



**RESHAPING TEACHER EDUCATION WITH AI UNDER NEP 2020: PERCEPTIONS
OF PRE-SERVICE TEACHERS**

Dr. Neelu Verma

Associate Professor, Bombay Teachers' Training College, HSNC University, Mumbai

drneelu@btcc.edu

Paper Received On: 20 MAY 2026

Peer Reviewed On: 24 JUNE 2026

Published On: 01 JULY 2026

Abstract

This research is aligned with the National Education Policy (NEP) 2020 and explores the role of Artificial Intelligence (AI) in reshaping teacher education in India. The study examines the perceptions of teacher trainees about the use of AI-driven tools to enhance curriculum development, improve assessment techniques and support continuous professional development in the teacher preparation process. The research combines a comprehensive literature review with primary data collected from 80 pre-service teachers from Mumbai. Quantitative data from Likert-scale questionnaire and qualitative feedback from open-ended responses indicate that while most trainee teachers perceive AI as a valuable tool for personalized learning, efficient planning and real-time feedback, they also express concerns about digital readiness, infrastructure gaps and ethical implications. The overall findings highlight a significant gap between NEP's vision and on-ground reality. The paper offers practical suggestions for policymakers and teacher education institutions. It also guides educators towards implementing curriculum reform, enhancing digital infrastructure, training faculty and strengthening ethical governance.

Key Words: Teacher Education, Artificial Intelligence, AI-Driven Strategies, NEP 2020

Introduction

Artificial Intelligence (AI) is creating a worldwide impact on education. It has the potential to address major educational challenges and personalize learning to improve teaching practices

(UNESCO, 2019). In India, traditional teacher education and school teaching methods have often been seen as outdated and rigid (EY India, 2025). This has contributed to a gap between educational outcomes and the skills required in the modern world. Recognizing these issues, India's National Education Policy 2020 (NEP 2020) calls for a paradigm shift in education through integration of technology, including AI, to enhance quality and relevance (Jain M. & Ritu, 2024). Teacher education in India plays a pivotal role in preparing competent educators for its vast and diverse school system. However, education sector has variable quality of training due to insufficient practical exposure and limited use of modern pedagogies. NEP 2020 proposes comprehensive reforms to revamp teacher education - for instance, moving to a four-year integrated B.Ed. as the minimum qualification by 2030 and emphasizing hands-on training and multidisciplinary learning. In this scenario, where AI is leading in every field, it may be used to strengthen teacher preparation too. This may be done by supplementing traditional training with personalized learning experiences and providing data-driven insights to improve instruction for teacher trainees. Integrating AI into teacher education aligns with NEP 2020's vision for producing 'future-ready' teachers equipped to handle 21st-century classrooms (Kumari, A. et al., 2025).

AI in Teacher Education: Global Perspectives and Theoretical Foundations

Research on AI in education shows that AI technologies can improve teaching and learning through personalized learning, intelligent tutoring systems, automation of administrative tasks, and data-driven decision-making, creating significant opportunities for both pre-service and in-service teacher education. AI-enabled platforms can customize training materials, support lesson planning and classroom management, and streamline assessment-related tasks such as grading and portfolio management, allowing teacher educators to focus more on mentoring, guidance, and meaningful academic interactions (Jain M. & Ritu, 2024). Review of related literature focuses on AI-driven analytics and feedback, where AI systems can analyze teaching simulations or classroom practice sessions to provide insights on teaching patterns, communication style and classroom engagement. A report by EY noted that in Indian schools, *"AI tools which automate repetitive tasks like grading and attendance allow teachers more time to engage with students and improve lesson delivery"* (EY - India). By extension, if teacher trainees are exposed to such AI tools during their training, they can learn to streamline their future work effectively as teachers. Indeed, many educators see promise in AI for reducing their daily grind. A recent survey by TeamLease EdTech (2024) found that about 61.6% of Indian educators are already using AI for tasks like lesson planning,

preparation and student engagement (People Matters, 2024). This trend emphasizes the need for teacher education curricula to incorporate AI literacy so that newly graduating teachers are comfortable working with AI from day one.

Al-Zyoud (2020) highlights how AI-driven platforms provide personalized training modules, real-time feedback, and competency-based learning, enabling teachers to enhance their skills efficiently. Celik et al. (2022) provide a systematic review of AI applications in teacher education, noting that AI can support educators by automating administrative tasks and offering data-driven insights. However, they also highlight concerns such as ethical considerations, bias in AI algorithms, and the digital divide.

Jamal (2023) explores how AI can assist teachers in developing the curriculum, instructional strategies and student engagement. The study identifies challenges such as resistance to technology adoption, lack of AI literacy, and infrastructure limitations in developing countries like India. Salas-Pilco et al. (2022) review the role of AI in analyzing student performance and providing predictive analytics to pre-service teachers. Sperling et al. (2024) emphasize the need for AI literacy among teachers. Their study advocates for curriculum reform to integrate AI literacy as a core component of teacher training.

Policy Context: NEP 2020 and AI Integration in Teacher Education

The National Education Policy (NEP) 2020 emphasizes the role of technology in transforming education and strengthening teacher training in India. It promotes a learner-centered, inclusive, and future-ready education system, with several provisions supporting the integration of AI in teacher education. One important initiative is the National Educational Technology Forum (NETF), which aims to encourage innovation, research, and the sharing of digital tools and best practices across institutions.

NEP 2020 also highlights the importance of digital infrastructure and online learning platforms for teacher preparation. In line with UNESCO's recommendations for inclusive AI in education, the policy recognizes that access to technology is essential to ensure that rural and underserved regions are not left behind.

Another major focus of the policy is competency-based teacher education and Continuous Professional Development (CPD). NEP encourages teachers to upgrade their professional skills regularly through ongoing learning opportunities. AI can support this process by providing personalized training recommendations, adaptive assessments, and feedback on teaching practices.

Initiatives such as Meritus AI reflect this growing emphasis on preparing teachers for technology-driven classrooms. Overall, NEP 2020 provides a strong foundation for integrating AI into teacher education while promoting equity, continuous professional growth and innovation.

AI-Driven Strategies in Teacher Education

AI-based tools are being commonly used in teacher education to improve teaching and learning practices. Pre-service teachers use platforms such as Google Classroom, ChatGPT and TeachFX to support lesson delivery, manage classroom interactions, and write teaching reflections. AI chatbots also assist in answering routine student queries, helping teachers focus more on engagement and instruction.

Virtual reality (VR) applications are being introduced in some teacher training programs to simulate classroom environments and strengthen practical teaching skills. AI also supports lesson planning through platforms like LessonUp and Notebook LM, which help teachers design structured and engaging lessons.

In assessment, tools such as Gradescope and Turnitin automate grading and provide timely feedback. Overall, AI is making teacher education more interactive and personalized.

Research Objectives: This study examines the role of AI in reshaping teacher education in India, with a specific focus on NEP 2020. Key objectives include:

- To analyze the perceptions of pre-service teachers regarding AI integration into their training.
- To offer practical suggestions for policymakers and teacher education institutions to introduce AI-enabled learning for better teacher preparation.

Research Design and Data Collection

The study adopts a **mixed-methods research design** incorporating both primary and secondary data. This approach allows for a comprehensive understanding of the topic by triangulating quantitative and qualitative evidence. The research is structured in two phases:

- **Secondary Research (Literature Review):** An extensive review of policy documents, academic literature as well as global best practices related to AI in teacher education was conducted. (Sources include scholarly journals, reports by educational bodies like, UNESCO, Ministry of Education India, Newspaper articles and recent studies on AI-driven teacher education)

- **Primary Research (Survey of Pre-Service Teachers):** A survey was designed to gather first-hand insights from pre-service teachers. The survey utilized a structured questionnaire comprising Likert-scale items (for quantitative measurement of perceptions) and open-ended questions (for qualitative feedback).

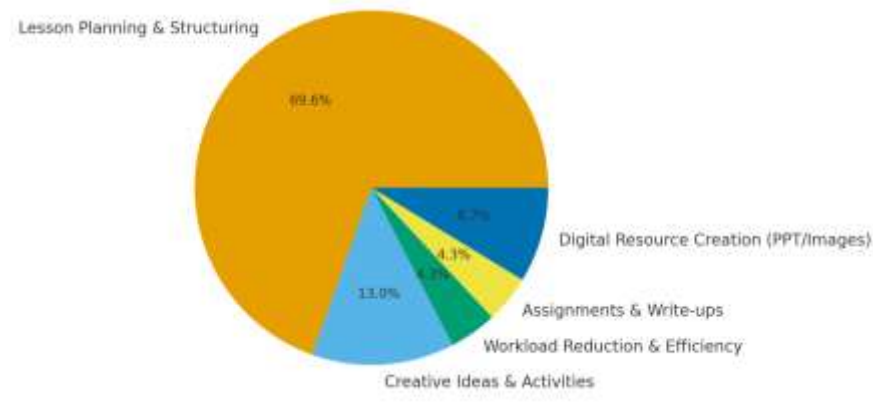
The data were collected from 80 pre-service teachers from Mumbai. Quantitative responses were analyzed through frequencies, percentages, and mean scores. Open-ended responses were examined through thematic coding to identify recurring themes. Findings from survey data and literature were integrated to draw meaningful conclusions and provide well-grounded recommendations.

Findings and Analysis

The key findings from the primary survey of pre-service teachers suggest that AI is mainly being used as an academic support tool for instructional preparation.

Fig. 1.1

Themes of AI Support during B.Ed. Program

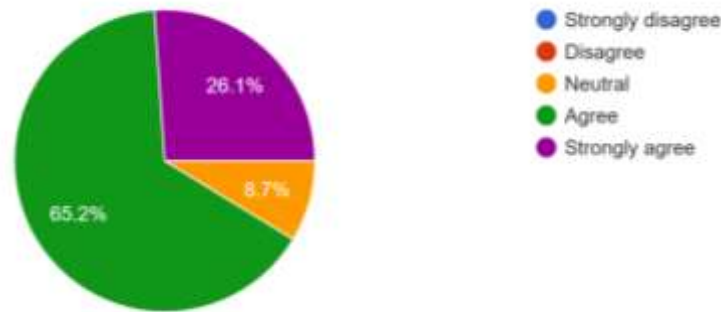


The above figure highlights that 69.6% of students relied on AI tools to organize lessons, prepare teaching content and improve classroom delivery. The second most common use was for generating creative ideas and activities (13%), suggesting that AI also helped students design engaging and innovative classroom practices. Digital resource creation, including PPTs and images, accounted for 8.7% of responses, reflecting the growing use of AI in preparing visual and presentation materials. Smaller proportions of students used AI for assignments and write-ups (4.3%) and for reducing workload and improving efficiency (4.3%). Overall, the graph suggests that AI is increasingly assisting B.Ed. students in practical teaching-related tasks, particularly in

lesson preparation, creativity, and resource development, thereby enhancing the overall teaching-learning process.

Fig. 1.2

Responses regarding the use of AI for improving Teaching Skills



The use of AI tools can significantly improve the quality of teaching skills developed during the teacher training process. As per the above figure, more than 90% of the teacher trainees felt that these tools can provide personalized support and resources that help trainees understand teaching methods more effectively.

Fig. 1.3

Responses regarding AI support for Lesson Plans and Feedback

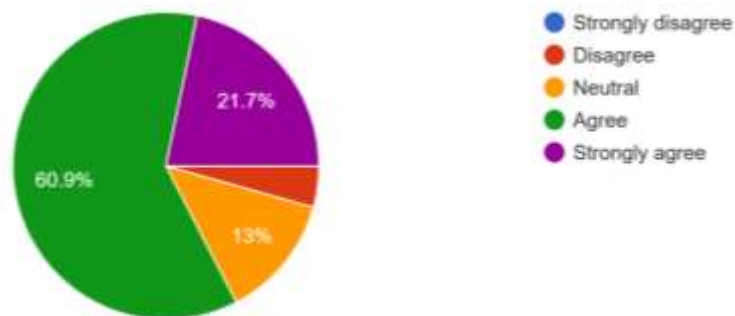


Figure 1.3 suggests that around 82% of the teacher trainees felt that AI can effectively guide them through their teaching practice (such as preparing lesson plans) and provide useful feedback to help them improve. It can also suggest new teaching strategies and classroom activities that make lessons more engaging for students. Many teacher trainees perceived that timely feedback from AI tools can help them build confidence and develop their teaching skills more efficiently.

Fig. 1.4
Responses regarding Automation of Tasks

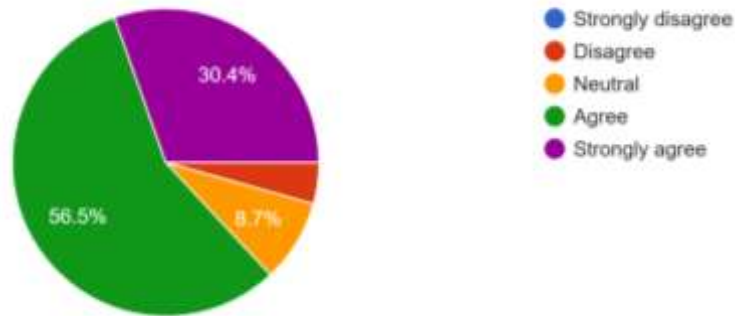


Figure 1.4 suggests that around 87% of teacher trainees perceived that AI-driven automation of tasks such as grading and attendance can reduce administrative workload and allow teachers to focus more on improving teaching methods, student interaction and creative lesson planning. They view AI as a supportive tool that enhances classroom efficiency.

Fig. 1.5
Concerns related to AI replacing Human Elements of Teaching

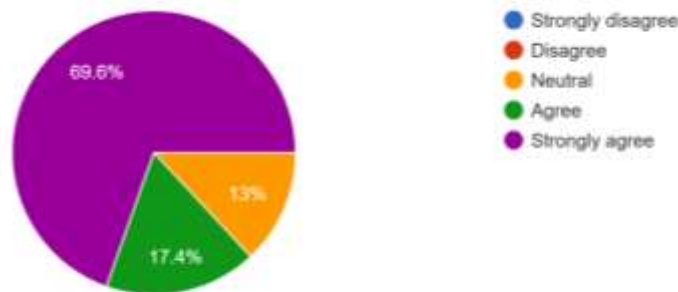


Figure 1.5 indicates that around 87% teacher trainees feel that AI cannot replace the human elements of teaching, such as empathy and mentorship. These findings align with literature suggesting that AI can effectively handle things like attendance tracking, grading objective tests, or scheduling, which means they can devote more energy to mentoring trainees. (Jain M. & Ritu, 2024).

Fig 1.6

Concerns related to the Increased Use of AI in Education that may Reduce the Demand for Human Teachers

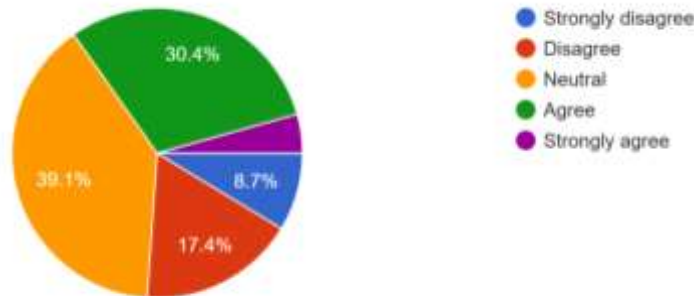


Figure 1.6 suggests that around 34% of the teacher trainees show concerns related to AI replacing teachers. However, most of them (around 66%) are either neutral or quite confident that excessive use of AI in teaching will not limit opportunities for future educators. Important human qualities of teachers like emotional support and personal guidance cannot be fully replaced by AI systems.

Challenges and Concerns

The analysis of open-ended questions and their responses revealed several concerns and challenges related to the use of AI in teacher education. A recurring issue raised by participants was the lack of proper training and confidence in using AI tools effectively (Jamal, 2023). Many pre-service teachers felt that while AI has strong potential in education, they were not adequately prepared to use it in their teaching practice. Some respondents agreed *“I need more training to effectively use AI tools in my teacher education.”* This exemplifies the digital literacy gap. NEP 2020 itself notes that teacher preparation and readiness are a challenge for tech integration (Tyagi, et.al., 2024). Respondents also raised the concern that *“lack of infrastructure is a major barrier to using AI in our training.”*

The findings also point to a gap between the vision of NEP 2020 and the present realities of teacher education. While the policy expects teachers to be technologically aware and innovative in their teaching methods, many participants felt that their *“training programme has not yet fully prepared us for teaching in an AI-supported learning environment”*. A lack of structured exposure to AI, limited practical experience and insufficient institutional readiness emerged clearly from the responses. This is also in sync with other studies by Tao et al. (2024) and Celik et al. (2022).

Although international research offers several ideas and models for AI integration in teacher education, similar context-based research and implementation in India is still limited.

Recommendations and Suggestions

In light of these findings, the study recommends that AI literacy be formally integrated into pre-service teacher education programmes through curriculum reforms, particularly within educational technology courses guided by bodies such as NCTE. Workshops, certification programmes, and practical training sessions can further help teacher trainees develop confidence in using AI tools for lesson planning, assessment, classroom engagement, and understanding the ethical dimensions of AI in education.

The study also emphasizes continuous faculty development, capacity-building programmes, improved digital infrastructure, and the expansion of platforms such as SWAYAM and DIKSHA to strengthen institutional readiness and ensure inclusive access to AI-supported learning resources. The study also recommends using AI for personalized teacher training and reflective feedback through AI-assisted assessment tools, while emphasizing that such technologies should support rather than replace human supervision and mentorship.

Finally, clear ethical guidelines and policy frameworks are necessary to ensure responsible use of AI in teacher education. Collaboration between institutions, policymakers and AI experts can support the development of transparent and human-centered approaches to AI integration. AI can strengthen teacher education in India by making it more competency-based and inclusive if it is thoughtfully implemented to preserve the essential human values of teaching and learning.

References

- Al-Zyoud, H. M. M. (2020). *The role of artificial intelligence in teacher professional development*. *Universal Journal of Educational Research*, 8(11B), 6263-6272.
- Celik, I., Dindar, M., Muukkonen, H., & Järvelä, S. (2022). *The promises and challenges of artificial intelligence for teachers: A systematic review of research*. *TechTrends*, 66(4), 616-630.
- EY India. (2025). *How AI is activating step changes in Indian education*. Ernst & Young Insights. (How AI is activating step changes in Indian education | EY - India)
- Jain M. & Ritu, (2024), *Artificial Intelligence In Teacher Education*, *International Journal of Research Publication and Reviews*, 5(12), 1333-1335.
- https://ijrpr.com/uploads/V5ISSUE12/IJRPR36199.pdf?__cf_chl_f_tk=QX0q8M0cgB8yXzP2O1DBZn2VvuvTQnG6qxcMZonoOp8-1783424515-1.0.1.1-i.59hUTi2V70l.6XlOYJQt75E67LQJ8YMwVvPg0RbZQ
- Jamal, A. (2023). *The role of artificial intelligence (AI) in teacher education: Opportunities &*

- challenges. *International Journal of Research and Analytical Reviews*, 10(1), 139-146.
- Kumari, A., Begum, S., Paunikar, M. S., Kaur, A., & Verma, S. (2025). The Role of Artificial Intelligence in Teacher Training: Enhancing Pedagogical Effectiveness. *Journal of Marketing & Social Research*, 2, 116-122.
- Ministry of Education, Government of India. (2020). *National Education Policy 2020*. New Delhi: MOE.
- Netragaonkar, Y. (2023). Role of artificial intelligence (AI) and augmented reality technology (ART) in higher education. *Scholarly Research Journal for Interdisciplinary Studies*, 11(65), 5–11.
- Netragaonkar, Y. (2021). Skill sets of the 21st century in higher education: 21st century technologies—Opportunities, challenges and advantages in higher education. In *21st Century Technologies: Opportunities, Challenges and Advantages in Higher Education* (pp. 71–90). Pune: Amitesh Publishers & Company. <https://orcid.org/0009-0002-2035-7421>
- Netragaonkar, Y. (2022). Artificial intelligence (AI) in higher education. In *21st Century Tech Trends* (pp.25–35). Pune: Amitesh Publishers & Company. <https://orcid.org/0009-0002-2035-7421>
- Netragaonkar, Y. D., Lokhande, N., Khanna, D., & Kishan, S. (2024). Augmented reality technology (ART) in science education and engineering technology: A review. *Journal of Engineering Education Transformations*, 38(2), 119–134.
<https://doi.org/10.16920/jeet/2024/v38i2/24195>
- Netragaonkar, Y. (2024). Role of Artificial Intelligence (AI) and Augmented Reality Technology (ART) In Higher Education. *IJFANS International Journal of Food and Nutritional Sciences*, 11 (10), 1-7
- People Matters. (2024, May 14). Over 60% of Indian educators embrace AI in classrooms. *People Matters* (online news). (News: Over 60% of Indian educators embrace AI in classrooms — People Matters)
- Salas-Pilco, S. Z., Xiao, K., & Hu, X. (2022). Artificial intelligence and learning analytics in teacher education: A systematic review. *Education Sciences*, 12(8), 569.
- Sandhya. M, Netragaonkar, Y. (2026). Accounting for Future Human Capital Readiness: AI Awareness, Career Aspiration, and the Pre-Professional Pipeline for AI-Enabled Accounting Careers. *Journal of Theoretical Accounting Research*, 22 (06).
<https://doi.org/10.69980/jtar.v22i6.216>
- Sperling, K., Stenberg, C. J., McGrath, C., Åkerfeldt, A., Heintz, F., & Stenliden, L. (2024). In search of artificial intelligence (AI) literacy in teacher education: A scoping review. *Computers and Education Open*, 100169.
- Tao, W., Yang, J., & Qu, X. (2024). Utilization of, Perceptions on, and Intention to Use AI Chatbots Among Medical Students in China: National Cross-Sectional Study. *JMIR Medical Education*, 10(1), e57132.
- Team Lease EdTech. (2024). *Revolutionizing Classrooms: The Impact of Generative AI on the*

- Future of Education (Report). Mumbai: Team Lease EdTech.*
- Tyagi, S., Banerjee, S., & Saxena, M. K. (2024). The Role of Artificial Intelligence in Implementing the National Education Policy-2020: Challenges and Opportunities. Indira Gandhi National Tribal University. ((PDF) the Role of Artificial Intelligence in Implementing the National Education Policy-2020: Challenges and Opportunities)*
- UNESCO. (2019). Artificial Intelligence in Education: Guidance for Policy-makers. Paris: United Nations Educational, Scientific and Cultural Organization.*