

THE ROLE OF AI IN EDUCATION AND SOCIETY IN INDIA: A CRITICAL ANALYSIS

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ABSTRACT

Education is a fundamental human right and a key driver of social, economic, and technological development. However, conventional education systems continue to face significant challenges, including overcrowded classrooms, unequal access to quality learning, limited teaching resources, and the need to address diverse learning abilities.

The rapid advancement of Artificial Intelligence (AI) has introduced innovative opportunities to transform education by making learning more personalized, efficient, and inclusive. AI-powered technologies such as intelligent tutoring systems, adaptive learning platforms, virtual assessments, predictive analytical, and generative AI tools are reshaping teaching methodologies, improving student engagement, and supporting educators in delivering customized learning experiences.

This paper critically analyzes the transformative role of AI in education by examining its

impact on teaching, learning, administration, and educational accessibility. It explores how AI can enhance academic performance, reduce administrative burdens, facilitate lifelong learning, and bridge educational gaps for students in remote and underserved communities. At the same time, the study highlights significant challenges associated with AI adoption, including concerns over data privacy, cybersecurity, algorithmic bias, ethical decision-making, digital inequality, and the evolving role of teachers in AI-assisted classrooms. The research also emphasizes the importance of maintaining human-centered education while leveraging technological advancements.

Using a qualitative research approach based on secondary data collected from academic journals, government reports, international organizations, and policy documents, this study evaluates the opportunities and limitations of AI in modern education. The paper concludes that while AI has immense potential to improve educational quality and accessibility, its implementations must be guided by robust ethical frameworks, transparent governance, inclusive policies, and continuous teacher training. Responsible and equitable AI systems can promote innovation and contribute significantly to achieving inclusive high-quality education in the digital era.

Keywords: *Artificial Intelligence, education, Personalized learning, administrative efficiency, student engagement, ethical challenges, data privacy, algorithmic bias, digital divide, equity, accessibility, underserved communities, AI in education, technology integration, education policy.*

1. Introduction

Education is a fundamental human right and one of the most important foundations for individual and national development. Every country gives high priority to education because it promotes peace, equity, economic growth, and social progress. The United Nations recognizes education as the right of every individual to receive quality education without discrimination. Education equips people with knowledge, skills, values, and critical thinking abilities that enable them to participate actively in society, improve their communities. It also plays a vital role in reducing poverty, creating employment opportunities, encouraging innovation, and achieving sustainable development. Therefore, ensuring equal access to quality education for everyone remains a major goal of governments and international organizations.

Despite its importance, traditional education systems continue to face several challenges. Many schools and colleges experience overcrowded classrooms, limited teaching resources, unequal access to quality education, and difficulty in meeting the diverse learning needs of students. Teachers often have limited time to provide individual attention, making personalized learning difficult. This concern is borne out by recent government data: in December 2023, the Ministry of Education reported a shortfall of over seven lakh teachers at the elementary level and more than one lakh at the secondary level, with rural and remote regions bearing the brunt of these vacancies. Such shortages compound the difficulty of offering individualised attention to students in already overcrowded classrooms.¹ Students from rural and economically weaker sections may

1 Monalisa Behera, 'Shortage of Teachers in India: Implications for Quality of Education' (Education for All in India, 4 April 2026) <<https://educationforallinindia.com/shortage-of-teachers-in-india-implications-for-quality-of-education/>> accessed 11 August 2026.

also face barriers in accessing quality educational resources. These challenges highlight the need for innovative solutions that can improve teaching and learning while making education more inclusive and effective.

One the most significant technological developments in recent years is Artificial Intelligence (AI). AI refers to the ability of computer systems to perform tasks that normally require human intelligence, such as learning, reasoning, decision-making, language understanding, and problem-solving. The term “Artificial Intelligence” was introduced at the Dartmouth Summer Research Project on Artificial Intelligence in 1956. Where researchers described it as the science and engineering of creating intelligent machines capable of performing cognitive tasks. Since then, AI has developed rapidly and has transformed various sectors, including healthcare, agriculture, finance, transportation, manufacturing, and education. In India, this expansion is visible within the school curriculum itself: the Central Board of Secondary Education now offers Artificial Intelligence as a skill subject in more than eighteen thousand affiliated schools from Class 6 onwards, and has trained over ten thousand teachers to deliver it since 2019. This institutional uptake suggests that AI is no longer a peripheral concern for Indian education but an emerging part of mainstream school curricula.²

Considering both the opportunities and challenges, it is essential to examine the role of AI in education critically. This study explores how AI is transforming teaching, learning, educational administration, and student development while also addressing the ethical, legal, and social issues associated with its implementations. The research aims to evaluate

2 Vaishnavi Shukla, '18,839 CBSE Schools Offer AI as a Skill Subject from Class 6: Education Ministry' (Careers360, 4 August 2025) <<https://news.careers360.com/18839-cbse-schools-offer-artificial-intelligence-as-a-skill-subject-from-class-6-nep-2020-recommendations-education-ministry>> accessed 11 August 2026.

whether AI can support the achievement of inclusive, equitable, and quality education while ensuring that technology remains a tool to assist educators rather than replace the essential human role in education.

2. Review of Literature

2.1 Jain and Jain (2019): Conducted an empirical study on the role of Artificial Intelligence in higher education. The findings indicated that the integration of AI into higher education institution of AI into higher education institution can significantly enhance students' learning capabilities and improve the overall learning process. The study also highlighted that AI has considerable potential for future development and application in the higher education sector³

2.2 Kataria et al. (2020): Examined the adoption of Artificial Intelligence in the Indian educator sector. Their study observed that the implementation of AI in Indian education was still at an early stage. However, the researchers identified substantial opportunities for the expansion of AI- based technologies in education. The study emphasized that appropriate adoption and effective implementation could contribute to the modernization of the Indian education system.⁴

2.3 Khan (2021) In the article titled “*Artificial Intelligence(AI) & Education: Developing Adaptable Learning Opportunities among Teachers & Learners*”, discussed

3 Suvrat Jain and Roshita Jain, “Role of Artificial Intelligence in Higher Education-An Empirical Investigation,” *International Journal of Research and Analytical Reviews*, Vol. 6, Issue 2, 2019, pp.144-150

4 A. Kataria, R. Mishra and P. Lalwani, “Role of Artificial Intelligence in Education,” *SSRN Electronic Journal*.

the meaning, importance, and growing role of Artificial Intelligence in education. The study examined the ways in which AI can support both teachers and learners by creating adaptable and technology-based learning opportunities. It also discussed various challenges associated with the implementation of AI and examined its emerging impact on the Indian education system.⁵

2.4 Sharma (2023): Highlighted the transformative role of Artificial Intelligence in the Indian education sector. According to the study, AI-based tools are improving teaching and learning processes by increasing the efficiency of assessment and grading while also encouraging critical thinking among students. The study further pointed out that AI can support the education sector in addressing the shortage of teachers by providing technology-enabled learning and teaching assistance.⁶

2.5 Sihag and Vibha (2024): Examined the growing influence of Artificial Intelligence on education in India. Their study found that AI contributes to personalized learning, supports teachers, and improves administrative and educational processes. AI-powered technologies, including intelligent tutoring systems and adaptive assessment tools, can customize learning experiences according to the individual needs and abilities of students. These technologies have the potential to increase student engagement, improve learning outcomes, and make educational practices more effective.

While the studies discussed above establish the conceptual and pedagogical relevance of

5 M. A. Khan, "Artificial Intelligence (AI) & Education: Developing Adaptable Learning Opportunities among Teachers & Learners," *Edutracks*, Vol. 20, No. 9, 2021, pp. 39-44.

6 Aditi Sharma, "Role of Artificial Intelligence in the Indian Education Sector: A Systematic Literature Review," *International Journal of Science and Research (IJSR)*, Vol. 12, Issue 6, June 2023, pp. 919-923.

AI to Indian education, they draw largely on qualitative observations rather than large scale administrative data. More recent government initiatives indicate that AI related instruction has already reached considerable scale, with a nationwide Artificial Intelligence and Computational Thinking curriculum for Classes 3 to 12 announced for rollout from the 2026-27 academic session. This suggests that the pace of AI integration into Indian classrooms may be outstripping the pace at which existing scholarship has been able to document its effects, reinforcing the need for the kind of updated, critical analysis undertaken in this paper.⁷

3. Objectives

The objectives of this paper are:

- 3.1 To examine current applications of AI in Indian education and society.
- 3.2 To critically analyse the opportunities and challenges of AI adoption in India.
- 3.3 To assess the impact of AI on equity, access, and employment.
- 3.4 To provide policy recommendations for responsible AI deployment in India.

This study uses a qualitative research based on secondary data.

4. Methodology

⁷ 'CBSE, NCERT Launch AI Curriculum for Classes 3 to 8: India Pushes Future-Ready Education in Schools' (Global Education News, 13 May 2026) <<https://globaleducationnews.org/cbse-ncert-launch-ai-curriculum-for-classes-3-to-8-india-pushes-future-ready-education-in-schools/>> accessed 11 August 2026.

This study adopts a descriptive and analytical research design to examine the role of Artificial Intelligence (AI) in transforming education and society in India. The study is based on secondary data collected from peer-reviewed journal articles, research papers, books, conference proceedings, government reports, and policy documents, particularly the *National Education Policy (NEP) 2020*.⁸

Relevant information was collected using keywords such as AI in education, AI in Indian education, personalized learning, generative AI, and AI and society. The collected data were analysed thematically to identify the major benefits, applications, challenges, ethical concerns, digital inequalities, and future opportunities associated with AI in education. The study also considers the impact of AI on teaching, learning, assessment, accessibility, skill development, and educational administration.

The study adopts a descriptive and analytical doctrine/qualitative research methodology based on secondary sources.

5. AI in Indian Education

Artificial Intelligence (AI) in transforming Indian education by improving teaching efficiency, personalized learning, assessment, and educational administration. AI powered tools can analyse student performance and provide customized learning materials, quizzes and recommendations according to individual needs.⁹ A recent illustration of this trend is the redesign of the NCERT run DIKSHA platform, relaunched in September

⁸ Fengchun Miao, Wayne Holmes, ronghuai Huang & Hui Zhang, *AI and Education: Guidance for policy-maker*, UNESCO, 2021.

⁹ Ministry of Education, Government of India, *National Education Policy 2020* (Government of India, 2020).

2025 with AI enabled adaptive learning, structured lesson sequencing, and multilingual support across twelve Indian languages. Such platforms show that AI driven personalisation is moving from a theoretical possibility to an operational feature of India's public digital education infrastructure.¹⁰

AI also supports teachers by automating grading, attendance, scheduling, lesson planning, and curriculum development, allowing more time for student interaction. Adaptive learning systems help students learn at their own pace and improve their critical and analytical skills. This is corroborated by recent government data showing that the national pupil teacher ratio has improved across all school stages, standing at twenty one students per teacher at the secondary level in 2024-25, comfortably within the National Education Policy 2020 benchmark of thirty students per teacher. Nonetheless, several states continue to report considerably higher ratios, indicating that automation and administrative support from AI remain necessary to sustain and extend these gains.¹¹

AI promotes accessibility and inclusivity through technologies such as speech-to-text, text-to-speech, virtual classrooms, and digital, data privacy, ethical concerns, and lack of infrastructure must be addressed for sustainable and equitable education in India. A concrete example of this potential is the National Council of Educational Research and Training's use of artificial intelligence and machine learning tools to translate newly developed textbooks for Classes 1 and 2 into all twenty two scheduled Indian languages, widening access to standardised learning material across the country's linguistically

10 IMARC Group, 'India Edtech Market Size, Share and Growth 2034' (IMARC Group, 2026) <<https://www.imarcgroup.com/india-edtech-market>> accessed 11 August 2026.

11 'India's School Teacher Count Crosses One Crore, Dropouts Decline: UDISE Report' (DD News, 29 August 2025) <<https://ddnews.gov.in/en/indias-school-teacher-count-crosses-one-crore-dropouts-decline-udise-report/>> accessed 11 August 2026.

diverse student population.¹²

6. Challenges in AI Integration

The integration of Artificial Intelligence (AI) into Indian education faces several challenges. The digital divide remains a major issue, particularly in rural and economically disadvantaged areas where access to reliable internet, digital devices, and technological infrastructure is limited. The high cost of implementing and maintaining AI systems also creates difficulties for many educational institutions. This disparity is substantiated by Ministry of Education data showing that only 18.47 per cent of rural schools have internet access compared with 47.29 per cent of urban schools, a gap of nearly twenty nine percentage points. Even where physical infrastructure exists, frequent power outages in rural areas often leave digital devices unusable, further undermining the reliability of AI based tools in these settings.¹³

Teacher training and technological skills are essential for effective AI adoption. Many teachers require proper training and continuous support to use AI tools effectively. The scale of this challenge is considerable: although the Central Board of Secondary Education has trained more than ten thousand teachers in AI related skills since 2019, this figure remains modest set against a national teaching workforce that crossed one crore for the first time in the 2024-25 academic year. Bridging this gap will require sustained, large

12 Vaishnavi Shukla, '18,839 CBSE Schools Offer AI as a Skill Subject from Class 6: Education Ministry' (Careers360, 4 August 2025) <<https://news.careers360.com/18839-cbse-schools-offer-artificial-intelligence-as-a-skill-subject-from-class-6-nep-2020-recommendations-education-ministry>> accessed 11 August 2026.

13 'Rural Schools Lag 29% Behind Urban in Internet Access: Edu Min Data' (MediaNama, 29 November 2024) <<https://www.medianama.com/2024/11/223-29-per-cent-disparity-rural-urban-schools-internet-access-education-ministry-data/>> accessed 11 August 2026.

scale investment in teacher training rather than isolated or short term programmes.¹⁴

Resistance to Technological change and fear of AI replacing teachers may also affect adoption. Therefore, professional development and awareness programmes are necessary.

AI integration also raises ethical and social concerns, including data privacy, algorithmic bias, over-dependence on technology, and lack of standardized regulation. These concerns are not merely theoretical: in 2020, the Bengaluru based edtech platform Unacademy suffered a data breach in which the personal account details of around twenty two million users were compromised and offered for sale on the dark web. Incidents of this kind highlight the urgent need for robust cybersecurity standards and clear accountability mechanisms as AI based platforms come to hold increasing volumes of sensitive student data.¹⁵ India linguistic and cultural diversity further requires AI tools that support multiple languages and local contexts. Addressing these challenges through government support, teacher training, better infrastructure, research, and ethical guidelines is essential for inclusive and effective AI-based education.¹⁶

7. AI and Personalised and Inclusive Learning

. Based on this information, they can recommend suitable learning materials and activities. This can be particularly useful for students who learn at different speeds. AI

14 Vaishnavi Shukla, '18,839 CBSE Schools Offer AI as a Skill Subject from Class 6: Education Ministry' (Careers360, 4 August 2025) <<https://news.careers360.com/18839-cbse-schools-offer-artificial-intelligence-as-a-skill-subject-from-class-6-nep-2020-recommendations-education-ministry>> accessed 11 August 2026; 'India's School Teacher Count Crosses One Crore, Dropouts Decline: UDISE Report' (DD News, 29 August 2025) <<https://ddnews.gov.in/en/indias-school-teacher-count-crosses-one-crore-dropouts-decline-udise-report/>> accessed 11 August 2026.

15 'Hacker Sells 22 Million Unacademy User Records After Data Breach' (BleepingComputer, 6 May 2020) <<https://www.bleepingcomputer.com/news/security/hacker-sells-22-million-unacademy-user-records-after-data-breach/>> accessed 11 August 2026.

16 Fengchun Miao & Wayne Holmes, *Guidance for generative AI in Education and Research* (UNESCO, Paris, 2023), pp. 8-12

can also support students with disabilities through One of the major advantages of AI in education is its ability to provide personalised learning experiences. AI systems can analyse students' academic performance, learning behaviour, and individual requirements assistive technologies such as speech-to-text, text-to-speech, automated captions, and voice recognition. These technologies can improve access to educational content for students with visual, hearing, and learning difficulties. AI powered translation tools can also help overcome language barriers in India's multilingual educational environment. However, AI tools may not fully address the needs of students with severe or complex disabilities and therefore require human support. Similarly, expensive assistive technologies may remain inaccessible to economically disadvantaged students. Hence, affordability, accessibility, and human assistance are necessary to ensure that AI promotes genuine educational inclusion.¹⁷ This affordability challenge is significant in the Indian context: students with disabilities make up less than 0.5 per cent of India's higher education population, compared with roughly 19 per cent in the United States, a gap only partly attributable to the availability of assistive technology. Institutions such as the Indian Institute of Technology, Delhi have nonetheless begun developing low cost, regional language assistive tools, including screen readers and tactile learning aids, pointing towards more affordable, India specific applications of AI enabled assistive technology.¹⁸

8. AI and the Transformation of India Society

The impact of AI extends beyond education and has the potential to transform Indian

¹⁷ UNESCO, *Artificial Intelligence and Education: Guidance for Policy-makers* (UNESCO, Paris, 2021).

¹⁸ 'Accessibility in Indian Universities: Lessons from the US' (*ThePrint*, 13 March 2025)

<<https://theprint.in/opinion/accessibility-in-indian-universities/2542503/>> accessed 11 August 2026.

society. AI is increasingly being used in healthcare, banking, agriculture, transportation, governance, communications, and employment. In education, AI can prepare students for a technology-driven economy by developing digital, analytical, and problem-solving skills. AI can also create new employment opportunities in areas such as data science, machine learning, software development, and AI research. At the same time, automation may reduce demand for certain routine jobs and create concerns about unemployment and skill displacement. This concern is reflected in India's Economic Survey 2024-25, which devoted a dedicated chapter to artificial intelligence and cited a survey in which sixty eight per cent of white collar workers expressed fear of job automation within five years. The Survey observed that a labour surplus economy such as India cannot afford protracted labour displacement, and called for proactive institutional measures, including retraining and social security support, to help workers transition towards higher skill, AI complementary roles.¹⁹ AI can also influence social interaction, decision-making, and access to information. The benefits of AI may not be equally distributed because differences in digital access, income, infrastructure, and technological skills can widen existing inequalities. Therefore, AI development must be accompanied by digital literacy, skill development, and inclusive policies. A human-centred approach is necessary to ensure that technological progress contributes to wider social development.

9. Opportunities

India has great opportunities to use Artificial Intelligence (AI) in education. NEP 2020 promotes digital learning and the use of emerging technologies, while NITI Aayog's AI

19 'Economic Survey 2024-2025: AI Evolution Poses Job Automation Risks in India' (Down To Earth, 31 January 2025) <<https://www.downtoearth.org.in/science-technology/economic-survey-2024-2025-india-at-a-watershed-point-with-ais-rapid-evolution>> accessed 11 August 2026.

for all initiative promotes AI awareness and skills. AI can support personalised learning, skill development, higher education, vocational training, and research. It can also help students develop skills in coding, data science, and AI according to industry needs. AI can assist teachers in assessment, grading, lesson planning, and analysing student performance. It can also support students with disabilities through speech-to-text, text-to-speech, translation, and other assistive technologies.²⁰ Thus, AI can make education more inclusive, accessible, efficient, and personised. However, proper infrastructure, teacher training, ethical safeguards, and data security are necessary for its effective implementation.²¹ This institutional support has recently been reinforced at the national level: the Union Government's IndiaAI Mission has begun establishing dedicated computing infrastructure, datasets, and skilling programmes for artificial intelligence, and the 2025-26 Union Budget specifically announced a Centre of Excellence for AI in Education with an allocation of five hundred crore rupees. Such measures indicate a growing recognition within Indian policymaking that realising the opportunities of AI in education requires sustained public investment rather than reliance on private initiative alone.²²

10. Golden Rule of Interpretation

The Golden Rule of Interpretation allows courts to modify the ordinary meaning of statutory words when a literal interpretation would lead to an absurd or unjust result. This rule is relevant to AI-related laws because existing legislation may not specifically address emerging technologies. Courts may therefore interpret legal provisions in a

²⁰ UNESCO, *Global Education Monitoring Report 2023: Technology in Education* (2023).

²¹ UNESCO, *Recommendation on the Ethics of Artificial Intelligence* (2021)

²² 'Announcements on AI in the 2025-26 Union Budget' (CERAI, 2025)

<<https://cerai.substack.com/p/announcements-on-ai-in-the-2025-26>> accessed 11 August 2026.

manner that gives effect to legislative intent while protecting privacy, equality, and other fundamental rights. The principle is particularly useful in addressing legal issues relating to AI, data protection, cybersecurity, and digital education.

11. Recommendation

Ethical AI Use: Develop clear guidelines to protect student data, ensure privacy, and reduce algorithmic bias.

Teacher Training: Provide regular training programmes to help teachers effectively use AI for personalized learning, assessment, and student support.²³

Equal Access: Improve internet connectivity, digital infrastructure, and affordable access to AI tools, particularly in rural and underserved areas. Recent data illustrate both the scale of India's connectivity drive and the distance still to be covered: by October 2024 the country had deployed more than 24.9 lakh 4G base stations across 783 districts and had reduced the average cost of mobile data from around Rs 269 per gigabyte in 2014 to roughly Rs 9 per gigabyte. Even so, urban tele-density stood at 134 per cent compared with 59 per cent in rural areas as of March 2024, showing that affordable access to AI based learning tools in rural schools cannot be assumed and must be actively planned for.²⁴

²³ Fengchun miao and Mutlu Cukurova, *AI Competency Framework for Teachers* (UNESCO, Paris, 2024), pp. 14, 43-49.

²⁴ Press Information Bureau, 'BharatNet: Bridging the Digital Divide' (Government of India) <<https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=153588&ModuleId=3>> accessed 11 August 2026; 'Growing Digital Divide in Indian Schools' (Rau's IAS Compass, 27 May 2025) <<https://compass.rauias.com/current-affairs/growing-digital-divide-indian-schools>> accessed 11

Human-AI Collaboration: AI should support rather than replace teachers, while maintaining human involvement in critical thinking, creativity, and emotional development.

Continuous Evolution: Regularly monitor and evaluate AI tools to ensure their effectiveness, fairness, safety, and positive impact on students and teachers.

12. Conclusion

The integration of Artificial Intelligence (AI) has the potential to bring a significant transformation to the Indian education system by making learning more personalized, efficient, accessible, and student-centred. AI can support teachers, improve assessment, identify learning gaps, and provide innovative educational resources. It can also

contribute to reducing educational inequalities by expanding access to quality learning opportunities. This trajectory is already becoming visible: the Central Board of Secondary Education and the National Council of Educational Research and Training have announced a nationwide Artificial Intelligence and Computational Thinking curriculum for Classes 3 to 12, to be rolled out from the 2026-27 academic session, marking one of the most extensive attempts globally to embed AI literacy within school education from an early stage. Whether this ambitious rollout narrows rather than widens existing educational inequalities will depend heavily on how effectively the infrastructural and training gaps identified in this paper are addressed.²⁵

August 2026.

25 'CBSE, NCERT Launch AI Curriculum for Classes 3 to 8: India Pushes Future-Ready Education in

However, the successful adoption of AI requires proper attention to the digital divide, teacher training, data privacy, ethical use, affordability, and technological infrastructure. AI should complement human teachers rather than replace them. Through effective policies, continuous evaluation, responsible innovation, and collaboration among the government, educators, technology providers and society, AI can contribute to building a more inclusive, equitable, and future- ready education system in India.

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