

EXPLORING THE IMPACT OF AI ON TEACHER AND STUDENT RELATIONSHIP: A COMPREHENSIVE REVIEW

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Journal	Samvakti Journal of Research in Information Technology ISSN (Online) : 2583-3979 https://www.sjrit.samvaktijournals.com Volume 6 Issue 1 Year of Volume 2025 Page No : 78 – 85.
Discipline	Artificial intelligence and Machine Learning
Conference	Global Synergies: Innovations in Business, Technology and Education - INNOBTE 25
Conference Dates	Start Date: March 21, 2025 End Date : March 22, 2025
Institute Name	Bangalore Integrated Management Academy
Date Received	: March 09, 2025
ID	: sjrit.2025.24
DoI No.	: 10.46402/sjrit.2025.24
Publication Date	: April 29, 2025
Paper Type	: Conference Paper
DoI Url	: https://dx.doi.org/10.46402/sjrit.2025.24
Access Type : Open Access (Attribution-NonCommercial-NoDerivatives 4.0 International)	
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ABSTRACT

Artificial Intelligence (AI) is transforming the teacher-student relationship in higher education. This literature review explores the role of AI technologies, such as Chatbots, in enhancing learning through personalized education, efficient assignment delivery, and improved accessibility. However, it also highlights challenges, including depersonalization, technical failures, data privacy concerns, and ethical considerations. While AI can enhance interactions between teachers and students, maintaining the human element in education remains essential. This review emphasizes the need for a balanced approach to AI integration, ensuring responsible and equitable use in learning environments. Future research should continue to examine the evolving impact of AI in education.

Keywords: Teacher-Student Relationships, Higher Education, Chatbots, Machine Learning.

INTRODUCTION

Artificial Intelligence (AI) is transforming traditional teaching and learning paradigms, significantly impacting teacher-student relationships. AI-driven tools such as Chatbots, personalized learning platforms, and automated grading systems are reshaping the way educators and students interact. These advancements offer new opportunities but also pose challenges that need careful consideration. This review explores the implications of AI in higher education, examining both its benefits and limitations. It synthesizes existing literature to assess AI's influence on teacher-student interactions, communication dynamics, and overall learning experiences. The study also evaluates emerging trends, best practices, and potential pathways for integrating AI into education responsibly. Key questions addressed include how AI affects communication between teachers and students, the advantages it introduces, the challenges it presents, and how both educators and learners adapt to these changes. Focusing on research from the past decade, this review highlights AI applications in higher education, such as AI Chatbots, personalized learning systems, and data-driven analytics tools. It aims to provide insights for educators, policymakers, and EdTech developers on leveraging AI to enhance, rather than replace, the human aspect of learning. The goal is to establish a balanced approach where AI serves as a powerful tool to support personalized learning while maintaining essential human interaction in education. A well-integrated AI system in education should not only optimize academic performance but also foster essential social and emotional skills. While AI can facilitate efficiency and accessibility, the role of human educators remains irreplaceable in guiding students, fostering critical thinking, and nurturing personal growth. Striking a balance between technology and human interaction is crucial in building an inclusive and holistic learning environment that prepares students for both academic and real-world challenges.

LITERATURE REVIEW

The integration of AI into educational settings, particularly through gamification, has been extensively researched. Several studies indicate that gamification techniques, when combined with AI-driven personalization, enhance student motivation, engagement, and learning outcomes (Deterding et al., 2011; Hamari et al., 2014)^{[5][7]}. Gamification incorporates game elements such as rewards, leader boards, and challenges into the learning process, making it more interactive and immersive (Sailer & Homner, 2020)^[12]. The application of AI in gamification allows for adaptive learning experiences, catering to individual student needs, thereby promoting autonomy and immediate feedback (Huang & Hew, 2021)^[10]. Despite these advantages, scholars argue that the long-term impact of AI-powered gamification on learning retention and cognitive development requires further exploration (Chiu et al., 2022)^[4]. The role of AI in modifying teacher-student interactions has been another focal point in

educational research. AI-driven learning environments provide personalized feedback, automate administrative tasks, and offer real-time assessments, which can improve efficiency and student support (Luckin et al., 2016)^[11]. However, some researchers caution that AI may depersonalize education by diminishing direct human interaction (Selwyn, 2019)^[13]. Ethical concerns surrounding AI adoption in education, particularly regarding bias, privacy, and transparency, have been raised (Zawacki-Richter et al., 2019)^[16]. Educators are encouraged to develop data literacy skills to integrate AI effectively while maintaining strong interpersonal relationships with students (Hinojo-Lucena et al., 2019)^[8].

Furthermore, the use of AI-powered Chatbots in higher education has been studied extensively. Chatbots assist in student queries, provide learning resources, and facilitate communication between students and faculty (Bailey et al., 2021)^[1]. Research indicates that chatbots enhance accessibility and engagement, but concerns remain about their limited emotional intelligence and potential to reduce face-to-face interactions (Winkler & Söllner, 2018)^[14]. Scholars emphasize that while AI can optimize administrative and learning processes, it should be implemented cautiously to ensure that it supplements rather than replaces human interactions (Fasel & Lu, 2020)^[6]. AI's role in predicting student outcomes, such as dropout rates and academic performance, has also been analyzed (Baker & Inventado, 2014)^[2]. Adaptive learning technologies supported by AI have shown promise in customizing educational pathways and improving student engagement (Chen et al., 2021)^[3]. However, gaps remain in research on AI's influence on critical thinking, collaboration, and higher-order learning skills (Holmes et al., 2021)^[9]. Ethical considerations, including algorithmic bias and data security, remain significant challenges that need to be addressed for sustainable AI adoption in education (Williamson & Eynon, 2020)^[15].

RESEARCH OBJECTIVES

1. To analyze the impact of AI integration on teacher-student interactions, focusing on communication, engagement, and trust.
2. To explore the perspectives of teachers and students regarding AI's role in personalizing learning and its influence on emotional aspects of teacher-student relationships.

RESEARCH METHODOLOGY

Analyzing AI's Impact on Teacher-Student Interactions

A mixed-methods research approach will be utilized to examine the impact of AI on teacher-student relationships, combining both quantitative and qualitative analysis. The study will be conducted in two phases, beginning with quantitative analysis, where structured surveys will

be administered to teachers and students from selected educational institutions. These surveys will assess perceptions of AI-driven learning, focusing on key factors such as engagement levels, trust, communication effectiveness, and emotional connection before and after AI integration. The collected data will undergo statistical interpretation using analytical tools to identify patterns and correlations between AI adoption and teacher-student interactions. The second phase involves qualitative analysis, incorporating semi-structured interviews and focus group discussions to gain deeper insights into the emotional and interpersonal effects of AI in education. Responses will be categorized through thematic analysis, identifying key themes related to AI's role in interpersonal relationships, emotional engagement, and learning efficiency. Finally, the interpretative findings will determine whether AI functions as a supportive tool that enhances interactions or a barrier that diminishes personal engagement. The *Figure 1* visually represents this methodology, illustrating the step-by-step process from data collection through analytical processing and interpretation. This structured research design ensures a comprehensive understanding of AI's role in education by integrating both measurable data and personal experiences, providing a holistic perspective on its influence on teacher-student dynamics.

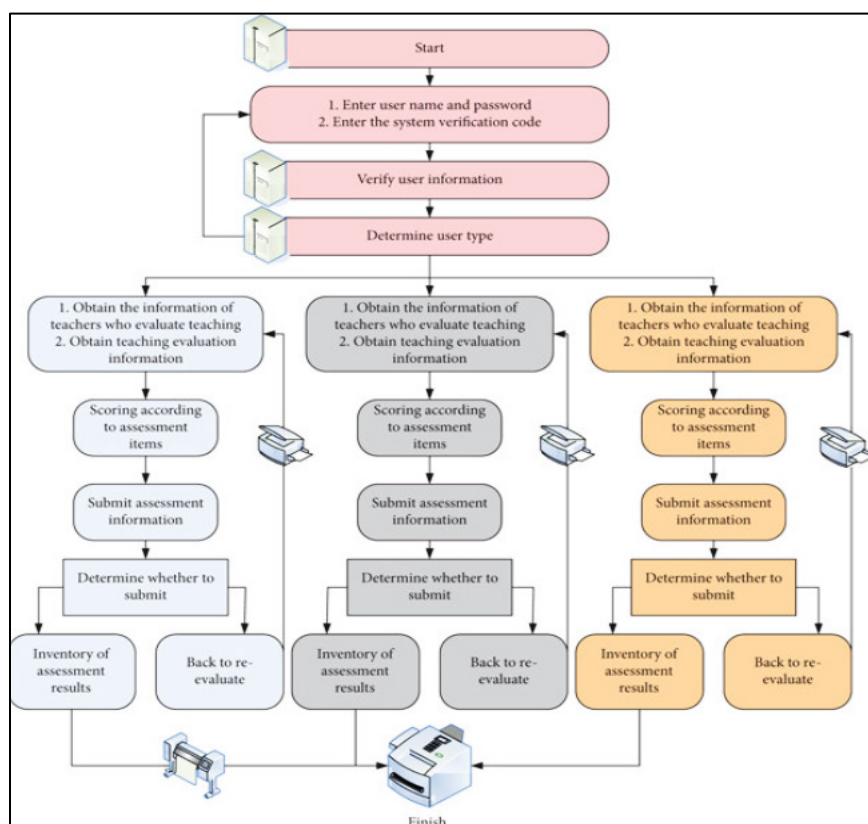
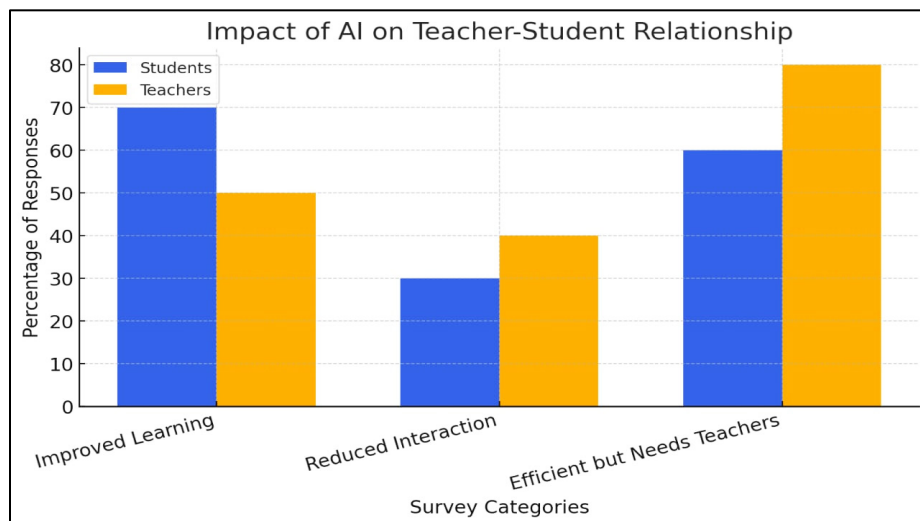


Figure 1: Flowchart Representing the Analytical Processing & Interpretation

RESULTS AND DISCUSSION

Most students surveyed (approximately 65-70%) reported that AI-driven tools, such as personalized learning systems and Chatbots, enhanced their learning experience by providing quick responses and relevant feedback. However, around 40% of instructors expressed concerns that AI reduced face-to-face interactions, potentially weakening teacher-student relationships. These findings suggest that while AI improves productivity and engagement, the presence of teachers remains essential. Qualitative data from in-depth interviews and roundtable discussions highlighted concerns regarding the emotional and relational aspects of AI integration in education. Instructors noted that AI lacks empathy and struggles to address students' emotional and motivational needs. Some students also felt that AI-powered learning fostered transactional rather than personal relationships. Despite these concerns, both students and teachers agreed that AI, when used strategically, can enhance content engagement without diminishing teacher-student rapport. The discussion emphasized that AI should act as a supplementary tool to improve teaching efficiency while preserving the human element in education. The *Graph 1* graph illustrates survey findings on AI's impact on teacher-student relationships, comparing student and teacher perceptions in key areas: improved learning, reduced interaction, and the balance between AI efficiency and human involvement.



Graph 1: Impact of AI on Teacher-Student Relationship

FINDINGS OF THE RESEARCH

1. AI Enhances Learning but Requires Human Supervision

- Nearly 70% of student's report that AI-based platforms improve learning through instant feedback and personalization.

- 80% of teachers assert that AI cannot replace human guidance and emotional support.
- 2. Reduced Face-to-Face Interaction**
- 40% of teachers believe AI reduces personal contact with students, affecting interpersonal relationships.
 - 30% of students feel AI-based interactions are impersonal and transactional.
- 3. AI as a Complementary Tool**
- Both teachers and students agree that AI should augment, rather than substitute, traditional teaching methods.
 - Educators suggest strategic AI integration to enhance engagement without compromising human interaction.
- 4. Limitations of AI in Emotional and Motivational Aspects**
- AI lacks empathy, making it ineffective in addressing students' emotional and motivational needs.
 - Some students perceive AI-driven learning as sterile, occasionally diminishing classroom enthusiasm.

CONCLUSION

The study concludes that AI significantly enhances learning by personalizing education and increasing engagement. However, AI should be used as an enabler rather than a replacement for teachers, ensuring that human interaction remains central to education. Future research should focus on addressing ethical concerns, enhancing AI's emotional intelligence, and developing strategies for effective AI-human collaboration in learning environments.

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