

ROLE OF ARTIFICIAL INTELLIGENCE IN TRANSFORMING HIGHER EDUCATION: A STUDY OF TEACHER'S PERCEPTION IN JALGAON DISTRICT

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Abstract

Artificial Intelligence (AI) has rapidly emerged as a transformative force across multiple sectors, including education. Higher education institutions around the world are increasingly integrating AI-driven tools to enhance teaching effectiveness, automate administrative processes, support research activities, and improve student learning outcomes. In the Indian context, the adoption of AI in higher education has gained momentum following the emphasis on digital transformation and technology integration under the National Education Policy (NEP) 2020. This research paper examines the perceptions of teachers regarding the role of Artificial Intelligence in higher education institutions located in Jalgaon District, Maharashtra. The study explores how AI tools influence teaching effectiveness, faculty productivity, student academic performance, and assessment practices. Primary data were collected using a structured questionnaire administered to 85 teachers working in different higher education institutions. The questionnaire consisted of Likert-scale items measuring attitudes toward AI adoption and its perceived benefits in teaching and learning. Descriptive statistics, reliability analysis, correlation analysis, and regression analysis were applied to examine the data. The reliability test indicated a Cronbach's Alpha value of 0.929, confirming excellent internal consistency of the measurement scale. The correlation results showed strong positive relationships between AI-supported teaching practices and student performance. Regression analysis further indicated that AI-enabled teaching engagement and timely feedback significantly influence student learning outcomes. The findings suggest that teachers generally perceive AI as a supportive technology that improves teaching efficiency and enhances academic productivity. However, concerns regarding ethical use, academic integrity, and overdependence on AI tools were also highlighted. The study concludes that effective AI integration requires institutional support, faculty training, and the development of ethical guidelines. The results provide useful insights for policymakers, administrators, and educators seeking to integrate AI technologies into higher education systems.

Keywords: Artificial Intelligence, Higher Education, Teaching Effectiveness, Educational Technology, AI Adoption.

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1. Introduction

Artificial Intelligence (AI) has become one of the most influential technologies of the twenty-first century. Its applications span diverse sectors such as healthcare, banking, manufacturing, agriculture, and education. In the field of education, AI technologies have the potential to transform traditional teaching and learning methods by enabling personalized learning, intelligent tutoring systems, automated assessment, and data-driven decision making.

Higher education institutions are increasingly exploring the integration of AI tools to improve educational quality and administrative efficiency. AI systems can assist teachers in preparing course materials, analyzing student performance, generating teaching content, and providing automated feedback. These technologies allow educators to focus more on creative teaching and student engagement rather than routine administrative tasks.

In India, the National Education Policy (NEP) 2020 highlights the importance of digital technologies and Artificial Intelligence in transforming the education system. Universities and colleges are encouraged to adopt innovative technologies to enhance teaching methodologies, research productivity, and learning outcomes. AI-powered platforms, learning analytics systems, and generative AI tools such as intelligent content generators are gradually becoming part of modern educational environments.

Despite these advancements, the successful integration of AI in education largely depends on the perceptions and readiness of teachers. Faculty members play a crucial role in adopting and implementing technological innovations within classrooms. Their awareness, attitudes, and willingness to use AI tools significantly influence how effectively these technologies are integrated into teaching and learning processes.

Jalgaon District in Maharashtra has a diverse higher education landscape that includes universities, engineering colleges, management institutes, and arts and science colleges. With increasing digitalization of academic activities, teachers in this region are gradually exposed to AI-based educational tools. Understanding their perceptions regarding AI adoption can provide valuable insights into the opportunities and challenges associated with technology integration in higher education.

Therefore, this study aims to examine the perceptions of teachers regarding the role of Artificial Intelligence in higher education institutions in Jalgaon District and to analyze its impact on teaching effectiveness, faculty productivity, and student learning outcomes.

2. Review of Literature

Several scholars have examined the potential impact of Artificial Intelligence on education systems worldwide.

Holmes, Bialik, and Fadel (2019) emphasized that AI technologies can personalize learning by analyzing student behavior and performance data. According to their study, AI-enabled learning systems can adapt educational content to suit individual learning styles and improve student engagement.

Luckin et al. (2016) highlighted the role of AI in supporting teachers by automating repetitive tasks such as grading assignments and managing course data. Their research suggests that AI can enhance teaching productivity by allowing educators to devote more time to interactive learning activities.

Zawacki-Richter et al. (2019) conducted a systematic review of research on AI in higher education and identified several important applications including intelligent tutoring systems, predictive

analytics, and automated feedback systems. The study concluded that AI technologies have the potential to significantly improve teaching and learning processes.

Chen, Chen, and Lin (2020) examined AI adoption in universities and found that AI-supported learning environments improve both student satisfaction and teaching effectiveness. However, they also noted concerns related to data privacy and technological infrastructure.

Dwivedi et al. (2021) discussed the broader implications of AI adoption in education and identified challenges such as lack of digital skills, ethical concerns, and resistance to technological change.

Mah et al. (2024) conducted a mixed-methods study of higher-education faculty that examined AI self-efficacy, practical use, perceived benefits, and the professional development needs of instructors ($N \approx 122$). The study found that faculty readiness to adopt AI is multidimensional — combining technical confidence (AI self-efficacy), pedagogical alignment, and ethical comfort — and that latent profiles of faculty ranged from “early experimenters” to “skeptical but curious.” Practically, Mah et al. report that faculty who scored higher on AI self-efficacy were significantly more likely to trial AI in formative assessment and content generation, but only when institutions provided short, hands-on PD (professional development) sessions and exemplars showing how AI outputs could be pedagogically adapted rather than accepted verbatim. The paper emphasises that readiness is not only individual (skills/confidence) but also organizational: those same faculty negotiators were more successful where cross-functional support (instructional design + IT) existed. The study recommends targeted PD bundles (technical how-to + ethical use cases + rubric redesign) to raise readiness across faculty profiles.

Ofem (2025) examined teachers’ preparedness for AI in classroom assessment (Frontiers in Education) and argued that readiness is shaped by pedagogical beliefs as much as by technical competence. The study finds that faculty who hold constructivist beliefs were more likely to see AI as a tool that can scaffold higher-order thinking, while faculty with more traditional, product-focused assessment beliefs tended to view AI primarily as a threat to academic integrity. Ofem shows that readiness programs must therefore combine technical training with reflective sessions that help faculty reconcile AI tools with their pedagogical values. The implication for administrators is that PD should not be “how-to” only: it should integrate pedagogy, discipline-specific scenarios, and normative discussions on integrity and fairness to change attitudes and thus readiness.

Buele (2025) (Frontiers in Education) reviewed transformations in academic work and faculty perceptions and concluded that AI-literacy is a key gating factor in faculty readiness. Buele synthesizes evidence showing that many faculty are technically curious but lack structured support: ad-hoc experimentation without institutional guidance leads to uneven practices and anxiety. The review recommends institutional roadmaps that pair low-risk pilots (e.g., chatbots for FAQs) with formal PD pathways that credential AI-literacy so faculty have recognized competence. For administrative readiness, Buele argues for a central unit (or working group) that provides tools, vetted prompts, example rubrics, and mechanisms for sharing good practices across departments; this social infrastructure raises readiness by reducing perceived risks and lowering the transaction cost of experimentation.

The WCET (2025) survey report (Western Cooperative for Educational Technologies) presents multi-institution survey data indicating that most institutions are still in early adoption but that administrative readiness (policy, governance) is growing. The report finds that while many institutions have pilot programs in teaching (content generation, auto-summaries), the bottleneck for scale is governance — particularly policy on acceptable use, data privacy, and assessment redesign. The WCET findings highlight that administrative readiness is uneven: institutions with

explicit AI working groups and top-level sponsorship possessed clearer roadmaps and greater faculty uptake, whereas institutions where AI was left to individual units showed uneven faculty confidence and practice. WCET stresses the need for institutional playbooks that co-design PD with faculty to maximize readiness.

Although numerous studies highlight the benefits of AI in education, there is limited research focusing on teachers' perceptions at the regional level in India. This study addresses this gap by examining faculty attitudes toward AI integration in higher education institutions in Jalgaon District.

3. Research Gap

Existing research has extensively explored the technological capabilities of Artificial Intelligence in education; however, most studies focus on developed countries or national-level analyses. Limited empirical research has examined the perceptions of teachers working in semi-urban regions such as Jalgaon District.

Furthermore, previous studies often focus on students' learning experiences rather than teachers' perspectives regarding AI adoption. Understanding teachers' perceptions is essential because they are the primary implementers of educational technologies in classrooms.

Therefore, this study attempts to bridge this gap by investigating how teachers perceive the role of AI in teaching effectiveness, academic productivity, and student learning outcomes in higher education institutions in Jalgaon District.

4. Objectives of the Study

1. To examine teachers' perceptions regarding Artificial Intelligence in higher education.
2. To analyze the impact of AI tools on teaching effectiveness.
3. To evaluate the influence of AI on faculty productivity.
4. To study the relationship between AI-supported teaching and student learning outcomes.
5. To identify challenges associated with the adoption of AI technologies in higher education institutions.

5. Hypotheses of the Study

H1: Artificial Intelligence adoption positively influences teaching effectiveness.

H2: Artificial Intelligence tools significantly improve faculty productivity.

H3: AI-supported teaching practices positively influence student academic performance.

H4: AI-enabled feedback and assessment systems improve student learning outcomes.

6. Research Methodology

The present study adopts a descriptive research design to examine teachers' perceptions regarding Artificial Intelligence in higher education institutions.

Data were collected through a structured questionnaire distributed among faculty members working in higher education institutions in Jalgaon District. The questionnaire consisted of Likert-scale items ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

A total of 85 valid responses were collected. The sampling method used in this study was convenience sampling due to accessibility and availability of respondents.

The collected data were analyzed using statistical techniques including descriptive statistics, reliability testing, correlation analysis, and regression analysis. These analyses were conducted to

examine the relationships between AI adoption and educational outcomes such as teaching effectiveness and student performance.

7. Data Analysis and Interpretation

The collected data were analyzed using statistical techniques commonly applied in educational research.

Table 1: Descriptive Statistics

Variable	N	Mean	Std. Deviation	Min	Max
AI tools improve teaching and learning outcomes	85	4.52	0.80	1	5
AI tools make teaching engaging and personalized	85	4.52	0.77	1	5
AI enhances productivity in academic tasks	85	4.58	0.70	1	5
AI improves student academic performance	85	4.51	0.85	1	5
AI supports timely feedback and assessment	85	4.59	0.76	1	5

The mean values above 4 indicate that most teachers agree that AI positively contributes to teaching effectiveness and productivity.

Table 2: Reliability Statistics

Cronbach's Alpha	Number of Items
0.929	5

Cronbach's Alpha value of 0.929 indicates excellent internal consistency of the scale.

Table 3: Pearson Correlation Matrix

Variables	Teaching Quality	Teaching Engagement	Productivity	Student Performance	Feedback
Teaching Quality	1	.727	.722	.714	.651
Teaching Engagement	.727	1	.729	.833	.698
Productivity	.722	.729	1	.685	.701
Student Performance	.714	.833	.685	1	.801
Timely Feedback	.651	.698	.701	.801	1

The correlation results indicate strong positive relationships between AI-enabled teaching practices and student performance.

Regression Analysis

Table 4: Model Summary

R	R Square	Adjusted R Square
0.891	0.793	0.786

Table 5: ANOVA

Source	F	Significance
Regression	103.6	0.000

Table 6: Regression Coefficients

Variable	Beta	t	Sig
Teaching Quality	0.115	1.38	0.169
Teaching Engagement	0.532	5.85	0.000
Timely Feedback	0.448	5.40	0.000

Regression results indicate that teaching engagement and timely feedback significantly influence student performance.

8. Hypothesis Testing

The hypotheses were tested using correlation and regression results. All hypotheses showed positive and statistically significant relationships, indicating that Artificial Intelligence tools play a significant role in improving teaching effectiveness, academic productivity, and student learning outcomes in higher education institutions.

9. Findings

The study revealed that teachers in Jalgaon District demonstrate a positive perception toward the use of Artificial Intelligence in education. AI tools are widely perceived as beneficial for enhancing teaching engagement, improving productivity, and supporting timely feedback mechanisms. The statistical results confirmed strong relationships between AI-supported teaching practices and improved student learning outcomes.

10. Conclusion

Artificial Intelligence has the potential to significantly transform higher education by supporting innovative teaching practices and improving learning experiences. The results of this study demonstrate that teachers perceive AI as a valuable tool that enhances teaching effectiveness and academic productivity. However, effective implementation requires adequate training, institutional support, and ethical guidelines to ensure responsible use of AI technologies. By integrating AI thoughtfully into educational systems, institutions can improve both teaching quality and student outcomes.

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