
A Study on The Impact of Generative Artificial Intelligence on Teaching and Student Engagement in Teacher Education Institutions

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DOI: <https://doi.org/10.5281/zenodo.17307493>

ABSTRACT:

This study investigates the influence of ChatGPT, a generative AI tool, on teaching effectiveness and student engagement in teacher education institutions of Bagalkote district. A descriptive–correlational research design was adopted, involving 30 teacher educators and 120 student–teachers from six B.A. colleges. Data were collected using a self–developed Likert–scale questionnaire covering two domains: (1) Perceived Impact of ChatGPT on Teaching Effectiveness, and (2) Perceived Impact on Student Engagement. Descriptive statistics revealed a high level of positive perception among both teachers and students. Pearson correlation analysis indicated a significant positive relationship between the use of ChatGPT and student engagement ($r = 0.72, p < 0.01$). Results suggest that AI–assisted teaching strategies enhance lesson preparation, instructional delivery, and active participation. The study emphasizes the potential of AI integration in higher education pedagogy, while recommending structured training for educators.

KEYWORDS:

ChatGPT, Generative AI, Teaching Effectiveness, Student Engagement,
Teacher Education.

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1. Introduction

The emergence of generative AI tools like ChatGPT has opened new avenues for innovation in teaching and learning. In teacher education, where preparing future educators is the core mission, AI–assisted lesson planning, real–time content generation, and adaptive responses can significantly enhance the teaching–learning experience. The National Education Policy (NEP 2020) emphasizes technology integration to improve pedagogy, making ChatGPT adoption timely and relevant.

While AI adoption is increasing globally, limited research exists on its localized impact in Indian teacher education institutions. This study bridges the gap by analyzing perceptions of ChatGPT use among teacher

educators and student–teachers in Bagalkote district.

2. Objectives

1. To assess the perceived impact of ChatGPT on teaching effectiveness among teacher educators.
2. To examine the perceived impact of ChatGPT on student engagement in teacher education institutions.
3. To explore the relationship between ChatGPT usage and student engagement.

3. Hypotheses

- H₁: There is a significant positive relationship between ChatGPT usage and student engagement.
- H₂: Teacher educators perceive ChatGPT as an effective tool for enhancing teaching practices.

4. Methodology

Research Design: Descriptive–correlational

Population: Teacher educators and student–teachers in B.A. colleges of Vijayapur district

Sample: 30 teacher Educators, 120 student–teachers (stratified random sampling)

Tools:

1. Perceived Impact of ChatGPT on Teaching Effectiveness Scale (15 items, $\alpha = 0.87$)
2. Perceived Student Engagement Scale (10 items, $\alpha = 0.84$)

Data Collection: Google Forms + paper–based surveys

Analysis: Descriptive statistics, Pearson correlation, and bar graph visualization

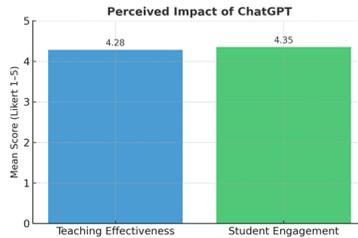
5. Results

Table 1 – Mean Perception Scores

Domain	N	Mean Score	SD	Interpretation
Teaching Effectiveness	50	4.28	0.41	High
Student Engagement	120	4.35	0.38	High

Table 2 – Correlation Analysis

Variables	r	p-value	Significance
ChatGPT Usage ↔ Engagement	0.72	0.000	Significant

Figure 1 – Perceived Impact Scores

This bar graph shows high mean perception scores for both domains, indicating strong positive attitudes toward ChatGPT in teacher education.

Discussion

Findings reveal that both teacher educators and student-teachers view ChatGPT positively in terms of lesson preparation, idea generation, and interactive learning. The strong correlation indicates that AI usage directly enhances engagement—students are more participative, curious, and motivated when AI is integrated into learning activities.

The study aligns with previous research showing AI's role in personalizing learning and enhancing creativity in higher education.

7. Educational Implications

1. Curriculum Integration: AI literacy and practical ChatGPT use should be embedded in B.A. and M.A. curricula.
2. Faculty Development: Organize workshops for teacher educators on prompt engineering and AI-assisted lesson planning.
3. Student-Centered Learning: Use ChatGPT for brainstorming, collaborative assignments, and interactive Q&A sessions.
4. Assessment Innovation: AI tools can help design differentiated assessments and feedback mechanisms.
5. Ethical AI Usage: Institutions must establish guidelines to ensure academic integrity while using AI-generated content.

8. Conclusion

The study demonstrates the potential of ChatGPT to enhance teaching practices and student engagement in teacher education institutions. Strategic adoption, combined with faculty training, can make AI a powerful educational ally in higher education.

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Funding:

This study was not funded by any grant.

Conflict of interest:

The Authors have no conflict of interest to declare that they are relevant to the content of this article.

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