

## ANALYSIS OF THE IMPACT OF USING CHATGPT ON IMPROVING STUDENTS' CRITICAL THINKING ABILITIES

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### Abstract

The development of information technology has brought significant changes to the world of education, particularly through the application of Artificial Intelligence (AI) to improve the quality of learning. One example of this application is ChatGPT, an AI platform capable of providing instant feedback in text-based interactions. Technology integration is considered to have significant potential in stimulating students' critical thinking skills. This study aims to analyze the impact of ChatGPT use on improving students' critical thinking skills in learning activities. This study used a literature review method by reviewing various literature relevant to the research. The results showed that the use of ChatGPT optimizes the speed of information acquisition. However, in reality, ChatGPT answers tend to be correct, so students believe them implicitly without critical review. This decline in cognitive engagement cumulatively results in a decline in critical thinking skills due to technology dependence. Therefore, the use of ChatGPT in learning needs to be wisely directed by educators so that it can become an effective supporting tool in improving students' critical thinking skills. The appropriate integration of AI technology in learning is expected to encourage the creation of a learning process oriented towards the development of critical thinking skills.

**Keywords:** Artificial Intelligence, ChatGPT, Critical Thinking Skills

### INTRODUCTION

The development of information and communication technology in the digital era has transformed various dimensions of life, particularly in education. This technological development and advancement have brought innovation and creativity to learning. In line with these dynamics, the paradigm of learning resources is now no longer solely teacher-centered. The integration of technology-based learning facilitates the learning process for both teachers and students (Herman et al., 2022). The availability of current technology provides learning flexibility without being limited by space and time. This condition is a positive driver that motivates students to broaden their horizons and improve their abilities. One emerging technology today is Artificial Intelligence (AI). Artificial Intelligence is the development of robotic technology whose decision-making capabilities resemble those of humans (Ramadhina et al., 2023). The use of AI in learning provides rapid access to information, assists in the development of ideas, and stimulates discussions of learning concepts. The use of AI in an educational context can open up new possibilities that can transform the way learning is managed. Various studies explain that AI can influence the learning process and can affect students' abilities (Supriyono et al., 2024). One popular artificial intelligence (AI) in the educational context is ChatGPT. ChatGPT (Generative Pre-trained Transformer) is a robot or chatbot that utilizes artificial intelligence (AI) capable of interacting and assisting humans in completing tasks by generating responsive and interactive text based on user requests (Maulana et al., 2023). ChatGPT exists as a means for students to dialogue directly with AI to obtain responsive feedback. This empowers students to not only receive information but also analyze, evaluate, and produce innovative, reflective solutions.

The advent of artificial intelligence (AI) has brought a new paradigm to education, where the ease of access to information presents significant challenges to users' independence and critical thinking skills. The orientation of education in the digital era has shifted from simply mastering content to strengthening higher-order thinking competencies, with critical thinking as a key pillar. Critical thinking is a key 21st-century skill that is crucial in the

context of formal education. Critical thinking encompasses the ability to analyze and evaluate information in depth, and construct logical arguments to make informed decisions. Critical thinking is the ability to express opinions in an organized manner (Septikasari, 2018). The integration of AI technology into learning is believed to be a means for students to facilitate information access and improve these critical thinking skills, especially when used in a targeted manner in learning activities (Ningsih et al., 2022; Sinurat et al., 2024). This is in line with research by Bachtiar et al. (2024) revealed that 150 respondents, consisting of 80% students and 75% teachers, found ChatGPT to be easy and fast in accessing information in a comprehensive manner. Furthermore, research by Fajriati et al. (2024) stated that Artificial Intelligence can facilitate learning through educational chatbots that can answer students' questions in real time and provide easier access to students in the independent learning process. Various other studies have shown a relationship between the use of ChatGPT and students' critical thinking skills. A study conducted by Rahman et al. (2021) indicates that artificial intelligence (AI) technology plays a strategic role in preparing students to face global challenges that demand high-level thinking competencies, creativity, and collaboration (Widodo et al., 2024). However, the use of ChatGPT requires structured pedagogical integration into learning practices to optimize this potential effectively. Furthermore, research by Magriva & Nensilianti (2025) stated that ChatGPT has a significant effect on students' critical thinking skills. The use of ChatGPT in learning facilitates students' ability to analyze, evaluate, and reflect on the information they receive. Through text analysis, students can explore various perspectives, thus providing a positive stimulus for them to avoid passively receiving information and instead actively test its validity and compare literature, thus enhancing critical thinking skills. However, The successful integration of this technology requires digital literacy readiness among users and appropriate pedagogical guidance to ensure AI functions as a means of developing reasoning, rather than simply as a mechanical task-solving tool. Therefore, this study aims to analyze the impact of ChatGPT use on improving students' critical thinking skills, by examining how the integration of this technology into learning can facilitate or hinder the development of students' critical thinking skills.

## LITERATURE REVIEW

The literature review in this study was designed to construct a conceptual understanding of the correlation between ChatGPT utilization and students' critical thinking skills. As a literature review, this section not only defines variables textually but also elaborates on various theories from previous literature. The theoretical discussion focuses on three main pillars: the ChatGPT intelligent system mechanism in learning, the conceptualization and indicators of critical thinking skills, and the correlation between ChatGPT utilization and critical thinking processes.

### ChatGPT Intelligent System Mechanism in Learning

ChatGPT's working mechanism is based on a Large Language Model (LLM) capable of predicting and generating responsive text resembling human conversation. In an educational context, this platform functions not merely as a search engine but also as a generator of articulate and instant answers. ChatGPT's ability to generate answers and draft text provides high accessibility efficiency for students in the classroom (Magriva & Nensilianti, 2025). However, the characteristics of text produced by this artificial intelligence often appear "always correct," potentially triggering trust bias in students. Therefore, ChatGPT's text output requires students' cognitive readiness to prevent information from being accepted at face value without going through a verification process.

### Conceptualization and Indicators of Critical Thinking

Critical thinking skills are an important aspect that must be developed in the 21st century. Critical thinking is the ability to understand complex problems and connect various pieces of information in an integrated manner, resulting in a logical and appropriate perspective on a problem (Mirawati et al., 2021; Purba et al., 2022). Critical thinking skills are the ability to analyze, evaluate, and reflect on problems to find the best solution (Padmakrisya & Meiliasari, 2023; Panjaitan et al., 2025). In line with this opinion, Fajriah (2022) stated that critical thinking skills need to be developed. One reason is to prepare students for maturity in life (Wijayanto et al., 2023). In addition, critical thinking skills are the process of formulating orderly reasons actively and skillfully from conceptualizing, applying, analyzing, integrating, or evaluating information collected through the process of observation, experience, reflection, and communication as a basis for determining action.

The critical thinking indicators in this study focused on three fundamental aspects relevant to students' digital interactions, according to Facione's Theory. First, analysis, which is the ability to identify intent, logical relationships, and argument structure in text generated by artificial intelligence. Second, evaluation and verification, which refers

to students' acuity in assessing the credibility of information and conducting data checks (fast-checking) to avoid bias. Third, reflection, which is the ability to draw objective conclusions (Adlini et al., 2022).

Thus, it can be concluded that critical thinking is an essential 21st-century competency that involves complex cognitive processes to analyze, evaluate, and reflect on information to generate logical solutions. In the context of technology-based education, mastering this skill is crucial to equip students to face the dynamics of digital information. Through these three main indicators, this study measures the extent to which the use of ChatGPT influences the depth of students' critical thinking in learning.

## Correlation of ChatGPT Usage with Critical Thinking Process

The integration of Large Language Models (LLMs) like ChatGPT into the education system creates new dynamics in students' cognitive processes. The relationship between the use of these tools and critical thinking skills can be explained through the following two main dimensions:

### 1. ChatGPT as a Cognitive Accelerator

ChatGPT functions as a cognitive accelerator, speeding up the information gathering and initial analysis phases. ChatGPT allows learners to bypass the time-consuming technical barriers of information retrieval, freeing up cognitive focus on evaluation. This technology provides a cross-disciplinary perspective in a short time, requiring students to compare and test the validity of the information presented (Bachtiar et al. 2024).

### 2. The Challenge of Originality and Dependence

On the other hand, there are significant challenges related to originality and the risk of dependency. If students use ChatGPT solely as an instant answering machine without engaging in independent reflection, this can trigger the degradation or decline of critical thinking skills. The tendency to obtain correct answers and copy and paste raw answers eliminates the evaluation and analysis phases, which are key indicators of critical reasoning (Sullivan et al., 2023). This dependency is feared to weaken students' ability to formulate conclusions, so that technology, which should be a tool, actually becomes a hindrance to intellectual ability.

## METHOD

This study employed a qualitative research method with a library research approach. Library research was conducted to collect data from various references and previous research findings related to the research subject as a theoretical basis for answering the research problem. According to Adlini et al. (2022), library research plays a crucial role in research because it includes a review of relevant theories and references. Furthermore, this method also aims to understand current theories and practices regarding how technology is applied in learning based on literature (Ibrahim et al., 2023). This research was conducted by reviewing, examining, and analyzing library sources relevant to the research topic to gain a comprehensive understanding of the research problem.

## RESULTS AND DISCUSSION

Advances in digital technology have driven changes in the learning process, giving students greater opportunities to manage and control their own learning. Technology plays a crucial role in today's digital-based learning. This is reflected in the use of various technologies to support and facilitate the learning process more effectively and interactively. The research revealed that the use of ChatGPT had a positive impact on students' learning dynamics, namely by increasing the speed and ease of access to information. However, the negative impact was the weakening of students' critical thinking skills due to their dependence on technology. The following discussion will outline the impact of the use of artificial intelligence (AI), specifically ChatGPT, on students' critical thinking skills.

ChatGPT is widely recognized in the literature as an instrument that offers speed and ease of data access unmatched by conventional methods. As an intelligent system based on a Large Language Model (LLM), this technology is capable of providing instant feedback and well-structured answers in a short time, effectively helping students understand complex subject matter while bridging the understanding gaps that often occur in self-paced learning (Pontjowulan, 2023). The cognitive efficiency offered allows AI to perform complex cognitive tasks and big data analysis more accurately than humans. In this context, ChatGPT acts as a virtual assistant that reduces the technical burden of searching for primary information (Ramadhina et al. 2023). Artificial intelligence provides benefits in learning environments, including ease of access and management of information, making the learning process more effective and efficient (Patriasih et al. 2025).

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By reducing the short-term memory workload required to search for raw data, learners theoretically have more cognitive space to focus on higher-order thinking processes such as problem-solving and decision-making (Bachtiar et al. 2023). Furthermore, this personalized, real-time accessibility significantly contributes to the learning process, as learners feel supported by a readily available private tutor, ultimately encouraging their active engagement in exploring information more independently and in-depth (Fajriati et al. 2024).

An analysis of various literature reveals that unsupervised use of ChatGPT significantly undermines students' achievement of critical thinking indicators. This failure stems from the characteristics of ChatGPT answers, which tend to be accurate, structured, and seemingly convincing, creating an illusion of truth that triggers cognitive passivity. This directly impacts analysis indicators, as students no longer feel the need to deeply identify the intent or structure of arguments. Consequently, this threatens originality of thinking, as students position themselves as passive recipients of information and neglect critical data processing (Zein, 2023).

This tendency for AI to "always be right" in its answers undermines evaluation and verification indicators. The emergence of the "Absolute Trust Phenomenon" leads students to dogmatically believe every output produced without any effort to verify it to avoid bias (Supriyono et al., 2024). When students perceive that technology has provided a perfect solution, their instinct to assess the credibility of information becomes dulled, leading to the abandonment of self-verification processes. Even if the answers generated appear convincing, the information is not always accurate. In education, this can be a source of error if users fail to re-verify (Judijanto et al., 2025).

In the final stage, the absence of this analysis and evaluation process results in a failure in the reflection indicator, namely the ability to draw objective and independent conclusions. The decline in reasoning power due to technological dependency is an unavoidable risk; students lose cognitive involvement in formulating their own conclusions because they have become accustomed to instantly adopting the results of machine thinking. As emphasized by Magvira & Nensilanti (2025), without an active verification and reflection process, this technological convenience actually leads to a decline in critical thinking skills due to accumulative dependency.

## CONCLUSION AND SUGGESTION

Based on the research results and discussion, it can be concluded that the use of ChatGPT in education is a double-edged sword for students' cognitive development. On the one hand, ChatGPT functions as an acceleration tool, offering efficiency and speed of information access in learning. However, on the other hand, the characteristic of ChatGPT's "always right" and structured answers creates a trust bias and illusion of truth that actually cripples students' critical thinking skills. This failure of critical thinking occurs systematically, starting with the weakening of the analytical aspect due to cognitive passivity, continuing to the collapse of the evaluation and verification aspects due to the phenomenon of absolute trust, and culminating in a failure of reflection due to high technological dependence. If not accompanied by strategic educational guidance, the convenience offered by ChatGPT will not improve quality but instead lead to a decline in students' critical thinking. Therefore, the integration of AI in learning must be positioned as a verification tool, not as a source of absolute truth, to maintain students' originality and independence of thought.

To address the risk of declining critical thinking skills, the use of ChatGPT in learning must be accompanied by teaching strategies that prioritize the thinking process, rather than simply seeking final answers. Here, the teacher's role is crucial as a guide, guiding students to view AI as a discussion partner, rather than as an infallible source of truth. One practical way is to get students used to answering open-ended questions that stimulate curiosity, encouraging them to reflect on the answers provided by AI (Rizki, 2024). Furthermore, teachers need to design assignments that require students to compare ChatGPT answers with original sources, such as textbooks or scientific journals. By teaching students how to use technology critically and ethically, it is hoped that students will remain independent in their thinking, so that ChatGPT truly becomes a tool that enriches their knowledge.

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