

Exploring the Use of Artificial Intelligence in Developing Writing Skills: A Systematic Review

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Abstract

This systematic review aims to evaluate the capabilities of AI over the last decade in generating ideas, critiquing essays, crafting stories, and providing writing feedback, particularly for writing scholars. The study seeks to help educators, researchers, and application developers understand the potential of AI in writing by addressing existing gaps in the literature. The findings indicate that AI is progressing in its role within the educational framework, highlighting new opportunities for developing writing assistance tools. In summary, integrating AI into writing instruction offers benefits for both students and teachers. For educators, AI tools present a way to enhance their teaching methods while preserving essential educational values. For students, AI serves as a valuable resource for their creative endeavors. With thoughtful integration, AI can complement traditional teaching, fostering an educational environment where technology enhances the human elements of learning and writing, rather than detracting from them. Future studies should also explore the social, emotional, and psychological impacts of AI writing tools on students. Understanding how these tools shape students' perceptions of writing, motivation, and self-efficacy is crucial as interactions with AI technologies increase. Research could be conducted to determine whether the use of AI tools boosts students' confidence in their writing skills or diminishes it by comparing human work with that of AI systems. In this context, students' expressions of their emotional experiences will provide valuable insights into the different ways they engage with AI support in writing.

Keywords. Artificial Intelligence, AI Writing Tools, AI-Assisted Writing, Systematic.

Introduction

Artificial intelligence (AI) is transforming multiple industries, including healthcare, finance, education, and media [1]. Within education, one emerging focus is the enhancement of writing skills using AI-based tools. While AI has traditionally been applied in forecasting and data analytics [2], its adoption in academic writing is relatively recent. Generative AI tools like ChatGPT have sparked discussions about AI as a co-author or writing assistant in academic contexts [3]. Writing remains a critical skill for academic success and professional development [4]. However, traditional writing instruction often faces challenges such as a lack of individualized feedback and limited student engagement [5]. AI addresses these concerns by providing immediate responses, generating content, and supporting the writing process [6–8].

Students' awareness of generative AI writing tools is increasing, encompassing conceptual, technical, and practical knowledge. Conceptually, students need to understand how these tools generate human-like content using language models and neural networks [6,7]. Technically, familiarity includes knowledge of Recurrent Neural Networks, transformer models, and programming languages employed in AI development [6]. Practically, students' experience using AI for tasks such as article and poetry generation indicates deeper engagement with these technologies [7,8]. Furthermore, awareness extends to ethical concerns, including bias, misinformation, and privacy, as well as engagement and curiosity in evaluating AI-generated outputs [9,10]. Despite these benefits, students' express concerns about plagiarism, loss of originality, and threats to academic integrity [9–11]. Fears include unintentionally submitting AI-generated content, over-reliance on AI hindering critical thinking and creativity [11,12], and misuse of sensitive data [13]. Limited technical skills, unequal access [14], and potential negative impacts on long-term academic and career development [15] further complicate AI adoption.

Nonetheless, students recognize numerous benefits of generative AI writing tools. AI can promote equitable education by providing digital resources to underserved regions [16]. It enhances interactivity, offers immediate feedback, and supports personalized learning [17–19]. AI tools facilitate collaboration between students and teachers, boost productivity, save time, improve access to diverse educational materials, and automate instructional tasks [20]. Beyond convenience, generative AI supports higher-order cognitive skills, stimulating creativity, critical thinking, and innovation [21]. Global studies have explored student perceptions of AI writing tools such as Chat GPT. In the U.S., social science students who perceived Chat GPT as useful and easy to use reported better academic outcomes [22]. Mexican students displayed mixed perceptions, with many not yet using Chat GPT for academics [23]. Chinese students generally welcomed generative AI, noting its benefits for writing and research but expressing concerns about misinformation, ethics, and developmental impacts [24]. UK students acknowledged AI's academic advantages but raised concerns about plagiarism [25]. In India, students perceived Chat GPT positively for ease of use and innovation [26], while Pakistani students were divided, citing its effect on creative writing [27]. Vietnamese students valued its efficiency and feedback, but struggled with evaluating sources [28]. Kazakhstan students held favorable attitudes toward Chat GPT, unaffected by demographics [29]. Studies in Saudi Arabia, Greece,

Spain, and Jordan similarly highlighted benefits such as awareness, engagement, and ease of use, alongside concerns over originality, critical thinking, and plagiarism [30–35].

Methods

A comprehensive literature search was conducted to identify peer-reviewed studies focusing on the use of Artificial Intelligence (AI) in writing within educational contexts. Databases such as Google Scholar, ERIC, Scopus, and JSTOR were utilized due to their broad access to scholarly resources. Search terms included combinations like “Artificial Intelligence writing,” “AI in education,” “generative AI,” “AI-assisted writing,” and “writing enhancement.” The search was limited to publications from 2020 to 2023, a period marked by significant advances in generative AI, especially in educational applications, ensuring the relevance of selected literature to current developments.

Inclusion criteria required that studies be peer-reviewed, focused on AI applications in educational writing (across primary to tertiary levels), and contain empirical data. Excluded were articles outside the education context, studies lacking empirical evidence (e.g., opinion pieces, editorials), and English articles translated from other languages, which could introduce interpretation bias. This ensured a focused, credible set of sources aligned with the review's objectives.

From each selected study, key information was extracted: author, year, research design (qualitative, quantitative, or mixed methods), and findings related to AI's impact on writing. This facilitated thematic comparisons and helped trace the evolution of scholarly interest in the topic. To minimize bias, all included studies were evaluated using the PRISMA checklist, emphasizing research clarity, methodological soundness, data collection techniques, and validity of conclusions. Prioritizing studies that met PRISMA standards ensured high-quality evidence.

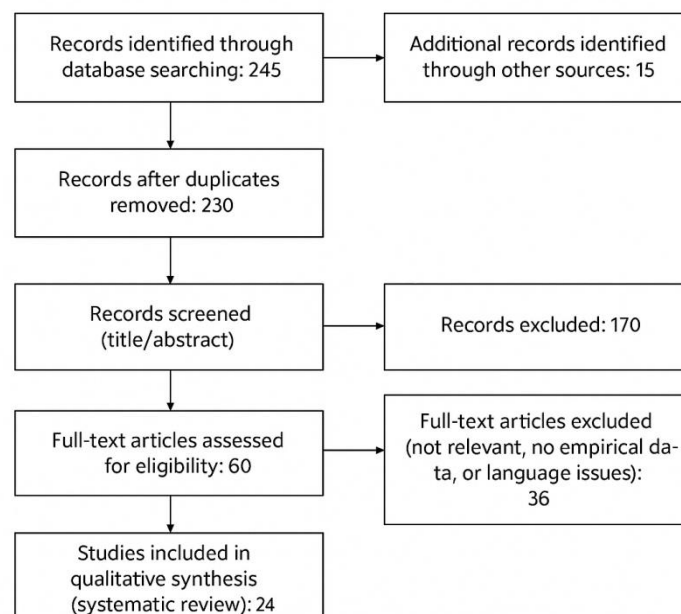


Figure 1. PRISMA Flow Diagram

Results

The systematic review included 24 peer-reviewed studies examining AI applications in writing education across the U.S., Europe, Asia, and Australia. AI tools were found to enhance learning outcomes and writing skills across different educational contexts. For instance, U.S. research focused on college-level writing, while European studies examined primary and secondary education, demonstrating AI's adaptability. The key applications and benefits of AI in writing instruction are summarized in the tables below. It summarizes the main ways AI is applied to support students in writing, including idea generation, essay evaluation, storytelling, and feedback provision.

Table 1. Key Applications of AI in Writing Instruction

Application	Description	Key Findings	Reference
Idea Generation	AI tools assist with brainstorming and structuring content	Students using AI produced higher-quality essays	Ahmed et al., 36
Essay Evaluation	Provides instant feedback on grammar, coherence, and structure	Continuous AI feedback improved writing performance	Gültekin, 37
Storytelling Assistance	Supports creative writing, narrative structure, and character development	AI-enhanced storytelling quality and creativity	38
Feedback Provision	Offers tailored suggestions for grammar and style	AI feedback promoted effective revision and reflective learning	39

Table 2 highlights the main advantages of integrating AI into writing education, focusing on personality, efficiency, and student engagement.

Table 2. Benefits of AI in Writing Education

Benefit	Description	Supporting Evidence
Personalization	AI adapts to individual student needs, offering customized support	Anand & Acharya, 40
Efficiency	Streamlines feedback delivery, allowing educators to focus on higher-order tasks	Liao et al., 41
Engagement	Increases student participation and motivation, leading to improved writing outcomes	Kim et al., 42

Discussion

Integrating AI in writing instruction has significant implications for both educators and students. Educators must adapt their teaching strategies to incorporate AI as a supportive tool rather than a replacement for traditional methods [43]. This involves not only understanding AI technologies but also guiding students in ethical usage, authorship awareness, and critical assessment of AI-generated content [44,45]. Professional development and training are essential for teachers [46], while a participatory, inquiry-based teaching approach can help students see AI as a collaborator rather than a crutch [47]. For students, AI tools enhance creativity, content generation, and revision [48]. However, to benefit fully, they must develop evaluative skills to distinguish high- from low-quality outputs and understand AI's limitations in creativity and analysis [49]. When integrated thoughtfully, AI supports traditional writing instruction and enriches both learning and teaching experiences [50].

Future studies should examine the long-term effects of AI on students' writing and critical thinking, as well as ethical concerns such as authorship and academic honesty [51]. Research should also explore multicultural and multilingual applications of AI to ensure equitable educational access across diverse student populations. Investigating best practices for integrating AI into various pedagogical models, such as collaborative writing or curriculum-based projects, is another critical area. Finally, the emotional and psychological effects of AI use on students' motivation, confidence, and self-efficacy should be analyzed to better understand.

Conclusion

This review highlights the informativeness impact of AI on writing instruction, emphasizing its benefits such as personality, efficiency, and increased engagement, while acknowledging limitations including ethical risks, reliability concerns, and unequal access. AI-generated feedback may reflect biased data, potentially affecting student learning, and the blurring of authorship boundaries raises issues of plagiarism and academic integrity. Furthermore, socioeconomic disparities limit access to AI tools in under-resourced settings. To enhance education meaningfully, AI integration must be strategic, inclusive, and ethically grounded. Future research should continue exploring under-examined areas, including long-term educational outcomes, cultural adaptability, and the emotional impact of AI on students, to fully realize its potential in writing education [47,51-53].

Conflict of interest. Nil

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