International Journal of Applied Home Science
(An International Double Blind Peer Reviewed / Refereed Research Journal of Home Science)
Volume 12 (5 & 6), May & June (2025) : 318-322
Received : 26.04.2025; Revised : 11.05.2025; Accepted : 26.05.2025

REVIEW PAPER
ISSN : 2394-1413 (Print)
DOI: https://doi-ds.org/doilink/07.2025-96276643/IJASS/12.5&6/318-322

Challenges and Opportunities of Al in Indian Higher Education: A Review

S. FATIMA BUSHRA[1] AND AJANTA NAYAK*[2]
[1]Faculty and [2]Assistant Professor
PG Department of Home Science, Shailabala Auto. Women's College, Cuttack (Odisha) India

*Corresponding Author

ABSTRACT

India is steadily adopting Artificial Intelligence (AI) in education, showing great potential to improve teaching and administrative functions. A paradigm shift is occurring in business schools from traditional teaching to smart education, enhancing students' experiences with personalized learning, adaptive systems, and evidence-based decision-making. AI is helping address critical challenges in Indian higher education, such as inadequate infrastructure, data privacy, and the need for skilled teachers. Significant progress has been made through intelligent tutoring systems, learning analytics, and adaptive learning techniques, paving the way for more efficient, individualized learning. Additionally, virtual agents and AI-based chatbots are being developed for simulation games, application training, and helpdesk support, increasing operational efficiency. India's AI adoption rate in higher education is the highest globally at 59%, indicating strong acceptance. However, AI's impact on academic integrity presents concerns; a recent survey found that 17% of students used AI for assignment completion, raising questions about institutions' preparedness to detect misuse. Faculty and assistants must evaluate AI use in students' research, and AI adoption in education should be paired with comprehensive training. This emphasize the need to prepare faculty and staff in higher education on AI tools and technologies, enabling effective monitoring of students' reliance on AI and proper control of AI model usage.

Keywords: Personalized, Learning, Efficiency, Application, Training

INTRODUCTION

The globe has realised that a state's economic prosperity is directly related to its educational system. Education is a nation's strength. A developed nation is always an educated one. India's higher education system is the world's third largest, following the United States and China. India, being a developing country, has made strides in education since its independence (Sheikh, 2017). The use of artificial intelligence (AI) into Indian higher education brings both considerable opportunities and challenges. "Global education systems are leaning towards a more personalized, student-centered approach. Innovations like Big Data, Machine Learning, and Artificial Intelligence (AI) have given the modern-day technology to accommodate the distinctive features of human beings – smart machines and computers have been built to understand individual-specific needs. This creates a path for "personalisation" in the field of education. It is clear that the next generation of educational reforms, driven by Big Data analysis and AI, will advance significantly, as seen by the proliferation of Education Technology (EdTech) start-ups and government investments in AI research (Bhutoria, 2022). Incorporating Artificial Intelligence (AI) into educational frameworks holds great promise for resolving issues and enhancing sustainable education in India. AI's role in education, with an emphasis on making learning more individualised, streamlining administrative procedures, and increasing accessibility.

Significance of AI Implementation in Higher Education of India:

The AI methods and strategies are being adopted in a big way in the higher education segment of India. The

How to cite this Article: Bushra, S. Fatima and Nayak, Ajanta (2025). Challenges and Opportunities of Al in Indian Higher Education: A Review. *Internat. J. Appl. Home Sci.,* **12** (5 & 6) : 318-322.

educational systems around the world are roping in AI solutions to make the process of learning easier for the students; no longer are these educational systems dependent on antiquated methods. Many novel methodologies and approaches of teaching and learning are being used by the institutions in India (Jaiswal and Arun, 2021).

In India, the application procedure can be especially daunting due to the enormous expense involved in pursuing higher education. The registration process's monotony is tempered by the efficiency with the basic information about prospective of students is gathered. AI, or Artificial Intelligence, assists in the college selection process by utilizing a certain algorithm that pairs the student profile with affordable colleges that meet their needs (Katti *et al.,* 2022).

Opportunities of AI in Higher Education:

1. ***AI Assisted Learning:*** Students are provided with personalized learning services through AI based devices. Machine learning algorithms are integrated into the education system to offer customized educational materials that suit the user's knowledge, experience and the learning style. Algabri *et al.* (2021). In India the implementation of AI driven personalized learning particularly through the tools and devices which are AI-based is changing the education sector for the better since the content is generated as per individual needs. As per the reports from NASSCOM, it is observed that more than 70% of the companies within India tend to use IT for education solutions and spend over 20% of the IT budget on such products (Kanchon *et al.*, 2024). Further as Sadman *et al.* (2024) noted, over 5.5 million participants in the AWS training programs based in India were AI tool-enabled for the courses offered. These developments indicate the presence and use of AI in the education field to transform the learning is accomplished in various ways.

2. ***Improved Teaching and Management Processes:*** AI integration can be used to automate mundane clerical activities like grading exams, managing information, and organizing different appointments that allow's the faculty and staff to focus more on the strategic activities. Research has shown that pedagogical design and implementation using AI technologies lead to better teaching practices and therefore better learning outcomes (Michel-Villarreal *et al.*, 2023).

3. ***Transforming Indian Higher Education Through AI-Driven Solution:*** Seen through the lenses of intelligent curriculum, it comprises intelligent tutoring systems, predictive analytics and adaptive learning that are improving Indian higher education by focusing on specific student requirements and delivering required outcomes. Intelligent tutoring systems help students to stay focused and engaged because they offer assistance instantaneously (Bhatia *et al.*, 2024), the adaptive designs increased a retention rates by up to 30% (Kaswan *et al.*, 2024). Predictive analytics allows to assess risk and potentially problematic for the students. In India, such AI systems have grown student attraction to 25% and STEM engagement to 40%, showcasing the tremendous prospects of AI in creating efficient, fitting and affordable educational solutions.

4. ***Optimizing Administrative Efficiency and Decision-Making in Higher Education with AI:*** Artificial intelligence technologies are advancing administration in higher education institutions by taking over different activities as marking, admissions processing, and financial aid applications. This results in educators directing more efforts towards learner engagement and personalized instructions. Moreover, predictive analytics powered by AI technologies provide universities with actionable insights, thereby making their strategies better focused and resources effectively utilized. Such developments increase the operational efficiency of processes, lead to decreased costs, and ultimately contribute to a higher educational standard (Saaida, 2023).

5. **Improving Collaboration and Efficiency of Activities in Public Sectors with AI:** The setup of governments, particularly in a hybrid setting, has been effective due to some core processes having been computerized and the

flows and management functions being elevated through AI techniques, More so AI has contributed to the level of company activities being 30% efficient. The level of achievement on a target has reduced by 25 %, and enhancement in the level of achievement of the tasks by 20%. Employees' areas of work focus have escalated from 15-20 % due to the availability of AI based technology while 40% believe that AI has improved the level of communications in the public sector (Penprase, 2024).

Challenges in Implementing AI in Indian Higher Education:

1. ***High Costs and Expertise Requirements*:** The application of AI in education sector goes together with high amount of expenditures, infrastructure and trained personnel. Pedro *et al.* (2019) stress on an interaction between AI and education that provides the best results. Teachers have to learn some digital skills to enable them and maximize the use of AI tools. Tools developers must be focused in developing real tools that are compatible with learning environments. In areas of rural India, primary six out of ten schools have no elementary digital facilities, schooling with the help of AI is still a tall order. Such inequalities would increase the inequalities in the education provision in future, Lopez *et al.* (2024) observe, and are likely to be the case, with currently only three in every twelve of rural Indian schools having access to the net.

2. ***Inability to Apply Critical Thinking and Emotion:*** AI is good in performing high volumes of repetitive operations but not so in being creative, metacognitive or emotionally intelligent. Creativity, as a skill that can be attributed to people, is important for one to be able to perform fast yet novel and effective solutions to the problems presented. For example, Bhatnagar (2020) mentions about machines the that it cannot mimic the emotionally charged bonds between the teachers and students, necessary for full education. Further, AI does not have non-verbal communication elements such as body language, facial expressions and even eye contact, as these element are important in interaction and teaching.

3. ***Ethical Threats and Privacy implications*:** AI education entails serious ethical issues and poses privacy concerns. According to Naz and Neetu (2024), as AI systems constantly gain access to more and more student data, such laws regarding data privacy and information security should be well enforced. India, as a country still developing data protection laws, is particularly at risk. About 70% educational institutions do not have policies in place to control AI based data analytics processes and hence the possibility of bias, prejudice and exposure of sensitive data (Naz and Neetu, 2024)

4. ***Workforce Displacement*:** According to Agarwal and Vij, A. (2024), the workforce of the future will have to be smart, multifunctional and work alongside algorithms, data and machines to boost output. It also raise the alert of risk of job displacement and excessive dependence on automation in low cost economies. For example, India's IT industry could stand to lose between 6–8 million jobs due to automation; in education routine use of AI tools in related to tasks that result in lower teacher participation in activities and reduced efforts by the students. In a similar vein, Bhatnagar (2020) cautions that if people become too accustomed to such usage of AI in everyday life, it will weaken people's academic interest as students will be less likely to evaluate other perspectives or immerse themselves in the process.

5. ***Gaps in Infrastructure and Accessibility:*** The digital divide between India's urban and rural divides constrains AI's promise in revolutionizing education for all. Lopez *et al.* (2024) remark that more than 40 % of elementary level institutional networks in rural areas are devoid of basic networks, this is not the case for urban institutional networks. Caste discrimination and lack of qualified teachers aggravate the problem even further as retarding AI application to

disadvantaged regions. Educational inequalities are likely to be perpetuated as long as these infrastructural deficiencies are not resolved.

The Future of AI Indian Higher Education:

AI related technologies are being embedded in student learning experiences and the university's infrastructure to leverage the current developments in the educational process in India. In addition to integrating AI into their curriculam, many Indian universities and institutions have been developing AI-based applications alongside research groups and corporations. Universities and other research institutions in the country have been able to leverage AI in some of their operations due to governmental support (AI India, 2023). India's AI-based educational learning centers are currently the fastest-growing in the country, a trend expected to shape the universities in India, to leverage the current technologies in the near future. With the growing demand of AI in systems and processes, there's an increasing adoption of AI programs for management and learning design tools as well among higher education institutions are integral in strengthening student's experience in learning programs.

Conclusion:

The implementation of Artificial Intelligence (AI) within the Indian higher education system holds promise with many benefits. It implementation appear to be challenging. AI has the ability to enhance the personalized approach to the learners as well as enable advanced methods of management and activity, teaching approaches, but it is also complicated by issues of costs, ecosystem gaps and ethical concerns. In spite of these odds, Indian Education is the future and as such it has to be adopted and it is the obligation of the educational stakeholders such as government, schools and private sectors in India. In order to effectively harness the AI for remaking the higher education in India and also the AI for education scenario in India, there has to be an active investment in inclusion, up skilling of the teaching staff on the integration of information technological and there should be measures for data security. If all these assets are properly planned for and invested into, AI will change the economies, improve the education system in India and turn it into the jewel of AI education

REFERENCES

Agarwal, P. and Vij, A. (2024). Assessing the Challenges and Opportunities of Artificial Intelligence in Indian Education. *International Journal for Global Academic & Scientific Research*, **3**(1) : 36-44.

Algabri, H.K., Kharade, K. and Kamat, R. (2021). Promise, threats, and personalization in higher education with artificial intelligence. *Webology*, **18**(6).

Bhatia, Abhay, Bhatia, Pankhuri and Sood, Devendra (2024). Leveraging AI to Transform Online Higher Education: Focusing on Personalized Learning, Assessment, and Student Engagement, *International Journal of Management and Humanities,* **11**(1):1-6

Bhatnagar, H. (2020). Artificial intelligence—a new horizon in Indian higher education. *Journal of Learning and Teaching in Digital Age*, **5**(2), 30-34.

Bhutoria, A. (2022). Personalized education and artificial intelligence in the United States, China, and India: A systematic review using a human-in-the-loop model. *Computers and Education: Artificial Intelligence*, **3**, 100068.

Jaiswal, A. and Arun, C. J. (2021). Potential of Artificial Intelligence for transformation of the education system in India. *International Journal of Education and Development using Information and Communication Technology*, **17**(1) : 142-158.

Katti, J., Agarwal, J., Bharata, S., Shinde, S., Mane, S. and Biradar, V. (2022, March). University admission prediction using Google Vertex AI. In 2022 First International Conference on Artificial Intelligence Trends and Pattern Recognition (ICAITPR) (pp. 1-5). IEEE..

Kaswan, K. S., Dhatterwal, J. S., & Ojha, R. P. (2024). AI in personalized learning. In Advances in Technological Innovations in Higher Education (pp. 103-117). CRC Press.

Kanchon, Md. Kabin Hasan, Sadman, Mahir, Nabila, Kaniz Fatema, Tarannum, Ramisa and Kha, Riasat (2024). Enhancing personalized learning: AI-driven identification of learning stylesand content modification strategies. *International Journal of Cognitive Computing in Engineering*, **5** : 268-278

Lopez, S., Vani Sarada, D. R., Pandey, A., Khuntia, M. andHaralayya, B. (2024). Artificial Intelligence Challenges and Role for Sustainable Education in India: Problems and Prospects. *Library Progress International*, **44**(3) : 18261-18271.

Michel-Villarreal, R., Vilalta-Perdomo, E., Salinas-Navarro, D. E., Thierry-Aguilera, R. andGerardou, F. S. (2023).

Challenges and opportunities of generative AI for higher education as explained by ChatGPT. *Education Sciences*, **13**(9) : 856.

Naz, N. and Neetu, K. (2024). Examining the practical implications of artificial intelligence adoption in higher education: A case study of Bihar state. *International Journal of Multidisciplinary Trends,* **6**(4): 32-38

Pedro, F., Subosa, M., Rivas, A. and Valverde, P. (2019). Artificial intelligence in education: Challenges and opportunities for sustainable development.

Penprase, B. (2024, October 13). The Future of AI and India. Forbes.

Saaida, M. B. E. (2023). AI-Driven Transformations in Higher Education: Opportunities and Challenges. *International Journal of Educational Research and Studies*, **5** : 29-36.

Sheikh, Y. A. (2017). Higher education in India: Challenges and opportunities. *Journal of Education and Practice*, **8**(1) : 39-42.

****