

Artificial Intelligence: Building Quality in Developing Creativity, Innovation, and Motivation in the Learning and Teaching Process

Junaidi*

Faculty of Law, Sjakhyakirti University, Palembang, Indonesia

*Correspondence to: Junaidi, Faculty of Law, Sjakhyakirti University, Palembang, Indonesia;

Email: junaidi@unisti.ac.id

Abstract: Artificial intelligence technology is expected to enhance educational quality and help students maximise their potential. Artificial intelligence technology can assist teachers in various ways, particularly in administrative tasks such as creating more interactive learning processes, setting final grades based on standards and assessments, and simplifying administrative processes. Artificial intelligence's advantages lie in its ability to automate tasks performed by educational institutions and to quickly generate and evaluate content. However, artificial intelligence also has disadvantages, such as uncertainty about control and privacy risks. As artificial intelligence cannot replace teachers, it is preferable for artificial intelligence to assist teachers in the learning process and in their emotional approach, helping to shape students' characters in the Society 5.0 era.

Keywords: Artificial Intelligence; Developing creativity; Learning and teaching processes

1. Introduction

Artificial intelligence (AI) refers to the intelligence exhibited by machines or software designed to create intelligent systems. Research into AI began in the 1950s with the aim of creating 'thinking machines' capable of solving complex mathematical problems. Interest in this field increased in 1950 with the introduction of Alan Turing's 'Turing Test', which involved conducting a series of tests to determine a machine's ability to think. Subsequently, John McCarthy coined the term 'artificial intelligence' in 1955 (Yadav et al., 2024; Netragaonkar, 2024).

Artificial intelligence (AI) has a significant impact

on many areas, including education and research. Education has the power to nurture talented individuals and equip them to tackle global challenges, making it a vital component of a country's development. Education is the key to freeing humans from ignorance. Failure of the education system will affect students' learning experiences (Jailani, 2020). AI has transformed education by enabling personalized learning experiences (Chen et al., 2020). AI has also enhanced the development of skills and education management (Banerjee et al., 2021). ChatGPT is a well-known AI-based chatbot. OpenAI, a California-based company focused on artificial intelligence research and applications, created this tool. This latest artificial



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intelligence model is based on the transformer neural network architecture. Transformer neural networks primarily have the ability to generate text comparable to human writing by understanding contextual cues in dialogue (Zhang et al., 2023).

This collaboration has led to various improvements in education, including more advanced teaching materials, improved management and personalized learning experiences (Ojha et al., 2024). Additionally, the application of AI in education has created new learning opportunities worldwide and offers more flexible and effective teaching methods (Afrita, 2023). Artificial intelligence (AI) is now widely used in education systems around the world, particularly in higher education during the pandemic (Senel & Can, 2021). The latest technological advances present great opportunities to develop and expand student-centered learning approaches, implement the best teaching methods and improve access for various community groups.

It is possible that incorporating artificial intelligence (AI) into teaching and learning activities could enhance the learning experience. However, to avoid negative effects, particularly on the educational process itself, AI must be applied ethically and responsibly (Sharma et al., 2024). AI can encourage collaboration and support continuous conversation in language learning (Vázquez-Cano, 2021). AI has the potential to help students experiencing learning difficulties reach their full potential. It can also increase students' confidence in the learning process in the affective domain (Hsieh, 2020). This is because AI has the potential to foster an engaging and comfortable learning environment (Rooein, 2019), thereby enhancing confidence and mitigating anxiety (Kim, 2021).

The rapid development of artificial intelligence has become a major concern for educational institutions, affecting their curricula and teaching methods. In education, issues often arise regarding learning patterns, including the use of inadequate teaching strategies and methods. The educational process is a subtle interaction between educators and students that demonstrates the human aspect. Researchers are interested in this phenomenon and want to study the potential of applying AI in education and its effects.

However, in order to maximize the potential of AI in education, it is crucial to understand and address

related issues. Current studies show that, although AI offers various opportunities to enhance the learning experience, there are several issues to consider when using it. According to research (Bawamenewi & Waruwu, 2023), for the most part, teachers and educators lack the technological skills necessary to utilize AI effectively. Educational institutions must also pay attention to ethical issues and student data privacy. Further studies are needed to develop policies that enable the ethical use of AI in education and to explore strategies that can be used to address these differences.

2. Research Method

This study employed qualitative methods and library surveys, focusing on memos and descriptive data. The literature review approach involved collecting data and information from various offline and online library materials, such as documents, books, and scientific journals. The literature sources had to be related to the issues to be addressed. Once data collection was complete, the literature was thoroughly analysed.

3. Result and Analysis

3.1 The Concept of AI in Supporting Education

Artificial intelligence (AI) is a computer capability consisting of algorithms that enable machines to process data effectively and generate information to aid decision-making (Junaidi, 2025). AI currently has the ability to think like humans. However, despite being created by humans, there is a possibility that AI could surpass its creators in intelligence (Junaidi et al., 2024). AI is being used more and more in many fields due to its ability to analyse information, recognise patterns and observe the environment (Junaidi & Fadzil, 2024). Examples of AI applications that assist with everyday tasks include ChatGPT, Canva, Slidesgo, CapCut, Grammarly, Google Meet, Zoom Meeting and Google Classroom.

Technology plays an important role in the education sector, both through offline applications such as QR codes and Android, and via the internet. It has the potential to boost students' interest in learning (Aldya et al., 2022). The latest technological advances and the capabilities of intelligent machines will have a significant impact on the future of education. Consequently, AI can present new opportunities and challenges for the management and administration of

educational institutions (Slimi, 2023). Currently, the learning process involves robot teachers and focuses on quickly mastering material. It also covers literacy and the way various systems around the world function (Zahara et al., 2023).

Artificial intelligence (AI) is used in education to personalize learning. These systems can adapt teaching materials to suit each student's learning style, abilities, experience and methods. Materials can be arranged to suit students' preferences, making them more interesting and allowing the learning process to be more student-centered (Xue & Wang, 2022). AI technology, with characteristics similar to humanoid robots, makes education easier. AI can provide instructions, assignments or explanations of material independently and at any time. This allows teachers to work more efficiently and perform administrative tasks such as assessment. Ultimately, this will improve the quality of learning activities (Begum, 2024; Oktavian et al., 2023). Therefore, AI can help to identify shortcomings in education and offer customizable digital learning plans to improve the efficiency and effectiveness of the learning process. Furthermore, AI enables universal access to learning anytime, anywhere, and in various formats (Yousuf & Wahid, 2021).

Compared to the cost of employing licensed teaching staff, implementing artificial intelligence (AI) in education appears to be more expensive. However, in the long term, AI may offer far greater benefits than teacher training costs (Begum, 2024). So, just how significant is the impact of AI on education? AI is a very important phenomenon because it can influence how teachers teach and how students acquire knowledge (Rifky, 2024; Junaidi, 2025). AI is used in education to support student-centered learning approaches, personalize learning experiences and enhance individual skills, with the ultimate goal of improving educational quality. AI also enables individuals to perform complex intellectual tasks via digital interaction (Jain et al., 2025). However, this digital process only provides information in the form of data that is processed according to the user's needs, making searching and problem solving easier. These aspects are important for students to complete the learning process. Nevertheless, students still require components of mental, moral, spiritual and social development that cannot be provided by technology,

such as artificial intelligence (Lasechko & Lasechko, 2024). While AI can provide a useful learning context, it cannot shape students' characters. Rather, it only helps students adapt to their personal needs during the learning process (Kroonivets et al., 2023). Therefore, it can be concluded that AI is more effective as a tool than as a substitute for teachers in the learning process.

The education sector cannot avoid global influences when facing the new era of society, a consequence of the Industrial Revolution. There are many important considerations regarding education policy, including teacher quality, facilities and infrastructure, the curriculum, learning methods and learning outcomes, with the aim of producing graduates who meet the demands of the job market (Aggarwal et al., 2023). Society 5.0 is an era that rapidly fulfils human needs and improves quality of life. In this context, the education sector is striving to improve the quality of education. But will AI take over the role of teachers in meeting the challenges of the Society 5.0 era? Gattupalli and Maloy (2023) argue that AI cannot fully replace teachers because digital machines cannot support students in developing their social and emotional skills. In the context of the Society 5.0 era, collaboration between educators and AI is key to improving the quality of education. Rather than distinguishing between educators and AI technology, educators must adapt and find the most effective methods to maximize value in the teaching and learning process while collaborating with ever-evolving AI technology (Chan & Tsi, 2023).

3.2 The Application of AI to Curriculum Development and Learning Methods in Educational Institutions

Artificial intelligence (AI) is a system designed for research and development, and can be used in machines or computers with intelligence equal to or higher than that of humans (Manongga et al., 2022). In the digital era, the impact of artificial intelligence on curricula and teaching strategies in educational institutions is a topic of increasing discussion. According to Liriwati (2023), a curriculum change involves adjusting and improving an existing curriculum by incorporating new elements or changing teaching methods entirely. In order to adapt the curriculum to advances in artificial intelligence technology in the 5.0 society era, changes are required.

The teaching tools or media used by teachers during the learning process play an important role in determining learning outcomes. In such situations, educators must select appropriate learning media to capture students' attention, boost their motivation and interest in learning, and make lessons more accessible (Rahma et al., 2024). Advances in educational technology have made learning easier. One example of this is the shift from physical books to e-books. This gives students many options for choosing the most convenient and efficient reading material. It is hoped that this change will encourage students to read more and improve their understanding. However, this has not yet been achieved, as many students still experience difficulties (Said & Aguslim, 2020).

Educators have not yet utilised all available media to help students learn. The learning process can fail because teachers do not understand their students' interests and are unsuccessful in using the available resources. Consequently, many students have not yet achieved their learning goals. Educational facilities provide information to make it easier for students to understand (Darmayanti et al., 2024). Leveraging artificial intelligence can transform the curriculum to make it adaptable to each student. This enables the development of learning materials tailored to students' needs, facilitating real-time monitoring and feedback. This will lead to greater student engagement in learning activities and optimal results.

According to Holmes (2020), artificial intelligence (AI) is a system designed to support teaching and learning. It is used in education in a practical sense. AI technology is used in education to personalize each student's learning experience. AI systems create unique learning profiles for each student, enabling learning materials to be adapted to their abilities, learning styles and experiences. This makes customized digital learning content easily accessible. The education sector and the teaching and learning process require artificial intelligence because it can improve learning outcomes and increase student independence, including for those with special educational needs (Garzon et al., 2025).

The Merdeka Curriculum allows for the use of artificial intelligence in learning design. The purpose of a free curriculum is to give educators more freedom and flexibility in organising the learning process. This curriculum focuses on creating innovative, creative and

technology-focused learning processes (Sopiansya et al., 2021).

3.2.1 Utilizing AI for Students

One of the most talked-about topics in the world of education at the moment is the application of artificial intelligence. ChatGPT is an AI application that enhances student participation, collaboration and accessibility (Cotton et al., 2023). One of the significant advantages of AI-based language models is that they provide a platform for asynchronous communication. This facility provides students with the opportunity to ask questions and discuss topics without being in the same location, which has been shown to increase participation and collaboration (Li & Xing, 2021). Another advantage of ChatGPT is its potential to help students work together. For example, ChatGPT can be used to form student groups, enabling them to collaborate on projects and assignments (Lewis, 2022).

One of the main impacts of applying AI to education is an increase in student enthusiasm and participation (Xia et al., 2022). AI can also increase students' interest in learning (Lin & Chang, 2020) and uses specialized tools, such as Smart Sparrow, to create an interactive learning environment (Hassan et al., 2023). Various studies have shown that applying technology can increase student engagement with educational materials (Khan et al., 2021; Kim et al., 2021). Artificial intelligence significantly improves educational outcomes and student satisfaction (Kuhail et al., 2022), as well as optimizing students' learning potential and academic achievement (Al Najdi & Al Hafdi, 2024). This high motivation and achievement may be due to the development and enhancement of personalized learning experiences (Okonkwo & Ibijola, 2021). Finally, GPT communication can support distance learning. This is very beneficial for students who cannot attend in-person learning due to physical or mental health issues (Barber et al., 2021).

Additionally, using artificial intelligence (AI) helps students to acquire crucial 21st-century skills such as creativity and critical thinking. AI can also help students to process complex information more easily and encourage deeper thought processes (Alam, 2023). During the language learning process, AI facilitates continuous conversations and enhances communication skills (Vázquez-Cano et al., 2021). This is because AI promotes collaborative learning and improves

communication skills among peers (Xu et al., 2024). These results demonstrate that AI can significantly assist students with learning difficulties in reaching their full potential.

Using artificial intelligence technology in the emotional aspect of learning can boost students' confidence in their outcomes (Hsieh et al., 2020). This is because AI can make the learning environment engaging and enjoyable, which can boost confidence and reduce anxiety about learning (Adiguzel, 2023; Kim et al., 2021). Interacting with robots can also boost self-confidence (Chiu, Moorhouse et al., 2023). According to research by Cotton et al. (2023), AI-supported educational interventions reduced anxiety levels in high school students. Therefore, artificial intelligence can help students to overcome their difficulties and develop the confidence and skills they need to succeed academically.

According to the author, the diverse, engaging and appropriate application of artificial intelligence can boost students' motivation to learn, encourage active participation in the educational process and improve academic achievement. Therefore, it is crucial for educators and curriculum designers to carefully consider how artificial intelligence can be used to create effective, motivating learning experiences for students. Motivation is an important component of the learning process. Highly motivated learners tend to participate more actively in class, remain committed to their studies, and achieve better results. The effect of AI on student motivation is an increasingly interesting topic.

According to the author, successfully implementing AI to enhance learning motivation greatly depends on teacher readiness and the availability of supporting facilities. While AI offers many opportunities, teachers must possess the necessary knowledge and skills to successfully integrate this technology into the learning process (Oktavia & Suseno, 2024). This includes understanding how to use AI, analyzing the data it generates, and adapting learning strategies based on its feedback. Additionally, sufficient technological infrastructure, such as appropriate hardware and reliable internet connections, is an important factor to consider to ensure all students in the school can access AI without barriers. Without this infrastructure, only students with better access are likely to utilize

AI, leaving others behind. Therefore, the use of AI in education depends not only on the technology used, but also on whether the existing educational environment supports and engages with it.

3.2.2 The Use of AI for Educators

In education, the use of artificial intelligence (AI) in management, learning and teaching has greatly benefited educators. According to Aldosari (2020), integrating AI technology has had a positive impact on educators' attitudes towards its application. One of the main benefits of using artificial intelligence is developing teaching skills (Jaiswal & Arun, 2021). This helps educators to improve because it encourages them to reflect. AI also makes teaching more flexible (Aldeman et al., 2021) by offering various ways to support student learning and helping teachers to better understand it (Vincent & Van Der, 2020). However, the success of AI depends on students' behavior and feelings (Schroeder & Craig, 2021). Furthermore, AI assists educators in their professional development by providing teaching assessment models and recommendations for enhancing teaching methods (Hu, 2021).

AI technology enables student evaluation to be based on their abilities. AI technology has been used to develop automated and intelligent systems that enable educators to assess and analyses students' learning abilities (Durall & Kapros, 2020). Furthermore, AI-based chatbots enable educators to monitor students' learning processes (Chiu et al., 2023) and gain insights into their learning (Westera et al., 2020). Various types of multimodal data, including electroencephalography, physiological measurements and eye tracking, have been employed to analyses complex student understanding, enabling accurate predictions about their learning performance (Giannakos et al., 2019). Voice recognition and pronunciation correction can also support foreign language learning (Vincent & Van Der, 2020).

Additionally, artificial intelligence has the ability to perform various repetitive tasks, thereby reducing the workload of teachers and administrators. Chatbots can ease teachers' administrative tasks by grading student work, assigning scores and providing feedback (Virkus, 2024). For instance, AutoGradr and Repl.it can automatically grade assignments and tests, saving

teachers time. Teachers can then use the remaining time to organize learning, help students, and develop professional skills. Furthermore, AI learning platforms offer numerous advantages to both educators and students. Universities have implemented chatbots to assist students outside working hours and answer their queries. Chatbots are also used in various settings, including libraries, student services, school restaurants, and educational programmes, to assist with evaluation, personalize lessons, and help with assignments (Rapp et al., 2021). More advanced learning management systems are expected to emerge in the future due to AI advancements (Nazir & Wang, 2023).

While ChatGPT offers many benefits for assessment in higher education institutions, artificial intelligence language models and other ChatGPT models may face several major issues when it comes to evaluation in the higher education sector. Using GPT-3 for university evaluations carries a risk of plagiarism. This artificial intelligence essay-writing system is designed to produce essays that meet standards. Consequently, students may use this system to submit essays that are not their own work, which could lead to mistakes in completing assignments (Dehouche, 2021).

There are three perspectives on education: the learner's (learning-facing), the teacher's (teacher-facing) and the system's (user-facing) (Zawacki-Richter et al., 2024). As a result, I can provide better support. The main benefit of using AI in Indonesian education is its ability to provide personalized learning experiences tailored to each student's needs. AI technology can adapt learning materials to each student's preferences and needs. Machine learning algorithms enable AI to assess learning outcomes and suggest customised materials (Yahya et al., 2023). Conversely, AI has the potential to transform how the Indonesian education system assesses students.

The author believes that artificial intelligence systems can evaluate students' written work, projects and oral responses using machine learning and natural language processing techniques. This automated evaluation process saves teachers time and provides more consistent, unbiased feedback. Ultimately, this improves the accuracy and reliability of assessments in the Indonesian education sector. Digital classrooms using artificial intelligence, such as virtual classrooms, allow students and educators to communicate directly,

even when they are far apart. This has great educational value. This is a highly relevant factor in Indonesia, where distance learning is becoming increasingly important for students in rural areas due to geographical constraints. AI-powered virtual classrooms encourage students to collaborate, participate and interact with each other. Conversely, artificial intelligence has the potential to contribute significantly to the design of the educational curriculum offered in Indonesia. Conventional curricula often struggle to keep up with the ever-changing needs of the job market and global developments. Data analysis supported by artificial intelligence can help educators and policymakers to better understand the needs of the labor market and which sectors will grow in the future.

Conclusion

Using artificial intelligence in education offers many benefits, including personalized learning, immediate feedback, improved collaboration, access to learning materials, intelligent learning analytics and support for lifelong learning. Teachers can enhance student learning outcomes by using AI to create interactive and engaging classes.

However, collaboration between educators, policymakers and technology experts is crucial to maximizing these benefits. Rather than being seen as a replacement for educators, AI should be viewed as a tool to enhance learning and teaching, while maintaining a human-centred approach to education. Strategic steps that must be taken include creating strict privacy policies, providing teachers with AI usage training, and carefully integrating technology. Incorporating responsible AI into education requires well-trained teachers and inclusive policies. With a balanced approach, AI can support, rather than replace, the human element in teaching and learning. This will create a more inclusive, effective and sustainable educational environment.

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