Generative AI And National Education Policy 2020: Transforming the Future of Indian Education—A Review

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ABSTRACT

Generative AI is a game-changer, and its transformative potential is evident in education. India has the opportunity to integrate Generative AI and improve its education system with respect to NEP 2020. The current study critically analyses and reviews the integration of Generative AI into the NEP 2020, and specific areas of competency-based education, multilingual education, teacher professional development, equity, and the integration of educational technology. The study has a structured narrative and thematic synthesis of the published research articles between 2020 and 2025, combined with the provisions of the related official documents of policy. The study mainly focuses on the educational promises of conversational AI, and identifies studies on adoption, research accounts and/or interventions. Depending on the task, context, user and teacher mediation, and available resources, different benefits can be gained. One challenge with the current trend to incorporate Generative AI into education is that educational institutions need to determine the extent to which they accept risks and rely on the technology, and also evaluate the educational benefits and potential harm caused by the technology. The review highlights the importance of longitudinal research in various contexts in India (i.e. school level, region, language, school resources).

Keywords: Generative artificial intelligence; NEP 2020; Indian education; AI literacy; multilingual learning; educational equity; responsible AI.

INTRODUCTION

The release of large language models has generated significant interest in educational AI. A key differentiating feature between these new generative AI models and the rule-based computer programs that came before them, is that generative AI models can engage in natural language conversations and provide longer responses to open-ended questions. While this feature can certainly be useful in various learning contexts and environments, research should focus more on the defensible educational benefits of using such models rather than assessing the models' ability to answer academic questions.

The 2020 National Education Policy in India outlines key visions for the Indian education system. The policy focuses on providing quality foundational education, ensuring curriculum and assessment flexibility, promoting multidisciplinary and multilingual education, addressing equity and inclusion, improving the quality of teachers, and facilitating accessibility to quality education using educational technology (Ministry of Education, 2020). While the National Education Policy was published before widely available commercial conversational GenAI systems, several focuses of the policy complement the use of educational technology in the classroom and, more broadly, the integration of research, design, and development of information and communication technology in education. As such, this research explores the potential policy alignment rather than provide a commercial endorsement.

Research related to the use of generative AI in education is rapidly expanding. Some research focuses more on the social dimensions of learning. Other research focuses on the use of educational technologies to assist teaching

and learning in low-resource government schools. Whether generative AI systems will improve educational opportunities for students in low-connectivity and low-resource settings is unknown. Whether there are institutional and social constraints to ensure education remains equitable and accessible is an important consideration.

This study answers three questions. Which GenAI applications do plausibly support NEP 2020 objectives? What does evidence show about learning, pedagogy, and teacher readiness? What governance and implementation measures are needed to minimize exclusion and harm? The focus of this study is an integrated policy-pedagogy analysis. It prioritizes relevance, contextual adequacy, and responsible use over technological innovations.

Consistent with other systemic and interdisciplinary reviews, this study reveals questions and opportunities for research in instruction, as well as challenges concerning validity and the consequences of the integration of technology on participation. Included studies are (Ahmad et al., 2023; Bahroun et al., 2023; Bond et al., 2024), (Dwivedi et al., 2023; Glaser, 2023; Grassini, 2023) and (Hwang & Chen, 2023; Lim et al., 2023; Pradana et al., 2023).

As a consensus among recent synthesis studies, apparent research growth must not be confused with the existence of reliable and consistent evidence in different disciplines and populations of learners. Relevant literature is (Wang et al., 2024; Zawacki-Richter et al., 2024; Zheltukhina et al., 2024), (Zirar, 2023; Rahman & Watanobe, 2023; Ogunleye et al., 2024) and (Yusuf et al., 2024b; Batista et al., 2024; Baig & Yadegaridehkordi, 2024).

REVIEW METHODOLOGY

This article employs a critical narrative synthesis approach, as opposed to a systematic review to claim exhaustiveness in literature coverage. Literature was located in identifiable peer-reviewed publications, supported by targeted searches for GenAI, ChatGPT, and artificial intelligence literacy, assessment, teachers, accessibility, education and relevant allied disciplines. The coverage is 2020-2025. Official NEP 2020 documents are treated as primary policy source materials, and DOI-bearing scholarly publications are treated as secondary materials.

The organising search logic joined (generative AI OR ChatGPT OR large language models) AND (education OR teaching OR learning) and merged these with concepts including India, NEP 2020, teacher education, multilingualism, digital divide, ethics and assessment. Eligible scholarly works provided a traceable publisher citation and DOI. Studies were classified and interpreted as one of empirical, review, conceptual or commentary research. Publications outside the targeted years, as well as records lacking reliable bibliographic identification, were excluded from the 100 item reference set.

Synthesis was based on alignment with policy, learning, educator capacity and adoption, ethics and governance. Interpretive weight was given to research which tests or compares learning in terms of education practices and to a lesser extent speculative research. The difference in populations, interventions, measures and types of research precluded a pooled effect estimate. The totality of evidence does not support conclusions on the prevalence or incidence of desired effects and no fabricated estimates are presented. The bounded scholarly collection of references does not represent an exhaustive and reproducible collection of evidence; therefore, no claims of complete coverage are warranted.

Different databases, disciplines and synthesis approaches are reflected in existing reviews of the evidence, hence their conclusions cannot be aggregated and treated as a pooled effect estimate. Relevant scholarship includes (Ipek et al., 2023; Ansari et al., 2023; Labadze et al., 2023) and (Liu et al., 2024; Memarian & Doleck, 2023).

The current thematic approach, integrates a number of different approaches including literature surveys, exploratory studies and pedagogical surveys. It avoids unwarranted quantitative synthesis. Relevant scholarship includes (Crompton & Burke, 2024; Lo, 2023; Montenegro-Rueda et al., 2023) and (Chiu, 2023).

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1.NEP 2020 and Educational Transformation

According to NEP 2020, quality education incorporates numerous skills, including critical thinking, creativity, imagination, voluntary participation, flexibility, empathy, and caring. It emphasizes the importance of holistic teacher development, regional and home-based language education, and judicious use of technology. NEP 2020 suggests several possible goals that could be assisted by GenAI technology. For example, suggestions that are aligned with the curriculum and have been reviewed for accuracy could help with differentiation by creating various types of questions, providing explanations in local language, or creating language practice activities.

There is a somewhat greater conceptual alignment for instructional support than for autonomous learning. Suggested explanations in local languages could be offered by a multilingual assistant, for example, but the assistant would not be able to evaluate the quality of translation and terminology. Adapting an activity for local resources could be suggested by a GenAI, but evaluating whether the suggested activity is safe, correct, and in accordance with the discipline, and determining whether it helps to achieve the goal of a particular curricular sequence, would be the responsibility of a teacher. For younger students, scaffolding may be required because they may not be able to recognise erroneous and overconfident outputs.

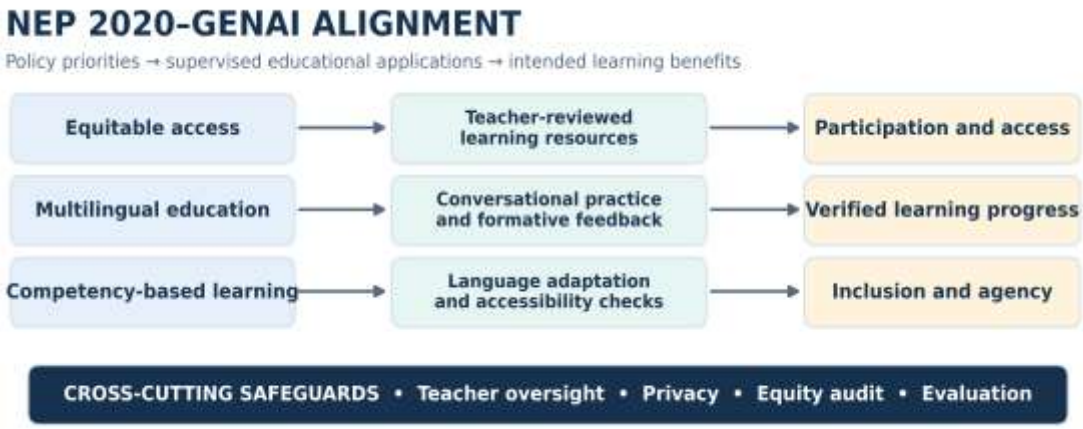


Figure 1. Conceptual alignment between NEP 2020 priorities, supervised GenAI uses and intended learning benefits .

Flexible higher education enables various opportunities such as supervised academic writing, programming demonstrations, tutoring, and interdisciplinary learning. These uses may assist in meeting the targets and aspirations of the NEP 2020 on multidisciplinary learning and lifelong education. Student agency, however, would depend on assessment policies that reward reasoning and disclose responsible use of educational technology.

The Academic Bank of Credits and the accompanying institutional changes relate to pathways of credentialing; GenAI must not be equated to the enabling IT infrastructure that supports these changes.

Hence, there must be a double test for policy compatibility. The pedagogical test is whether the use of AI improves a defined learning process or outcome. The equity test is whether students with different situations and challenges (e.g. students with limited connectivity or teacher support) benefit equally. Failure on either test means that though the technology is made available to facilitate learning, learning transformation in the direction of the NEP has not occurred.

Relevant scholarship includes (Hays et al., 2024; Yuan, 2023; Su & Yang, 2023) and (Lodge et al., 2023; Zhang & Tur, 2023).

This distinction is important for education policy: an education technology intervention that decreases the time burden on teachers may be worthwhile, but it should not be assumed that this technology improves students' foundation literacy skills.

Table 1. Alignment between NEP 2020 priorities and plausible GenAI applications

NEP priority	GenAI application	Contribution	Challenge	Supporting studies
Multilingual access	Validated local-language glossaries	Comprehension and continuity	Mistranslation; uneven coverage	Barrot, 2023; Yuan, 2023
Competency-based teaching	Tiered formative practice	Targeted feedback	Uneven item validity	Lo, 2023; Ogunleye et al., 2024
Teacher professional growth	Draft resources and practice cases	Planning support	Weak subject checking	Sperling et al., 2024; Tan et al., 2025
Flexible higher education	Research and writing scaffolds	Interdisciplinary inquiry	Overreliance; attribution	Kasneci et al., 2023; Lim et al., 2023
Inclusive participation	Accessible text simplification	Alternative entry points	Connectivity; bias	Crompton & Burke, 2024; Chiu, 2023

2. Generative AI Applications in Indian Education

The most apparent proposed use case is personalised tutoring. Breaking complex ideas and materials into smaller components allows conversational models to answer in a stepwise fashion or generate worked examples. Additionally, these models can generate quizzes. Students may be able to use these tools to help them study outside of class for topics they find difficult. However, using prompts to infer personalisation is not the same as having a validated learner model. Models may produce incorrect explanations or examples that are too advanced for the student. Teachers should define learning objectives and assess student understanding by using diagnostic questions.

The use of conversational AI for language instruction is also promising. AI-assisted dialogue can provide students with opportunities to write and edit drafts. Having models provide students with alternative wordings or suggestions can also help students improve their writing. However, AI models privilege linguistic register and mistranslate subject-specific terms. Thus, there is a need for human experts to review AI generated translation and provide bilingual glossaries to help students improve their writing.

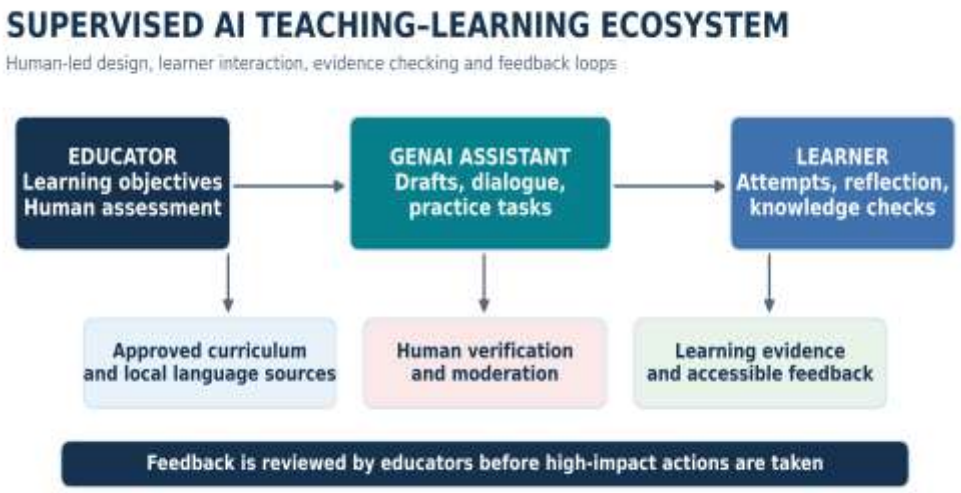


Figure 2. Human-supervised instructional ecosystem for educational GenAI (original diagram).

GenAI can complete many assessment tasks such as suggesting rubric descriptors, formative questions, sample explanations, and comments. While these outputs may reduce the time educators spend preparing for assessment, there are risks associated with these outputs such as misclassifying the learner performance or providing

feedback that is confident and unfair. It is vital to have human moderation to assess the validity of the feedback. High stakes assessments (e.g. graduating exams) require greater controls and transparency than informal practice quizzes.

Evidence on the use of GenAI cannot be generalized to other fields of study. Assistants for writing programs can explain syntax and identify errors, and in doing so, encourage and reinforce plagiarism. Ideas for laboratory-based tasks may assist in developing activities. Other professional courses (i.e. teaching nursing and medicine, etc.) report a variety of tasks with distinct requirements. Approaches to "reliable practical competence" should not be drawn from one course to another. Modeling examples for one course may not be accurate examples for others.

GenAI can assist accessibility and inclusivity in education, as the systems can format text in ways easier understood and accessible to the user. However, beneficial access and uses are reliant on several factors including cost, compatibility of the device, and whether it is integrated by a user with a disability. Incorrect uses of these technologies can widen the learning divide.

The benefits of using GenAI in educational environments are clear and evident. Based on the priorities of the National Education Policy (NEP), researchers predicted and mapped specific applications of GenAI to each priority (see Table 1). Overall, improvable and reversible tasks, such as assessment of learner's perception rather than the learner's performance, can be implemented as a strategy to educate and expand the use of GenAI, as long improvements continue to be evident.

Studies of writing and feedback analyze revision and assessment as well as communication in different disciplines, but they vary in terms of setting and type of evaluation. Other related work includes (Alghamdi, 2024; Barrett & Pack, 2023; Barrot, 2023) and (Beck & Levine, 2023; Boudouaia et al., 2024; Lu et al., 2024).

Research on tutoring and support illustrate possible pedagogical uses but fail to confirm all interactions improve understanding. Related work includes (Baha et al., 2023; Guo et al., 2022; Lee et al., 2023) and (Steele, 2023; Stojanov, 2023; Zheng & Stewart, 2024).

Research on the boundaries of model performance and understanding suggest that learners may misunderstand the correct solutions to problems, but are able to game the system to achieve correct answers. Related work includes (Araújo & Saúde, 2024; Bucaioni et al., 2024; Cooper, 2023) and (Haindl & Weinberger, 2024; Humphry & Fuller, 2023; Xing, 2024).

Professional education accounts illustrate contrasting safety requirements such as the verification of clinical and discipline-specific claims, and not relying on plausible answers. Related work includes (Allen & Woodnutt, 2023; Araji & Brooks, 2024; Barker et al., 2024) and (Castonguay et al., 2023; Kavadella et al., 2024; Thorat et al., 2024).

Technology demonstrations and classroom interventions illustrate possible formative uses, but require careful judgment when assessing transfer. Related work includes (Joshi et al., 2024; Keiper et al., 2023; Parker et al., 2023) and (Sun et al., 2024; Yilmaz & Yilmaz, 2023; Kasneci et al., 2023).

Table 2. Thematic synthesis of selected peer-reviewed evidence

Study	Context	Design	Focus	Finding	Limitation	Indian implication
Yusuf et al. (2024)	Global	Systematic map	GenAI themes	Pedagogy, ethics and adoption dominate	Variable study designs	Identify Indian evidence gaps
Crompton & Burke (2024)	International	Literature review	Classroom affordances	Assistance and risks coexist	Early publication window	Evaluate context-

						dependent use
Kasneci et al. (2023)	International	Conceptual synthesis	LLMs and pedagogy	Opportunities require caution	Not an Indian outcome trial	Teacher oversight
Sperling et al. (2024)	International	Scoping review	Teacher AI literacy	Professional knowledge underexplored	Diverse constructs	Build training capacity
Chan & Hu (2023)	Higher education	Perception study	Student views	Benefits and concerns reported	Self-report focus	Do not equate views with gains
Yilmaz & Yilmaz (2023)	Computing education	Intervention study	Programming learning	Task-specific learning indicators	Discipline constrained	Test transfer to curricula

3.Teacher Competencies, Inclusion, and Institutional Readiness

Familiarity with prompting is not the same as successful integration. Teachers need to understand the intricacies of generative models and make ethical judgements on issues of student privacy, fairness, and authorship. Educator AI literacy also includes critical assessment of sources and evaluation of claims, distinguishing formative and summative uses, and designing assessments to make student reasoning visible. Training focused on efficiency may not improve quality.

While student acceptance and TA's willingness to adopt imply readiness, assumptions of equal readiness should be guarded. Variability in interest, perceived usefulness, and self-efficacy are influenced by prior digital experience, discipline and teaching approach, school policy, and the nature of the task. The presence of faculty with experience and training, coupled with stable and reliable internet, does not equal parity with schools in which students share devices and have limited bandwidth.

Assessing institutional readiness also means assessing whether available technology meets the requirements of teaching, learning, and assessment. The requirement for complementary teacher professional learning as part of technology procurement should also be taken into account. Not all schools have the same capacity to integrate and keep pace with changes in technology.

Trainings should be designed to implement classroom pilots, which involve teachers analyzing and tweaking lessons guided by AI compared to lessons with alternate instructional designs. To improve literacy, training should be contextualized to particular places and repeated over time. Teachers should be trained in the use of other technologies, instructional materials, and textbooks, so they can competently evaluate the adequacy of the AI. Relevant studies include (Xu & Li, 2024), (Yuan et al., 2024), (Zhang et al., 2024) and (Zhu et al., 2024).

Regarding other gaps in the digital environment, we can learn from research focused on teacher education, particularly the need for sustained support. Related studies include (Büyükeksi & Çetinkaya, 2024), (Xu et al., 2024), (Zhang et al., 2024b; Fang & Liu, 2025) and (Zhu et al., 2025).

The following points concern unresolved ethical, legal and policy issues associated with AI in education. Educational risks such as hallucinated citations and fictitious explanations are critical. Teachers need to model detection of errors in responses, and instructional design more broadly, for students to identify and address these risks. Integrating AI-based technologies in the classroom to teach and assess enables teachers to fulfill their role. Replacing teachers with AI is an educational risk. Spot-checking and routine oversight of integrating AI in instruction is defensible.

There are also risks to data governance. Student prompts may cover personal information, assignment submissions, or sensitive data. Institutions should ensure that there is sufficient control on the collection of

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personal data and define the storage and retention terms before using external services. Just having a privacy statement does not guarantee an adequate legal basis, protection of confidentiality, or protection from unauthorized reuse.

AI will not replace unsupervised forms of academic integrity. The indiscriminate use of AI-detection software in education will likely have negative unintended consequences on the detection of academic misconduct, the integrity of educational research, and the detection of plagiarism, whereby students may resort to extensive use of paraphrasing and other creative ways to present "polished" text. The goal is to shift the paradigm of assessment to the evaluation of authentic knowledge and judgment, while ensuring protection of unauthorized access to assessment tools.



Figure 3. Paired opportunities and educational risks of GenAI adoption

Exclusion and bias can be a consequence of unrepresentative training data, language imbalances, inadequate accessibility and unequal access to digital networks. India-specific benchmarking requires representation and attention to linguistic subtleties, disability, and cultural contexts. There must be accountability for real persons to review harmful outputs and inappropriate content, make adjustments, and report complaints. Such accountability is especially important when AI is used to recommend actions to support vulnerable learners.

We compare these potential benefits and countervailing risks in Figure 3. The appropriate policy response is proportional governance: more experimentation with lower-risk practices and stricter governance with higher-risk practices, especially in high-stakes assessment and automated decisions in discipline.

There are a number of scholarly works in various stages of publication that address the responsible use of artificial intelligence (AI) in the context of academic integrity, authenticity and honesty (Chauncey & McKenna, 2023; Dergaa et al., 2023; Kim, 2023), (Kirwan, 2023; Luo, 2024; Nikolic et al., 2023) and (Perkins, 2023).

Ethics-oriented discussions address student reliance on AI, the responsibility of the AI industry to protect the public, and the unintended adverse social impact of persuasive conversational systems. Relevant studies are (Ratten & Jones, 2023; Tam et al., 2023; Tlili et al., 2023), (Vargas-Murillo et al., 2023; Yusuf et al., 2024a; Zhang et al., 2024a) and (Cotton et al., 2023).

Evaluative and governance studies stress the need for control and review mechanisms to assess the system output rather than the reliance on system outputs. Relevant studies are (Farrokhnia et al., 2023; Fuchs, 2023) and (Garg & Goel, 2022; Halaweh, 2023; Pavlik, 2023).

As generative models and policies quickly evolve, institutional approval should be tied to use cases and mechanisms rather than a broad approval for a specific generative application. Incident reporting can document and help reduce errors and determine the continued use of a system for educational benefits.

Table 3. Priority institutional actions for responsible GenAI use

Challenge	Safeguard	Accountable actors	Priority	Indicator
Unreliable outputs	Expert review and source checking	Teachers; department heads	Immediate	Factual error rate
Teacher capability	Applied AI literacy modules	Teacher education institutions	High	Observed verification skills
Digital exclusion	Low-bandwidth and accessible provision	Government; institutions	High	Participation across groups
Data exposure	Data minimisation and vendor audit	Data protection leads	Immediate	Reported privacy incidents
Academic misconduct	Transparent AI-use assessment rules	Academic councils	High	Process evidence quality
Unproven benefits	Evaluated, reversible pilot studies	Research and curriculum teams	High	Learning outcomes; workload

4. Implementation Framework and Future Directions

Figure 4 presents an integrated model of governance for the integration of policy objectives with evidence-based pedagogical design, teacher capacity, accessible ICT infrastructure, and oversight. Continuous improvement and accountability are fundamental to this model. In Figure 5, the model is broken down into five phases for a graduate institutional framework. Phase 1: Perform a baseline readiness and equity audit. Phase 2: Train teachers, strengthen teacher networks, and build accessibility and data protection. Phase 3: Experiment with low-stakes applications defined by boundaries and governed by documented learning objectives. Phase 4: Analyze quality and assess learner performance and evaluate for unintended consequences. Phase 5: Refine, eliminate or scale uses of Technology-Enhanced Learning.



Figure 4. Layered framework for responsible GenAI governance in Indian education



Figure 5. Five-stage roadmap for context-sensitive institutional implementation

Evaluation should incorporate both student work samples and achievement indicators. Satisfaction ratings on their own are inadequate. Institutional policies should name the responsible official, clarify the disclosure requirements and/or prohibit the uploading of unrelated personal information. Regulatory alignment and public accountability are of special importance to government funded education. Future Indian research should examine a range of socio-economic conditions, levels of education, subject areas and language groups. The research should aim to examine short- and long-term learning outcomes and encourage replication.

A practical comparison should document baseline data, teacher preparation time, what teachers understand about the resource they were trained to use, teacher's ability to provide language accessibility to students, and the extent to which the model requires correction before an institution recommends it be used for teaching.

CONCLUSION

India should adopt bound and supervised AI tools to foster educational outcomes and evaluate the impact within diverse institutional contexts. In many instances, the key to judging the responsible integration of AI in education lies not in how many AI tools are deployed in education, but in improved learning outcomes and fairness. A focus on the procurement of AI tools and neglect of critical outcomes may lead to broken educational promsies of a prolonged nature.

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