LITERATURE REVIEW: THE IMPLEMENTATION OF ARTIFICIAL INTELLIGENCE IN EDUCATION

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Abstract
The development of Artificial Intelligence (AI) plays an important role in human life, one particular is in education. The potential for using artificial intelligence (AI) in education to help teachers enhance learning, and triggering more exciting and effective individual learning. This literature review explores the current state of research on the implementation of artificial intelligence (AI) in education. The aim is to understand the potential benefits, challenges, and concerns associated with integrating Artificial Intelligence into educational settings. A qualitative research approach, leveraging the use of literature review as a research design and approach was used and effectively facilitated the realization of the study purpose. This study showed that AI has been widely embraced and applied in education, notably by educational institutions, in a variety of ways. In the beginning, AI was represented by computer and computer-related technologies, which later evolved into web-based and online intelligent education systems. With the help of embedded computer systems and other technologies, and web-based chatbots were used to carry out tasks and collaborate with instructors. These platforms have helped instructors improve the quality of their instructional activities and carry out various administrative tasks, such as evaluating and grading student assignments, more quickly and effectively.
Keywords: Artificial Intelligence (AI), Education, Instructors

Introduction (Times New Rowman 12, bold)

Education is a critical aspect of human development, and advancements in technology have paved the way for new opportunities and challenges in the field. One such advancement is the implementation of artificial intelligence (AI) in education. In recent years, the rapid advancement of artificial intelligence (AI) has brought forth exciting opportunities and immense potential in various domains, including education. The integration of AI technology in educational settings has sparked a growing interest among researchers, educators, and policymakers. The implementation of AI in education facilitates the creation of personalized learning experiences, enhances teaching methodologies, and opens up new avenues for educational innovation (Tapalova & Zhiyenbayeva, 2022). AI has the potential to revolutionize how the educational system operates, boost institutional competitiveness, and empower educators and learners at all levels (Viktorivna et al., 2022)

Indonesia is currently experiencing a new paradigm in education, Artificial Intelligence (AI) can be employed to provide new insights into how students learn, how to tailor students' educational experiences, obtain additional information to assist decision making in designing learning activities (Ahmad et al., 2020). As Artificial intelligence, which is available to both teachers and students, assists educators in creating learning activity that are tailored to their specific needs. It raises awareness of new technological solutions that provide students alternatives and promote new teaching and learning approaches. Artificial intelligence advancements have resulted in the creation of personalized educational routes (Tapalova & Zhiyenbayeva, 2022). Artificial intelligence (AI) is already giving creative techniques for teachers and schools to understand how their students are performing, as well as allowing for a rapid, personalized, and focused length of content (Neha, 2020). The implementation of AI in education is the ability to personalize learning experiences. Traditional classrooms often struggle to cater to the diverse learning needs and preferences of students, resulting in a one-size-fits-all approach to education. By leveraging AI, educational systems can adapt and tailor instruction to meet individual students' needs, whether through personalized content, adaptive assessments, or intelligent feedback mechanisms. This personalized learning approach has the potential to improve student engagement, motivation, and academic performance. However, it

is essential to acknowledge the challenges and considerations that surround the implementation of AI in education. This literature review aims to provide a comprehensive analysis of the current landscape of AI implementation in education. By reviewing a wide range of studies, research papers, and expert opinions, this article seeks to uncover the opportunities, challenges, and implications of incorporating AI into educational practices. It will examine exemplify successful applications of AI in various educational contexts, shedding light on the transformative potential of AI in improving teaching and learning outcomes.

Method

The research design of this study is Literature Review. Literature review is a description of theories, findings and other research materials obtained from reference materials to be used as the basis for research activities. Literature Review contains reviews, summaries, and the author's thoughts on several library sources, it can be from articles, books, slides, information from the internet, etc. about topic discussed. A good literature review must be relevant, up-to-date, and sufficient. This research has several stages. The stages of this library research are: 1. Researcher seek and collect reference sources related to the subject matter, 2. Researcher read and examine the sources that have been collected before and recorded the appropriate focus or core, 3. Researcher make conclusions.

From the previous description. This data will be processed into descriptive data. This goes hand in hand with writing (Rasimin, 2018). The researcher uses Google Scholar in searching the article with the keyword Artificial Intelligence in Education. From the results search there are lots of articles that appear so researchers try to limit the year article was published, namely in the year 2019-2022. After that the researcher read and filter the articles that appear in order to get articles that are relevant to research purposes. After the process of searching and collecting reference sources or materials research, finally the researcher determines five journal articles that are relevant to the theme and the purpose of this study. The following are articles that are the object of this research:

Table 1. Research Object

No	Research Object
1	Ahmet Göçen (2020)
2	G.-J. Hwang et al. (2020)
3	Kumar (2019)
4	Pisica et al., (2023)
5	Tapalova & Zhiyenbayeva (2022)

Findings and Discussions

Table 2. Hasil Penelitian

No	Artikel	Findings
1	Ahmet Göçen (2020)	Benefits - Artificial intelligence can be used in many areas from individual learning, examination opportunities, face recognition system to taking attendance at the entrance to the class. - Artificial intelligence systems can help in reviewing exam results, student movements, and student communication. The risk - Negative consequences for social ties. - Artificial intelligence will take over all educational tasks; even a teacher may not be needed

2	G.-J. Hwang et al. (2020)	-	Artificial Intelligence that aids in assessment, data collection, boosting learning progress, and creating new strategies might be useful to teachers.
3	Kumar (2019)	-	Artificial Intelligence provides a complete smart learning environment that guides the learner through course selection, evaluation, and even certification.
		-	AI assists instructors with material preparation and course content management in a cloud database, as well as tracking student progress as all data is created and updated online.
4	Pisica et al., (2023)	Challenge	
		-	The integration of AI into education is a challenging endeavor that calls for a solid infrastructure, supporting infrastructure changes, and a sizable number of digital equipment. To make the system operational, it also requires training for everyone involved in the teaching-learning process, and institutions must build a strategic strategy for implementing AI.
		-	AI adaptation requires both financial and human resources. Teachers must adjust to the new teaching techniques, but many of them lack the training required to do so successfully because there aren't enough resources available and it hasn't been funded for. Independent of their instructional schedule, mastering technology requires hours of training and practice, causing challenges with time management, availability, and multitasking. As a result of the ongoing software upgrades, many teachers may find it difficult and expensive to keep up with the changes, which could result in educational equity issues.
		Benefits	
		-	Using different tools in the teaching process making the learning process more accessible, more attractive teaching methods and more meaningful for the students' assessment and evaluation.
5	Tapalova & Zhiyenbayeva (2022)	-	The development of artificial intelligence technology allows for greater efficiency and quality in education that is centered on the requirements and desires of students.
		-	Teachers can use social networking sites and chatbots in education to make instruction more effective, accessible 24 hours a day, enhance student involvement, and save time.
		-	AI enable teachers to analyze vast volumes of student data, build prediction models, track educational progress, and tailor learning to students' requirements in order to assure high-quality learning. Personalised educational pathways improve e-learning quality and give students with personalised learning materials and tools. Furthermore, they promote contact between students and educators.

According to Gocen (2020) integrating Artificial intelligence in education can be used in many areas from individual learning, examination opportunities, face recognition system to taking attendance at the entrance to the class and it can help in reviewing exam results, student movements, and student communication. Based on the result of his research, AI can offer personalized learning experiences, adapting to the unique needs and pace of each learner. It can

provide tailored content, recommendations, and adaptive assessments, it is in line with the result of G.-J. Hwang et al. (2020), Artificial Intelligence that aids in assessment, data collection, boosting learning progress, and creating new strategies might be useful to teachers. AI can assist in creating online examination platforms, automated grading systems, and adaptive testing approaches. These advancements can enhance the efficiency and fairness of the examination process. AI chatbots or virtual assistants can assist students in answering questions, providing guidance, or directing them to appropriate resources. Such systems can enhance student communication channels, especially in scenarios where immediate human assistance may not be available.

Gocen (2020) also stated that implementing AI in Education also have any challenges, AI might give negative consequences for social ties. The concern here is that the use of AI in education could potentially lead to a decrease in interpersonal interactions between students and teachers or among students themselves. Face-to-face interactions and personal connections are often seen as important elements of the learning process. It is possible that increased reliance on AI systems could reduce the level of social engagement and interpersonal skills development. However, it is crucial to note that the impact on social ties may vary depending on the specific implementation and design of AI technology in educational settings. Another challenge is

Artificial intelligence will take over all educational tasks; even a teacher may not be needed. AI could replace the need for human teachers altogether. While advancements in AI have led to improvements in education, such as personalized learning experiences and intelligent tutoring systems, it is important to recognize that teachers play vital roles beyond delivering content. Teachers often provide mentorship, guidance, emotional support, critical thinking development, and facilitate social skills that cannot be easily replicated by AI. It is more likely that AI will augment teachers' roles rather than completely replacing them.

According to Kumar (2019), Artificial Intelligence provides a complete smart learning environment that guides the learner through course selection, evaluation, and even certification. The system is designed to help learners choose suitable courses based on their interests, goals, and abilities. It might consider factors such as previous academic performance, career aspirations, or personal preferences. By leveraging artificial intelligence, the system can provide personalized recommendations tailored to each learner's needs. The system goes beyond just providing educational content or assessments; it also assists learners in obtaining certifications or qualifications. It can guide learners through the process of completing necessary requirements and assessments for certification in a particular field or course. With the help of artificial intelligence, the system can ensure that learners meet the necessary criteria and provide them with the necessary documentation. AI assists instructors with material preparation and course content management in a cloud database, as well as tracking student progress as all data is created and updated online (Kumar, 2019). Artificial intelligence employs to assess the learner's progress and performance. It can analyze data gathered from various sources, such as quizzes, assignments, or participation, to provide continuous feedback and track the learner's development. This feedback can inform the learner about areas of improvement and help them stay on track towards their learning goals.

Pisica et al., (2023), Using different tools in the teaching process making the learning process more accessible, more attractive teaching methods and more meaningful for the students' assessment and evaluation. However, implementing AI in education will face several challenges. It needs a solid infrastructure, supporting infrastructure changes, and a sizable number of digital equipment. To make the system operational, it also requires training for everyone involved in the teaching-learning process, and institutions must build a strategic strategy for implementing AI. AI adaptation requires both financial and human resources. Teachers must adjust to the new teaching techniques, but many of them lack the training required to do so successfully because there aren't enough resources available and it hasn't been

funded for. Independent of their instructional schedule, mastering technology requires hours of training and practice, causing challenges with time management, availability, and multitasking. As a result of the ongoing software upgrades, many teachers may find it difficult and expensive to keep up with the changes, which could result in educational equity issues.

According to Tapalova & Zhiyenbayeva (2022), the development of artificial intelligence technology allows for greater efficiency and quality in education that is centered on the requirements and desires of students. Teachers can use social networking sites and chatbots in education to make instruction more effective, accessible 24 hours a day, enhance student involvement, and save time. AI enable teachers to analyze vast volumes of student data, build prediction models, track educational progress, and tailor learning to students' requirements in order to assure high-quality learning. Personalised educational pathways improve e-learning quality and give students with personalised learning materials and tools. Furthermore, they promote contact between students and educators.

Conclusion

AI integration in education can be applied in various areas, such as individual learning, examination opportunities, face recognition systems, and student communication. AI can offer personalized learning experiences, tailored content, recommendations, and adaptive assessments. However, it may also lead to a decrease in interpersonal interactions between students and teachers or among students themselves. AI chatbots or virtual assistants can assist students in answering questions, providing guidance, and directing them to appropriate resources. AI can augment teachers' roles, but it is essential to recognize that teachers play vital roles beyond delivering content.

AI provides a smart learning environment that guides learners through course selection, evaluation, and certification. It can provide personalized recommendations tailored to each learner's needs and assists in obtaining certifications or qualifications. AI also assists instructors with material preparation, course content management, and tracking student progress.

However, implementing AI in education faces several challenges, including a solid infrastructure, supporting infrastructure changes, and a large number of digital equipment. Training for all involved in the teaching-learning process is also required, and institutions must build a strategic strategy for implementing AI. AI adaptation requires both financial and human resources, and teachers may struggle with time management, availability, and multitasking due to ongoing software upgrades.

In conclusion, AI technology can improve education by making it more effective, accessible, and accessible. Teachers can use social networking sites and chatbots to enhance student involvement, analyse vast amounts of student data, track progress, and tailor learning to students' needs.

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