

The Influence of ChatGPT on Students' Learning Motivation and Learning Outcomes

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ABSTRACT

The development of generative Artificial Intelligence (AI) has significantly transformed learning practices in higher education, particularly through the utilization of ChatGPT as an academic support technology. This article aims to analyze the influence of ChatGPT usage on students' learning motivation and learning outcomes within the context of digital education transformation. This study employed a literature review method by examining scientific publications from last five years related to AI implementation, ChatGPT, learning motivation, learning outcomes, digital literacy, and academic integrity. The findings indicate that ChatGPT has the potential to enhance students' learning motivation through easier access to information, personalized learning experiences, and interactive academic assistance. Furthermore, ChatGPT can contribute to improved learning outcomes by supporting conceptual understanding, idea development, and feedback processes during learning activities. However, the effectiveness of ChatGPT implementation depends on students' AI literacy, critical thinking skills, and ethical technology use. Therefore, ChatGPT should be positioned as a learning support tool that enhances students' academic abilities rather than replacing independent thinking processes.

Keywords: Artificial Intelligence, ChatGPT, Digital Literacy, Learning Motivation, Learning Outcomes.

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1. | INTRODUCTION

The development of digital technology has brought significant changes to the higher education paradigm, especially through the use of Artificial Intelligence (AI)-based technology. Digital transformation in education no longer only focuses on the use of technological devices as a medium for delivering materials, but has evolved towards an adaptive, personalized, and data-based learning system. Artificial Intelligence is starting to be used to support various academic activities, such as providing learning resources, providing automated feedback, and developing more individualized learning experiences. Studies on the implementation of AI in higher education show that this technology has great potential in improving the quality of learning, although it still presents challenges related to user readiness, ethics, and changes in the role of educators (Zawacki-Richter et al., 2020; Chen et al., 2020).

The emergence of generative AI technology, especially ChatGPT, has become one of the most significant developments in the world of education in recent years. ChatGPT is a Large Language Model (LLM)-based system that is able to generate responses in the form of text, explain concepts, provide recommendations, and help complete various academic activities. In the context of education, this technology provides opportunities for students to get learning assistance quickly and flexibly without being limited by space and time. Kasneci et al. (2023) explain that large language models such as ChatGPT can support learning through personalization of materials, providing feedback, and increasing access to academic information. However, the use of this technology also raises debates about the dependence of technology, the validity of information, and the potential for a decrease in students' critical thinking skills (Lo, 2023).

In the student learning process, learning motivation is one of the important factors that determine academic success. Students who have high learning motivation tend to show active involvement, independent learning skills, and greater effort in understanding learning materials. The presence of ChatGPT has the potential to affect learning motivation through easy access to information, support for academic problem solving, and the ability to provide personalized responses according to user needs. Research on the use of ChatGPT in education shows that this technology can increase learning engagement as students gain a more interactive and responsive learning experience (Tlili et al., 2023; Geroche & Guay, 2024). However, inappropriate use can cause students to be less active in building understanding independently because they rely too much on the answers generated by AI (Cotton et al., 2023).

In addition to learning motivation, student learning outcomes are also an important aspect that needs to be studied in the context of using ChatGPT. Learning outcomes are not only related to the achievement of academic grades, but also include the ability to understand concepts, think critically, solve problems, and produce quality academic work. The use of AI technology can help students understand complex material, organize ideas, and obtain alternative perspectives in the learning process. Studies on

generative AI show that this technology has a potential relationship with improving academic performance when used as a support tool, not as a substitute for students' thinking processes (Yilmaz & Yilmaz, 2023; Lim et al., 2023).

Nonetheless, ChatGPT's impact on student motivation and learning outcomes is not automatic. The effectiveness of the use of this technology is influenced by various factors, such as digital literacy skills, understanding of the ethical use of AI, and students' ability to evaluate the information provided by AI systems. Bhullar et al. (2024) emphasized that the use of ChatGPT in higher education needs to be understood as part of a learning ecosystem that requires the readiness of students and institutions. A similar thing was stated by Yu et al. (2024) that the acceptance and sustainability of ChatGPT use is influenced by the perception of benefits, ease of use, and the level of user trust in the technology.

Based on these developments, a study of the influence of ChatGPT on student motivation and learning outcomes is important to understand how generative AI technology can be effectively integrated in higher education. Previous research has discussed many benefits and risks of ChatGPT in general, but studies that link the use of ChatGPT with aspects of learning motivation and student learning outcomes still need further in-depth. Therefore, this study aims to analyze the influence of ChatGPT on student motivation and learning outcomes and identify supporting factors and challenges in its implementation in the modern educational environment (Montenegro-Rueda et al., 2023; Jo, 2024).

2. | RESEARCH METHOD

This research method uses a literature review approach with the aim of comprehensively analyzing various scientific studies on the influence of the use of ChatGPT on student motivation and learning outcomes in the context of digital education. The literature review approach was chosen because it was able to provide a comprehensive overview of the development of the use of Artificial Intelligence (AI), especially generative AI, in the learning process and identify various findings of previous research related to the benefits, challenges, and implications of the use of ChatGPT in higher education. This study refers to the principle of systematic literature analysis by examining various relevant academic publications regarding the integration of AI in education (Zawacki-Richter et al., 2020; Montenegro-Rueda et al., 2023).

The data sources in this study were obtained from various scientific articles published in the 2020–2024 range through academic databases such as Google Scholar, reputable international journals, and scientific publications that discuss AI in education, the use of ChatGPT, learning motivation, learning outcomes, digital literacy, and academic ethics. Literature selection is carried out based on several criteria, namely articles that discuss the use of Artificial Intelligence or ChatGPT in the educational environment, are related to student learning activities, and are published within a predetermined period. The literature used includes empirical research, systematic

review, conceptual studies, and policy articles that provide perspectives on the development of AI in education (Chen et al., 2020; UNESCO, 2023).

The data analysis process is carried out through several stages, namely identification of literature sources, selection of articles based on the relevance of the theme, grouping of research findings, and interpretation of the relationship between the use of ChatGPT and student motivation and learning outcomes. The literature that has been collected is then analyzed in a descriptive-qualitative manner by identifying patterns of findings regarding the benefits of ChatGPT as a learning support, factors that affect the effectiveness of its use, and various risks that arise in the implementation of the technology. The analysis was carried out by comparing various research results to gain a deeper understanding of ChatGPT's position in modern learning transformation (Kasneci et al., 2023; Lo, 2023).

In the study process, special attention was paid to two main aspects, namely the influence of ChatGPT on the psychological aspect of learning in the form of student learning motivation and its influence on the academic aspect in the form of learning outcomes. In addition, this study also considers supporting factors such as AI literacy, critical thinking skills, and students' self-regulation in using digital technology. With this approach, this research is expected to be able to produce an analysis that not only sees ChatGPT as a learning technology, but also understands how the interaction between technology, students, and the education system can shape an effective, adaptive, and sustainable learning experience (Bhullar et al., 2024; Yu et al., 2024).

3. | RESULTS AND DISCUSSION

The results of the study show that the existence of ChatGPT has provided significant changes to the pattern of student interaction with learning resources, the process of searching for information, and the strategy for completing academic activities. As a form of generative artificial intelligence, ChatGPT not only functions as an information search tool, but also as a learning assistant that is able to provide explanations, examples, feedback, and support in understanding various academic concepts. This change shows a paradigm shift in learning from a model that relies entirely on conventional information sources to more flexible and technology-based learning. Research on the application of AI in higher education shows that artificial intelligence technology has great potential to improve the quality of learning through personalization of learning experiences and the provision of academic support in real-time (Zawacki-Richter et al., 2020; Chen et al., 2020).

In the context of higher education, ChatGPT provides opportunities for students to develop independent learning because this technology is able to provide responses according to user needs. Students can use ChatGPT to explain concepts that are difficult to understand, make material summaries, develop research ideas, and obtain alternative viewpoints in solving academic problems. This ability makes ChatGPT one of the technologies that supports student-centered learning-based learning. Kasneci et al. (2023) explained that large language models have the ability to increase access to

learning resources and provide a more adaptive learning experience. These findings are strengthened by Lo (2023) who states that ChatGPT has a potential contribution to increasing learning effectiveness when used as a support for the thought process, not as a substitute for students' intellectual activities.

From a learning motivation perspective, the use of ChatGPT shows a complex relationship between technology and student psychological factors. The ease of obtaining academic aid can increase students' confidence because they get support when facing learning difficulties. Students who previously experienced obstacles in understanding certain material can use ChatGPT to get additional explanations quickly so as to increase interest and engagement in the learning process. Research by Tlili et al. (2023) shows that AI-based chatbots can create a more interactive learning experience because students can have a two-way dialogue with technological systems. This is in line with research by Geroche and Guay (2024) who explains that AI-based learning environments can increase student engagement if the technology is designed to support active learning activities.

In addition to increasing learning engagement, ChatGPT can also contribute to increasing students' intrinsic motivation through a more personalized learning experience. Students have the opportunity to set the learning rhythm according to their individual needs, repeat certain explanations, and explore broader topics based on their academic interests. In this case, the use of AI technology can support the concept of adaptive learning that places students as the main controllers of the learning process. However, this positive influence is highly dependent on the ability of students to use technology appropriately. Bhullar et al. (2024) explain that the use of ChatGPT in higher education is not only related to the availability of technology, but is also influenced by the user's readiness, the purpose of use, and the ability to integrate AI in learning strategies.

While it provides various benefits, the use of ChatGPT also has potential risks to students' motivation to learn. The ease of getting instant answers can cause some students to reduce their efforts in understanding concepts in depth. Reliance on AI has the potential to change the learning orientation from the process of understanding to simply obtaining the final result. Cotton et al. (2023) reminded that the unsupervised use of ChatGPT can affect academic integrity because students can use the technology to produce assignments without going through an adequate thought process. Therefore, ChatGPT needs to be positioned as a support tool that strengthens students' abilities, not as a substitute for learning activities.

Regarding learning outcomes, studies show that ChatGPT has the potential to improve student academic achievement through several mechanisms. First, this technology helps students understand the learning material through the presentation of simpler alternative explanations. Second, ChatGPT can help students explore ideas and structure their thoughts before producing academic papers. Third, this technology is able to provide initial feedback on students' writings or answers so as to support the

process of revision and improvement of learning outcomes. Research by Yilmaz and Yilmaz (2023) shows that the use of generative AI is related to the improvement of the learning process because students receive additional support in understanding and developing knowledge.

In addition, the use of ChatGPT can support the development of high-level thinking skills if students are able to evaluate the information produced. AI technology needs to be understood not only as a tool to obtain answers, but also as a medium to train analytical skills, information comparison, and academic reflection. Lim et al. (2023) explain that generative AI can be an important part of the future of education when used to strengthen human abilities, such as creativity, problem-solving, and critical thinking. This view shows that the success of using ChatGPT is not only determined by technological capabilities, but also by the user's competence in managing and evaluating the results provided by AI.

Nevertheless, the improvement of learning outcomes through ChatGPT cannot be separated from the challenge of information validity. Generative AI models still have the possibility of generating information that is inaccurate or inappropriate for the academic context. Therefore, students must have AI literacy skills to be able to assess the quality of information before using it in academic activities. UNESCO (2023) emphasizes that the use of generative AI in education must be accompanied by strengthening digital competence, ethical understanding, and critical thinking skills. This shows that AI literacy is an important factor that determines whether ChatGPT has a positive impact or actually causes obstacles in learning.

Student acceptance of ChatGPT is also influenced by the perception of the benefits and ease of use of the technology. Students who see ChatGPT as a tool that helps the learning process tend to have a higher intensity of use than students who have doubts about its effectiveness. Yu et al. (2024) show that user satisfaction factors and benefit perception have a relationship with the sustainability of ChatGPT's use in higher education settings. Thus, the successful implementation of ChatGPT requires an approach that considers both technological aspects as well as user behavior.

Studies on the use of ChatGPT in education also show that educational institutions need to make adjustments to the learning evaluation system. Assessment models that are only oriented towards the final product become less relevant because students can get help from AI technology in producing academic papers. Rudolph et al. (2023) stated that the development of ChatGPT encourages the need to change the evaluation approach towards assessment that emphasizes students' thinking processes, arguments, creativity, and reflection. This is important so that the use of AI does not reduce the quality of learning, but rather strengthens students' academic abilities.

In addition to the evaluation aspect, the policy on the use of ChatGPT is also an important factor in maintaining a balance between technological innovation and academic integrity. Educational institutions need to provide clear guidelines regarding the use of AI in academic activities so that students understand the limitations of using

this technology. The study of Dwivedi et al. (2023) shows that generative AI presents great opportunities in various fields, but it also requires proper governance to avoid negative impacts. Therefore, the use of ChatGPT in education needs to be directed through a responsible approach and oriented towards improving the quality of learning.

Overall, the results show that ChatGPT has a significant influence on student motivation and learning outcomes, but these influences are contextual and depend on how it is used. ChatGPT can be an instrument that supports independent learning, increases student engagement, and aids academic achievement when used critically and ethically. Conversely, uncontrolled use can lead to technology dependence, degrade the quality of thought processes, and increase the risk of academic violations. Therefore, the integration of ChatGPT in higher education needs to be carried out by paying attention to student readiness, lecturer competence, AI literacy, and academic policies that support the responsible use of technology (Montenegro-Rueda et al., 2023; Jo, 2024).

4. | CONCLUSION

The use of ChatGPT in higher education shows significant changes in student learning patterns, both in terms of motivation and learning outcomes. As a generative Artificial Intelligence-based technology, ChatGPT provides an opportunity to create a more flexible, personalized, and interactive learning experience. This technology can help students understand the material, explore information, develop ideas, and get academic support quickly so that it has the potential to increase engagement and motivation to learn.

In terms of learning outcomes, ChatGPT has the potential to support increased concept understanding, problem-solving skills, and the quality of academic products when used as a learning support tool. However, the success of its use is highly dependent on students' ability to manage the use of technology critically and responsibly. The use of ChatGPT that is not accompanied by information evaluation skills can pose various challenges, such as technology dependence, decreased independence of thinking, and the risk of academic integrity violations.

Thus, ChatGPT cannot be seen as just a tool for obtaining answers instantly, but needs to be placed as a learning partner that helps strengthen students' thinking processes. The implementation of ChatGPT in higher education requires strengthening digital literacy and AI literacy, the development of clear academic policies, and learning strategies that still place critical thinking skills as the main goal. Through the right approach, the use of ChatGPT can be part of the transformation of digital education that supports more adaptive, innovative, and competency-oriented learning in the future.

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Data Disclosure Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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