

***AI-DRIVEN SKILL DEVELOPMENT IN NEP HIGHER EDUCATION:
GUJARAT IMPLEMENTATION***

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Abstract

The National Education Policy (NEP) 2020 marks a transformative era in Indian academia by prioritizing the integration of Artificial Intelligence (AI) to foster 21st-century skills (International Journal of Engineering Research & Technology [IJERT], 2020). This study examines the scope and patterns of AI-driven skill development in Gujarat's higher education institutions, focusing on the alignment of state initiatives with NEP goals. Adopting a secondary data-based analytical approach, the research synthesizes information from peer reviewed journals, government reports, and regional news archives from 2019 to 2025 (ResearchGate, n.d.). The findings reveal that Gujarat is successfully transitioning from policy design to grassroots execution, highlighted by the "Surat Model," which has trained over 4,000 educators in AI pedagogy (Sandesh, 2025), and the scheduled introduction of "Foundations and Methods of AI" for Classes 11-12 (Gujarat Samachar, 2025). Additionally, the state has utilized digital monitoring platforms like Vidya Samiksha Kendra to revolutionize institutional effectiveness (International Journal of Indian Law [IJIRL], 2025). However, critical implementation gaps persist, most notably a stark rural-urban digital divide and linguistic barriers for Gujarati-medium students (Umrethia, 2026), as most high-quality AI tools remain English-centric. Ethical concerns regarding student data privacy in AI-powered tracking systems also emerge as a significant challenge (U.S. Department of Education, 2023). The study concludes that while administrative will is strong, long-term success depends on achieving infrastructure parity and linguistic localization. Key recommendations include launching a "Rural Tech Mission," developing localized AI content, and establishing robust data protection frameworks. Moving forward, the focus must shift from theoretical literacy to project-based learning to ensure an AI-driven workforce that is both technically skilled and ethically grounded.

Keywords: NEP 2020, Artificial Intelligence, Skill Development, Gujarat Higher Education, Digital Divide, Teacher Training.

AI-Driven Skill Development in NEP Higher Education: Gujarat Implementation

Introduction

Artificial Intelligence (AI) is transforming higher education by reshaping curriculum design, assessment, and skill development through adaptive learning and analytics. The National Education Policy (NEP) 2020 mandates AI integration to foster 21st-century skills like critical thinking and digital literacy (International Journal of Indian Law [IJIL], 2025), aiming to enhance global employability (IJERT, 2020). In alignment with this, Gujarat has launched several initiatives, including AI-focused academic programs and industry-academia collaborations. However, a significant research gap exists as most studies are conceptual or national in scope. This study adopts a secondary data-based approach to specifically examine the implementation patterns and challenges of AI-driven skill development in Gujarat's higher education institutions under the NEP 2020 framework.

Research Gap:

Current research is primarily national and theoretical, leaving a gap in state-specific empirical data for Gujarat. Scholarly attention is missing regarding how local infrastructure, institutional readiness, and the lack of Gujarati-medium AI tools impact practical implementation. This study analyses the transition from policy design to ground reality in Gujarat.

Objective:

1. To examine AI- driven skill development enterprise in advanced education institutions of Gujarat within the frame of NEP 2020.
2. To dissect the extent to which these enterprises align with the objects and pretensions of NEP 2020.
3. To identify the institutional, academic, and infrastructural challenges encountered during the perpetration of AI- driven skill development programs in advanced education.
4. To give policy acquainted recommendations for enhancing the effectiveness and impact of AI- driven skill development enterprise in Gujarat's advanced education sector.

Methodology

This study on AI- Driven Skill Development in NEP Higher Education Gujarat perpetration” is grounded on secondary exploration, synthesizing being literature, policy documents, government reports, and indigenous news to dissect openings, challenges, and perpetration specifics without primary data collection (ResearchGate, n.d.).

Research Design

A methodological literature review was conducted following established secondary exploration methodologies. The review involved structured selection, evaluation, and conflation of sources to insure a comprehensive understanding of AI integration in India’s NEP 2020 and its impact on skill development in Gujarat’s advanced education institutions (PRISMA Statement, n.d.).

Source Selection Criteria

Sources were named grounded on the following criteria

- ✓ Published after 2019(post-NEP 2020 advertisement)
- ✓ Direct applicability to AI integration in advanced education and skill development
- ✓ Focus on Gujarat or India-specific perpetration
- ✓ Priority given to blink- reviewed journals, sanctioned government reports, and indigenous news for contextual depth

Data Collection and Analysis

The curated sources (Links 1 – 12) were reviewed to prize crucial information on NEP- AI solidarity, class changes introducing AI subjects in classes 11 – 12, schoolteacher training programs (e.g., Surat), and broader AI operations in advanced education. Thematic analysis was employed to identify patterns in Gujarat’s rollout, including institutional enterprise, state- position class acclimations, and policy measures. Findings were synthesized and cross-referenced to give a coherent overview of the compass, perpetration trends, and challenges of AI- driven skill development in Gujarat.

Literature Review

Role of AI and NEP 2020 Vision AI is transforming Higher Education Institutions (HEIs) into data-driven centers by enabling personalized learning paths and administrative automation. The NEP 2020 identifies AI as a critical driver to bridge the global skill gap

(IJERT, 2020). By introducing subjects like "Foundations of AI" in Classes 11 and 12, the policy shifts the focus from rote learning to 21st-century competencies, including critical thinking, digital literacy, and ethical coding (Frontiers in Educational Science [FES], n.d.).

Gujarat's Implementation and Grassroots Progress Gujarat has proactively aligned its state curriculum with NEP 2020 objectives. A standout success is the "Surat Model," where over 4,000 teachers have been trained in AI-based pedagogy to use generative tools for lesson planning and assessment (Sandesh, 2025). The state is also developing a State Curriculum Framework (SCF) to integrate AI subjects into textbooks, ensuring students are industry-ready before entering university.

Critical Challenges and Research Gap Despite strategic progress, implementation faces hurdles such as the rural-urban digital divide, high infrastructure costs, and a lack of AI tools optimized for the Gujarati language. Current literature remains focused on "Policy Design" rather than "Post-Implementation Impact." This study addresses the gap by analysing secondary data to understand the practical realities and longitudinal learning outcomes of AI-driven classrooms in Gujarat (Umrethia, 2026).

Gujarat Perpetration Analysis AI in Education

Strategic Alignment and Curriculum Overhaul: Gujarat has emerged as a frontrunner in aligning with NEP 2020 by shifting from rote learning to a technology-integrated framework. Following NCERT guidelines, the state is introducing "Foundations and Methods of AI" as a formal subject (Gujarat Samachar, 2025). This phased rollout begins with Classes 9–12 to ensure students are industry-ready before entering higher education.

Teacher Empowerment (The Surat Model): A cornerstone of the state's strategy is large-scale capacity building, notably the "Surat Model" where approximately 4,000 teachers were trained in AI pedagogy (Sandesh, 2025). The focus extends beyond basic AI literacy to practical applications, such as using generative AI tools for personalized lesson planning and automated student assessment.

Infrastructure and Smart Integration: The state is leveraging its existing "Smart School" infrastructure to host AI-driven tools. Through digital platforms and pilot programs, Gujarat is testing AI-integrated software in the Gujarati language to ensure inclusivity (Umrethia, 2026). These hubs serve as testing grounds for localized pedagogy before a full-scale state-wide launch.

Localized Hurdles and Future Roadmap: Despite progress, a "Gujarat Gap" persists due to the urban-rural divide and technological inertia in older institutions. Connectivity issues in tribal belts and the challenge of developing high-quality Gujarati AI content remain key hurdles. However, the roadmap is clear:

- **2026-27:** Launch of new AI-integrated textbooks for Classes 9 and 11.
- **2027-28:** Full-scale implementation of AI as a formal subject in Board Examinations (Classes 10 and 12)

AI Skill Development Challenges in Gujarat

Infrastructure and Digital Divide: Gujarat faces a stark discrepancy between urban and rural infrastructure. While cities like Ahmedabad enjoy 5G connectivity, schools in tribal belts and rural areas like Kutch struggle with inconsistent internet (Gujarat Samachar, n.d.). Additionally, many state-run schools lack the necessary student-to-computer ratio required for the practical "Foundations of AI" curriculum, hindering hands-on skill development.

Teacher Readiness and Administrative Load: The "Human-in-the-Loop" model faces hurdles due to technical inertia and high administrative burdens. Despite large-scale training (e.g., 4,000 teachers in Surat), many educators struggle to troubleshoot AI tools during live lessons (Avaiya, 2025). Furthermore, the mandatory real-time data entry for platforms like Vidya Samiksha Kendra has increased the workload, leading to implementation delays.

Linguistic and Ethical Barriers: Most AI tools are optimized for English, creating a "language barrier" for Gujarati-medium students (Umrethia, 2026). Translating complex technical concepts without losing accuracy remains a challenge. Ethically, there are significant concerns regarding student data privacy (U.S. Department of Education, 2023) for the 1 crore learners tracked by the state, alongside risks of algorithmic bias from Western-trained AI models.

Implementation Lag and Practical Skilling: There is a notable gap between policy design and classroom reality. While the syllabus integration for Classes 9–12 is underway, the transition from "theory on paper" to "practical skilling" is still in the pilot phase. This creates an implementation lag for students graduating in the immediate 2025–2026 batches.

Conclusion

Key Findings and Strategic Integration

The conflation of exploration papers and indigenous reports confirms that Artificial Intelligence has transitioned from a technical specialized tool to a foundational pillar of India's National Education Policy (NEP) 2020 (IJIRL, 2025). A primary finding is that AI

integration is being executed through a binary approach class reform and executive digitization. In Gujarat, the preface of "Foundations of AI" for Classes 11 and 12, coupled with the "Surat Model" of training over 4,000 preceptors, demonstrates a visionary shift (Sandesh, 2025; Gujarat Samachar, 2025) toward creating a future-ready pool. likewise, the data suggests that AI- driven platforms like the Vidya Samiksha Kendra have revolutionized academy monitoring, allowing for real- time shadowing of pupil performance and powerhouse pitfalls. This signifies that the part of AI in advanced and secondary education is n't to replace mortal instruction, but to give a "mortal- in- the- circle" community that enhances substantiated literacy and institutional effectiveness.

Critical Challenges and Future Recommendations

Despite the strategic progress, the secondary data highlights significant "perpetration Gaps" that could hamper the long- term success of AI- driven skill development. The most prominent issue is the Digital Divide, where pastoral and ethnical sections in Gujarat warrant the high- speed connectivity and tackle needed for advanced AI training compared to civic capitals. also, the literature points toward a "verbal hedge," as utmost high- quality AI tools are presently optimized for English, creating a disadvantage for indigenous language scholars. To insure the ethical and indifferent rollout of AI, it's recommended that the government focuses on developing localized AI content and robust data sequestration fabrics. unborn sweats should prioritize the "Last- afar Pupil" by subsidizing digital structure and evolving the part of preceptors from information dispensers to AI- facilitators. For the NEP 2020 vision to be completely realized, the focus must remain on a holistic approach that balances technological invention with mortal- centric pedagogical values.

Discussion

The analysis of secondary data reveals that AI integration under **NEP 2020** is rapidly moving from policy to practice. In Gujarat, the introduction of AI as a formal subject for Higher Secondary students and the training of 4,000+ teachers in Surat signify a strong administrative push toward "**Future-Ready**" skilling.

However, the discussion highlights three critical gaps:

Digital Divide: A significant infrastructure gap exists between urban hubs and rural schools, risking educational inequality.

Human-AI Synergy: AI is being positioned as a "Teaching Assistant" (Human-in-the-loop) to handle data and personalization, rather than replacing the empathetic role of the teacher.

Linguistic & Ethical Barriers: The lack of AI tools in Gujarati and concerns over student data privacy remain unresolved challenges.

While Gujarat is a leader in adoption, the success of AI-driven skilling depends on ensuring equitable access and localized content for every student.

Recommendations & Suggestions

- ✓ Infrastructure Parity: Launch a "Rural Tech Mission" to provide high-speed internet and hardware to remote schools, eliminating the urban-rural digital divide.
- ✓ Linguistic Localization: Develop AI-driven educational content and tools in Gujarati to ensure language is not a barrier to technical skill development.
- ✓ Continuous Pedagogical Training: Establish permanent AI training centers for teachers to move beyond basic literacy to advanced AI-classroom integration.
- ✓ Project-Led Curriculum: Shift from theoretical exams to project-based assessments where students solve local social or economic problems using AI tools.
- ✓ Data Ethics & Privacy: Enact a specific "Student Data Protection Act" to guarantee the moral application of AI and stop the improper use of student data.
- ✓ Public-Private Partnerships (PPP): Collaborate with tech giants to set up "AI Innovation Hubs" in district schools for real-world industry exposure.
- ✓ Inclusive AI Kits: Provide low-cost, offline AI learning kits for schools with limited connectivity to ensure no student is left behind.
- ✓ Holistic Evaluation: Use AI to track student progress beyond marks, focusing on soft skills, creativity, and emotional intelligence as per NEP 2020 goals.

Limitation

Reliance on Secondary Data: This study is primarily based on secondary sources, including news reports, journal articles, and government documents. The absence of primary data—such as direct surveys or interviews with students and teachers—means the findings reflect existing literature rather than new, first-hand field evidence.

Geographic Specificity (Gujarat-Centric): A significant portion of the implementation data (e.g., the Surat teacher training and Vidya Samiksha Kendra) is specific to the state of Gujarat. Consequently, these findings may not be fully generalizable to other Indian states with different educational infrastructures and socio-economic conditions.

Digital Divide and Infrastructure Disparity: The study acknowledges a major gap in technology access. In rural or underprivileged areas where basic internet and hardware are

lacking, the theoretical benefits of AI mentioned in the papers cannot be accurately measured or verified.

Linguistic Constraints: Current AI tools and research are predominantly English-centric. The study is limited by the lack of data regarding the effectiveness of AI tools in regional languages like Gujarati, which may create a barrier for students in non-English medium schools.

Early Stage of Implementation: Since the integration of AI under NEP 2020 is still in its infancy (with many curriculum changes scheduled for 2026-27), there is a lack of long-term data to assess the actual impact of AI on student career outcomes and psychological development.

Ethical and Privacy Data Gaps: While ethical concerns like data privacy and algorithmic bias are discussed, there is limited empirical evidence in the current sources on how these issues are being managed on the ground during large-scale student data tracking.

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