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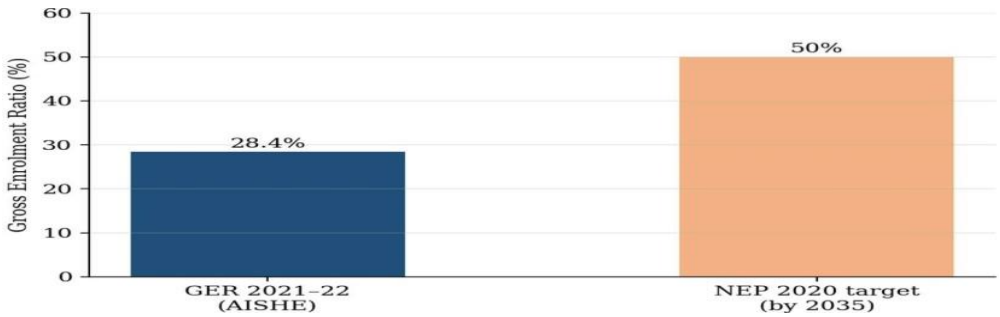
Artificial Intelligence in Higher Education: Opportunities, Challenges and Policy Framework for Viksit Bharat @2047

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ABSTRACT
Artificial Intelligence (AI) refers to computational systems that perform tasks associated with human intelligence, such as learning from data, processing language, predicting outcomes and generating content. In education, applications range from adaptive learning and automated feedback to generative AI assistants.

India has one of the world's largest higher education systems. The All India Survey on Higher Education (AISHE) 2021–22 recorded 1,168 universities, 45,473 colleges and about 4.33 crore students, with a Gross Enrolment Ratio (GER) of 28.4% against the National Education Policy (NEP) 2020 target of 50% by 2035 (MoE, 2020; MoE, 2022). Expanding access at this scale, with limited faculty and resources, makes technology-enabled quality improvement attractive. Figure 1 shows that enrolment has grown but remains well below the NEP target.

Figure1:Gross Enrolment Ratio in Indian Higher Education against the NEP 2020 Target(%)



Source: MoE(2022),AISHE2021–22;MoE(2020).

AI connects directly to Viksit Bharat @2047: a developed economy needs a skilled, digitally literate workforce, and higher education is its principal source. This paper argues that AI adoption must be human-centred, ethically governed and inclusive, so that Digital India's infrastructure benefits government degree colleges and rural learners as much as elite institutions. It responds to the seminar's themes of science, technology, innovation and policy convergence. The paper re views the literature, states itsobjectivesandmethod, describes the Indian scenario, weighs opportunities and risks, examines the policy framework, and proposes a phased roadmap.

2. REVIEW OF LITERATURE

Zawacki-Richter et al. (2019) reviewed research on AI applications in higher education and found it dominated by computer science and STEM authors, with limited critical engagement with pedagogy and ethical risks. Kasneci et al. (2023) argue that large language models can support personalized learning and reduce teacher workload, but warn of bias, over-reliance, misinformation, privacy risks and the need for new competencies among teachers and learners. UNESCO's guidance on generative AI (Miao & Holmes, 2023) recommends a human-centred approach, institutional policies, data-privacy protection and teacher capacity-building.

In India, NITI Aayog's (2018) National Strategy for AI identified education among priority sectors and stressed skilling. NEP 2020 (MoE, 2020) promotes technology integration in teaching, assessment and administration. More recently, the India AI Governance Guidelines (MeitY, 2025) set out voluntary principles for responsible AI across sectors.

Gap. The literature is largely global and technology-focused, while Indian policy documents address AI broadly. In the sources consulted, there is limited integrated analysis of how these policies reach government degree colleges and rural institutions, and no authoritative national dataset on AI use in colleges was identified. This paper addresses the analytical and policy dimension of that gap.

3. OBJECTIVES OF THE STUDY

1. The objectives are as follows:
2. 1. To outline the major applications of AI in higher education.
3. 2. To analyse the opportunities and challenges associated with the adoption of AI in higher education.
4. 3. To review existing Indian policies and initiatives, distinguishing between implemented, announced, and

proposed measures. To examine digital inclusion, ethics, privacy and institutional readiness, especially in government and rural colleges.

5. ToproposeaphasedpolicyframeworkforViksitBharat@2047.

4. RESEARCH METHODOLOGY

The study is descriptive and analytical and relies entirely on secondary data: NEP 2020, AISHE reports, Press Information Bureau(PIB) releases, Ministry of Education and Meit Y documents, parliamentary replies, and peer-reviewed and international literature. The status of policy initiatives was checked against official sources in October 2026.Nosurvey, interview, experiment or primary data collection was conducted. Interpretations and recommendations are the author's own. Figure 1 plots official data; Figures 2 and 3 are the author's conceptual illustrations, not empirical findings.

5.ARTIFICIAL INTELLIGENCE IN HIGHER EDUCATION: CURRENT SCENARIO IN INDIA

AI applications fall into several areas. In **teaching and personalised learning**, adaptive platforms, Ail tutors and content-generation tools adjust material to learner pace. In **assessment**, tools provide automated feedback and support evaluation, while AI-text detection is increasingly debated. In **research**, AI assists literature search, data analysis and coding. In **academic administration**, it supports admissions, scheduling and early identification of students at risk. For **accessibility**, speech-to-text, translation and assistive tools help learners with disabilities and those studying in regional languages. For **skill development**, AI courses and certifications build employability.

The relevance is greatest where resources are thinnest. Government degree colleges and rural Institutions often have large class sizes, a significant proportion of first-generation learners, and students facing language barriers.so AI-based remedial support and multilingual content could narrow gaps. Yet connectivity, devices and faculty readiness vary widely, so benefits will not be automatic.

Existing digital platforms provide a base on which AI tools can be layered. National learning platforms such as SWAYAM already offer online courses, and AI-enabled features such as translation, recommendation and automated feedback could extend their reach. The policy question is therefore less whether AI tools exist than whether colleges have the connectivity, skills and governance to use them well.

6. OPPORTUNITIES OF AI IN HIGHER EDUCATION

AI can improve **learning outcomes** through paced instruction and prompt feedback, although Indian evidenceis still emerging. It can raise **faculty productivity** by automating routine tasks, freeing time for mentoring. It can accelerate **research and innovation** and strengthen **employability** by making AI literacy a graduate attribute. Opportunities are also systemic. At scale, AI-enabled administration can free scarce staff time, and early-warning analytics canhelp colleges support students at risk of dropping out, which matters for the GER target. For first-generation learners, multilingual explanation and round-the-clock practice cancomplementclassroom teaching. Each opportunity, however, carries a matching risk, and Table 1 summarizes the balanced picture.

Table1:OpportunitiesandChallengesofAIinHigherEducation

Application Area	Potential Benefits	Major Challenges	Policy Response
Personalised Learning	Adaptive learning pace; individualised remedial support	Digital divide; device and connectivity gaps; algorithmic bias	Affordable access; multilingual AI tools
Assessment	Faster feedback; reduced faculty workload	Academic integrity concerns; opaque grading systems	Human oversight; transparent AI-use guidelines
Research Assistance	Faster literature reviews; data analysis; research productivity	Misinformation; fabricated citations; plagiarism	Verification mechanisms; responsible AI-use guidelines
Academic Administration	Improved efficiency; automated processes; early-warning systems	Data privacy concerns; cybersecurity risks	DPDP Act-compliant data governance

Student Support	Round-the-clock guidance; improved accessibility; personalised assistance	Over-reliance on AI; reduced human interaction	Hybrid mentoring; human-centred counselling

Source: Author's analysis based on the literature and policy documents reviewed..

These risks are interlinked rather than separate. A college without trained faculty cannot judge algorithmic bias; without privacy safeguards, personalised learning becomes surveillance; without assessment redesign, integrity rules become unenforceable. Ethical governance should therefore rest on transparency about when AI is used, accountability for decisions affecting students, fairness across languages and backgrounds, and human oversight of consequential outcomes, consistent with the human-centred approach in the guidance reviewed.

8.EXISTING POLICY FRAMEWORK AND GOVERNMENT INTIATIVES

This section separates existing policies, announced and operational initiatives, and the author's proposals (Section 9).

Existing policies and frameworks

- **NEP2020**promotestechnologyintegrationandenvisagesaNationalEducational Technology Forum (NETF) as an autonomous body (MoE, 2020). A parliamentary reply of March 2023 records that an NETF Cell was established at AICTE (Rajya Sabha,2023); the sources consulted did not confirm a separate autonomous NETF.
- **India AI Mission**, approved on 7 March 2024 with an outlay of ₹10,371.92 crore over five years, has seven pillars, including compute capacity, datasets and India AI Future Skills (₹882.94 crore) to expand AI education from foundational to doctoral levels (PIB,2024; Rajya Sabha, 2025). A PIB backgrounder (2025) reports 38,000 GPUs under the mission.
- **India AI Governance Guidelines** (5November2025) are voluntary and principle-based, with an action plan across short, medium and long terms (MeitY, 2025).
- **Digital Personal Data Protection Act 2023andRules2025**:the Rules were notified on 13 November 2025 and are being

enforced in phases over 12–18 months (MeitY, 2025b), directly relevant to student data.

Announced and Operational Initiatives

- The **Centre of Excellence (CoE) in AI for Education** was announced in Union Budget 2025–26 with a ₹500 crore outlay (MoE, 2025). The Ministry of Education has since established it at IIT Madras as the Bodhan AI Centre of Excellence, launched on 12 February 2026 at the Bharat Bodhan AI Conclave (MoE, 2026). A national "Bharat EduAI Stack" is described as under development; its outcomes are yet to be evaluated.

No UGC regulation specific to AI use in higher education was identified in the sources consulted; institutions therefore rely largely on general guidance. Overall, national initiatives emphasise compute, models and centralised innovation, while college-level readiness receives less explicit attention. Of the mission's outlay, compute capacity takes 44.0%, Future Skills 8.5% and Safe &Trusted AI 0.2%(Rajya Sabha,2025;sharescomputed by the author).This is outlay, not expenditure, but it suggests that skills and safeguards are small parts of national AI investment.

9. POLICY RECOMMENDATIONS FOR VIKSIT BHARAT @2047

The following recommendations are proposed by the author and should not be interpreted as existing government commitments.

2. **AI Literacy and Faculty Development:** Introduce short, mandatory AI-pedagogy training modules for faculty members, leveraging platforms such as SWAYAM and India AI Future Skills resources.
3. **Affordable Infrastructure:** Establish state-level shared connectivity and computing hubs to support government and rural colleges.
4. **Responsible AI Use:** Develop institutional policies addressing AI-use disclosure, assessment design, academic integrity, and human oversight.
5. **Data Privacy and Cybersecurity:** Implement student-data protection practices aligned with the Digital Personal Data Protection (DPDP) framework and conduct regular vendor security audits.
6. **Curriculum and Employability:** Integrate AI literacy into undergraduate curricula across disciplines, emphasising domain-specific applications and project-based assessment.

7. **Research and Collaboration:** Promote regional university–industry partnerships and research collaborations linked to the national Centres of Excellence (CoE).
8. **Multilingual and Accessible Tools:** Encourage the development and adoption of Indian-language AI applications and assistive AI-based learning resources to support diverse learners.
    1. **Monitoring and accountability:** AI-readiness indicators in institutional reporting, with periodic independent review.

Progress could be tracked through simple, college-level AI-readiness indicators: the share of faculty trained in AI pedagogy, availability of reliable connectivity and devices for students, adoption of a written AI-use policy, completion of data-protection audits, and student and faculty feedback on AI tools. Publishing such indicators would make accountability practical and allow lagging institutions to be supported early.

The recommendations are phased because institutions start from unequal positions. Short-term actions establish norms and baseline data; medium-term actions build shared infrastructure and curricula; long-term actions embed governance and an indigenous research ecosystem. Responsibility is shared: the Union Government and regulators set direction, states and universities enable institutions, and colleges adapt practice to their students (Table 2).

Table2:Policy Road map for AI-Enabled Higher Education(Recommendations)

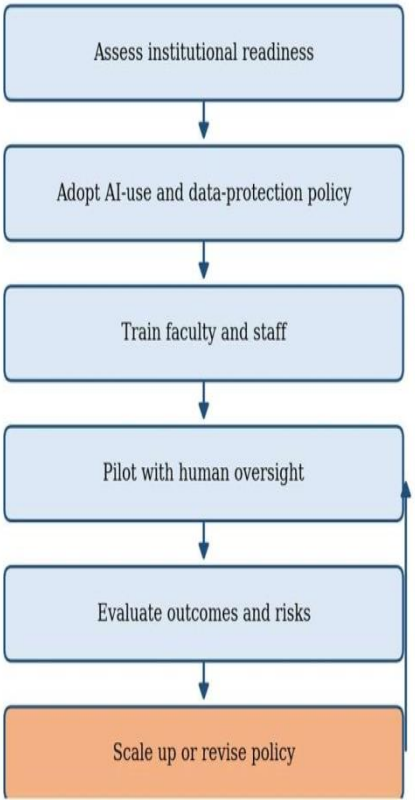
Implementation Roadmap for AI Integration in Higher Education towards Viksit Bharat @2047			
Timeframe	Priority Actions	Responsible Stakeholders	Expected Outcomes
Short-term (2026–2028)	Institutional AI-use policies; faculty AI-literacy programmes; college readiness audits	Ministry of Education (MoE), UGC, State Higher Education Councils, colleges	Baseline data; common institutional norms; improved faculty readiness

Medium-term (2029–2035)	Shared computing and connectivity hubs; AI-integrated curricula; multilingual tools; data privacy audits	MoE, MeitY/India AI, State Governments, universities, industry	Reduced digital access gaps; improved graduate employability; wider AI adoption

Note: All the actions are proposed by the author and do not represent existing government commitments.

Figure 2 sets out a workflow a college can follow to adopt AI responsibly; evaluation decides whether to scale up or revise policy.

Figure 2: Responsible AI Adoption Workflow for Higher Education Institutions



Source: Author's conceptual illustration.

Figure 3 shows how the elements connect: AI infrastructure, faculty development, ethical governance and inclusive access are parallel foundations; institutions translate them into practice, which contributes to the Viksit Bharat @2047 vision.

Figure3: Policy Implementation Framework for AI in Higher Education



Source: Author's conceptual illustration.

10. DISCUSSION AND IMPLICATIONS

The analysis suggests that the binding constraint on AI in Indian higher education is likely to be faculty capacity and equitable access rather than algorithms. Three implications follow. First, national investment is weighted towards compute and models, so colleges need dedicated support for connectivity and training to benefit. Second, because Governance remains largely voluntary and sector-specific; therefore, higher education institutions must establish their own safeguards to ensure academic integrity, data privacy, and human oversight (Figure 2). Third, AI should complement rather than replace teachers, as mentoring and personal interaction remain essential for supporting first-generation learners.

Whether AI narrows or widens educational inequality will depend on how quickly national initiatives reach government degree colleges. Limitations include reliance on secondary sources, limited Indian impact evidence and the conceptual nature of Figures 2 and 3. Future research could survey faculty readiness and student experience in government colleges.

The findings link to the wider Viksit Bharat @2047 agenda in four ways. AI literacy builds human capital for a digital economy; shared infrastructure and multilingual tools promote inclusion; university–

industry partnerships support innovation; and transparent, privacy-respecting governance strengthens public trust. Higher education that adopts AI responsibly can therefore contribute directly to national development goals rather than merely to institutional efficiency.

11. CONCLUSION

AI offers significant potential to improve the quality, accessibility and relevance of Indian higher education, but its benefits depend on governance and capacity rather than technology alone. Existing initiatives, including NEP 2020, the India AI Mission, the Bodhan AI Centre of Excellence and data-protection rules, provide a foundation. A phased, human-centred approach that prioritizes faculty development, affordable infrastructure, ethical safeguards and inclusive access can extend these benefits to government degree colleges and rural learners, contributing to Viksit Bharat @2047. Empirical studies of faculty readiness and learning outcomes in government colleges would strengthen the evidence for these policy choices.

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