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THE RELATIONSHIP BETWEEN AI USE AND CRITICAL THINKING IN EFL ACADEMIC WRITING

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Abstract. The rapid development of artificial intelligence has significantly transformed English as a Foreign Language (EFL) academic writing practices. AI-powered applications, particularly ChatGPT, provide students with opportunities to generate ideas, organize arguments, receive feedback, improve grammatical accuracy, and revise academic texts. However, the increasing use of these technologies has raised important questions concerning their relationship with students' critical thinking abilities. The present study examines the relationship between AI use and critical thinking in EFL academic writing, focusing on analytical reasoning, evaluation of information, argument development, independent decision-making, and reflective writing practices. A qualitative, literature-based research design is adopted to investigate how AI-assisted writing influences students' cognitive engagement and academic performance. Previous research suggests that structured AI-assisted instruction can support critical thinking when students actively evaluate generated information, question suggestions, and make independent decisions. At the same time, excessive dependence on AI-generated content may reduce opportunities for independent reasoning and original idea development. Recent empirical studies involving EFL university students have demonstrated positive associations between guided ChatGPT use, critical thinking, and writing proficiency. The study emphasizes that the educational value of AI depends not simply on the frequency of its use but on the quality of students' interaction with the technology. It concludes that AI should function as a supportive learning resource rather than a replacement for human reasoning. Integrating critical thinking activities into AI-assisted academic writing

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instruction may help EFL students develop stronger analytical, evaluative, and independent writing abilities.

Keywords: artificial intelligence, critical thinking, EFL students, academic writing, ChatGPT, analytical reasoning, AI-assisted learning, writing development, digital literacy, independent learning.

INTRODUCTION

Academic writing is a complex intellectual activity that requires students to demonstrate linguistic competence, logical reasoning, analytical abilities, and the capacity to communicate ideas effectively. For students learning English as a Foreign Language, academic writing presents additional challenges because they must simultaneously manage language accuracy, vocabulary selection, sentence construction, argument development, and critical evaluation of information. In higher education, academic writing is not simply the production of grammatically correct sentences. It involves identifying problems, examining evidence, comparing different perspectives, developing arguments, and presenting conclusions supported by reliable information. Therefore, critical thinking represents an essential component of successful academic writing. Critical thinking is commonly understood as the ability to analyze information, evaluate evidence, interpret arguments, identify assumptions, and make reasoned decisions. Facione (1990) identifies interpretation, analysis, evaluation, inference, explanation, and self-regulation as central dimensions of critical thinking. These abilities are particularly important in academic writing because students must demonstrate that their arguments are based on logical reasoning rather than unsupported opinions. In recent years, the development of artificial intelligence has introduced significant changes into academic writing practices. AI-powered applications such as ChatGPT can generate text, explain complex concepts, suggest vocabulary, identify grammatical problems, and provide alternative interpretations of information. These capabilities have made AI increasingly attractive to university students who need

additional support during the writing process. Kasneci et al. (2023) explain that large language models offer important educational opportunities, including personalized learning, immediate feedback, and support for complex educational activities. However, they also emphasize the need to consider limitations related to inaccurate information, bias, and students' dependence on generated content. In EFL academic writing, AI tools can help students overcome difficulties associated with language production. Students may use ChatGPT to brainstorm ideas, develop outlines, improve sentence structures, and receive explanations of grammatical mistakes. These functions can reduce some linguistic difficulties and allow learners to concentrate more effectively on the content of their writing. Kohnke, Moorhouse, and Zou (2023) discuss the potential applications of ChatGPT in language teaching and learning, emphasizing its ability to support interactive language practice and provide individualized assistance. Nevertheless, the educational effectiveness of these tools depends on how students use them and whether their interaction promotes active learning. One important concern is the relationship between AI use and critical thinking. Although AI can provide immediate answers and generate sophisticated arguments, students may accept these responses without examining their accuracy, relevance, or logical consistency. Such behavior can limit opportunities for independent reasoning. On the other hand, AI can also become a useful instrument for developing critical thinking when students use it to challenge their assumptions, compare arguments, identify weaknesses, and examine alternative explanations. Yin and Dou (2025) investigated an AI-assisted critical thinking intervention involving 250 undergraduate EFL learners from three public universities. Their research examined changes in writing proficiency and students' acceptance of ChatGPT in critical-thinking-oriented writing activities. The findings indicated significant improvements in critical thinking reflected in students' writing following the intervention. The study suggests that structured AI-supported writing instruction can support analytical development when critical thinking is explicitly

incorporated into learning activities. Similarly, research by Shintia, Nurjati, and Rahayu (2025) investigated the relationship between ChatGPT usage, essay writing, and critical thinking among 201 undergraduate EFL students. Their findings indicated a significant positive association between ChatGPT usage and critical thinking, with essay writing playing an important mediating role. These findings suggest that the relationship between artificial intelligence and critical thinking is more complex than a simple positive or negative influence. The educational effects depend on students' purposes, interaction strategies, evaluation skills, and level of intellectual engagement. Rusdin (2024) examined EFL students' experiences with ChatGPT in academic writing and identified both advantages and challenges. Students valued AI assistance for overcoming uncertainty, clarifying vocabulary, and generating content suggestions. However, the research also highlighted the importance of balancing technological support with human judgment to maintain originality and authenticity.

Mahapatra (2024) investigated ChatGPT as a formative feedback tool in academic writing and demonstrated the potential of AI-supported feedback to contribute to students' writing development. Such findings suggest that AI can support revision and improvement, although students still need to make independent decisions about the quality of their work. The relationship between AI use and critical thinking is particularly relevant to Uzbek university students. Many EFL learners experience difficulties developing arguments, evaluating academic sources, identifying weaknesses in evidence, and expressing original opinions in English. AI applications may provide additional opportunities for overcoming these challenges. However, if students rely excessively on AI-generated paragraphs and arguments, they may produce linguistically sophisticated texts without developing the analytical abilities necessary for independent academic work. Therefore, the present study examines the relationship between AI use and critical thinking in EFL academic writing. Particular attention is given to the ways students use AI tools, their ability to evaluate generated information,

their participation in independent reasoning, and the implications of AI-assisted writing for academic development. The study is guided by the following research questions: How is AI use related to critical thinking in EFL students' academic writing? What opportunities and challenges does AI-assisted writing create for students' analytical and evaluative abilities? How can EFL teachers integrate AI tools into academic writing instruction while maintaining students' independent reasoning and intellectual responsibility?

METHODS

The present study adopts a qualitative, literature-based research design to investigate the relationship between AI use and critical thinking in EFL academic writing. The methodological framework is informed by critical thinking theory, computer-assisted language learning, AI-assisted writing research, and academic literacy. The study draws on Facione's (1990) conceptual framework of critical thinking and recent empirical investigations into ChatGPT use among university EFL students. Relevant academic literature was examined thematically, focusing on the relationship between AI-assisted writing practices and the cognitive processes involved in academic text production. Particular attention was given to the use of AI for brainstorming, outlining, argument development, source evaluation, grammatical revision, and feedback interpretation. The analysis also considered the distinction between productive AI assistance and excessive dependence on AI-generated content. Critical thinking was examined through several interconnected dimensions. Analytical reasoning concerns students' ability to identify the main ideas of a topic, recognize relationships between arguments, and examine supporting evidence. Evaluation involves assessing the accuracy, credibility, relevance, and reliability of information generated by AI systems. Inference refers to the ability to develop logical conclusions based on available evidence. Explanation concerns the presentation of arguments through clear and logically connected statements. Self-regulation involves monitoring

one's reasoning, identifying weaknesses in arguments, and revising conclusions when necessary. These dimensions are consistent with the framework proposed by Facione (1990). AI-assisted writing was examined in relation to the different stages of academic text production. These include idea generation, planning, drafting, revision, and final editing. The analysis distinguishes between students who use AI as a source of feedback and those who depend on it to generate complete arguments or paragraphs. This distinction is important because the two practices may involve different levels of cognitive engagement. The literature-based design also considers empirical evidence from recent EFL studies. Yin and Dou (2025), Shintia et al. (2025), Rusdin (2024), and Mahapatra (2024) provide relevant evidence concerning AI-supported writing, critical thinking, and academic performance. Since the present manuscript does not report an original experiment involving Uzbek university students, no original participant data, questionnaire results, statistical coefficients, or experimental outcomes are claimed.

The analysis of previous research identifies several important dimensions of the relationship between AI use and critical thinking in EFL academic writing. These dimensions demonstrate that AI can support cognitive engagement when used purposefully, but may also create challenges when students depend on generated content without sufficient evaluation.

Analytical reasoning is an essential component of academic writing because students must examine information, identify relationships between ideas, and construct logical arguments. AI tools can support this process by generating possible arguments, presenting alternative viewpoints, and explaining complex topics. For example, when students write an argumentative essay about the influence of social media on education, ChatGPT can suggest different perspectives concerning educational opportunities, digital distraction, communication, and academic performance. These suggestions may provide a starting point for further investigation. However, students must decide which arguments are relevant and whether the information is supported by reliable evidence.

Yin and Dou (2025) investigated an AI-assisted critical-thinking-oriented writing intervention involving undergraduate EFL learners. Their findings indicated improvements in critical thinking reflected in students' writing after structured ChatGPT-supported instruction. This evidence suggests that AI can support analytical reasoning when students are guided to engage actively with generated information. However, the ability to generate arguments should not be confused with the ability to analyze them. Students need to examine relationships between claims, evidence, and conclusions rather than simply reproduce AI-generated suggestions.

Evaluation is another central dimension of critical thinking.

Academic writers must determine whether information is accurate, relevant, credible, and appropriate for a particular research purpose. AI-generated information may appear convincing even when it contains incorrect facts, incomplete explanations, or fabricated references. Kasneci et al. (2023) emphasize that large language models can generate inaccurate information and may reproduce biases present in their training data. Therefore, users should approach AI-generated responses critically. In EFL academic writing, students may encounter difficulties evaluating AI-generated sources because they are still developing their academic literacy and research skills. For example, ChatGPT may provide a statement about a particular educational theory and attach a reference that appears academically appropriate. However, students must verify whether the cited publication exists and whether it actually supports the statement. This process can encourage source evaluation and information literacy when students are explicitly taught to verify generated content. Instead of accepting AI responses immediately, students should compare them with academic publications, identify unsupported claims, and examine whether the proposed arguments are logically consistent. Rusdin (2024) similarly highlights the importance of balancing AI assistance with human judgment in EFL academic writing. The study emphasizes that

students should retain responsibility for evaluating suggestions and maintaining the authenticity of their work.

Argument development is one of the most demanding aspects of academic writing. Students must formulate clear claims, provide relevant evidence, consider alternative perspectives, and develop conclusions that logically follow from their arguments. AI tools can provide support by suggesting possible structures and presenting counterarguments. For instance, when students develop an essay about online education, they may ask ChatGPT to identify weaknesses in their argument or present an alternative position. Such interaction can encourage students to reconsider their initial opinions and develop more balanced discussions. However, if learners simply copy generated arguments, the process may reduce opportunities for independent idea development. Shintia et al. (2025) examined the mediating role of essay writing in the relationship between ChatGPT usage and critical thinking among undergraduate EFL students. Their findings indicated a significant positive association between ChatGPT usage and critical thinking, with a path coefficient of $\beta = 0.401$ (p less than .001). The study suggests that writing activities are an important part of understanding how AI use relates to students' critical thinking abilities. This is particularly important because writing requires learners to organize their thoughts, justify claims, and connect evidence with conclusions.

Feedback plays an important role in academic writing development because it helps students identify weaknesses and improve their texts. Traditional feedback may come from teachers, peers, or writing tutors. AI systems introduce an additional source of feedback that can be accessed at different stages of the writing process. Students can request explanations of unclear sentences, ask for suggestions concerning paragraph organization, and receive comments on the logical structure of their arguments. Mahapatra (2024) investigated ChatGPT as a formative feedback tool in academic writing through a mixed-methods intervention involving tertiary-level ESL students.

The study examined students' writing development through repeated assessments and focus group discussions, demonstrating the relevance of AI-supported formative feedback in writing instruction. However, feedback becomes educationally valuable only when students understand and evaluate it. For example, if ChatGPT suggests replacing a sentence with a more sophisticated expression, students should consider whether the new sentence preserves their intended meaning and fits the academic context. Reflective thinking occurs when learners examine the reasons behind suggested changes and decide independently whether to accept or reject them. This process can strengthen students' awareness of their own writing and encourage more responsible use of AI tools.

One of the main concerns associated with AI-assisted academic writing is cognitive offloading. Cognitive offloading refers to the use of external resources to reduce the mental effort required to perform particular tasks. In academic writing, students may rely on AI systems to generate ideas, construct arguments, summarize sources, and produce complete paragraphs. Although these practices may reduce immediate workload, excessive dependence can limit opportunities for independent reasoning. Kasneci et al. (2023) emphasize that the integration of large language models into education requires careful consideration of their cognitive and pedagogical consequences. If students consistently allow AI systems to make decisions for them, they may become less engaged in evaluating information and constructing original arguments. This concern does not mean that all AI assistance is harmful. Rather, the educational value of AI depends on whether it supports or replaces students' intellectual activity. A balanced approach requires students to remain responsible for the content, reasoning, and final decisions in their academic writing.

Independent learning is closely connected with critical thinking because students need to make decisions, evaluate their progress, and take responsibility for their

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academic development. AI tools can support independent learning by providing explanations and feedback without requiring students to wait for teacher assistance.

However, independence should not be confused with unrestricted dependence on automated systems. Students demonstrate independent learning when they use AI selectively, question generated responses, verify information, and make their own decisions. Yin and Dou (2025) provide evidence that structured critical-thinking-oriented AI instruction can support EFL writing development. Their findings suggest that the instructional design of AI-supported activities is an important factor in determining their educational value. Therefore, students should be encouraged to use AI as a source of suggestions and feedback rather than as an automatic producer of academic content.

The literature indicates that the relationship between AI use and critical thinking depends strongly on how students interact with AI tools. Productive AI use involves asking questions, comparing alternative arguments, requesting explanations, identifying weaknesses, and verifying information. Unproductive AI use may involve copying complete responses, accepting unsupported claims, and submitting AI-generated paragraphs without meaningful revision. Shen and Chen (2026) examine how graduate EFL students use ChatGPT in academic writing and distinguish between critical engagement and forms of unreflective dependence. Their research highlights the importance of understanding students' purposes and reasoning when interacting with AI. This distinction demonstrates that the frequency of AI use alone is insufficient for evaluating its educational impact. Students who use AI frequently but evaluate every suggestion may engage in substantial critical thinking. In contrast, students who use AI less frequently but copy its responses without verification may demonstrate limited intellectual engagement. Consequently, the quality of AI interaction is more educationally meaningful than the simple number of times a student accesses the technology.

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DISCUSSION

The findings of the literature-based analysis suggest that the relationship between AI use and critical thinking in EFL academic writing is complex and depends on the nature of students' interaction with artificial intelligence. One of the central conclusions is that AI does not automatically improve or weaken critical thinking. Its educational influence depends on whether learners actively participate in analytical, evaluative, and reflective processes. Facione's (1990) framework provides a useful theoretical foundation for understanding this relationship. Critical thinking includes interpretation, analysis, evaluation, inference, explanation, and self-regulation. These abilities are directly relevant to academic writing because students must develop arguments and justify their conclusions through logical reasoning. AI tools may support these processes by providing alternative perspectives, identifying possible weaknesses, and offering immediate feedback. The findings of Yin and Dou (2025) provide particularly relevant empirical evidence. Their intervention involving 250 undergraduate EFL students demonstrated significant improvements in critical thinking reflected in writing following structured ChatGPT-supported instruction. This suggests that AI can become a valuable educational resource when it is integrated into a pedagogical framework that explicitly emphasizes critical thinking. The relationship identified by Shintia et al. (2025) also supports the importance of writing as a cognitive activity. Their findings indicate a positive association between ChatGPT usage and critical thinking among undergraduate EFL students. However, these findings should not be interpreted as evidence that unrestricted AI use necessarily improves critical thinking in every educational context. The design of learning activities remains important. Students need opportunities to evaluate AI-generated responses and develop independent interpretations. Another important issue concerns the reliability of AI-generated information. Academic writing requires evidence-based reasoning, and inaccurate information can weaken the quality of students' arguments. Kasneci et al. (2023)

highlight the limitations of large language models, including their potential to produce incorrect information and reproduce biases. Consequently, students should be trained to verify AI-generated claims through credible academic sources. This practice can strengthen information literacy and encourage students to approach technological tools critically. Rusdin (2024) demonstrates that EFL students value ChatGPT for overcoming writing difficulties, but emphasizes the need to balance AI support with human judgment. This balance is particularly important for maintaining originality and ensuring that students remain responsible for their academic work. In Uzbek higher education institutions, the integration of AI into academic writing instruction should therefore focus on developing independent reasoning alongside linguistic competence. Students may benefit from using ChatGPT to identify possible arguments, explain difficult concepts, and receive feedback. However, they should independently decide which arguments are appropriate and support their conclusions with reliable academic evidence. Teachers also have an important role in creating learning environments in which AI encourages intellectual engagement rather than replacing it. For example, students can be asked to identify weaknesses in AI-generated arguments, compare alternative explanations, and justify why particular suggestions are accepted or rejected. Such activities encourage learners to use AI as an object of critical examination. Overall, the analysis suggests that the relationship between AI use and critical thinking should be understood through the quality of interaction, the structure of writing activities, and the level of student responsibility.

The findings have several implications for EFL academic writing instruction in higher education. Teachers should integrate AI-assisted activities that require students to analyze and evaluate generated information rather than simply receive completed texts. For example, students can write an argumentative paragraph independently and then ask ChatGPT to identify possible weaknesses in their reasoning. They should subsequently compare the feedback with their original ideas and explain which

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recommendations they consider appropriate. Another useful activity involves examining AI-generated arguments and identifying unsupported claims, logical inconsistencies, and missing evidence. Students can also compare different AI-generated explanations of the same topic and determine which responsible is more accurate and relevant. Teachers should encourage learners to verify references and factual claims through academic databases and reliable publications. Assessment should focus not only on the quality of the final written product but also on students' ability to explain their reasoning, justify their decisions, and demonstrate independent understanding. Furthermore, universities should develop clear guidelines concerning acceptable AI use, academic integrity, authorship, and the responsible use of generated content. The integration of critical thinking into AI-assisted writing instruction can help students develop both academic English proficiency and the intellectual skills required for successful university study.

The present study has several limitations. First, it is based on a qualitative analysis of existing literature rather than an original empirical investigation involving Uzbek EFL students. Second, the relationship between AI use and critical thinking may vary according to students' English proficiency, previous academic experience, digital literacy, and familiarity with AI technologies. Third, studies conducted in different educational and cultural environments may produce different results. Therefore, findings from other countries should not automatically be generalized to Uzbek university students. Another limitation concerns the measurement of critical thinking. Improvements in writing quality do not necessarily indicate equivalent improvements in general critical thinking abilities. Future research should combine independent writing assessments, critical thinking tests, questionnaires, interviews, and classroom observations. Longitudinal investigations would also be useful for determining whether students maintain their critical thinking abilities when AI assistance is unavailable. Empirical studies involving Uzbek university students could provide more context-

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specific evidence concerning the educational relationship between AI use and critical thinking in EFL academic writing.

CONCLUSION

The present study examined the relationship between artificial intelligence use and critical thinking in EFL academic writing through a qualitative analysis of existing research. The analysis demonstrates that AI tools can provide valuable support for idea generation, argument development, language revision, feedback interpretation, and academic writing improvement. However, the educational contribution of AI depends on the extent to which students remain actively involved in analytical and evaluative processes. Previous research by Yin and Dou (2025) and Shintia et al. (2025) indicates positive relationships between structured AI use, writing activities, and critical thinking among EFL university students. At the same time, Kasneci et al. (2023) and Rusdin (2024) emphasize the importance of human judgment, information verification, and responsible AI use. For Uzbek university students, AI-assisted writing can provide additional opportunities to improve academic English and develop analytical abilities. Nevertheless, excessive dependence on generated content may reduce opportunities for independent reasoning and original argument construction. In conclusion, artificial intelligence should be viewed as a supportive educational resource rather than a substitute for critical thinking. Effective AI-assisted writing instruction should encourage students to question generated information, verify evidence, compare alternative perspectives, and take responsibility for their academic decisions. Integrating critical thinking activities into EFL academic writing can help universities develop learners who are not only linguistically competent but also analytically independent and capable of using artificial intelligence responsibly.

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