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Impact and Use of AI Tools in Teaching and Learning in Higher Education: A Case Study in Perspective to the New Education Policy of India

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Abstract: The rise of artificial intelligence (AI) has the ability to completely change higher education around the world. In India, this change is very much in line with the goals set out in the National Education Policy (NEP) 2020. This review paper looks at how AI tools are used and how they affect teaching and learning in higher education institutions (HEIs), focusing on the NEP 2020. Focusing on digital integration, adaptive learning, and data-driven educational methods in the policy shows how important AI is in changing how we teach, test, manage, and get students involved. In this study, ideas from ten research papers and other studies that were mentioned in the main literature review are put together to look at the latest trends, innovations, and practices in integrating AI into Indian higher education institutions. This article talks about how AI tools like ChatGPT, personalized learning platforms, and clever tutoring systems are used to make teaching more effective and help students do better in school. In addition, the paper talks about how AI helps with NEP goals and inclusive education, such as bilingual education, flexible curricula, and teachers' ongoing professional development. A method based on qualitative content analysis was used, and the steps of the study are shown in a workflow. The results show how important it is to have a strong AI system, rules for using AI in an ethical way, and programs to help people learn new skills. However, problems like not knowing how to use technology, worries about data safety, resistance from teachers, and a lack of standard AI curriculums still exist. The paper also looks at future issues like AI governance, pedagogical fairness, and institutional readiness and includes relevant case studies. Finally, AI has a huge potential to change higher education in India if it is used in line with the goals of NEP 2020. To close the gaps and create long-lasting, moral, and welcoming AI-powered learning environments, policymakers, educators, and developers must work together.

Keywords: AI Tools, Teaching and Learning in Higher Education, New Education Policy of India.

INTRODUCTION

Indian education is supposed to become more holistic, flexible, diverse, and in line with the needs of the 21st century, according to the National Education Policy (NEP) 2020. One important part of the strategy is how to use new technologies, especially Artificial Intelligence (AI), to change the way we teach, learn, and run institutions. NEP wants AI to be used in Higher Educational Institutions (HEIs) to improve student results, give teachers more power, and make administration more efficient. More and more, AI tools are changing digital teaching, adaptive tests, smart tutoring, and personalized learning settings. The National Educational Technology

Forum (NETF) is something that the NEP encourages to be created so that technology can be used to help teach and build skills. AI should be taught in schools so that students are ready for a future based on technology. This is especially important in fields like engineering, computer science, and interdisciplinary studies. This review looks at recent studies, policy papers, and real-life case studies to look at the role, effects, and difficulties of implementing AI in Indian higher education. It hopes to give you useful information about NEP 2020's AI vision.

METHODOLOGY

The review study used a qualitative content analysis method to put together research papers and government policy documents that were already out there. The method involved picking important papers from the source document's reference list, listing outcomes, pointing out problems, and coming up with thematic insights.: Literature Collection → Filtering Relevant Papers → Thematic Content Analysis → Synthesis of Key Insights → Tabular Review of Studies → Case Study Inclusion → Summary & Conclusion (Fig.1).

Fig.1- Workflow diagram for methodology

LITERATURE REVIEW

The authors looked at 26 study papers that were all about how to use and improve artificial intelligence tools in higher education. In line with India's New Education Policy, these studies were carefully looked over to find out what the most important results, chances, and problems were when it came to AI-driven teaching and learning.

Literature Review Summary Table

Table 1: Summary of Key Research Papers Reviewed

Ref.No	Research Paper Title	Major Outcome of Study	Major Challenges/Research Gaps
1	Utilization of Artificial Intelligence in Outcome-Based Curriculum Evaluation and Development	Demonstrated AI's role in evaluating and improving outcome-based curricula.	Lack of framework for scalable curriculum customization using AI.
2	ChatGPT for Teaching, Learning and Research: Prospects and Challenges	Highlighted ChatGPT's potential in academic content generation and personalized tutoring.	Issues with accuracy, biases, and ethical considerations.
3	The Role of Artificial Intelligence in Creation of Future Education: Possibilities and Challenges	Showed AI's transformative capabilities in redefining education systems.	Limited long-term empirical data on AI's impact.
4	Improving Educational Outcomes Through Adaptive Learning Systems using AI	Proved effectiveness of adaptive AI systems in enhancing learning efficiency.	Integration with existing LMS platforms remains complex.
5	New Era of Artificial Intelligence in Education: Towards a Sustainable Multifaceted Revolution	Emphasized sustainability and inclusivity through AI in education.	Need for governance frameworks and interdisciplinary alignment.
6	The Promises and Challenges of Artificial Intelligence for Teachers: A Systematic Review of Research	Identified both advantages and psychological barriers for teachers using AI.	Insufficient teacher training and trust in AI systems.
7	Enhancing the Educational Process through AI and Gamified Learning	AI combined with gamification increased engagement and knowledge retention.	Lack of scalable models across subjects and age groups.
8	The Impact of Artificial Intelligence Tools on Academic Writing Instruction in Higher Education	AI tools significantly improved student writing outcomes.	Over-reliance on tools may affect critical thinking skills.
9	Academic Communication with AI-powered Language Tools in Higher Education	Enhanced student confidence and productivity in academic writing.	Challenges around originality and academic integrity.
10	Generative Artificial Intelligence: Implications and Considerations for Higher Education Practice	GAI tools reshape curriculum design, delivery, and evaluation.	Absence of clear ethical guidelines and policies.

11	Integrating ICT with Artificial Intelligence for Transformative Education	AI-ICT integration fosters personalized and inclusive education.	Digital divide and infrastructure limitations in rural areas.
12	The Impact of ChatGPT on Higher Education	Found ChatGPT useful for assignments and formative feedback.	Concerns about misuse and plagiarism persist.
13	Understanding Teachers' Perspectives on ChatGPT-Generated Assignments in Higher Education	Revealed mixed teacher opinions on AI-generated submissions.	Lack of regulatory frameworks to monitor misuse.
14	AI and Student Engagement: A Comparative Analysis	AI tools increased student motivation and course engagement.	Low awareness of AI benefits among educators.
15	Evaluating the Impact of AI Tools on Grammar Mastery: A Comparative Study of Learning Outcomes	Grammar learning significantly improved using AI tools.	Transferability of outcomes across disciplines remains unclear.
16	Rethinking Higher Education Teaching and Assessment In-Line with AI Innovations: A Systematic Review and Meta-Analysis	Urged revamping traditional pedagogies through AI-enhanced assessments.	Limited teacher readiness and curriculum adaptability.
17	Analyzing the Impact of AI Tools on Student Study Habits and Academic Performance	AI helped streamline study routines and improve grades.	Need for longitudinal studies to validate claims.
18	Understanding the Impact of ChatGPT in Education	ChatGPT fosters creativity and exploration in learning.	Ethical concerns about dependency and misinformation.
19	Exploring Factors Influencing University Students' Intentions to Use ChatGPT	Found strong correlation between task-tech fit and ChatGPT use intention.	Lack of AI usage awareness across student demographics.
20	Shaping the Future: Education and Skill Development for Viksit Bharat@2047	Proposed AI-integrated skill frameworks aligned with NEP goals.	Gap in actionable policy mechanisms for implementation.
21	AI-enhanced Education: Exploring the Impact of AI Literacy on Generation Z's Academic Performance in Northern India	AI literacy correlated positively with academic success.	Disparity in AI literacy access across regions.
22	Challenges in Artificial Intelligence Development in Higher Education in China, India, and Indonesia	Identified student-reported barriers in AI adoption across countries.	Institutional policies vary widely with inconsistent implementation.

23	Student Perspectives on Optimising AI Tools to Enhance Personalised Learning in Higher Education	Students reported improved personalized learning via AI tools.	Lack of faculty alignment with student expectations.
24	Transforming Education: A Comprehensive Review of Generative Artificial Intelligence in Educational Settings through Bibliometric and Content Analysis	GAI is reshaping educational research and pedagogy.	Bibliometric gaps in emerging regional literature.
25	A Study on the Role of Turnitin and ChatGPT in the Field of Education	AI aids in plagiarism detection and academic assistance.	AI's dual role complicates academic integrity monitoring.
26	The Application of Artificial Intelligence Tools in Higher Education: Opportunities and Challenges	Reviewed key AI opportunities across disciplines.	Challenges include ethical use, data security, and personalization issues.

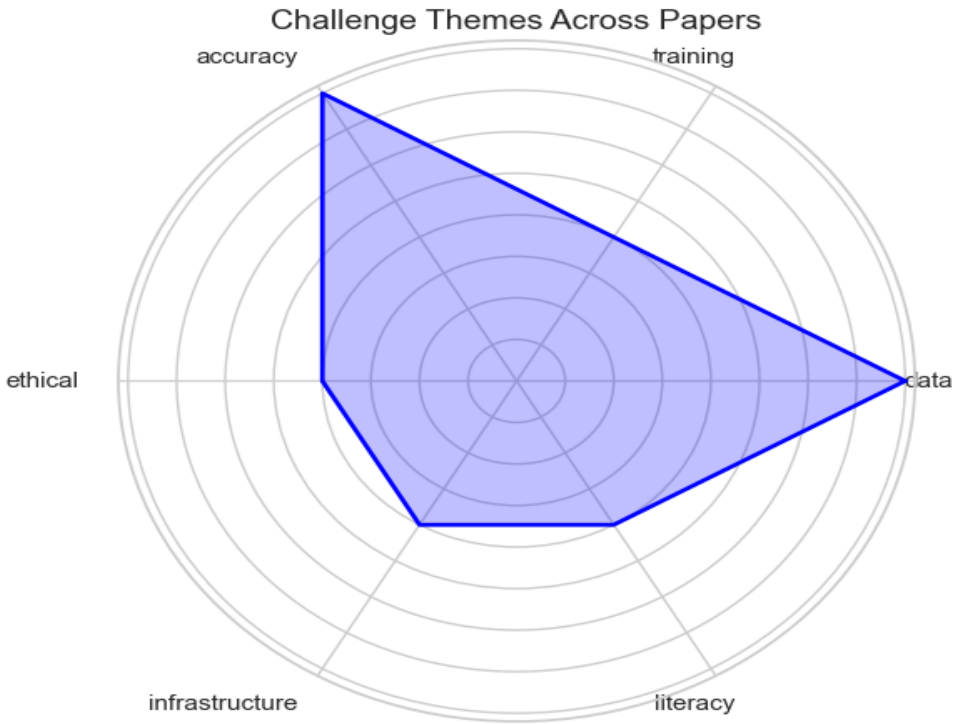

Figure 1: challenges and insights for AI in education

MAJOR INSIGHTS FOUND

All of the studies that were looked at (Table1 & Figure 1)show that NEP 2020 is pushing Indian higher education institutions to use AI more and more. More and more, AI tools are being used

for personalized learning, tests, and management. Even though there are clear benefits, there are still some problems, such as the digital divide, worries about ethics, teachers who aren't ready, and problems with infrastructure. Everyone agrees that for AI to be adopted smoothly, there needs to be a regulatory structure, interdisciplinary curriculum, and national-level programs like NETF. The review also shows that both students and teachers are open to AI as long as it is supported and trained properly.

CASE STUDIES

Several case studies from Indian higher education institutions show how AI can be used in the real world, in line with the goals of NEP 2020. Summary of some of them is given below table (Table-2 and Figure 2).

Table 2: AI Integration in Higher Education Case Studies Aligned with NEP 2020

Case Study/Ref.No.	Area/Domain	Year of Implementation	Outcome	Align with NEP? / Challenge
Adaptive Learning Platforms [27][28]	Personalized Learning	2023	Improved engagement and academic outcomes via individualized learning paths	YES / Requires high-quality performance data and teacher training
Automated Grading Systems [27][29]	Assessment & Feedback	2022	Reduced grading time and enabled real-time feedback	YES / Concerns around algorithmic accuracy and ethical data use
AI-Enhanced Language Learning [30][31]	Multilingual Education	2023	Strengthened multilingual proficiency and classroom engagement	YES / Challenges in AI content accuracy and teacher preparedness
VR/AR in Education [32][33]	Immersive Learning Tools	2024	Enabled deeper conceptual understanding through 3D and mixed reality content	YES / Uneven access to infrastructure and digital resources
AI in STEM Programs [34]	STEM Education	2022	Boosted conceptual clarity and problem-solving through AI-powered learning aids	YES / Infrastructure and AI literacy gaps among students and faculty

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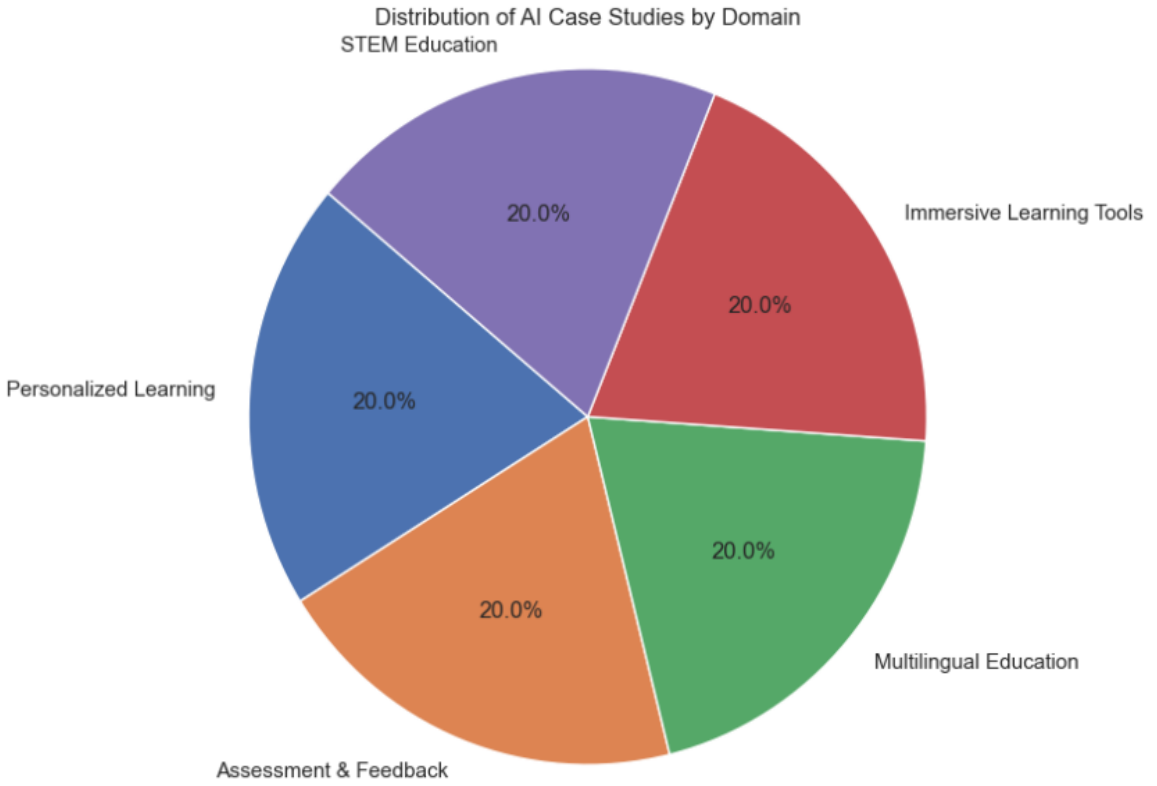

Figure 2: case study for application of AI in higher education

CHALLENGES AND FUTURE CONCERNS

Even though AI has the potential to change higher education in India, there are some problems that need to be fixed before it can be widely used: - Teachers who aren't trained and people who don't want to use new technology. There are ethical issues, such as data privacy, algorithmic bias, and cheating in school. Limited infrastructure, especially in rural and semi-urban places. — Universities don't all follow the same AI program. - Strong policy and control systems are needed to oversee the use of AI. In the future, we need to worry about making sure that everyone has access, keeping an eye on regulations, teaching everyone how to use AI, and keeping the human touch in training.

DISCUSSION AND CONCLUSION

This review emphasizes how important AI is to achieving NEP 2020's goal of a tech-enabled, student-centered, and adaptable higher education system. The study of some books and real-life examples shows that AI is already making big changes to how we teach, learn, and grade. To fully use AI, though, policymakers, organizations, educators, and technology providers need to work together and coordinate their efforts. The next steps must include improving the school's digital infrastructure, helping teachers gain new skills, and making sure that AI tools are used in a responsible way. Ultimately, AI should not be seen as just a tool, but as a force that can change things for the better. It can make education more accessible and personalized, close learning gaps, and encourage new ideas in higher education, all of which are goals of India's National Education Policy.

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