The Role of Artificial Intelligence Tools and Digital Literacy in Shaping EFL Students' English Writing Skills

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Abstract: The rapid development of digital technology, particularly Artificial Intelligence (AI), has brought significant changes to English as a foreign language (EFL) learning, especially in writing skills. This article aims to conceptually examine the role of Artificial Intelligence tools and digital literacy in shaping EFL students' English writing skills. This study uses a conceptual review approach with a literature review method of scientific articles, books, and research reports relevant to writing learning, educational technology, and digital literacy. The results of the study show that the use of AI tools, such as grammar correction applications, machine-assisted writing, and automatic feedback, can help students improve linguistic accuracy, text organization, and metacognitive awareness in writing. However, the effectiveness of AI tools depends heavily on students' digital literacy, which includes the ability to understand, evaluate, and use technology critically and ethically. Digital literacy plays an important role in ensuring that the use of AI is not merely mechanical but also supports the development of critical thinking and creativity in writing. This article emphasizes that the balanced integration of AI tools and digital literacy can be a potential strategy for improving the quality of EFL writing instruction. These conceptual findings are expected to serve as a basis for educators and researchers in designing more effective technology-based writing instruction that is oriented toward the development of 21st-century competencies.

Keyword: Artificial Intelligence Tools, Digital Literacy, Writing Skills, EFL, Language Education.

INTRODUCTION

Digital transformation has changed the global education paradigm, including in the teaching of English as a foreign language (EFL). The integration of technology in education is no longer optional, but rather a necessity in order to meet the demands of 21st-century learning, which emphasizes critical thinking skills, creativity, collaboration, and digital literacy (Voogt, et al., 2013). In language learning, technology plays an important role in facilitating a more interactive, autonomous, and learner-centered learning process (Chapelle, 2001).

Among the four language skills, writing is often considered the most complex skill for EFL learners because it requires the simultaneous integration of linguistic, cognitive, and metacognitive aspects (Hyland, 2019). EFL students often experience difficulties in writing English, especially in terms of grammar, idea organization, and text cohesion (Graham, 2018). This condition encourages educators to utilize technology as a means of supporting more effective and adaptive writing learning to meet students' needs.

With the development of technology, Artificial Intelligence (AI) has emerged as an innovation that is increasingly being adopted in language education. AI tools such as grammar checkers, automated writing evaluation (AWE), and AI-based writing assistants offer instant, personalized, and continuous feedback to students (Zhai, et al., 2021). A number of empirical studies show that the use of AI in writing learning can improve EFL students' grammatical accuracy, text structure quality, and linguistic awareness (Li, et al., 2015; Ranalli, et al., 2017). For example, a study by Ranalli et al. (2017) found that the targeted use of AWE significantly improved students' writing revisions compared to traditional feedback alone.

However, the use of AI tools in writing instruction is not without challenges. Several empirical studies report that students tend to use AI tools mechanically without reflective understanding of the language errors being corrected (Link et al., 2022). Overreliance on technology has the potential to weaken critical thinking skills and learning autonomy if not balanced with adequate digital literacy competencies (Kasneci et al., 2023). This shows that the effectiveness of AI in writing instruction is not only determined by technological sophistication, but also by the cognitive readiness and digital literacy of its users.

Digital literacy is understood as the ability to access, evaluate, utilize, and create information using digital technology critically and ethically (UNESCO, 2018). In the context of language learning, digital literacy plays an important role in helping students understand the function of technology as a learning tool, not just an instant correction tool (Godwin-Jones, 2018). Empirical research shows that students with high levels of digital literacy are better able to utilize technology for language reflection, writing revision, and independent idea development (Ng, 2012; Park & Kwon, 2022).

Several studies also reveal a positive relationship between digital literacy and writing skills. For example, research by Park and Kwon (2022) shows that digital literacy contributes significantly to the quality of EFL students' academic writing, particularly in terms of idea organization and text coherence. These findings reinforce the view that digital literacy is a key factor in the successful integration of technology, including AI, in English writing instruction.

Although research on AI and digital literacy in language education continues to evolve, most studies are still separate empirical studies, focusing on the effectiveness of technology or digital literacy competencies individually. Studies that conceptually integrate the role of Artificial Intelligence tools and digital literacy in shaping EFL students' writing skills are still relatively limited, especially in the context of language education in developing countries. Therefore, a conceptual study is needed that can summarize empirical findings, critique existing challenges, and offer an integrative framework for the use of AI and digital literacy in EFL writing learning.

Based on this background, this article aims to conceptually examine the role of Artificial Intelligence tools and digital literacy in shaping EFL students' English writing skills. This study is expected to contribute theoretically to the development of technology-based writing learning and serve as a reference for educators and researchers in designing critical, ethical, and 21st-century competency-oriented learning practices.

METHOD

This article uses a conceptual study approach with a library research method to examine the role of Artificial Intelligence (AI) tools and digital literacy in shaping the English writing

skills of EFL students. A conceptual study was chosen because it aims to develop theoretical understanding through critical synthesis of existing theories, models, and empirical findings, rather than to test hypotheses through field data collection (Jaakkola, 2020). This approach allows the author to identify conceptual patterns, relationships between variables, and relevant research gaps in the field of language education.

The data sources in this study were academic literature, including reputable journal articles, scientific books, conference proceedings, and institutional reports relevant to the topics of AI in education, digital literacy, and EFL writing instruction. The literature was collected through scientific databases such as Scopus, Web of Science, ERIC, and Google Scholar. The search process was conducted using keywords such as artificial intelligence in education, AI tools in EFL writing, digital literacy, EFL writing instruction, and technology-enhanced language learning. Sources were selected selectively by considering the relevance of the topic, the credibility of the publisher, and the theoretical and empirical contributions of each source (Boote & Beile, 2005).

Data analysis was conducted using thematic analysis and conceptual synthesis techniques. Each selected source was analyzed to identify key concepts, empirical findings, and theoretical implications related to the use of AI tools and digital literacy in EFL writing instruction. Furthermore, these concepts were grouped and compared to find connections, gaps, and contradictions that emerged in the literature (Snyder, 2019). This process aimed to build a comprehensive understanding of how AI tools and digital literacy interact in shaping EFL students' writing skills.

To increase the validity of the study, this article applies the principle of critical review, which not only summarizes previous research findings but also critically evaluates the assumptions, methodologies, and research contexts used in previous studies (Grant & Booth, 2009). This approach allows for the development of a more reflective and contextual framework, particularly in addressing the challenges of implementing AI and digital literacy in language education.

The results of the conceptual synthesis are then used to formulate theoretical and pedagogical implications for EFL students' English writing learning. Thus, this conceptual review method is expected to make a meaningful contribution to the development of technology-based writing learning theory and practice, as well as provide a basis for further empirical research in the field of language education.

RESULT AND DISCUSSION

Based on a review of conceptual and empirical literature, it was found that Artificial Intelligence (AI) tools play a significant role in supporting the development of EFL students' English writing skills, especially in terms of the mechanical and linguistic aspects of writing. Various studies show that AI-based writing tools, such as grammar checkers, automated writing evaluation (AWE), and AI writing assistants, contribute positively to improving students' grammar, spelling, and sentence structure (Ranalli, et al., 2017; Zhai, et al., 2021). These findings indicate that AI tools can function as linguistic scaffolding that helps students reduce their cognitive load when writing in a second language.

In addition to linguistic aspects, the results of the study also show that AI tools can increase students' metacognitive awareness in the writing process. Instant automatic feedback allows students to make repeated revisions and reflect on their language errors (Li et al., 2015). However, the effectiveness of AI in improving writing quality holistically including idea development, coherence, and argumentation is not always consistent. Several studies report that without adequate pedagogical guidance, the use of AI tends to be limited to surface-level revisions (Link et al., 2022).

The results of the study also confirm that digital literacy is a determining factor in optimizing the use of AI tools in EFL writing learning. Digital literacy enables students to understand the function of AI as a learning aid, not as a substitute for the writing thinking process itself (UNESCO, 2018). Empirical studies show that students with high levels of digital literacy are better able to evaluate the suggestions provided by AI, select relevant feedback, and integrate it into the reflective writing revision process (Ng, 2012; Park & Kwon, 2022).

Furthermore, the literature shows an interactive relationship between AI tools and digital literacy in shaping the writing skills of EFL students. AI tools provide technological support, while digital literacy functions as a cognitive and ethical framework that guides the use of these technologies (Godwin-Jones, 2018). Without adequate digital literacy, the use of AI has the potential to lead to over-reliance, unintentional plagiarism, and a decline in student learning autonomy (Kasneci et al., 2023). Therefore, digital literacy is not only supportive but a key prerequisite for meaningful AI integration in writing instruction.

From a pedagogical perspective, the results of this study indicate that the role of teachers remains crucial in mediating the use of AI tools in EFL writing instruction. Teachers play a role in guiding students to use AI critically, reflectively, and ethically, as well as linking technological feedback to broader writing learning objectives (Hyland, 2019). Thus, AI tools should be positioned as co-writing assistants that support the learning process, not as the main authority in assessing students' writing.

CONCLUSION

This conceptual study confirms that Artificial Intelligence (AI) tools and digital literacy play complementary roles in shaping EFL students' English writing skills. AI tools contribute significantly to improving the technical and linguistic aspects of writing, such as grammatical accuracy, sentence structure, and revision process efficiency. The presence of automatic and personalized feedback from AI allows students to engage in a more iterative and reflective writing process, which was previously difficult to achieve through conventional learning.

However, this study also emphasizes that the use of AI tools does not automatically guarantee an overall improvement in writing quality. Without adequate digital literacy, the use of AI has the potential to encourage technological dependence, superficial revisions, and a decline in students' cognitive awareness of the writing process itself. Therefore, digital literacy functions not only as a technical skill, but also as a cognitive and ethical competency that enables students to use AI critically, selectively, and responsibly.

From a theoretical perspective, this article contributes to the development of an integrative understanding of EFL writing learning in the era of artificial intelligence. This study positions AI tools not as a substitute for the writing thinking process, but as pedagogical scaffolding whose effectiveness is highly determined by digital literacy and learning design. Thus, the relationship between AI tools and digital literacy needs to be understood as a dynamic relationship that shapes the quality of EFL students' writing processes and outcomes.

Pedagogically, these conceptual findings imply the need for teachers to play an active role in mediating the use of AI tools in writing learning. Teachers are expected to be able to design writing activities that encourage students to reflect on AI feedback, relate it to learning objectives, and develop critical thinking and creativity skills. The integration of AI in writing learning should be directed towards a guided use of technology approach, where technology is used in a targeted, controlled manner and in line with language pedagogy principles.

In addition, this study also highlights the importance of paying attention to ethical and educational policy aspects in the use of AI. Issues such as plagiarism, ownership of written work, transparency in the use of AI, and equitable access to technology need to be seriously considered by educational institutions. The development of clear policies regarding the use of

AI in EFL writing learning is an important step to ensure that technology is used fairly and responsibly.

In conclusion, this study recommends the need for further empirical studies to systematically examine the relationship between AI tools, digital literacy, and the writing skills of EFL students in various educational contexts. Quantitative, qualitative, and mixed-method research can provide a deeper understanding of how the integration of AI and digital literacy can be optimized to improve the quality of English writing learning in the digital age.

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