

# A Review on the Impact of Artificial Intelligence in the Teaching and Learning Process in India

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## Abstract

Artificial Intelligence is rapidly transforming India's educational landscape, offering unprecedented opportunities to personalize learning, enhance pedagogical outcomes, and address systemic challenges of scale and accessibility. This review article examines the multifaceted impact of AI on teaching and learning processes across Indian schools and higher education institutions. Drawing upon recent policy initiatives, empirical studies, and institutional case examples, it analyzes key developments including AI-enabled classroom implementations in urban schools, integration of intelligent platforms like SWAYAM, and large-scale university partnerships with global AI leaders. The article identifies significant impacts: improved curriculum completion rates, enhanced student engagement, personalized learning pathways, and strengthened teacher capabilities through data-driven insights. It also critically examines challenges including digital infrastructure gaps, data privacy concerns, algorithmic bias, and the imperative of responsible AI adoption. The review concludes that while India has established robust policy foundations through NEP 2020 and the India AI Mission, realizing AI's transformative potential requires scalable solutions, teacher empowerment, and sustained attention to equity and inclusion.

**Keywords:** Artificial Intelligence, Indian education, NEP 2020, personalized learning, teacher empowerment, digital transformation

## 1. Introduction

The integration of Artificial Intelligence into India's teaching-learning processes represents one of the most significant pedagogical shifts since the country's independence. As India aspires to become a developed nation by 2047 under the Viksit Bharat vision, the role of AI in education has moved from experimental interventions to systemic integration. The National Education Policy (NEP) 2020 explicitly advocates for AI and data analytics to personalize learning and address diverse learner needs, positioning technology as central to educational reform.

This review synthesizes current evidence on AI's impact in Indian classrooms, examining both school education and higher education contexts. It addresses three central questions: How is AI currently being deployed in Indian educational settings? What measurable impacts are emerging? And what challenges must be addressed to ensure equitable, responsible AI adoption?

## 2. AI in School Education: Emerging Evidence from Urban Classrooms

India's school education system, serving over 250 million students, presents both immense challenges and opportunities for AI integration. Recent pilot implementations in urban centers demonstrate AI's potential to transform conventional teaching-learning dynamics.

## 2.1 Personalized Learning and Cognitive Tools

In Belagavi, Karnataka, the education department launched AI-powered cognitive learning tools through interactive eBooks that adapt to individual student pace and comprehension levels. These deep learning-based systems include assessment-based navigation, where student responses determine subsequent learning pathways, and automated revision modules targeting identified error patterns. Early impact metrics reveal compelling outcomes: an 18% increase in curriculum completion rates, particularly among lower-performing students, and a 20% higher likelihood of self-initiated practice sessions among learners using AI-based eBooks.

## 2.2 AI-Enabled Classroom Monitoring

Parallel initiatives in Pimpri Chinchwad have implemented AI-enabled classroom monitoring across selected public schools. These systems employ facial and posture recognition to track student attentiveness, behavioral analytics to detect distraction or disengagement, and teacher motion mapping to analyze instructional delivery. Insights are shared with educators through dashboards suggesting pedagogical adjustments—repositioning, voice modulation, or re-engagement strategies.

The results demonstrate measurable improvements: a 25% increase in active classroom participation, with teachers able to intervene early in cases of consistent disengagement. Additionally, behavioral data helped reduce student absenteeism by highlighting boredom-linked dropout risks.

## 2.3 Curriculum-Level Integration

Beyond classroom tools, India's school curriculum is evolving to prepare students for an AI-driven future. Following NEP 2020 guidelines, the Central Board of Secondary Education has introduced two-fold AI integration in affiliated school curricula, aiming to make young learners "future AI ready". This systematic approach recognizes that AI literacy must begin early, positioning students as active participants in technological transformation rather than passive consumers.

## 3. Higher Education: Systemic AI Integration

India's higher education sector has witnessed more extensive AI adoption, with recent developments signaling a paradigm shift in how universities approach teaching, learning, and research.

### 3.1 The SWAYAM Platform and AI4D

The government's flagship MOOC platform SWAYAM has integrated AI-enabled features including personalized recommendations, adaptive content delivery, automated feedback, and progress tracking tools. A study examining Artificial Intelligence for Development (AI4D) usage among 410 students at Bhopal School of Social Sciences found significant relationships between AI engagement and learning outcomes. The research highlighted that instructor attitude toward technology substantially moderates AI's effectiveness, suggesting that successful integration requires not merely technological deployment but concomitant faculty development.

### 3.2 University-Industry Partnerships

February 2026 marked a watershed moment with OpenAI's announcement of partnerships with leading Indian institutions including IIT Delhi, IIM Ahmedabad, AIIMS New Delhi, Manipal Academy of Higher Education, UPES, and Pearl Academy. The initiative aims to support over 100,000 students, faculty, and staff through campus-wide ChatGPT Edu access, structured training, and discipline-specific implementation guidance.

**Notable institution-specific focus areas include:**

- **IIT Delhi:** Engineering-led innovation and advanced research, integrating generative AI into applied

problem-solving and systems design

- **IIM Ahmedabad:** Embedding AI fluency across strategy, finance, marketing, and public policy curricula, complemented by formal certifications
- **AIIMS New Delhi:** Exploring AI applications in medical education, faculty development, and clinical training, including proposed establishment of an AI in Medical Education Hub with quality benchmarks and ethical standards
- **Pearl Academy:** Integrating AI into creative workflows including design development, branding, and digital media

#### 4. Policy Framework and National Initiatives

India's AI-in-education trajectory is shaped by evolving policy architecture. NEP 2020 provides foundational vision, emphasizing adaptive, student-centric learning environments. Digital platforms including DIKSHA, serving over 200 million students and teachers, increasingly incorporate AI-powered features for personalized learning paths and automated assessments.

The February 2026 Bharat Bodhan AI Conclave, organized by the Ministry of Education, brought together over 3,100 participants to deliberate on AI-driven transformation. Key conclusions emphasized that while India possesses strong AI solutions, scaling them to reach every learner requires statewide ecosystem platforms rather than standalone tools, and that teacher support represents the single most significant leverage point for improving learning outcomes .

#### 5. Challenges and Considerations

Despite promising developments, AI integration in Indian education faces substantial challenges.

##### 5.1 Infrastructure and Access

Digital infrastructure remains uneven across India's geography and socioeconomic spectrum. While urban pilots demonstrate AI's potential, rural and resource-constrained schools lack reliable connectivity, devices, and technical support. Without deliberate attention to equity, AI risks exacerbating rather than reducing educational disparities.

##### 5.2 Teacher Preparation and Agency

Research consistently emphasizes that instructor attitude and capability critically moderate AI's effectiveness. The Bharat Bodhan Conclave underscored that AI must strengthen teacher agency and support contextual pedagogy rather than drive uniform digital templates. This requires substantial investment in pre-service and in-service teacher training, moving beyond basic digital literacy to pedagogical integration.

##### 5.3 Data Privacy and Ethics

AI-driven education generates vast data on student behavior, attention, and performance. The DPDP Act 2023 provides foundational protection, but experts caution that robust implementation and clear ethical standards are essential to prevent misuse and build public trust. Algorithmic bias, transparency, and accountability mechanisms require ongoing attention.

##### 5.4 Academic Integrity and Critical Thinking

Concerns persist that AI tools may facilitate academic dishonesty or diminish critical thinking if students become overly dependent on technology for answers . Balancing AI's benefits with preservation of essential cognitive skills requires thoughtful pedagogical design and emphasis on responsible use.

## 6. Future Directions

India's AI-in-education journey is entering a critical phase. Policy recommendations emphasize streamlining regulatory approvals, harmonizing data standards, and incentivizing open-source AI development. The vision of Viksit Bharat 2047 positions AI literacy as essential for national development, requiring collaborative efforts among educational institutions, government, and industry.

Emerging priorities include development of sovereign Large Language Models supporting India's linguistic diversity, expansion of multilingual AI tools for equitable national adoption, and creation of national orchestration platforms coordinating statewide initiatives.

## 7. Conclusion

The impact of AI on India's teaching and learning processes is increasingly evident across school and higher education contexts. From personalized cognitive tools in Belagavi classrooms to systemic university partnerships with global AI leaders, India is actively constructing an AI-integrated educational future. Measurable gains in curriculum completion, student engagement, and pedagogical responsiveness demonstrate AI's potential to address longstanding educational challenges.

Yet technology alone cannot transform education. Realizing AI's promise requires sustained investment in teacher empowerment, infrastructure, ethical frameworks, and equity-focused implementation. As India advances toward Viksit Bharat 2047, the integration of AI into education must remain fundamentally human-centered—enhancing rather than replacing the essential relationships between teachers and learners, and ensuring that technological transformation serves the nation's diverse, multilingual, and aspirationally rich student population.

## References

1. NITI Aayog Frontier Tech Hub. (2025). Beyond Chalk and Talk: AI-Driven Classrooms and Cognitive Learning in Urban India.
2. Khan, T., Nag, A. K., Basu, S., & Saluja, V. (2025). Artificial Intelligence for Development (AI4D) Usage, Learner Autonomy, Wellbeing and Digital Literacy in ODL. *Journal of Learning for Development*, 12(2), 330-346.
3. Times Now News. (2026, February 18). From IIT Delhi to AIIMS: OpenAI Embeds AI Across India's Leading Campuses.
4. Millennial Asia. (2025). Artificial Intelligence Integration into School Education: A Review of Indian and Foreign Perspectives, 16(1), 173-199.
5. NITI Aayog Frontier Tech Hub. (2025). When Classrooms Start Learning Too: How AI is Reshaping Urban Education in India.
6. Discover Artificial Intelligence. (2025). AI literacy at higher education and India's vision Viksit Bharat 2047: a systematic review, 5(294). Springer.
7. Mathrubhumi English. (2026, February 18). 1 lakh students, faculty set for AI push as OpenAI partners with IIT Delhi, IIM Ahmedabad, others.
8. ANI News. (2026, February 14). Bharat Bodhan AI Conclave 2026 concludes with shared resolve for responsible AI-driven transformation in Education.
9. Fachportal Pädagogik. (2025). Artificial Intelligence for Development (AI4D) Usage, Learner Autonomy, Wellbeing and Digital Literacy in ODL.
10. The New Indian Express. (2026, February 18). OpenAI partners with leading Indian Universities to



embed AI across education.