



Exploring the Role of ChatGPT in Enhancing English Writing Skills Among EFL Students

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Abstract

Background: The rapid development of artificial intelligence (AI) has transformed educational practices, including English language learning. Among various AI-powered tools, ChatGPT has gained significant attention due to its ability to generate human-like responses and provide instant feedback for language learners.

Aim: This study aims to explore the role of ChatGPT in enhancing English writing skills among EFL students and to examine students' perceptions regarding its benefits and challenges in academic writing.

Method: This study employed a quantitative descriptive survey design. Data were collected through a questionnaire distributed to Indonesian university students who had experience using ChatGPT for English writing activities.

Results: The findings indicate that students generally perceive ChatGPT as a useful tool for improving English writing skills. Participants reported improvements in grammar, vocabulary, idea organization, and writing confidence. However, concerns regarding overreliance on AI-generated content and reduced critical thinking were also identified.

Conclusion: ChatGPT has considerable potential to support English writing development among EFL students. Nevertheless, responsible and critical use remains necessary to maximize educational benefits.

Introduction

The rapid advancement of artificial intelligence (AI) has transformed various aspects of education, including language teaching and learning. AI-powered technologies have increasingly been integrated into educational settings to provide personalized learning experiences, immediate feedback, and enhanced learning support. As digital technologies continue to evolve, educators and students are exploring innovative tools that can facilitate language acquisition and academic skill development (Holmes et al., 2019).

One of the most prominent AI technologies in recent years is ChatGPT, a generative AI model developed by OpenAI. ChatGPT utilizes natural language processing (NLP) to generate human-like responses and assist users in completing a wide range of language-related tasks. Since its introduction, the platform has gained widespread popularity among students due to its ability to provide explanations, generate ideas, answer questions, and support academic writing activities (Kasneci et al., 2023).

The increasing use of ChatGPT has significantly influenced English as a Foreign Language (EFL) learning. Among the four language skills, writing is often regarded as one of the most challenging because it requires learners to organize ideas, apply grammatical rules accurately, select appropriate vocabulary, and maintain coherence throughout a text (Hyland, 2019). Consequently, many EFL students experience difficulties in producing effective written work and often require additional support beyond classroom instruction.

Recent studies indicate that ChatGPT can serve as a valuable learning tool for EFL students. The platform enables learners to receive instant feedback, improve grammatical accuracy, expand vocabulary knowledge, and develop writing organization skills.

Furthermore, ChatGPT allows students to practice writing independently and revise their work more efficiently, potentially contributing to improved writing performance and learner confidence (Mahapatra, 2024; Teng et al., 2024).

Beyond its linguistic benefits, the use of ChatGPT may also influence cognitive engagement during the writing process. Writing involves complex cognitive activities such as idea generation, planning, memory retrieval, language processing, and self-monitoring (Levelt, 1989). From a neurolinguistic perspective, language production requires the coordination of multiple cognitive systems that support meaning construction and linguistic encoding (Friederici, 2011). Therefore, technological tools that provide writing assistance may help learners manage cognitive demands while engaging more effectively in academic writing tasks.

Several studies have reported positive perceptions regarding the use of ChatGPT in language learning. Learners often view the technology as helpful for improving writing quality, increasing motivation, and fostering independent learning. However, researchers have also raised concerns regarding overreliance on AI-generated content, academic integrity, and the potential reduction of critical thinking skills when students depend excessively on automated assistance (Farrokhnia et al., 2024; Cotton et al., 2024).

Although research on ChatGPT in education has expanded rapidly, several gaps remain in the existing literature. First, many studies primarily focus on the effectiveness of ChatGPT in improving writing outcomes, while fewer studies investigate students' perceptions of how the technology supports their writing development. Second, limited research has explored the relationship between AI-assisted writing and learners' cognitive engagement during the writing process. Third, studies focusing on Indonesian EFL learners remain relatively scarce despite the growing adoption of ChatGPT in higher education contexts.

Therefore, this study aims to explore the role of ChatGPT in enhancing English writing skills among EFL students. Specifically, the study examines students' perceptions of ChatGPT, identifies its perceived benefits in supporting writing development, and investigates challenges associated with its use in academic writing activities. The findings are expected to contribute to the growing body of knowledge on AI-assisted language learning and provide insights for educators seeking to integrate ChatGPT effectively into EFL writing instruction.

Literature Review

Artificial Intelligence in Education

Artificial Intelligence (AI) has become one of the most transformative technologies in contemporary education. AI refers to computer systems capable of performing tasks that typically require human intelligence, including learning, problem-solving, decision-making, and language processing (Russell & Norvig, 2021). In educational contexts, AI has been increasingly utilized to provide personalized learning experiences, adaptive instruction, and automated feedback that support students' academic development (Holmes et al., 2019).

The integration of AI into education has created new opportunities for enhancing teaching and learning processes. AI-powered systems can analyze learners' needs, provide individualized recommendations, and facilitate self-directed learning beyond traditional classroom settings (Luckin et al., 2016). Furthermore, Zawacki-Richter et al. (2019) argue that AI technologies have the potential to improve educational accessibility and learner engagement by offering immediate support and customized learning pathways. Consequently, AI is becoming an essential component of digital education in the twenty-first century.

ChatGPT in Language Learning

ChatGPT is a generative artificial intelligence model developed by OpenAI that utilizes Natural Language Processing (NLP) to generate human-like responses. The tool has gained

significant attention in educational settings due to its ability to assist learners in various academic tasks, including information retrieval, idea generation, content creation, and language learning activities (Kasneci et al., 2023).

Musical training provides language learners with opportunities to enhance auditory discrimination, phonological awareness, vocabulary acquisition, and listening comprehension. Previous studies have demonstrated that music-trained individuals often outperform non-musicians in language-related tasks due to enhanced auditory processing and stronger cognitive control mechanisms (Kraus & Chandrasekaran, 2010; Gordon et al., 2015). Furthermore, musical experience has been associated with improved neural encoding of speech sounds and more efficient language processing, as reflected in electrophysiological measures such as MMN, N400, and P600 responses (Patel, 2011; Besson et al., 2011). These findings suggest that music-based learning activities may serve as effective pedagogical tools for supporting second language acquisition and promoting linguistic development.

Despite these advantages, concerns have been raised regarding the use of ChatGPT in education. Researchers highlight issues such as academic integrity, misinformation, overreliance on AI-generated content, and the potential reduction of critical thinking skills (Cotton et al., 2024; Dwivedi et al., 2023). Therefore, the integration of ChatGPT into educational practices requires careful guidance to ensure responsible and ethical use.

English Writing Skills

Writing is a fundamental language skill that enables individuals to communicate ideas, opinions, and information effectively through written texts. In English language learning, writing plays a crucial role in academic achievement because it requires learners to demonstrate linguistic competence, critical thinking, and communicative effectiveness (Hyland, 2019).

For EFL learners, writing is often considered one of the most challenging skills to master. Students frequently encounter difficulties related to grammar, vocabulary, organization, coherence, and idea development (Richards & Renandya, 2002). These challenges may reduce learners' confidence and limit their ability to express ideas effectively in English.

Feedback is widely recognized as an important factor in improving writing skills. Ferris (2011) argues that constructive feedback helps learners identify errors, revise their texts, and develop greater awareness of language use. In recent years, technological tools have emerged as alternative sources of writing support, providing learners with additional opportunities to improve their writing performance through immediate and accessible feedback mechanisms.

Cognitive and Neurolinguistic Perspectives on Writing

Writing is not merely a linguistic activity but also a complex cognitive process involving multiple mental operations. According to Levelt (1989), language production requires the coordination of conceptualization, formulation, and articulation processes. During writing activities, learners must generate ideas, organize information, retrieve vocabulary, construct grammatical structures, and monitor language accuracy simultaneously.

Neurolinguistic research suggests that language processing involves the interaction of several brain systems responsible for memory, attention, and linguistic encoding (Friederici, 2011). Hagoort (2019) further explains that successful language production depends on the integration of cognitive and neural mechanisms that facilitate meaning construction and communication. Consequently, writing tasks often impose substantial cognitive demands on language learners.

Cognitive Load Theory provides a useful framework for understanding the mental effort involved in learning activities. Sweller (1988) argues that excessive cognitive load can hinder learning performance by overwhelming learners' working memory capacity. In the context of EFL writing, technological tools that provide linguistic support may help reduce

cognitive demands and allow learners to focus on higher-order thinking processes such as idea development and text organization.

Previous Studies on ChatGPT and EFL Writing

Recent studies have increasingly explored the role of ChatGPT in supporting EFL writing development. Mahapatra (2024) reported that ChatGPT improved students' academic writing performance by providing immediate feedback and facilitating text revision. Similarly, Teng et al. (2024) found that learners perceived ChatGPT as a valuable learning companion that enhanced motivation, writing confidence, and self-regulated learning.

Research conducted in various educational contexts has also demonstrated positive impacts of ChatGPT on vocabulary development, grammatical accuracy, and writing organization. Werdiningsih et al. (2024) reported that Indonesian EFL students viewed ChatGPT as an effective tool for generating ideas and improving written assignments. Likewise, Almelhi et al. (2024) found that AI-assisted writing activities contributed to higher levels of learner engagement and writing quality.

Nevertheless, previous studies have identified several challenges associated with the use of ChatGPT in writing instruction. Concerns regarding plagiarism, overdependence on AI-generated content, and the reliability of generated information remain prominent issues in the literature (Cotton et al., 2024; Farrokhnia et al., 2024). These findings indicate that while ChatGPT offers significant educational benefits, further research is needed to understand how students perceive its role in supporting writing development and cognitive engagement in EFL learning contexts.

Method

Research Design

This study employed a quantitative descriptive survey design to explore the role of ChatGPT in enhancing English writing skills among EFL students. A survey method was selected because it enables researchers to collect data from a relatively large number of participants and identify general patterns regarding students' perceptions, experiences, and attitudes toward the use of ChatGPT in academic writing (Creswell & Creswell, 2018). The study focused on examining perceived benefits, cognitive engagement, and challenges associated with the use of ChatGPT for English writing activities.

Research Site and Participants

The study was conducted at several universities in Indonesia where students had experience using ChatGPT to support English writing tasks. The participants consisted of 120 undergraduate students enrolled in English-related courses. Participants were selected using purposive sampling because they met the criteria of having used ChatGPT for academic writing activities at least once during their studies (Etikan et al., 2016).

Table 1. Demographic Information of Participants

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	48	40.0
	Female	72	60.0
Academic Year	First Year	25	20.8
	Second Year	37	30.8
	Third Year	34	28.3
	Fourth Year	24	20.0

Experience Using ChatGPT	Less than 6 months	32	26.7
	6–12 months	46	38.3
	More than 1 year	42	35.0

Instrument

Data were collected using a structured questionnaire adapted from previous studies on AI-assisted language learning and educational technology (Farrokhnia et al., 2024; Teng et al., 2024). The questionnaire consisted of 20 items divided into four dimensions: perceived usefulness, writing improvement, cognitive engagement, and challenges of using ChatGPT.

Responses were measured using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree).

Table 2. Questionnaire Indicators

Dimension	Indicator	Number Of Items
Perceived Usefulness	ChatGPT helps learning activities	5
Writing Improvement	Grammar, vocabulary, organization	6
Cognitive Engagement	Idea generation, critical thinking, self-reflection	5
Challenges	Dependency, misinformation, academic integrity	4
		20

Data Collection

Data were collected through an online questionnaire distributed using Google Forms over a four-week period. Before completing the questionnaire, participants were informed about the purpose of the study and provided informed consent. Participation was voluntary, and respondents were assured that all information would be kept confidential and used solely for academic purposes (Cohen et al., 2018).

The questionnaire link was shared through university communication channels, including class groups and academic networks. After the collection period ended, all responses were screened to ensure completeness and eligibility before being included in the analysis.

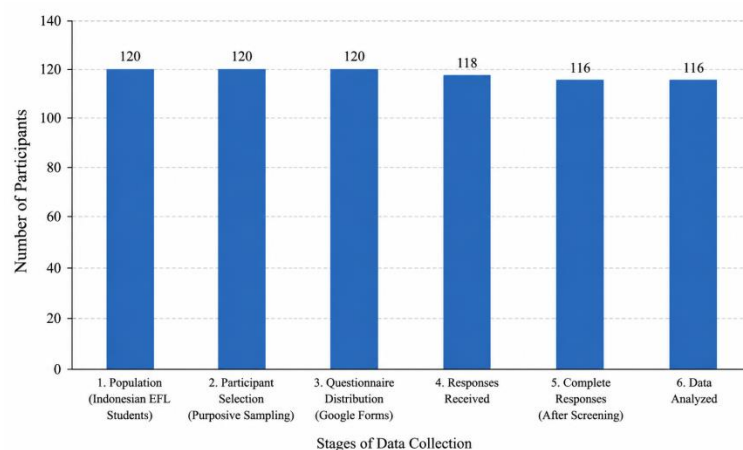


Figure 1. Data Collection Process

Data Analysis

The collected data were analyzed using descriptive statistical techniques. Frequencies, percentages, means, and standard deviations were calculated to summarize students' responses regarding the use of ChatGPT in English writing activities (Field, 2018).

The mean scores were interpreted using the following criteria:

Table 3. Interpretation of Mean Scores

Mean Range	Interpretation
1.00–1.80	Very Low
1.81–2.60	Low
2.61–3.40	Moderate
3.41–4.20	High
4.21–5.00	Very High

The findings were then presented in tables and discussed in relation to previous studies on AI-assisted language learning, EFL writing development, and cognitive engagement. This approach enabled the researcher to identify trends in students' perceptions and evaluate the educational implications of ChatGPT in supporting English writing skills.

Result and Discussion

Result

The study investigated students' perceptions regarding the role of ChatGPT in enhancing English writing skills. The results were analyzed using descriptive statistics, including mean scores and standard deviations for each research dimension.

Table 4. Students' Perceptions of ChatGPT in English Writing

Dimension	Mean	SD	Interpretation
Perceived Usefulness	4.32	0.58	Very High
Writing Improvement	4.21	0.61	Very High

Cognitive Engagement	4.08	0.67	High
Challenges of Use	3.42	0.72	High
Overall Mean	4.01	0.65	High

The findings indicate that students generally hold positive perceptions regarding the use of ChatGPT in English writing activities. The highest mean score was recorded for Perceived Usefulness ($M = 4.32$), suggesting that students considered ChatGPT a beneficial tool for supporting their learning activities. Similarly, Writing Improvement obtained a very high mean score ($M = 4.21$), indicating that students believed ChatGPT contributed positively to grammar accuracy, vocabulary development, and text organization.

Meanwhile, Cognitive Engagement achieved a high mean score ($M = 4.08$). This finding suggests that ChatGPT assisted students in generating ideas, organizing thoughts, and maintaining engagement during the writing process. However, the Challenges of Use dimension also received a relatively high score ($M = 3.42$), indicating that students were aware of potential concerns related to dependency, misinformation, and academic integrity.

Table 5. Perceived Benefits of ChatGPT in Writing Activities

Statement	Mean
ChatGPT helps me improve grammar accuracy.	4.35
ChatGPT helps me expand my English vocabulary.	4.28
ChatGPT assists me in organizing ideas.	4.22
ChatGPT increases my confidence in writing.	4.17
ChatGPT helps me revise written assignments.	4.31

The results reveal that grammar improvement ($M = 4.35$) was perceived as the most significant benefit of ChatGPT. Students also reported positive effects on vocabulary development, writing organization, and confidence in completing academic writing tasks.

Table 6. Challenges Associated with ChatGPT Use

Statement	Mean
I may become dependent on ChatGPT.	3.65
ChatGPT sometimes provides inaccurate information.	3.58
Excessive use may reduce critical thinking.	3.47
AI-generated content may raise academic integrity concerns.	3.38

The findings indicate that dependency on AI tools emerged as the primary concern among participants. Students also acknowledged the possibility of receiving inaccurate information and the potential impact of ChatGPT on critical thinking skills.

Discussion

The findings demonstrate that ChatGPT is perceived positively by EFL students as a tool for improving English writing skills. The high mean score for perceived usefulness indicates that students recognize the educational value of AI-assisted writing support. This finding is consistent with Mahapatra (2024), who reported that ChatGPT contributes to writing development by providing immediate feedback and facilitating revision processes. Similarly, Teng et al. (2024) found that students viewed ChatGPT as an effective learning companion that supports academic writing activities.

The results also reveal that ChatGPT contributes to writing improvement, particularly in grammar accuracy, vocabulary development, and idea organization. These findings align with previous studies suggesting that AI-assisted feedback can enhance learners' linguistic competence and writing performance (Almelhi et al., 2024; Werdiningsih et al., 2024). By providing instant suggestions and corrections, ChatGPT enables students to identify and address language-related difficulties more efficiently than traditional writing practices.

From a cognitive and neurolinguistic perspective, the findings suggest that ChatGPT may support learners' cognitive engagement during writing activities. Writing requires substantial cognitive effort because learners must generate ideas, organize information, retrieve linguistic knowledge, and monitor language accuracy simultaneously (Levelt, 1989). The relatively high mean score for cognitive engagement indicates that ChatGPT assists students in managing these complex processes. This finding supports Cognitive Load Theory, which argues that instructional support can reduce unnecessary cognitive burden and allow learners to allocate greater mental resources to higher-order thinking tasks (Sweller, 1988).

Nevertheless, students also expressed concerns regarding the use of ChatGPT. The relatively high scores related to dependency, misinformation, and academic integrity indicate that learners recognize potential risks associated with excessive reliance on AI-generated content. These findings are consistent with Cotton et al. (2024) and Farrokhnia et al. (2024), who emphasize the importance of responsible AI use in educational settings. While ChatGPT offers valuable support, students must continue to develop independent writing skills and critical evaluation abilities.

Overall, the findings suggest that ChatGPT has considerable potential to enhance English writing development among EFL students while simultaneously supporting cognitive engagement during the writing process. However, educators should encourage balanced and ethical use of AI technologies to maximize learning benefits and minimize potential drawbacks.

Implications

The findings of this study have several implications for English language teaching and learning. First, language educators may consider incorporating music-based activities into language instruction to support the development of listening comprehension, phonological awareness, and vocabulary acquisition. Since music-trained learners demonstrated superior behavioral performance and enhanced neural responses during language-processing tasks, musical activities may provide additional opportunities for learners to strengthen language-related cognitive skills.

Second, educational institutions may integrate music-supported learning approaches into second language curricula. Activities such as rhythm training, song-based learning, and melodic repetition can create engaging learning environments while promoting auditory

discrimination and language processing abilities. These approaches are consistent with sociocultural learning theory, which emphasizes the role of mediated learning experiences in cognitive development (Vygotsky, 1978).

Third, the findings highlight the importance of interdisciplinary approaches that combine insights from neuroscience, linguistics, and music education. Understanding the relationship between musical training and language processing may assist educators in designing innovative instructional strategies that foster both cognitive and linguistic development.

Finally, the study suggests that music-based interventions may serve as valuable supplementary tools for supporting second language learners, particularly in areas related to pronunciation, listening comprehension, and speech perception. Future educational programs should therefore consider integrating musical experiences as part of comprehensive language-learning practices.

Limitations and Future Research

This study has several limitations. The sample was limited to Indonesian university students, which may restrict the generalizability of the findings. In addition, the study relied on self-reported perceptions rather than direct measurements of writing performance. Future research may employ experimental or mixed-method approaches to examine the actual impact of ChatGPT on writing quality and cognitive development among EFL learners. Furthermore, future studies could investigate long-term effects of AI-assisted writing tools in different educational contexts.

Conclusion

This study explored the role of ChatGPT in enhancing English writing skills among EFL students. The findings revealed that students generally perceived ChatGPT as a valuable learning tool that supports grammar improvement, vocabulary development, idea organization, and writing confidence. The results also indicated that ChatGPT contributed positively to students' cognitive engagement by assisting them in generating ideas and managing the writing process more effectively.

From a cognitive and neurolinguistic perspective, the use of ChatGPT appears to support learners in handling complex writing tasks by reducing cognitive burden and facilitating language processing. This finding suggests that AI-assisted writing tools can serve as useful learning companions in contemporary EFL classrooms when integrated appropriately into instructional practices.

Despite its benefits, several challenges were identified, including concerns related to dependency, misinformation, academic integrity, and reduced critical thinking. Therefore, the use of ChatGPT should be accompanied by responsible learning practices and adequate guidance from educators to ensure that students continue to develop independent writing abilities.

Overall, ChatGPT demonstrates significant potential as a supplementary educational tool for improving English writing skills among EFL students. Future research is recommended to investigate the long-term effects of AI-assisted writing on language development and cognitive performance across different educational contexts.

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