

# ChatGPT as a Writing Aid: Opportunities and Challenges in Developing Students' Logical Reasoning Skills

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## Abstract

The integration of artificial intelligence (AI) in education has transformed the academic landscape, offering new tools to enhance students' writing and reasoning skills. This study investigates the effectiveness of ChatGPT in supporting logical reasoning in writing among university students. The research employs a descriptive qualitative approach, incorporating surveys and semi-structured interviews with 15 students from the English Education Program at Universitas Islam Madura. The study examines how ChatGPT influences argument structuring, idea generation, and clarity in writing, while also identifying potential challenges and limitations. The findings indicate that 93.3% of students perceive ChatGPT as beneficial, particularly in improving logical coherence and content organization. Students reported that ChatGPT helps develop structured arguments, refine transitions, and overcome writing difficulties. However, significant limitations were identified, including the lack of proper citations, occasional inaccuracies, and the risk of over-reliance on AI-generated content. The study highlights the importance of critical evaluation when using ChatGPT, emphasizing that AI should be a supplementary tool rather than a primary knowledge source. These results contribute to ongoing discussions on AI's role in higher education, underscoring the need for AI literacy training and ethical AI integration in academic writing. The study suggests that future research should explore long-term impacts of AI-assisted learning, real-time citation integration, and AI's role in fostering independent critical thinking, ensuring AI remains a constructive force in education

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## INTRODUCTION

The rapid advancement of information technology has significantly transformed various aspects of human life, including education, communication, and professional work (Rashidovich, 2023). The emergence of artificial intelligence (AI) has further accelerated these transformations, offering unprecedented convenience in accessing, analysing, and generating information. AI applications, particularly those based on natural language processing (NLP), have revolutionized

the way individuals interact with information, allowing for more efficient data retrieval and structured decision-making processes (Waltz, n.d.). Among these AI-driven innovations, large language models such as ChatGPT have gained widespread attention due to their ability to generate human-like text, provide insightful responses, and assist users in a variety of tasks, including writing and critical reasoning (Hameed, 2020)(Rashidovich, 2023)

The influence of AI in education is growing, with studies indicating that AI-powered tools can enhance students' cognitive development, problem-solving abilities, and analytical skills (Isachenko, 2018)(Fridayani et al., 2022) . Writing, as a fundamental academic skill, plays a crucial role in students' intellectual growth and professional preparedness (Fidan, 2019). Effective writing requires logical reasoning, clear argumentation, and systematic structuring, all of which are essential for producing coherent and persuasive academic texts (Aharony et al. 2017) However, many students struggle with these aspects, particularly in developing logical connections between ideas and organizing their thoughts coherently. Given this challenge, AI tools such as ChatGPT offer promising support by providing suggestions, structuring arguments, and generating content that aligns with logical reasoning principles. Despite these advantages, concerns remain regarding the reliability, accuracy, and ethical implications of relying on AI-generated content in academic writing (Combemale et al., 2023).

One of the primary challenges in student writing is the ability to construct logical reasoning that supports well-founded arguments. Logical reasoning enables students to present their ideas coherently, ensuring that arguments are systematically developed and substantiated with evidence (Zakir, 2015). However, many students experience difficulties in structuring their writing logically, often resulting in fragmented or poorly articulated essays. This issue is exacerbated by the increasing demand for higher-level critical thinking and analytical writing in academic settings (Nurillahwaty, 2022). While traditional learning approaches, such as instructor feedback and peer review, remain valuable, they may not always be sufficient in addressing students' immediate challenges in writing (Permatasari & Rosy, 2021). This gap in instructional support has led researchers to explore alternative methods, including the integration of AI-powered writing assistants like ChatGPT, to enhance students' logical reasoning skills.

In response to this issue, AI models like ChatGPT provide a potential solution by offering real-time assistance in generating ideas, structuring arguments, and refining writing clarity. ChatGPT is designed to process and generate text based on vast linguistic datasets, allowing it to produce coherent and contextually relevant responses (Susnjak, 2024). This functionality enables students to use ChatGPT as an auxiliary tool for improving their writing skills by offering guidance on logical sequencing, argument development, and content organization. However, despite its potential benefits, concerns have been raised regarding its limitations, including the lack of academic citations, occasional inaccuracies, and the risk of over-reliance on AI-generated content without critical evaluation (Santini, 2018).

Previous research has explored the role of AI in supporting academic writing, particularly in enhancing students' reasoning abilities. For example, studies have found that AI-powered tools can serve as effective learning aids by providing structured responses and suggestions for improving writing coherence (Maulana & Darmawan, 2023). AI applications have also been found to improve the efficiency of the writing process by reducing cognitive load and enabling students to focus on refining their arguments rather than struggling with structural issues (Lund & Wang, 2023). Moreover, some studies suggest that AI-generated writing assistance can help students overcome writer's block by offering relevant prompts and ideas for content development (Abada et al., 2023). However, these studies also highlight potential drawbacks,

such as the tendency for AI-generated responses to lack depth, originality, and nuanced argumentation compared to human-written texts (Combemale et al., 2023)

Given the growing reliance on AI in education, further empirical research is needed to evaluate the effectiveness of ChatGPT in supporting students' logical reasoning in writing. While anecdotal evidence and preliminary studies indicate that AI tools can facilitate structured thinking and improve writing fluency, systematic investigations into their pedagogical value and limitations remain limited. This study aims to bridge this gap by assessing the effectiveness of ChatGPT in enhancing logical reasoning in writing among students in the English education program at Universitas Islam Madura. By analyzing students' experiences, perceptions, and challenges in using ChatGPT as a writing aid, this research seeks to provide insights into the potential of AI-driven tools in academic learning and contribute to discussions on best practices for AI integration in education.

In summary, this study examines the role of ChatGPT as an AI-powered writing assistant in supporting students' logical reasoning and writing coherence. While AI technologies offer promising solutions for enhancing academic writing, their impact on students' cognitive development and learning outcomes requires further exploration. This research will contribute to the ongoing discourse on AI in education by providing empirical evidence on the benefits and limitations of ChatGPT in academic writing, ultimately informing best practices for its effective use in higher education settings.

## METHOD

This study employs a descriptive qualitative research design to explore the effectiveness of ChatGPT in supporting students' logical reasoning in writing. A qualitative approach was selected as it allows for an in-depth understanding of students' experiences, perceptions, and interactions with AI-based writing tools (Sugiyono, 2015, as cited in (Permatasari & Rosy, 2021)). By analyzing subjective insights from students, this study aims to assess the practical value of ChatGPT in academic writing.

The research adopts a mixed-method data collection strategy, incorporating surveys and semi-structured interviews. The combination of these methods ensures that both quantitative trends (through descriptive percentage analysis) and qualitative perspectives (through thematic analysis of interviews) are captured. By integrating survey data with personal reflections from students, the study provides a comprehensive assessment of ChatGPT's role in logical reasoning and writing.

The study was conducted with 15 students from the English Education Study Program at Universitas Islam Madura. The selection of participants was purposeful, targeting students who have engaged with ChatGPT as part of their academic writing process. Purposeful sampling ensures that respondents have relevant experience using AI-based writing tools, allowing for richer data collection (Creswell & Creswell, 2017). The relatively small sample size aligns with the qualitative nature of the study, where the goal is not to generalize findings but to understand user experiences in depth (Patton, 2015). The insights drawn from this study may serve as a basis for future large-scale research on AI integration in education.

Data collection was carried out using two primary methods: A structured survey was designed using Google Forms to capture students' usage patterns, experiences, and perceived effectiveness of ChatGPT in supporting logical reasoning in writing. Following the survey, semi-structured interviews were conducted with all 15 students. This method was chosen because it allows for open-ended responses, enabling researchers to gain in-depth insights into

students' reasoning and decision-making processes when using ChatGPT. The interviews were conducted in a flexible and interactive manner, allowing participants to elaborate on their experiences while ensuring consistency in thematic exploration across respondents (Creswell & Poth, 2016).

## FINDINGS AND DISCUSSION

The study aimed to investigate the effectiveness of ChatGPT in supporting logical reasoning in writing among students. Data collected from 15 students in the English Education Program at Universitas Islam Madura provided insights into their usage patterns, perceived benefits, and limitations of ChatGPT as a writing aid. The survey results indicated a high adoption rate of ChatGPT, with 93.3% of students reporting regular usage for academic writing and only 6.7% stating that they had never used the tool.

This high percentage suggests that ChatGPT has become an integral part of students' writing processes, reflecting a growing reliance on AI-powered tools in academic settings. Students reported that they frequently used ChatGPT for various writing tasks, including structuring arguments, generating ideas, refining language, and clarifying concepts. The tool was particularly valued for its ability to provide immediate responses, guidance on logical reasoning, and coherent structuring of written content.

The results revealed that ChatGPT helped students structure their arguments more coherently, with 93.3% of respondents agreeing that it contributed positively to their logical reasoning skills. Many students emphasized that ChatGPT provided clear outlines and logical sequences that enhanced the organization of their essays.

Interview responses further supported this finding, as students reported that ChatGPT assisted them in developing well-structured introductions, main body paragraphs, and conclusions. By offering structured templates and guiding students on logical flow, ChatGPT enabled them to articulate their arguments in a more systematic and persuasive manner.

In addition to improving structure, students indicated that ChatGPT helped clarify complex ideas and make their writing more coherent and readable. The AI model's ability to break down concepts into concise explanations allowed students to present their arguments with greater precision and clarity.

Several students noted that before using ChatGPT, they often struggled with maintaining coherence between paragraphs. The AI tool provided contextually relevant transitions, making it easier for them to link ideas logically. These findings align with existing research indicating that AI-driven writing assistants can enhance students' ability to construct clear and logically consistent arguments (Fidan, 2019).

One of the most frequently cited benefits of ChatGPT was its ability to help students generate ideas when they faced difficulty starting their writing. Several students mentioned that ChatGPT provided valuable insights on how to approach a topic, particularly when they lacked initial direction.

Students reported that ChatGPT was especially useful in providing alternative perspectives on a given topic, suggesting relevant subtopics that could be explored in their writing, offering background information to contextualize their arguments. These findings align with previous research highlighting AI's role in expanding students' cognitive engagement and promoting creative thinking (Hameed, 2020).

One of the most commonly reported issues was ChatGPT's inability to provide proper citations or references for the information it generated. Six students explicitly mentioned this

as a major drawback, stating that ChatGPT's responses often lacked verifiable sources, making it difficult to use its content in formal academic work.

This limitation poses significant concerns regarding academic integrity and the credibility of AI-generated content. As Santini, (2018) emphasizes, references play a crucial role in ensuring the validity of academic arguments, and the absence of citations reduces the reliability of AI-generated insights.

Another recurring concern was that ChatGPT occasionally provided inaccurate or misleading information. Three students reported that ChatGPT misunderstood their queries, leading to irrelevant or contextually inappropriate responses.

Moreover, ChatGPT's reliance on pre-trained data limited to 2022 meant that some students encountered outdated information, particularly in fields requiring recent data. These concerns reflect broader discussions in AI research, where scholars caution that AI-generated text must be critically evaluated for accuracy and contextual relevance (Combemale et al., 2023).

Several students raised concerns about the risk of over-reliance on ChatGPT, which could potentially hinder independent critical thinking skills. Some students admitted that they relied on ChatGPT without fully analyzing or verifying the AI-generated content, leading to a passive learning approach.

This aligns with ethical concerns raised by (Maulana & Darmawan, 2023) who argue that while AI can assist students in writing, excessive dependence on automated tools may weaken their ability to develop original ideas and critical reasoning skills.

## CONCLUSION AND IMPLICATION

This study provides empirical evidence on the effectiveness of ChatGPT in supporting students' logical reasoning in writing, demonstrating that AI-powered tools can significantly enhance argument structuring, idea generation, and writing clarity. With 93.3% of students reporting positive experiences, the findings highlight ChatGPT's role in improving coherence and logical transitions in academic writing. However, limitations such as the lack of proper citations, occasional inaccuracies, and the risk of over-reliance indicate the need for critical evaluation and responsible AI usage in education. These findings contribute to the existing knowledge on AI's pedagogical impact, emphasizing that while ChatGPT is a valuable supplement to academic learning, it cannot replace independent critical thinking and traditional research methods. The study underscores the importance of AI literacy and ethical considerations in higher education, urging educators to incorporate AI guidance into academic curricula. Future research should explore long-term effects of AI-assisted writing, integration of real-time citation tools, and AI's role in fostering independent analytical skills, ensuring that AI remains a constructive rather than a substitutive force in education..

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