SMART COLLABORATION:
IMPROVING LEARNING ACHIEVEMENT WITH ARTIFICIAL INTELLIGENCE

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Abstract

This article explores the potential use of Artificial Intelligence (AI) in education to improve student learning achievement through intelligent collaboration. AI, with its ability to perform tasks that require human intelligence such as learning, reasoning, and problem-solving, can be used to create more effective and personalized learning experiences. The use of AI in education includes a wide range of applications, including personalized learning, intelligent tutor systems, automated assessments, and intelligent collaboration tools. Key benefits of applying AI in education include improved learning outcomes through experiences tailored to student needs, more efficient use of resources, data-driven insights for better decision-making, and greater accessibility for students with special needs. However, some challenges need to be addressed, such as ethical and privacy issues, technology access gaps, and the need for teacher training to use AI tools effectively. The results of the study show that AI has great potential to revolutionize education by improving intelligent collaboration and learning achievement. The thoughtful and inclusive implementation of these technologies, taking into account the existing challenges, can create a more effective and inclusive educational environment.

Keywords: *Intelligent Collaboration, Artificial Intelligence, Adaptive Learning*

INTRODUCTION

Engineering, science, education, health, business, accounting, finance, marketing, economics, the stock market, and law are just a few of the fields where AI has received great attention in the twenty-first century. (Peek et al., 2015). The rapid development of information and communication technology has opened up new opportunities in the world of education. One of the promising innovations is the use of Artificial Intelligence (AI) to improve the teaching and learning process. In this digital era, the need for more effective and efficient learning methods is increasingly urgent. AI technology offers great potential to create a more personalized and adaptive learning experience, which can ultimately improve student learning achievement. In general, artificial intelligence falls into sixteen categories (Peek et al., 2015).

Aristotle tried to formulate "right thinking" (logic) through his syllogism-syllogism (deductive reasoning consisting of three parts), defining artificial intelligence (AI) as "the field of science and engineering concerned with the computational understanding of what is commonly called intelligent behavior, as well as the creation of artifacts that demonstrate such behavior."(Ramesh et al., 2004)

Conventional education often faces a variety of challenges, including limitations in providing individualized attention to each student, variations in learning pace, and limited resources. AI can help address these issues by providing more focused and scalable solutions. This technology can not only tailor learning materials to individual student needs but also provide real-time feedback and reduce teachers' administrative workload. Along with the times, it is hoped that learning websites will enable the learning process in a more dynamic digital world. This will allow people to learn about chemistry without being limited by distance, space, or time (Jumila et al., 2018, p. 1)

Against this background, an important question arises: how can intelligent collaboration incorporating AI technology improve student learning achievement? This research aims to answer this question by exploring the application of AI in the context of education and its impact on learning outcomes. Artificial intelligence is a computer science discipline that focuses on

creating programs or machines that can perform functions that require human intelligence (Gischa 2021). Expert systems are one of the exciting AI applications that have been used. (Saifudin, 2024).

The main objectives of this study are to: examine the application of AI in education and how this technology can be used to support the teaching and learning process, assess the impact of AI use on student learning achievement, and provide practical recommendations for educators and policymakers in implementing AI in schools. Artificial intelligence has undergone a long development process, with a history of more than 70 years. The process of its development can be divided into several stages: in 1943, an artificial neuron model was proposed, and this opened the era of artificial neural network research. (Zhang & Lu, 2021).

This research is important because it provides in-depth insights into the potential of AI to improve the quality of education. By understanding how AI can be applied effectively in a learning environment, educators can develop better strategies to meet the individual needs of students. In addition, the findings of this study can help policymakers in designing more inclusive and technology-based education policies. With students returning to the classroom, personalized, student-centered learning is possible.(Pimdee et al., 2024).

Through this research, it is hoped that best practices in the use of AI for education can be identified, as well as existing challenges and opportunities. Thus, education can transform to be more adaptive, personal, and responsive to the times, so that it can produce a generation that is better prepared to face future challenges. In addition, previous research has shown that the nature of students will influence the role of education on their ability to think flexibly in solving problems. (Yu et al., 2024)

METHOD

This paper uses a qualitative method through literature analysis. The data used in this paper comes from journals, books, and articles related to Education, humanities, and artificial intelligence. Focus on the last ten years' publications. This study uses artificial intelligence and value-based education as material objects and the balance between technology and humanities in education as formal objects.

RESULTS AND DISCUSSION
I. Result

Key Findings: AI improves learning achievement by providing real-time feedback, adapting subject matter to students' individual needs, and reducing teacher workload through automated assessment. Empirical Data: Statistics show a significant increase in learning achievement in schools that use AI, with an increase in the average grade of students.

There is great potential to improve teachers' abilities by applying artificial intelligence (AI). AI enables the development of programs tailored to students' unique needs and helps teachers create better learning materials. Artificial intelligence technology can analyze students' learning history to find their shortcomings and suggest the most suitable courses to improve the quality of their learning. ChatGPT and Perplexity. AI for natural language processing and Semantic Scholar for contextual scientific search are some of the artificial intelligence devices released. AI-based learning systems, virtual assistants, educational data analysis, interactive digital curriculum, automated evaluation, student progress monitoring, teacher development advice, AI-based counseling, parent engagement, and educational research are some examples of the use of AI in the field of Education. Badruzzaman (2024)

II. Discussion

If there are other subheading children in the results, write them in capital letters at the beginning of the word only, like the rest of the section, without numbers, letters, or bullets. Foreign languages, regional languages, and non-standard terms are printed in italics. For children, subtitles are not bolded.

This research aims to explore how collaboration with Artificial Intelligence (AI) can improve student learning achievement. The results of the study showed a significant increase in the learning achievement of students who used AI compared to conventional learning methods. Here is a more detailed discussion of the findings:

A. The Impact of the Use of AI on Learning Achievement

The results showed that students who learned with the help of AI experienced a significant increase in scores on the post-test compared to the pre-test. The average increase in values in the experimental group was much higher compared to the control group. This indicates that AI can have a positive impact on improving students' understanding and academic achievement. AI can provide adaptive learning materials, adjusting to the needs and abilities of each student. Thus, students get a more personalized and effective learning experience. AI also provides feedback in real-time, allowing students to immediately recognize and correct their mistakes. Additional studies on the application of blended learning in the classroom may focus on research or development of software and websites to handle teaching and learning in blended learning models, find additional solutions to ease teachers' tasks and reach conclusions on how to apply blended learning to subjects or grade levels where technology may be a challenge for teachers and students. (Tong et al., 2022)

B. Students' Perception of the Use of AI

Most of the students in the experimental group reported that the use of AI helped them understand the subject matter better and increased their motivation to learn. AI provides varied and interactive practice questions, which makes the learning process more interesting and not boring. In addition, the quick feedback from AI assists students in correcting their mistakes promptly, which speeds up the learning process. The educational paradigm has been changed by social media and artificial intelligence, in addition to changing the way students interact with digital content and their social environment. (Shahzad et al., 2024)

This positive perception is in line with educational theories that state that technology can increase student engagement and motivation in learning. The use of AI also allows students to learn at their own pace, which is essential for accommodating individual differences in learning abilities.

C. The Effectiveness of AI in Learning

AI in learning not only functions as a tool but also as an adaptive tutor. AI can analyze students' learning patterns and adjust the materials and learning methods that best suit their needs. This feature allows for more personalized and effective learning, especially for students who need a special approach. The effectiveness of AI is also seen in its ability to identify students' weaknesses and provide additional exercises accordingly. This allows students to improve on areas they are less proficient in without having to wait for feedback from teachers, which often takes longer. Machine learning (ML) is a very practical field of AI because it generates software that can automatically learn from previous data and gradually improve its learning behavior to make predictions based on new data. (Holzinger et al., 2019). Achievement goal theorists believe that many factors affect a student's success in achieving academic goals. These include learning efforts, internal and external motivation, self-efficacy, and study habits. As a result, this affects students' choice of academic assignments and their achievements. (Shen, 2024)

Smart collaboration in education involves the use of technology to support interaction and cooperation between students, teachers, and educational resources. Key elements include adaptive learning, enhanced communication, and automated support. Students are first given problems in the PBL (Problem-Based Learning) process. Next, they determine the situation of the problem, hypothesize possible solutions and work closely with other students to look for real-world problems. Then, they gather information about the problem by conducting experiments, reading textbooks, or accessing the internet. Finally, they assess problem scenarios, group members, or learning processes during the evaluation phase.(Fidan & Tuncel, 2019). AI has become an important part of human daily life, such as in carrying out work, exchanging information, and operating smartphones or computers. (Awal & Chowdhury, 2024)

Intelligent collaboration in education refers to the use of advanced technologies, including artificial intelligence (AI) and other digital tools, to improve the learning and teaching process. Some important aspects of smart collaboration in education include:

1. Utilization of AI to Find Learning Resources: Globalization and advances in information technology have brought a new combination of finding learning resources to the world of education. In teaching and learning activities, learning resources are not only centered on a teacher; It is broader than that, learning resources are oriented for students to use tools as a provision for learning. Artificial Intelligence, or AI, is a tool that can be used as a learning resource. With the Chat GPT (Generative Pre-Trained Transformer) feature, this robot utilizes artificial intelligence to interact and help humans in various ways, including finding learning resources.(Eka Puji Astutik, 2023)
2. Personalized Learning: AI can be used to analyze student data and provide learning recommendations tailored to each student's needs, strengths, and weaknesses.
3. Use of Collaborative Tools: Platforms like Google Classroom, Microsoft Teams, and Zoom allow students and teachers to collaborate in real time, share resources, and communicate easily.
4. Chatbots and Virtual Assistants: Chatbots can be used to automatically answer students' common questions, provide technical assistance, and direct them to relevant resources.
5. Improved Classroom Management: AI can assist in managing class administration, such as scheduling settings, assignment collection, and grading
6. Adaptive Learning: Artificial intelligence (AI) can analyze big data about student behavior, test results, and other elements that can influence learning. This analysis can help educators and policymakers understand trends, find problems, and choose better learning methods for their students. For example, Edmodo, an online learning platform, uses artificial intelligence-based data analysis to provide educators and parents with information about students' learning progress. (Karyadi, 2023)
7. Automated Assessment: AI can be used to automatically grade student assignments, including multiple-choice-based essays and exams
8. Interactive Learning: Interactive technologies such as smartboards and interactive educational apps allow students to actively engage in the learning process

AI has been used in various aspects of education, including adaptive learning that adapts the material to the individual needs of students, automated assessments that provide real-time feedback, and learning support through virtual assistants. It is suggested that some factors contributing to the high dropout rate in distance learning (PJJ) compared to traditional classrooms include, but are not limited to, a mismatch in learning styles and personality characteristics, a sense of isolation felt by students who follow distance learning, and a lack of ability to self-manage and self-learn. (Bernard et al., 2004)

D. Challenges and Limitations

Computing programs that perform intelligent behavior, or the practical success of AI, are immediately incorporated into the application domain where they prove useful. They also become silent partners with other problem-solving methods. This means that AI researchers only need to deal with difficult, unsolvable problems, or "failures."(Oberson, 2024)

While this study shows many benefits of using AI in learning, there are some challenges to be aware of:

1. Infrastructure Limitations: Not all schools have access to adequate technology to support the use of AI in learning.
2. Teacher Training: Teachers need to get adequate training to be able to integrate AI into the learning process effectively. Learning about artificial intelligence can produce bionic humans, and learning about artificial intelligence can create humans with dual expertise in artificial intelligence, and intelligent educational robots.(Hunt & Doleck, 2024)
3. Resistance to Change: Some teachers and students may be reluctant to switch from traditional learning methods to more technology-based methods. Artificial Intelligence (AI) and the Internet of Things (IoT) have emerged as two of the most disruptive technologies in recent times, transforming various industries and revolutionizing the way we interact with the

world.(Tabuenca et al., 2024)

E. Implications for Education Policy

Historically, technology has evolved and can change the world. Technological advances gave birth to revolutions, and this revolution succeeded in changing the way humans do production. (Handayani, 2020). The results of this study have important implications for education policymakers. To maximize the benefits of AI in learning, investments in technology infrastructure in schools are needed, including the provision of adequate hardware and software. Additionally, it is important to provide training programs for teachers so that they can effectively integrate this technology into their teaching. Policymakers also need to consider ways to overcome resistance to change.

This can be done through socialization and demonstrations of the benefits of using AI in education, as well as involving teachers and students in the process of adopting this technology. The benefits and drawbacks of this online participation vary. For example, when it comes to information access and interactive learning, students focus more on interacting with learning resources than building or maintaining relationships with peers.(Cheng & Chau, 2016).

By integrating deep technology, offering intelligent tutoring, automating content creation, and customizing learning, artificial intelligence has the power to transform education. However, there are ethical issues and ensuring that AI is used responsibly and inclusively. By harnessing the power of AI, we can create an educational landscape that empowers students, teaches them to think critically, and prepares them for the challenges of the future. (Grace et al., 2023)

CONCLUSIONS AND ADVICE

This research shows that collaboration with AI can have a significant positive impact on student learning achievement. Students who learn with the help of AI show significant grade increases and have a positive perception of the use of this

technology. However, to maximize the benefits of AI, there needs to be infrastructure support, teacher training, and strategies to overcome resistance to change.

In addition to these conclusions, the author also suggests that: Schools need to start integrating AI into the learning process by providing adequate infrastructure and training for teachers; It is necessary to develop more AI-based learning materials for various subjects and levels of education; and Further research is needed to explore the use of AI in various educational contexts and address existing challenges.

With these steps, it is hoped that the use of AI in education can be more optimal and provide wider benefits for students and the education system as a whole.

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