AI & Indian Knowledge System in Education Industry

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Abstract: AI has the potential to address some of the biggest challenges in education today, innovate teaching and learning practices and accelerate progress in education industry. With the potential it brings the limitations by lessening the significance of unique traditional way of Indian education system. Holding the guru and student relationship in a unique way. The emerging of AI in education has lot of prospects and danger to the system. With the emerging NEP 2000 in Indian education system, Indian Knowledge system is also getting its significance role of teaching and learning process. The limitations of AI can be taken care by Indian knowledge system as it is derived from ancient gurus and its values. Implementing Indian Knowledge system and emerging AI can bring wonders in Indian Education system ensuring quality education and bringing better outcome.

Key Words: AI, Education, Indian Knowledge system, India.

1. INTRODUCTION:

In 2024, the Indian Education system is experiencing significant reforms and innovations driven by the National Education Policy (NEP) 2020, technological advancements, and a focus on skill development. Despite notable improvements, challenges related to quality disparities, infrastructure, and equity remain. Continued efforts to address these challenges and adapt to emerging trends will be crucial for the ongoing development of the education system in India.AI and automation may change the landscape of jobs in education, they also offer opportunities for innovation and improvement. Balancing technology with the human elements of education will be key to ensuring positive outcomes for both educators and students. The adoption of AI in India is growing rapidly across various sectors, reflecting both the country's burgeoning tech ecosystem and its strategic focus on digital transformation. Here are some statistics and trends highlighting AI's capture in India. AI is playing a trans formative role in the Indian education system by enhancing personalized learning, improving administrative efficiency, and creating engaging educational experiences. While there are notable benefits, challenges such as the digital divide, data privacy, and the need for teacher training need to be addressed to fully leverage AI's potential. Continued investment in technology, infrastructure, and training will be key to ensuring that AI contributes positively to education in India.

AI Market Size in India was valued at around $2.5 billion in 2022 and is projected to grow at a compound annual growth rate (CAGR) of approximately 30-35% over the next few years. By 2025, the market size is expected to reach $7-8 billion. **The Investment Trends** in Indian startups and companies are receiving increasing funding for AI-related ventures. In 2023, AI startups in India attracted more than $2 billion in funding. Major investors include venture capital firms, private equity, and global tech giants. Many other sectors like Health care, Retail, E Commerce, Finance is utilizing the opportunity and benefiting of AI. AI applications in healthcare, including diagnostic tools and personalized medicine, are growing. The market for AI in healthcare in India is projected to reach around $1.2 billion by 2025. AI-driven solutions for customer service, personalization, and supply chain optimization are expanding. The adoption of AI in retail and e-commerce is estimated to grow at a CAGR of 30% from 2023 to 2027. AI in the financial sector is being used for fraud detection, customer service, and algorithmic trading. The AI market in financial services in India is expected to grow to about $1.5 billion by 2025. AI tools for personalized learning and administrative efficiency are increasingly being adopted. The market for AI in education is projected to grow at a CAGR of 35% over the next few years.

2. GOVERNMENT INITIATIVE :

Indian government has launched initiatives like the "National Strategy for Artificial Intelligence" to promote AI development. This is a strategy focuses on leveraging AI for economic growth, improving governance, and enhancing societal well-being.

India is investing in AI research centers and fostering partnerships between academia and industry. The government's emphasis on AI research includes funding and supporting AI innovation hubs and laboratories. India is a significant source of AI talent, with numerous universities and institutions offering specialized AI and data science programs. The country is producing a growing number of AI professionals, although there is still a need for more skilled talent to meet industry demand. Despite the growing talent pool, there is a notable skills gap in the AI sector. Efforts are underway to bridge this gap through upskilling programs and collaborations between educational institutions and industry.

India has a thriving ecosystem of AI startups, with over 500 active AI-focused startups as of 2023. These startups are working on a range of applications, from healthcare to finance and beyond.

3. OPPORTUNITIES OF AI IN EDUCATION

AI can tailor Personalized Learning in educational experiences to individual students' needs. Adaptive learning platforms use algorithms to adjust the difficulty of content based on a student's performance, helping to provide a more personalized learning journey. Intelligent Tutoring systems offer real-time feedback and support to students, often using natural language processing to understand and respond to student queries. They can provide additional explanations, practice problems, and even suggest resources based on a student's specific struggles

AI can streamline administrative tasks such as grading, scheduling, and even admissions processes. For instance, AI-powered tools can automatically grade multiple-choice tests or provide initial assessments of written assignments. AI can analyze large amounts of data to provide insights into student performance and learning patterns. Educators can use this information to identify at-risk students, adjust teaching strategies, and improve overall educational outcomes. AI tools can help create educational content, from generating practice questions to designing interactive simulations. This can make it easier for educators to develop materials that are engaging and aligned with learning objectives. AI-powered virtual assistants and chat bots can offer 24/7 support to students, answering questions, providing guidance, and facilitating communication between students and teachers. This can enhance the learning experience, especially in online and hybrid learning environments. AI can break down language barriers by providing real-time translation services, making educational resources more accessible to non-native speakers and supporting multilingual classrooms. AI-driven tools, like gamified learning platforms, can increase student engagement by making learning more interactive and fun. These tools can adapt to student preferences and learning styles to keep them motivated. AI can improve accessibility for students with disabilities. For example, AI-powered text-to-speech and speech-to-text applications can support students with visual or hearing impairments. AI can help predict student outcomes and identify potential issues before they become significant problems. This can enable early interventions and support strategies to improve student success.

The Integration of AI in education holds great promise, but it also comes with challenges such as data privacy concerns, the need for robust digital infrastructure, and ensuring that AI tools are used to complement, rather than replace, the human element in education. As AI continues to evolve, it's likely to play an increasingly central role in shaping the future of education.

3. CHALLENGES IN EDUCATION INDUSTRY:

Challenges such as data privacy concerns, infrastructure limitations, and the need for robust AI governance frameworks are being addressed. The Indian government and industry stakeholders are working on policies to tackle these issues.

The integration of AI into education and other sectors brings remarkable advancements, but it also raises important concerns about the potential loss of human values, moral considerations, and the essential "human touch." Here are some key issues and perspectives regarding these concerns:

3.1. Lack of Empathy and Emotional Understanding
- Human Touch: AI lacks the ability to genuinely empathize with individuals. While AI can simulate conversational interactions and provide responses based on data, it cannot truly understand or respond to emotional nuances in the same way a human can.
- Emotional Support: In education, students often benefit from emotional support and encouragement from teachers and mentors. AI systems may struggle to offer the same level of emotional reassurance and understanding.

3.2. Ethical and Moral Decision-Making
- Ethical Frameworks: AI operates based on algorithms and data, and while it can follow programmed ethical guidelines, it lacks an inherent sense of morality or ethical judgment. Decisions made by AI are limited to the parameters set by its developers and may not account for complex moral dilemmas.
- Bias and Fairness: AI systems can inadvertently perpetuate biases present in the training data. Ensuring fairness and ethical decision-making in AI requires careful design, ongoing monitoring, and human oversight to mitigate potential biases.

3.3. Privacy and Data Security
- Data Collection: AI systems often require access to significant amounts of data, raising concerns about data privacy and security. The collection and use of personal data need to be managed responsibly to protect individuals' privacy and prevent misuse.
- Informed Consent: Ensuring that individuals are fully aware of how their data is being used and obtaining informed consent is crucial. AI applications must prioritize transparency and respect for user privacy.

3.4. Loss of Personal Connection
- Human Interaction: The human connection in education—through face-to-face interactions, personal mentorship, and real-time feedback—is crucial for building relationships and fostering trust. AI, while efficient, cannot fully replicate these personal interactions.
- Student Engagement: The engagement and motivation that come from personal relationships with teachers and peers can be diminished when AI systems are over-relied upon.

3.5. Ethical Use of AI
- Moral Implications: The deployment of AI must consider the moral implications of its applications. For instance, using AI for surveillance in educational settings raises questions about student privacy and autonomy.
- Accountability: Clear accountability must be established for decisions made by AI systems, particularly in sensitive areas such as education. Determining responsibility and addressing ethical issues requires human oversight.

3.6. Human- Centric Design
- Design Considerations: AI systems should be designed with human values in mind, incorporating ethical principles and respecting human dignity. Engaging interdisciplinary teams, including ethicists and human-centered design experts, can help address these concerns.
- Balancing Technology and Humanity: The challenge lies in balancing the efficiencies offered by AI with the need for human interaction and values. AI should complement, not replace, the human elements essential to education and other fields.

3.7. Educational Equity
- Access and Inequality: The integration of AI in education must address issues of accessibility and equity. Ensuring that all students have equal access to AI-enhanced learning tools and resources is critical to avoiding widening existing disparities.

3.8. Responsibility and Regulation
- Regulatory Frameworks: Governments and organizations need to establish and enforce regulations that address the ethical use of AI, safeguard human values, and ensure responsible development and deployment of AI technologies.
- Continuous Review: Ongoing review and adaptation of AI systems are necessary to address emerging ethical concerns and to align technology with evolving societal values.

The Integration of AI into the education system in India necessitates comprehensive training for both educators and students. This training is crucial for ensuring that AI tools are used effectively and that the potential benefits are maximized. Here's a detailed look at why and how training is needed:

4. TRAINING NEEDS FOR TEACHERS :

Basic AI Literacy: Teachers need a foundational understanding of AI, including how AI systems work, their capabilities, and their limitations. This includes knowledge of AI tools available for education and how they can be integrated into teaching practices.

Application of AI Tools: Training should cover practical applications of AI tools in the classroom, such as adaptive learning platforms, intelligent tutoring systems, and data analytics for tracking student performance.

Integration of AI in Curriculum Design: Educators need guidance on how to design and integrate AI tools into the existing curriculum effectively. This involves aligning AI applications with learning objectives and ensuring they complement traditional teaching methods.

Pedagogical Strategies: Training should include strategies for using AI to enhance pedagogical approaches, such as personalized learning, formative assessments, and differentiated instruction.

Data Management: Teachers must be trained on best practices for managing student data, including data privacy, security, and compliance with regulations. Understanding how to handle and protect sensitive information is essential.

Annette Scheunpflug et.al (2006) explores the integration of global education and education for sustainability in the research study. The need for educational systems to prepare students for a complex, interconnected world by merging these two critical educational approaches were discussed. The research focuses on the components of global education and sustainability, examining current practices, and proposing strategies for their effective integration. The literature reviews, case studies, and qualitative analysis helps the author aim to provide insights into best practices and future directions for educational reform. The main objective of the research study is to define the core concepts and inter sections between global education and sustainability in education. It is also to identify effective strategies for creating pedagogical practices and for creating curricular ensuring sustainability practices and awareness among the young. The methodology used for the study includes literature review analyzing the theoretical framework, to understand the current education policies related to global education and sustainability. Case studies was also used to provide practical examples and understand the real world education settings. Qualitative and Comparetive analysis was done for different countries to understand the variations in practices and to highlight the best practices in integrating global and sustainability in education. The scope of this study includes developing curriculum integrating global education and sustainability concepts. This includes creating interdisciplinary modules and learning activities that reflect real-world challenges. Future work should aim to influence educational policy to better support the integration of global and sustainability education. This includes advocating for policies that provide clear guidelines and resources for schools.More research is needed to evaluate the outcomes of integrated educational approaches. This includes assessing how these programs impact students' knowledge, attitudes, and behaviors regarding global and sustainability issues. Continued exploration into effective teacher training programs is necessary. These research should focus on identifying best practices for preparing educators to teach global and sustainability topics. Future studies could explore international collaborations and exchanges to share successful practices and strategies for integrating global and sustainability education. This could enhance the global exchange of ideas and foster innovation in educational practices.

The researcher concludes that integrating global education and education for sustainability is essential for preparing students to address global challenges and contribute to sustainable development. The author also discusses few challenges in practicing global education like the research in the field of global education is underdeveloped, empirical research is missing in the field of global learning processes, challenges remain at the institutional level also, teachers training and further research is needed in regards to both theoretical framing and empirical foundations. These challenges may be tackled by cooperation between protagonists of global learning, people dealing with environmental education

and those dealing with education for sustainability than by concurrence between the different roots of Educational sustainability development.

Implementing Indian Knowledge system into education The Indian Knowledge Systems (IKS), or the Bhāratīya Jñāna Paramparā Vibhāga is a division of the Ministry of Education of the Government of India which purports to promote indigenous Indian systems of knowledge. Established in October 2020, it is located in the AICTE headquarters in New Delhi. The Indian knowledge systems comprise of Jnan, Vignan,and Jeevan Darshan that have evolved out of experience, observation, experimentation and rigorous analysis. The tradition of validating and putting into practice will impact our education, arts and many other fields. This can to a great extend reduce the limitations of AI which challenges the traditional Indian spirit of education.

5.CONCLUSION

AI is now becoming a game changer in the Indian education sector. AI has emerged as a revolutionary force, transcending traditional boundaries and reshaping industries across the globe. AI is proving to be a game changer, bringing significant advancement in teaching methodologies, personalized learning and overall student engagement. According to the report IBEF, India had 41.38 million students enrolled in higher education in the year 2020-21 and size of the online education market in India is expected to grow by US $ 2.28 billion during 2021-25. Every student is different and unique in terms of learning patterns, pace and style. Sometimes it becomes challenging for a teacher to design a methodology that meets the needs of each student. According to a report by the Indian Ministry of Education, personalized learning contributes to improving student performance by increasing retention rates and overall academic achievements.

AI is undeniably a game changer in Indian Education sector. As we move forward, it is imperative to embrace AI responsibly, Leveraging its potential to create an inclusive and progressive educational landscape for the benefit of all learners. Even though AI has made life easier, it has created an unseen danger to human species. Education is not only about imparting knowledge, the tradition of education in India is deeply rooted in its ancient history, evolving through various periods and cultural influences. India's education system has undergone significant reforms, emphasizing universal education, literacy and technical training. Education in India has been influenced by various philosophers and cultural practices and it continues to evolve to meet contemporary needs. Even though AI is contributing to a more dynamic, efficient and personalized education system in India, although its integration requires careful management to address associated challenges. Implementing Indian Knowledge system is one of the best solution at the times of AI getting the life changer of all learners in education industry.

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