

Integration of AI Tools for Educational Purposes by Teachers in Kollam

Viji V¹, Dr Indhu L²

^{1,2}Department of Commerce, University Institute of Technology, Kollam

Abstract

Artificial Intelligence (AI) has rapidly transformed the educational landscape by offering innovative tools that support teaching, learning, and assessment. The integration of AI tools in classrooms enables teachers to enhance instructional effectiveness, personalize learning experiences, and improve student engagement. The present study examines the integration of Artificial Intelligence tools for educational purposes by teachers in Kollam district, Kerala. The study focuses on understanding the level of awareness, frequency of use, perceived benefits, and challenges faced by teachers in implementing AI-based tools in their teaching practices. A descriptive survey method was adopted and data were collected from teachers using a structured questionnaire. The findings indicate that teachers demonstrate a moderate to high level of awareness regarding AI tools such as intelligent tutoring systems, automated assessment platforms, and AI-assisted content generators. However, the extent of actual classroom integration remains moderate due to constraints such as lack of training, limited institutional support and technological barriers. The study highlights the importance of professional development programs and institutional initiatives to promote effective AI integration in education. The research concludes that AI tools can significantly enhance teaching efficiency and student learning outcomes when appropriately integrated into classroom practices.

Keywords: Artificial Intelligence, Educational Technology, AI Tools, Teachers, Digital Learning, Classroom Innovation

Introduction

One of the most revolutionary technologies of the twenty-first century is artificial intelligence. AI-based tools are being utilized more frequently in the field of education to boost student engagement, increase teaching effectiveness, and enable individualized learning experiences. Virtual teaching assistants, intelligent tutoring programs, automated grading systems, and AI-driven content creation platforms are just a few of the many AI-powered tools available to educators today. Opportunities to change conventional classroom procedures into more dynamic and interactive learning environments are presented by the incorporation of artificial intelligence in education. AI tools can be used by educators to assess student performance, spot learning gaps, and create individualized teaching plans that meet the needs of each student. Digital technology utilization in education has increased dramatically in India in recent years. The potential of AI tools to improve teaching and learning is being investigated more and more by educational institutions. Since they are the main facilitators in charge of incorporating technology into the classroom, teachers are essential to this change. Teachers are progressively implementing AI-based teaching aids to enhance their instruction. However, comprehensive research is

needed to determine the degree of adoption, awareness, and difficulties related to the integration of AI tools. This study looks at how Kollam teachers use AI tools in the classroom and what influences their uptake.

Need of the Study

The rapid advancement of Artificial Intelligence technologies has created new opportunities for improving the effectiveness of teaching and learning processes. Despite the growing availability of AI-powered educational tools, many teachers are still in the early stages of integrating these technologies into their instructional practices. Understanding the level of awareness and usage of AI tools among teachers is essential for designing appropriate training programs and educational policies. The need of the present study arises from the increasing importance of digital competence among teachers and the necessity to prepare educators for technology-driven classrooms. In the context of Kollam district, limited empirical studies have been conducted to examine the integration of AI tools in education. Therefore, it becomes important to explore how teachers perceive AI technologies, how frequently they use them, and what barriers they face during implementation. The findings of this study can help policymakers, educational administrators, and teacher training institutions to develop strategies for promoting effective AI integration in educational settings.

Research Methodology

The present study adopted a descriptive survey method to investigate the integration of AI tools for educational purposes by teachers in Kollam district. The survey method was considered appropriate as it enables the collection of data from a large number of respondents regarding their perceptions, practices, and experiences. The sample consisted of teachers working in various schools and colleges in Kollam district. A random sampling technique was used to select participants. A structured questionnaire was developed to collect data from teachers. The questionnaire included items related to awareness, usage frequency, perceived benefits, and challenges of AI tools. The questionnaire was distributed to teachers and responses were collected for analysis. Percentage analysis, mean scores, and basic statistical comparisons were used to analyze the collected data.

Theoretical Framework

The integration of Artificial Intelligence (AI) tools in education is supported by several educational and technological theories that explain how teachers adopt and utilize digital technologies in the teaching–learning process. The present study on Integration of Artificial Intelligence Tools for Educational Purposes by Teachers in Kollam is grounded in the Technology Acceptance Model, Diffusion of Innovation Theory, Constructivist Learning Theory, TPACK Framework and Artificial Intelligence in Education (AIED) Framework theoretical perspectives.

1. Technology Acceptance Model (TAM): Fred Davis created the TAM in 1989 to explain how people adopt and utilize new technology. This model states that adoption of technology is influenced by two main factors: The degree to which educators think AI tools will enhance their ability to teach is known as perceived usefulness, and the degree to which they think AI tools are simple and need little effort is known as perceived ease of use. When it comes to AI integration, teachers are more likely to use tools like intelligent tutoring platforms, automated assessment systems, and AI-assisted

lesson planners if they believe these technologies are useful and simple to use. The relationship between teachers' perceptions of AI tools and their actual use in the classroom is explained by TAM.

2. **Diffusion of Innovation Theory:** Everett Rogers (2003) developed the Diffusion of Innovations Theory, which describes how novel concepts and innovations proliferate within a social structure. Innovators, early adopters, early majority, late majority, and laggards are the stages at which people accept innovations, according to this hypothesis. Some teachers at educational institutions experiment with digital tools and adopt AI technology fast, while others take longer because of uncertainty, inadequate training, or a lack of technological infrastructure. This theory helps understand how AI-based educational tools gradually spread among teachers in educational institutions in Kollam.
3. **Constructivist Learning Theory:** This theory, which is primarily linked to the writings of Jean Piaget and Lev Vygotsky, also lends support to the study. Constructivism places a strong emphasis on how students actively create knowledge via communication, investigation, and teamwork. By offering individualized learning routes, interactive simulations, and adaptive learning systems, as well as by supporting student-centered learning settings, AI tools can enhance constructivist education. Teachers using AI tools can design learning experiences where students engage actively with content rather than passively receiving information.
4. **TPACK Framework:** The Technological Pedagogical Content Knowledge introduced by Punya Mishra and Matthew J. Koehler's, describes how educators successfully use technology into their lessons. Three primary knowledge domains are highlighted by the framework: Technological Knowledge (TK) is knowledge of digital tools and technology, Pedagogical understanding (PK) is understanding of teaching methods, and Content Knowledge (CK) is the teacher's subject-matter expertise. When educators properly integrate these three elements, AI tools are successfully integrated. For example, teachers using AI-based learning platforms must understand the subject content, choose appropriate teaching strategies, and effectively utilize AI technologies to enhance learning outcomes.
5. **Artificial Intelligence in Education (AIED) Framework:** The focus of the Artificial Intelligence in Education (AIED) framework is on the ways in which AI technologies might enhance educational administration, teaching, and learning. AI solutions can help teachers with content creation and class preparation, learning analytics and performance tracking, automated assessment and feedback, and adaptive learning systems. These resources promote students' individualized learning experiences and assist teachers in making data-driven instructional decisions.

Teachers' opinions, institutional support, and pedagogical expertise all have an impact on how AI tools are incorporated into the classroom. While the Diffusion of Innovation Theory explains how these technologies spread among schools, the Technology Acceptance Model analyzes instructors' desire to adopt AI technologies. The TPACK framework emphasizes the significance of integrating technology, pedagogy, and subject knowledge for successful integration, whereas constructivist learning theory supports AI's role in fostering active learning. When taken as a whole, these theoretical stances offer a solid conceptual basis for comprehending how Kollam educators use and use AI tools for teaching.

Results and Discussion

The results of the study indicate that most teachers are aware of the existence of AI-based educational tools, but the frequency of usage varies significantly. A majority of teachers reported using AI tools for

lesson planning, content generation, and assessment preparation. Teachers identified several benefits of AI integration, including improved teaching efficiency, time-saving in administrative tasks, and personalized learning support for students, and enhanced classroom engagement. However, the study also revealed certain challenges faced by teachers. These include limited training opportunities, lack of technical support, inadequate digital infrastructure in schools, and concerns regarding ethical use of AI technologies. Despite these challenges, teachers expressed positive attitudes toward the adoption of AI tools and recognized their potential to improve teaching and learning outcomes. The findings highlight the need for systematic training programs and institutional support to promote effective integration of AI technologies in education. The findings of the study have several important implications for educational practice. Teacher training programs should include modules on AI literacy and digital pedagogy. Educational institutions should provide access to AI-enabled learning platforms and technological infrastructure. Policymakers should develop clear guidelines for the ethical and responsible use of AI in education. By addressing these aspects, the integration of AI tools can be effectively enhanced in classrooms.

Conclusion

Artificial Intelligence has the potential to revolutionize educational practices by enabling innovative teaching strategies and personalized learning experiences. The present study explored the integration of AI tools for educational purposes by teachers in Kollam district. The findings reveal that teachers possess a reasonable level of awareness regarding AI technologies, but the actual level of classroom integration is still developing. The study emphasizes the importance of professional development programs, institutional support, and improved digital infrastructure to facilitate effective AI integration. When teachers receive adequate training and support, AI tools can significantly enhance the quality of teaching and learning. Therefore, promoting AI literacy among teachers and encouraging the responsible use of AI technologies will play a crucial role in shaping the future of education.

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