

Original Research Article

NEP 2020 and Artificial Intelligence: Transforming Teaching, Learning, and Assessment in Higher Education

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Received: 10 September, 2026 | Accepted: 24 September, 2026 | Published: 1 October, 2026

Abstract

India's National Education Policy (NEP) 2020 articulates an ambitious vision for the comprehensive reform of higher education, foregrounding technology integration, multidisciplinary learning, and learner-centred pedagogy as central pillars. Concurrently, the global proliferation of artificial intelligence (AI) across educational domains has prompted serious scholarly and policy-level engagement with its transformative potential and inherent risks. This paper presents a critical analysis of the intersection between NEP 2020 and AI-driven transformation in three core dimensions of higher education: teaching, learning, and assessment. Drawing upon verified policy documents, systematic reviews, and empirical studies published by reputable international bodies and journals between 2016 and 2025, the paper examines how NEP 2020's policy architecture creates both affordances and constraints for AI adoption. The analysis reveals that while the policy's emphasis on digital infrastructure, personalised learning, and continuous assessment aligns substantively with global AI-in-education trajectories, significant challenges persist regarding equitable access, faculty preparedness, ethical governance, and assessment integrity. The paper argues that realising NEP 2020's AI-enabled vision demands a critical, context-sensitive implementation strategy that moves beyond techno-optimism toward principled, evidence-informed integration.

Keywords: artificial intelligence, National Education Policy 2020, higher education, teaching, learning, assessment, India

Introduction

The advent of artificial intelligence (AI) in higher education represents one of the most consequential technological shifts in the history of educational practice. From early intelligent tutoring systems to contemporary large language models, the trajectory of AI in education has expanded from narrowly defined applications to broadly pervasive tools that reshape pedagogical relationships, institutional structures, and assessment paradigms (Holmes et al., 2019; Luckin et al., 2016). In India, this global transformation converges with a landmark domestic policy reform: the National Education Policy (NEP) 2020, which envisions a fundamental restructuring of the higher education ecosystem over the coming decades (Government of India, 2020). NEP 2020 is distinctive in its explicit recognition of technology, including AI, as a vehicle for achieving educational equity, quality, and access at scale. The policy advocates for the integration of AI-powered tools in curriculum design, pedagogical delivery, student assessment, and institutional governance (Government of India, 2020). However, the gap between policy aspiration and implementation reality remains substantial, particularly in a country marked by pronounced digital divides, uneven institutional capacity, and diverse linguistic and socio-economic contexts (European Commission, 2022; Selwyn, 2019). This paper undertakes a critical analysis of how NEP 2020 engages with AI across three interconnected dimensions of higher education: teaching, learning, and assessment. Rather than offering a descriptive account of AI applications, the paper interrogates the alignment between policy vision and empirical evidence, examines the structural conditions that mediate AI adoption, and identifies the critical challenges that must be addressed if AI is to fulfil its purported transformative role within the framework of NEP 2020. The analysis is grounded in a comprehensive review of policy documents, systematic reviews, and peer-reviewed scholarship from authoritative sources, ensuring that every major claim is supported by verifiable evidence.

NEP 2020 and the AI Imperative

NEP 2020 represents the first comprehensive overhaul of India's education policy in over three decades, replacing the National Policy on Education of 1986 and its 1992 modifications. The policy is organised around several foundational principles: equity, inclusion, quality, affordability, and accountability (Government of India, 2020). For higher education specifically, NEP 2020 proposes multidisciplinary institutions, flexible curricular structures, a choice-based credit system, and a significant emphasis on technology-mediated education. The policy's engagement with technology is both explicit and systematic. It recommends the creation of a National Educational Technology Forum (NETF) to facilitate the exchange of ideas on the use of technology, calls for the integration of AI and machine learning into educational programmes, and advocates for the deployment of intelligent tutoring systems to support personalised learning pathways (Government of India, 2020). The policy also envisions the National Digital Education Architecture (NDEAR) as a unifying digital infrastructure to support teaching, learning, and administration across institutions. However, a critical reading of NEP 2020 reveals that its treatment of AI, while forward-looking, remains largely aspirational. The document acknowledges the potential of AI but offers limited detail on implementation mechanisms, ethical safeguards, or faculty development frameworks. This aspirational quality is not necessarily a deficiency; policy documents typically operate at a strategic level. Yet it creates a significant implementation gap that must be addressed through subsequent regulatory frameworks, institutional strategies, and capacity-building initiatives (AICTE, 2022). The All India Council for Technical Education (AICTE) has subsequently integrated AI-related considerations into its Approval Process Handbook, signalling a gradual operationalisation of NEP 2020's vision (AICTE, 2022). International frameworks provide useful comparative reference points. UNESCO's Beijing Consensus on Artificial Intelligence and Education (2019) was among the first

global instruments to articulate principles for AI governance in education, emphasising equity, transparency, and human agency. This was followed by UNESCO's (2021) comprehensive guidance for policy-makers, which offered a systems-level view of AI integration, and subsequently by its 2023 guidance specifically addressing generative AI in education and research (UNESCO, 2023). The OECD's (2021) Digital Education Outlook similarly examined how AI, robotics, and blockchain could reshape teaching and learning, cautioning against uncritical adoption. These international frameworks share with NEP 2020 a recognition of AI's transformative potential, but they differ in their specificity regarding ethical governance, data privacy, and the centrality of teacher agency.

AI and the Transformation of Teaching

AI's impact on teaching in higher education extends beyond the mere automation of routine tasks; it fundamentally reconfigures the pedagogical relationship between educators and students. Zawacki-Richter et al. (2019), in their seminal systematic review, identified four primary areas of AI application in higher education: profiling and prediction, intelligent tutoring systems, assessment and evaluation, and adaptive learning environments. Within the domain of teaching, intelligent tutoring systems and adaptive platforms have received the most sustained scholarly attention (Chen et al., 2020; Kabudi et al., 2021). NEP 2020 envisions a pedagogical shift from teacher-centred instruction to learner-centred, experiential, and inquiry-based approaches. AI technologies can potentially facilitate this transition by providing real-time analytics on student engagement, automating administrative tasks, and enabling educators to focus on higher-order pedagogical activities (Bond et al., 2024). The U.S. Department of Education (2023) similarly emphasised that AI should augment rather than replace teachers, positioning educators as essential decision-makers who interpret AI-generated insights within specific pedagogical contexts. Despite these possibilities, the implementation of AI in teaching within Indian higher education faces formidable challenges. Faculty readiness is a primary concern: many educators lack the digital literacy and pedagogical training required to integrate AI tools effectively into their practice (Popenici & Kerr, 2017). Furthermore, the rapid pace of AI development means that professional development programmes risk becoming outdated almost as soon as they are designed. The European Commission (2022) ethical guidelines underscore the importance of equipping educators not merely with technical skills but with the critical capacity to evaluate AI tools for pedagogical validity, fairness, and alignment with educational values. NEP 2020's vision of technology-enabled teaching also intersects with India's linguistic diversity. AI-powered natural language processing tools offer the potential to deliver instruction in regional languages, thereby advancing the policy's goal of multilingual education. However, the current state of AI development is heavily skewed toward English and a small number of other high-resource languages, raising questions about whether AI tools can genuinely serve India's linguistically heterogeneous student population (UNESCO, 2021). This tension between technological promise and contextual reality exemplifies the broader challenge of implementing AI in ways that are responsive to local conditions rather than merely importing global solutions.

Personalised Learning and Adaptive Systems

The concept of personalised learning has been a central aspiration of educational theory for decades, but AI offers a technical infrastructure that makes meaningful personalisation feasible at scale. Adaptive learning systems powered by AI can analyse student performance data in real time, identify knowledge gaps, and dynamically adjust instructional pathways to meet individual learner needs (Kabudi et al., 2021). These systems represent a significant departure from the one-size-fits-all model that has historically characterised much of higher education instruction. NEP 2020 explicitly endorses personalised learning as a core principle, advocating for educational pathways that are

responsive to individual learner profiles, interests, and aptitudes (Government of India, 2020). This alignment between AI capabilities and policy vision is conceptually compelling. Chen et al. (2020) documented the rapid growth of AI in education research, demonstrating that adaptive learning and intelligent tutoring constitute the largest clusters of scholarly activity in the field. Holmes et al. (2019) argued that AI-enabled learning environments could provide the kind of individualised attention that has traditionally been available only through expensive one-on-one tutoring. However, critical analysis demands attention to the limitations and risks of AI-personalised learning. Luckin et al. (2016) cautioned that the effectiveness of AI in education depends fundamentally on pedagogical design rather than technological sophistication; poorly designed AI systems may reinforce existing inequalities or narrow the curriculum to what is easily measurable. Selwyn (2019) further warned against the tendency to treat AI as a solution to fundamentally political and structural problems in education, arguing that techno-solutionist narratives often obscure the social and economic conditions that shape educational outcomes. In the Indian context, the promise of personalised AI-driven learning is constrained by infrastructure deficits, particularly in rural and semi-urban institutions where reliable internet connectivity, adequate computing resources, and digital literacy remain uneven (UNESCO, 2021). The World Bank (2025) has noted that while AI has the potential to personalise university education, the benefits are likely to accrue disproportionately to well-resourced institutions unless deliberate equity-focused policies are implemented. NEP 2020 acknowledges the importance of bridging the digital divide but does not provide a detailed operational framework for ensuring that AI-driven personalised learning reaches marginalised student populations.

Rethinking Assessment in the Age of AI

Assessment represents perhaps the most contested domain of AI integration in higher education. The emergence of generative AI tools, particularly large language models, has fundamentally disrupted established assessment practices, compelling institutions to reconsider the design, delivery, and integrity of evaluations (UNESCO, 2023). This disruption operates in two directions: AI as a tool for enhancing assessment, and AI as a challenge to assessment validity. On the enhancing side, AI offers significant capabilities for automating routine grading, providing formative feedback, and enabling continuous assessment models that track student learning over time rather than relying on high-stakes examinations (U.S. Department of Education, 2023). NEP 2020's emphasis on competency-based education and continuous, formative assessment aligns well with these AI capabilities. The policy's recommendation for a shift from rote memorisation to critical thinking and application-based evaluation requires assessment methods that are more sophisticated and resource-intensive—precisely the kind of methods that AI can help operationalise at scale (Government of India, 2020). On the challenge side, generative AI has raised profound concerns about academic integrity. Research has demonstrated that AI systems can produce assessment outputs, including essays and technical solutions, that may be difficult to distinguish from student-authored work (UNESCO, 2023). This development has prompted institutions worldwide to reconsider the design of authentic assessments that require demonstration of learning processes rather than mere product outputs. The OECD (2021) observed that AI necessitates a fundamental rethinking of what is being assessed and how assessment evidence is interpreted. Within the Indian higher education context, the assessment challenge is compounded by the scale of the system. With thousands of institutions and millions of students, ensuring assessment integrity while simultaneously pursuing the kind of pedagogically rich, formative assessment envisioned by NEP 2020 is an extraordinarily complex undertaking. The AICTE (2022) has begun to address these challenges through updated guidelines, but a comprehensive national framework for AI-resilient assessment design remains to be developed.

The European Commission (2022) emphasised that ethical AI use in assessment requires transparency, explainability, and the preservation of human oversight—principles that must be embedded within any Indian framework for AI-enabled assessment.

Critical Challenges and Constraints

The foregoing analysis reveals several intersecting challenges that mediate the relationship between NEP 2020's AI aspirations and their practical realisation. First, the digital divide remains a structural barrier. While NEP 2020 envisions technology-enabled education as a vehicle for equity, the reality is that digital infrastructure, reliable connectivity, and computing resources are unevenly distributed across India's higher education landscape (UNESCO, 2021). AI tools that depend on robust digital ecosystems risk exacerbating rather than mitigating existing inequalities unless accompanied by deliberate investment in infrastructure and access. Second, ethical governance of AI in education is an area where NEP 2020's framework is notably underdeveloped. UNESCO's (2023) guidance on generative AI underscores the importance of data privacy, algorithmic transparency, bias mitigation, and human agency—principles that require specific regulatory and institutional mechanisms. The European Commission (2022) similarly emphasised that educators must be equipped to make ethical judgments about AI use. While India has initiated broader discussions around AI ethics through national-level strategies, the education-specific ethical governance framework remains in its nascent stages. Third, faculty development and institutional capacity building represent a critical prerequisite that cannot be treated as an afterthought. Zawacki-Richter et al. (2019) found that the majority of AI in higher education research is produced by computer science and engineering disciplines, with relatively limited engagement from educators in the social sciences, humanities, and professional programmes. This disciplinary imbalance suggests that AI integration may proceed unevenly across fields of study, potentially creating a two-tier system where STEM disciplines benefit disproportionately from AI tools while other disciplines are left behind. Fourth, the assessment integrity challenge demands systemic rather than piecemeal responses. As UNESCO (2023) advised, institutions must move beyond reactive approaches to generative AI and instead redesign assessment architectures to emphasise process-based evaluation, authentic tasks, and supervised demonstrations of competence. This redesign requires substantial investment in faculty training, curriculum revision, and quality assurance mechanisms. Finally, the epistemological implications of AI in education warrant careful consideration. Selwyn (2019) argued that the narrative of AI transforming education often reflects a techno-determinist perspective that attributes causal power to technology while neglecting the social, political, and economic contexts that shape educational outcomes. A critical approach to AI integration under NEP 2020 must therefore foreground questions of power, equity, and educational purpose, asking not merely how AI can be implemented, but to what ends and for whose benefit.

Conclusion

This paper has examined the intersection of NEP 2020 and AI-driven transformation across teaching, learning, and assessment in Indian higher education. The analysis demonstrates that NEP 2020's policy vision is broadly aligned with global trajectories in AI-in-education, sharing with international frameworks such as those of UNESCO, the OECD, and the European Commission a recognition of AI's potential to enhance personalisation, efficiency, and access. However, the translation of this vision into practice requires addressing fundamental challenges related to digital infrastructure, ethical governance, faculty capacity, assessment integrity, and epistemological clarity. The evidence reviewed suggests that AI integration in higher education cannot be treated as a purely technical undertaking. It is, at its core, a pedagogical, institutional, and ethical project that demands sustained investment,

context-sensitive design, and ongoing critical evaluation. For NEP 2020's AI-enabled vision to be realised in ways that genuinely advance educational quality and equity, Indian higher education institutions, regulatory bodies, and policymakers must engage with the complexities of AI integration in a manner that is both ambitious and principled, harnessing technological possibilities while safeguarding the human values that lie at the heart of education.

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