

Chapter 11

Science Mapping of “Artificial Intelligence in Education” Literature Landscape: A Bibliometric and Content Analysis Discourse

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ABSTRACT

Educational methods are being transformed by AI-powered systems that enable independent study, tailored instruction, and the gaining of varied disciplines. On the other hand, AI's use in education has also sparked a global debate on areas related to ethics in classroom education. The objective of this work is to present a thorough examination of academic literature about the application and challenges of artificial intelligence (AI) in educational settings. Through the use of sophisticated bibliometric methods such as co-citation analysis, bibliographic coupling, and keyword co-occurrence analysis, the objective of this work is to map out the ongoing debate on use of artificial intelligence in education and identify the underlying patterns, connections, and new developments in this area. The chapter proposes future routes for research and innovation in this quickly developing field in addition to providing insights on the historical evolution and current status of AI in education.

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INTRODUCTION

The goal of artificial intelligence (AI) is to program technology to mimic human intellect in areas like learning, pattern recognition, and decision-making. Machine learning, computer vision, NLP, and robotics are all part of artificial intelligence (AI) (Wardat et al., 2024). The primary goal of artificial intelligence is to make machines act more intelligently than humans in areas such as data analysis, problem-solving, and situational adaptation. Artificial intelligence (AI) can revolutionize education by streamlining administrative processes, enhancing data-driven decision-making, and creating more tailored learning experiences for students (Xie et al., 2019). Teachers can improve their methods of instruction, cater lessons to the requirements of individual students, and create classrooms that are more welcoming and interesting for all students by utilizing AI.

In this age of Industry 4.0, it is critical to equip the future generation to face unknown challenges by incorporating Artificial Intelligence (AI) into education. More and more schools are embracing Industry 4.0 (Zhang et al., 2024) approaches to education, which use artificial intelligence to improve classroom instruction and student performance. Educational methods are being transformed by AI-powered systems that enable independent study, tailored instruction, and the gaining of varied disciplines. A further example of AI's revolutionary potential in the decision-making processes of higher education is the creation of chatbot platforms for educational advice. Educational institutions can gain significant insights from these platforms, which show excellent efficiency and customer satisfaction (Zhang et al., 2024).

Studies on the use of chatbots powered by artificial intelligence in the classroom have shown promising results, particularly in the area of social studies, where they have the ability to improve both student performance and the quality of instruction. In addition, according to Yi (2024), personalized education models that incorporate recommendation algorithms and semantic similarity analysis highlight the importance of AI in enhancing learning experiences and managing resources optimally. Yi (2024) argues that educational institutions may create a more flexible and personalized learning environment by using AI technology to detect user demands, improve teaching effectiveness, and adjust learning paths.

There are a lot of ways in which artificial intelligence (AI) can improve classroom instruction and student achievement. Chatbots and speech recognition platforms are examples of AI-powered solutions that can provide students with individualized learning experiences (Wang, 2023). Adaptive learning routes are made possible by these technologies, which let students go at their own speed while receiving specific help when they need it. Artificial intelligence also makes it easier to create dynamic classrooms where students actively participate, which in turn boosts their motivation. One example is how the use of AI chatbots in language classes has led to considerable gains in students' fluency and confidence when speaking the target language. Better learning outcomes and higher student satisfaction are the results of AI-driven educational platforms that maximize the use of resources and the efficiency of instruction (Huang, 2023). With the help of AI, teachers may improve classroom instruction, create more conducive settings for student collaboration, and meet the needs of students with a wide range of learning styles.

Nevertheless, there are other important factors to think about and obstacles to overcome before AI is widely used in classrooms. To make good use of AI tools in the classroom, there has to be extensive professional development and training for educators (Wang, 2023). The significance of continuous assistance and training programs should be underscored because many teacher educators have expressed uncertainty and incompetence when it comes to dealing with the consequences of AI in ILTE (Wang, 2023). Additionally, it is crucial to thoroughly handle ethical concerns related to AI use, including data protection, algorithmic prejudice, and the depersonalization of educational experiences. The necessity

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