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AI Tools for Teaching Aids and the National Education Policy (NEP) 2020

Sharda Nand Mishra
Teacher, Samastipur Bihar, India

Abstract- The integration of Artificial Intelligence (AI) into educational practices offers transformative potential for teaching and learning processes. AI tools can make education more personalized, efficient, and accessible by adapting to individual student needs, providing real-time feedback, and automating administrative tasks. This paper explores the role of AI technologies as effective teaching aids, focusing on their alignment with the objectives of India's National Education Policy (NEP) 2020. The NEP 2020 emphasizes the use of technology to promote personalized learning, improve teacher effectiveness, enhance access to quality education, and bridge existing educational gaps, particularly in rural and under-resourced areas. The study analyzes current initiatives such as adaptive learning platforms, intelligent tutoring systems, virtual reality applications, and automated assessment tools, illustrating their contribution toward achieving NEP's goals of learner-centered education and digital literacy. It also highlights challenges faced in implementation, including insufficient infrastructure, lack of digital skills among educators, and ethical concerns regarding data privacy. Finally, the paper proposes actionable recommendations like continuous professional development for teachers, strategic investment in technology infrastructure, and developing policy frameworks for responsible AI use. These measures aim to foster a more interactive, inclusive, and future-ready education system in India.

Keywords- Artificial Intelligence in Education, NEP 2020, Personalized Learning, Intelligent Tutoring Systems, Adaptive Learning Platforms.

I. INTRODUCTION

AI Tools in Education

Artificial Intelligence (AI) tools encompass a wide range of applications designed to enhance teaching and learning processes by making them more efficient, personalized, and engaging. These tools support educators in delivering content more effectively while promoting active learning and addressing individual student needs. One of the most significant AI applications in education is adaptive learning platforms. These systems use advanced algorithms to analyze student performance in real time and adjust the learning content accordingly. For instance, if a student struggles with a particular concept, the platform automatically provides additional resources, practice exercises, or alternative explanations, allowing learners to progress at their own pace. This promotes inclusivity and personalized learning, which significantly improves engagement and retention, as noted by Kerimbayev et al. (2023).

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Intelligent Tutoring Systems (ITS) are another important AI tool that simulates one-on-one tutoring by providing real-time feedback and guidance. These systems assess student responses and offer hints, explanations, or corrective feedback, much like a human tutor would. ITS are especially effective in subjects like mathematics and science, where step-by-step problem solving is critical. By continuously adapting to individual learning needs, ITS encourage critical thinking and deeper understanding of concepts.

Automated assessment tools further support educators by evaluating student performance quickly and accurately. These tools can automatically grade multiple-choice tests, essays, and assignments while providing instant feedback to both students and teachers. This reduces the administrative workload of educators and allows them to focus more on interactive and personalized teaching strategies. In addition, automated assessments facilitate frequent and timely evaluations, enabling educators to monitor student progress and adjust instruction accordingly.

Natural Language Processing (NLP) applications also play a key role in language learning and comprehension. AI-powered chatbots, automated essay scoring systems, and language translation tools help students improve their reading, writing, and communication skills by providing instant corrections, suggestions, and interactive practice. NLP tools also aid in simplifying complex texts and offering explanations, making learning more accessible. Together, these AI tools represent a significant shift toward more adaptive, interactive, and efficient educational practices, fully supporting the vision of India's National Education Policy (NEP) 2020.

Alignment with NEP 2020

The National Education Policy (NEP) 2020 emphasizes transforming India's education system to make it more flexible, multidisciplinary, and technology-driven. AI tools strongly align with these objectives and can significantly contribute to their implementation. One of the primary aims of NEP 2020 is Personalized Learning. AI technologies, such as adaptive learning platforms, analyze student behavior, performance, and learning pace, allowing the system to customize lessons to fit individual needs. This ensures that every student receives a unique learning experience that helps them grasp concepts effectively, catering to their strengths and addressing their weaknesses. Such personalization is key to improving academic performance and learner engagement. Another important aspect of NEP 2020 is Teacher Empowerment.

AI reduces the burden of routine tasks like grading assignments, monitoring attendance, and managing administrative paperwork. Intelligent Tutoring Systems can also assist teachers by providing real-time insights into student progress, helping them design more targeted interventions. This enables educators to concentrate more on creative teaching practices and student engagement rather than mechanical tasks. AI tools also promote Access and Inclusion, particularly in rural and remote regions where resources are limited. Through digital classrooms, language translation tools, and virtual labs, students in underprivileged areas can access high-quality educational content, supporting the NEP's mission to reduce learning inequities across the country. The policy emphasizes Curriculum Innovation, encouraging the integration of technology into education. AI-driven tools foster essential skills such as critical thinking, problem-solving, and digital literacy, preparing students to thrive in the digital age and contributing to a more future-ready workforce.

Current Initiatives

Several practical initiatives have been launched in India to integrate Artificial Intelligence (AI) into the education system, aligning with the goals of the National Education Policy (NEP) 2020 and promoting more effective, personalized learning. One notable initiative is IIT Madras's "AI for Educators" Course. This free online program is designed to empower school teachers with foundational knowledge of AI

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technologies. It focuses on helping educators understand how AI can be applied in classroom teaching and assessment practices. The course provides theoretical insights and practical examples of using adaptive learning platforms, automated assessment tools, and intelligent tutoring systems. By equipping teachers with this knowledge, the initiative helps bridge the digital skills gap and prepares them to implement technology-driven pedagogies effectively (Times of India, 2025).

Another significant effort is the AI Training Program by the UP Government, conducted in collaboration with IIT Kanpur and the State Council of Educational Research and Training (SCERT). This large-scale program aims to train science teachers in AI fundamentals, digital literacy, and computational thinking. It targets nearly 75 lakh students across Uttar Pradesh, one of India's largest states, helping promote digital education in schools where traditional resources and access have been limited. This initiative is crucial in democratizing access to modern learning tools and aligning with NEP 2020's goal of enhancing learning outcomes through technology (Times of India, 2025).

In Delhi, the government has introduced AI-Powered Smart Classrooms, integrating smart boards, robotics, and AI-based learning aids in government schools. These smart classrooms facilitate interactive lessons, real-time feedback, and immersive learning experiences. Robotics and AI applications help students develop critical thinking and digital skills, promoting hands-on learning aligned with the NEP's emphasis on experiential education (Times of India, 2025).

Beyond these, other initiatives include:

- DIKSHA Platform: A digital learning platform supported by the Government of India, offering AI-based personalized learning paths, assessments, and interactive content for teachers and students.
- National Educational Technology Forum (NETF): As recommended by NEP 2020, the NETF is envisioned to provide a platform for the free exchange of ideas on the use of technology, including AI, in education policy and practice.
- Together, these initiatives reflect India's strong commitment to integrating AI into its education system and promoting equitable, technology-enhanced learning environments.

Challenges and Considerations

Despite the significant promise that Artificial Intelligence (AI) holds for transforming the education sector, several major challenges hinder its widespread and effective adoption across India's educational landscape.

Infrastructure Limitations

One of the most significant barriers to implementing AI tools is the lack of adequate technological infrastructure, especially in rural and remote regions. Many schools do not have access to reliable internet connections, modern computing devices, or AI-powered learning platforms. Without the necessary hardware and connectivity, deploying advanced solutions such as adaptive learning platforms, intelligent tutoring systems, or virtual reality (VR) applications becomes nearly impossible. This digital divide directly contradicts the inclusive vision of NEP 2020, which aims to provide equitable quality education to all students.

Digital Literacy of Educators and Learners

Another critical challenge is the lack of digital skills among educators and students. Many teachers are not adequately trained to incorporate AI-based tools into their pedagogical practices. A large number of educators still rely on traditional, teacher-centered methods and are unfamiliar with emerging technologies like automated assessment systems or natural language processing (NLP) applications. Similarly, students in underprivileged areas often lack exposure to digital environments, which affects

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their ability to benefit from AI tools. Without targeted professional development programs, the potential of AI in education remains underutilized.

Ethical and Privacy Concerns

The use of AI in education raises important ethical issues, particularly related to data privacy and security. AI tools collect large volumes of data on student performance, behavior, and personal information to personalize learning experiences. However, without proper regulations, this data could be misused or inadequately protected, leading to privacy violations. Moreover, algorithmic biases present in some AI systems could reinforce existing educational inequalities if not carefully monitored. This makes it essential to establish clear guidelines and policies for the ethical use of AI in schools.

Recommendations

To effectively integrate Artificial Intelligence (AI) tools into the Indian education system in alignment with the National Education Policy (NEP) 2020, several important steps must be taken. First, significant investment in technological infrastructure is necessary, particularly in rural and underserved regions. Many schools currently lack access to reliable internet connectivity, modern computers, and AI-powered devices such as smart boards and virtual labs. To bridge this gap, government programs should prioritize funding for digital infrastructure, ensuring equitable access to AI tools and enabling all students to benefit from technology-enhanced learning environments.

Second, continuous professional development for educators is essential. Teachers often face challenges in adopting new technologies due to insufficient training and limited digital literacy. Comprehensive training programs should be implemented to build teachers' confidence and skills in using AI-based tools such as adaptive learning platforms, intelligent tutoring systems, and automated assessment software. These programs could include workshops, online certification courses, and hands-on practical sessions, enabling educators to integrate AI into their teaching practices effectively and meaningfully.

Third, robust policy frameworks are needed to address ethical and data privacy concerns related to AI in education. Since AI tools collect large amounts of student data for personalized learning, clear guidelines must be developed regarding how this data is stored, shared, and used. Policies should also ensure the responsible and transparent use of AI systems, preventing algorithmic bias and protecting student privacy. These frameworks will help establish trust among educators, students, and parents. Collaborative efforts between government bodies, educational institutions, and technology providers should be encouraged. Public-private partnerships can foster innovation by enabling resource sharing, co-development of localized solutions, and scaling of successful models. Collaborations can help pool expertise, reduce costs, and support the development of AI applications specifically designed to meet the diverse needs of India's educational context.

II. CONCLUSION

The integration of AI tools in education can significantly advance NEP 2020's goals by making learning more personalized, inclusive, and efficient. With strategic implementation and by overcoming challenges, AI can transform India's education system for the 21st century.

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