the future of education by redefining teacher roles, moving beyond rote learning and towards promoting critical thinking, creativity, and problem-solving skills.

Integration of Technology:

They need to be equipped with the knowledge and skills to effectively integrate technology into pedagogy, leveraging artificial intelligence and other tools to enhance the learning experience.

Fostering Socio-Emotional Skills:

Teacher educators must emphasize developing socio-emotional intelligence in teachers, enabling them to create supportive learning environments that nurture students' holistic growth.

Collaboration and Inclusivity:

They should emphasize the importance of collaboration, both among teachers and between educators and students, fostering a culture of inclusivity and personalized learning pathways.

Research and Innovation:

Teacher educators should be engaged in research to identify innovative teaching practices and adapt them to meet the needs of the diverse learner population.

Developing a Skilled Workforce:

By preparing teachers for the future, teacher educators contribute to building a skilled workforce capable of driving economic growth and social progress in India.

Promoting Indian values and cultural awareness:

Teacher educators can contribute to inculcating positive Indian values and ensuring cultural awareness among students.

Lifelong learning:

Teacher educators should encourage teachers to embrace a mindset of continuous learning and personal and professional development to stay abreast of current trends and methods.

2. Objectives of the Study

1. To explore the role of teacher educators in enhancing the quality of education in India.
2. To identify the challenges faced by teacher educators in the current educational framework.
3. To propose strategies for strengthening the contribution of teacher educators towards achieving Viksit Bharat 2047.
4. To examine the impact of teacher educators on the development of a knowledge-driven society.

Hypothesis

1. **Teacher Educators play a crucial role in enhancing the quality of education, which is essential for building a knowledge –driven society in line with viksitbhart 2047.**
2. **Strengthening teacher education infrastructure and aligning it with the goals of Nep2020 will contribute to sustainable national development and a globally competitive education system.**

13. Literature Review

National Education Policy (NEP) 2020 also emphasizes improving teacher training and professional development as a means to enhance educational standards in India.

Operational Definition-

Teacher Educator- a professional who prepares, mentors, and supports both aspiring and

practicing teachers in developing effective instructional skills and strategies, contributing to the improvement of education quality.

Viksit Bharat 2047- is the government's vision *to transform the country into a self-reliant and prosperous economy by 2047.*

Scope of Research

- The present research is the scope of Greater Mumbai.
- Limitation of research:-
- The dignity of the presented research is limited to One B.Ed. College only.

Methodology

- Research Method-Descriptive research method was used for the study.
- Sample
- Sample was first and second year students of B.Ed In Sree Narayana Guru College Of Education,Mumbai.
- Total sample is 80 B.Ed. students.

Research tools:-

- The present research tool used was 'Questionnaire'.
- Data Collection-
- Data was collected through Google form.

Data Analysis

Statistical analysis using SPSS and thematic analysis for qualitative data

Findings

1. **Impact on Educational Quality-** The study reveals that well-trained teacher educators significantly improve the quality of teaching, resulting in better student engagement & learning outcomes.
2. **Alignment with NEP2020 –**Teacher education programs aligned with NEP2020 have shown improved students' performance,increased research potential and higher adaptability to global educational standards.
3. **Challenges and Opportunities-** While infrastructure gaps and limited resources pose challenges, targeted policy interventions and increased investment in teacher education infrastructure present significant opportunities for improvement.

Conclusion

Teacher educators are key agents of change in the journey towards Viksit Bharat 2047.By strengthening teacher education and aligning it with future societal and technologicalneeds, India can build a robust, knowledge-driven society capable of addressing globalchallenges. This study underscores the need for strategic interventions, continuousprofessional development, and policy

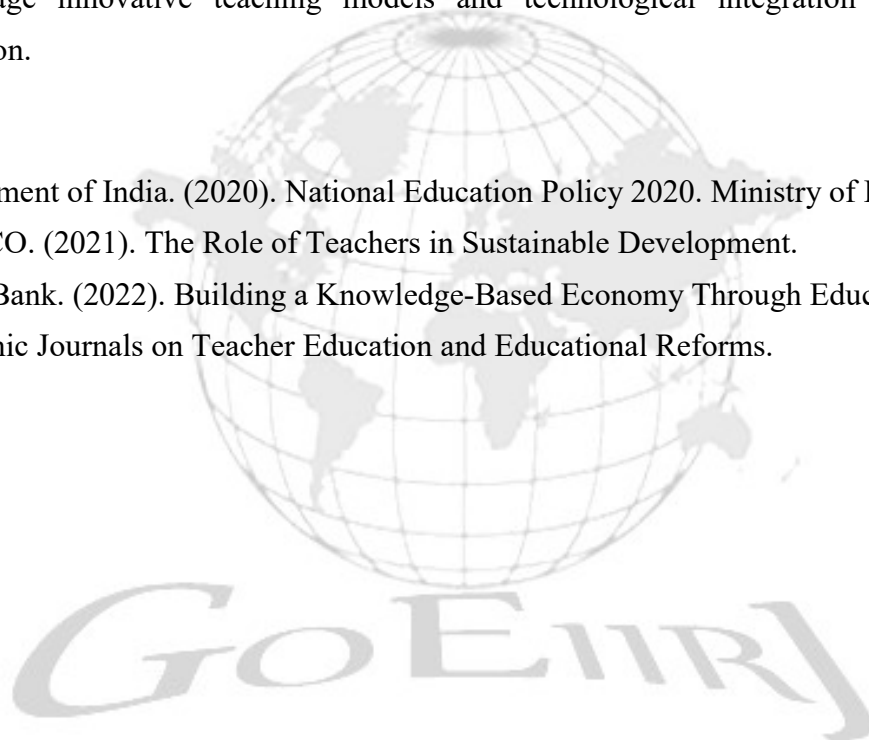
support to empower teacher educators and enable them to contribute effectively to national development.

Recommendations

1. Establish a National Teacher Educator Council to oversee the implementation of teacher education reforms.
2. Increase funding for teacher training and professional development programs.
3. Promote international collaboration to adopt best practices in teacher education technologies.
4. Encourage innovative teaching models and technological integration at all levels of education.

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IKS: VIPASSANA- A SEARCH FOR THE ULTIMATE TRUTH**Dr. S. A. Tidke***Professor,**MVP's College of Education, Nashik-2*

Abstract-

Having an incredible impact across the whole world, Indian knowledge system is an ocean of knowledge it has been widely studied throughout the world for religious, moral, cultural and spiritual guidance for the mankind. The more we explore, the more we generate new dimension for life which makes life meaningful in its true sense. Indian knowledge system i.e. IKS has a great heritage consisting of various disciplines leading to the knowledge of every aspect of life in the universe. One of the disciplines of IKS is Bhagwan Gautam Buddha's 'Vipassana' i.e. an insightful meditation which is very useful for spiritual and holistic upliftment of the human being that leads to reach to the ultimate truth of life or self realization. The present paper focuses light on the concept of Vipassana as a meditation technique, a part of IKS which reveals the true nature of religion, the real truth.

Key concepts: IKS, Discipline, Vipassana, holistic upliftment, Ultimate truth.

IKS: The Concept –

The Indian Knowledge System (IKS) is an ocean of knowledge which has a very rich and diverse traditions, philosophies, disciplines and practices. It is an ancient and holistic approach for understanding the universe and life of all the creatures on the earth. It includes so many branches like *vedas, upanishads, ayurveda*, Buddhism, spirituality, *yoga*, meditation, geology, astrology, agriculture, science etc. IKS is in fact a great contribution to the whole universe which is unique. From the concept of zero to the concept of machine intelligence all we have derived from IKS. It focuses on the connected and inter dependent nature of all the things and always searched for the principles and laws that govern the universe. This knowledge system has been developed over many years through the valuable contributions of numerous sages, seers, and scholars. Our *rishis* were great scientists. IKS is a source of illumination enlightening to the human being and helping him develop in all the dimensions of life.

IKS and Vipassana:

One of the most profound spiritual disciplines of IKS is the Vipassana Meditation technique which belongs to the Buddhist tradition. It is very much significant in today's modern world also as it reveals the true nature of the mind-matter phenomenon.

Origin of Vipassana-

We find its origin in many Indian religious books and it was also practised by many saints.

Only thing was we did not realize 'how' aspect of this technique. Various reference of this technique are found in many scriptures like rugved, bhagwad geeta etc.

उत्क्रामन्तम स्थितं वापि भुञ्जानम्वा गुणान्वितम ।
विमूढा नानु पश्यन्ति, पश्यन्ति दन्यानचाक्षुषः ॥१०॥
(Shrimad Bhagwad Geeta chapter15)

Bhagwan Gautam Buddha discovered this technique by taking a lot of efforts and showed us the path of ultimate truth. It was discovered before 2500 years by him. After some years this great knowledge or technique was forgotten in India due to. But this very knowledge was preserved in its original form in Myanmar, our neighbouring country. In 1969, it came to India through *Aacharya* Shri S. N. Goenkaji. He started teaching this technique to us and it has proved to be very much result oriented profound technique. Up till now there are total 255 Vipassana centers in 160 countries overall the world.

What is Vipassana:

The word Vipassana(a pali word) means to see with special outlook, insight, or clear seeing. This meditation technique involves the systematic and objective observation of one's own sensations. The sensations include the sensations of fear, anxiety, happiness, hatred, animosity etc. The Vipassana Meditation aims at developing the faculty of wisdom. Consistent observation of impermanent nature of mind and matter helps one to be equanimous in any situation leading to the attainment of liberation from misery from root level of mind, the ultimate truth. The more one practises Vipassana Meditation for its total contribution or its spiritual core, the more it is beneficial for his health. It is a way of living healthy life. It is based on realistic observations means one's own experience in meditation of the facts only without any addiction, subtraction, religion and philosophy.

According to Gautam Buddha the root cause of human suffering is ignorance or lack of understanding of the true nature of the mind - matter phenomenon due to our Sanskaras of the previous births. Vipassana Meditation helps to cultivate mindfulness and awareness by which one can achieve deeper understanding of himself and the world around him. This faculty of understanding enables individuals to be free from the cycle of suffering and attain real mental peace, happiness, and liberation.

Four noble truths- four pillars of Vipassana:

The Four Noble Truths

1. Existence of Suffering (sorrow)-

There is suffering, dissatisfaction, and discomfort causing sorrow in life. It's acknowledging that suffering arises from various factors in different forms.

2. The origin of Suffering (cause and effect happening simultaneously)-

One should Understand that craving,aversion, and ignorance are the three main causes for creating sorrow or suffering that leads to dissatisfaction and distress.

3. Eradication of Suffering (end of sorrow)- One can overcome Suffering or sorrow.

4. The path to overcome suffering-

There is a way to overcome the suffering by removing the causes of suffering This path has eight principles: right understanding, right intention, right speech, right action, right livelihood, right effort, right mindfulness, and right concentration.

Benefits of Vipassana:

1. Liberation from suffering- One can free himself from the cycle of suffering and rebirth. This is to say achieving salvation.
2. Inner peace and happiness- One can experience deep mental peace and happiness throughout the life by consistent practice of vipassana.
3. Wisdom and understanding of the truth - By practising vipassana one develops wisdom and understands the truth of life.
4. Mindfulness- Increased awareness is mindfulness. By practising vipassana Mindfulness gets sharpened and becomes the active engine for our progress on this path of vipassana.
5. Increase in concentration power- By regular practice of it, concentration power is increased.
6. Interpersonal relationship is improved.
7. Improved mental health- Emotional management is automatically done by regular practice of vipassana. One can get rid of mental trauma.
8. Reduces stress as one is equanemous and dwelling in the present moment.
9. Better sleep quality- By practising this technique duration of sleep lessens and can get sound sleep.
10. Self-awareness is enhanced.
11. Addiction management- By its practice one can get rid of addiction like smoking, drinking etc.
12. Positive effects on brain functions - A research has proved that vipassana meditation has positive effects on brain functions.

In a nut shell, being an integral part of IKS, vipassana meditation technique is very important and effective that one should learn and practice it for better quality life. It is very much significant in this modern era to live stress free life.

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