REVIEW ARTICLE

EFL students' perceptions of AI-assisted writing tools: A systematic narrative hybrid review

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Abstract

This study explores EFL students' perceptions of AI-assisted writing tools through a systematic narrative hybrid review of 19 open-access studies published between 2020 and 2025 by employing a structured selection process presented via a PRISMA flow chart. As AI tools like ChatGPT, Grammarly, and Turnitin become more prevalent, understanding their impact on students' writing skills, self-directed learning, and academic integrity is essential. Data were collected from ERIC, ULAKBİM, Google Scholar, and ResearchGate, using a multi-stage search. Using SWOT and descriptive content analysis, the study examines AI tools' benefits, challenges, and pedagogical implications in EFL writing. Findings suggest that AI improves efficiency, accuracy, idea generation, and personalized learning, yet concerns include over-reliance, plagiarism risks, and ethical issues. By addressing these factors, the study suggests the need for best practices in AI integration into ELT curricula. It emphasizes the need for teacher training, AI literacy programs, and ethical guidelines to ensure responsible AI use while maximizing its benefits.

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Keywords
AI-assisted writing, AI literacy, EFL student perceptions, Ethical guidelines, SWOT, descriptive content analysis.

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Introduction

The swift progress of Artificial Intelligence (AI) has had a profound impact on multiple fields, particularly education, where it has been integrated into numerous teaching and learning processes. AI technologies have enhanced personalized learning, adaptive assessment, and content generation, making education more efficient and tailored to individual needs. In English language teaching (ELT), AI-driven applications have introduced fresh opportunities for both teachers and students, particularly with the rise

of AI-assisted and AI-powered writing tools. AI-assisted writing tools support the writing process by enhancing human efforts without replacing them entirely. These tools can help with tasks such as grammar correction, vocabulary enhancement, and idea generation, yet human input remains crucial. For instance, AI-assisted tools might suggest improvements or corrections to a piece of writing, but the learner still plays an active role in shaping the content and making final decisions (Aue & Lee, 2023). In contrast, AI-powered tools are often designed to autonomously generate content, analyze text, or assist in language learning with minimal human intervention. These tools can automate different stages of the writing process, improving efficiency but also sparking concerns about excessive reliance on technology.

This section examines the history and development of AI in educational settings, and its integration into ELT, especially its impact on writing skills by using AI-assisted writing tools. It also highlights both the benefits and challenges that these technologies bring to language learners and educators.

Historical background of artificial intelligence and its impacts on education

The roots of Artificial Intelligence (AI) date back to the mid-20th century, when early researchers began investigating methods to build machines capable of mimicking human intelligence. Initial AI endeavors concentrated on creating rule-based systems and symbolic reasoning, where machines were programmed to carry out tasks according to predetermined rules and logical frameworks. These foundational approaches are often referred to as "symbolic AI" or "good old-fashioned AI" (GOFAI). The goal was to imitate human cognitive functions, like problem-solving and decision-making, by manipulating symbols and abstract ideas. (Russell & Norvig, 2016). These systems laid the groundwork for the future evolution of AI, although they were limited in scope and flexibility. In the years that followed, the emergence of machine learning (ML) algorithms brought a major transformation to AI research. Instead of depending on predefined rules, machine learning allowed systems to learn from data, continuously enhancing their performance as they gained more experience. This transition from rule-based to learning-based systems opened the door to more sophisticated AI applications. The introduction of neural networks, computational models modeled after the human

brain's structure and functions, significantly broadened the potential of AI. Deep learning models, a type of neural network, performed exceptionally in tasks such as visual recognition, voice processing, and comprehending natural language. (Nilsson, 2010). The acceleration of AI development has been fueled by the exponential increase in computational power and the availability of vast amounts of data. These factors have made it possible for AI systems to analyze and process information on a previously unimaginable scale.

Today, AI is not just about automating tasks but also about augmenting human capabilities, improving decision-making processes, and enabling new forms of interaction between humans and machines. With the ongoing advancement of AI, its influence on various sectors, including education, is becoming more profound. It has transformed education through tailored learning experiences, dynamic assessments, and innovative content generation, providing fresh approaches to student engagement and teacher support (Luckin et al., 2016). Moreover, AI-driven tools used in education are now capable of delivering instant feedback, generate customized learning materials, and even simulating complex classroom environments, transforming how education is delivered and experienced across the globe. As AI research continues to progress, we can expect to see even more transformative applications that will shape the future of education and other industries.

The increasing importance of digital literacy

With the improvement of computer technology and the emergence of various digital applications that we are exposed to and use in our daily lives the 21st century has brought a new term, ‘’digital literacy’’ which involves critically evaluating information, communicating through digital tools, and practicing ethical behavior online (Hague & Payton, 2010). Also, it includes not only the ability to navigate and create digital content but also the capacity to engage responsibly with emerging technologies such as artificial intelligence (Ng, 2012). With the rise of AI, there is a growing need for AI literacy—an understanding of how AI systems work, their societal impacts, and how to interact with them effectively. Ng (2012) emphasizes that digital literacy encompasses cognitive,

technical, and social-emotional skills, all of which are also essential when engaging with AI technologies. Integrating AI literacy into digital literacy equips individuals with the tools to not only consume AI-driven content but also to question and shape how AI influences their digital environments, education, and daily decision-making.

Artificial intelligence in English language education with a special focus on writing skills

Artificial Intelligence (AI) has significantly influenced education, especially in English language teaching (ELT). Overall, AI has reshaped the educational environment by introducing adaptive learning platforms, intelligent tutoring technologies, and automated evaluation tools. These AI-driven systems offer customized learning experiences and instant feedback, enabling students to progress at their own pace (Chen et al., 2020). For example, intelligent tutoring systems utilize algorithms to assess student progress and deliver personalized learning resources (Zawacki-Richter et al., 2019). Although AI offers many advantages, issues such as data privacy, algorithmic bias, and the dynamics of teacher-student interaction continue to be key concerns (Selwyn, 2019). Nevertheless, AI continues to enhance accessibility, engagement, and learning outcomes, thus reshaping modern education (Holmes et al., 2021).

In the realm of ELT, AI has been increasingly utilized to support language acquisition through applications such as chatbots, speech recognition systems, and automated feedback mechanisms. These technologies provide learners with interactive and immersive learning experiences, helping them develop language skills more effectively (Godwin-Jones, 2019). AI-powered platforms like Duolingo and Grammarly enable learners to practice language skills, offering instant corrections and suggestions to enhance learning (Xu et al., 2022). While AI has proven beneficial in ELT, scholars emphasize the importance of balancing human interaction with AI-assisted learning to ensure comprehensive language development (Ranalli, 2021). AI writing tools have emerged as significant assets in language education, offering support in improving writing skills. Applications such as Grammarly, QuillBot, and ChatGPT offer automated evaluations of grammar, coherence, and writing style (Bai & Wang, 2023). These AI-driven assistants help learners enhance writing accuracy and fluency by offering real-

time suggestions (Hao & Wang, 2021). Nevertheless, worries persist about excessive dependence on AI tools and the possible reduction in critical thinking abilities (Kessler, 2020). Teachers emphasize that AI writing tools should be considered supplementary resources, not replacements for human involvement, and encourage their responsible use in language learning (Zhang & Yu, 2021). As these applications keep advancing, additional research is necessary to evaluate their lasting effects on students' writing skills and cognitive involvement. AI technologies, especially those targeting writing skills, have transformed English language teaching by providing tailored, effective, and easily accessible learning opportunities. While there are challenges and concerns surrounding their integration, to shed light on the information in the literature, this study aims to answer the following questions:

- What are the key strengths and weaknesses of AI writing tools based on EFL students' perceptions?
- What opportunities and challenges do AI writing tools present for students?
- How can students maximize the benefits of AI writing tools while overcoming their disadvantages?

Methodology

This study employs a systematic narrative hybrid review as its research methodology. A systematic narrative hybrid review is a type of review that combines both systematic and narrative review methods to synthesize existing research. The systematic aspect of this approach involves a structured and transparent process for selecting and evaluating studies, ensuring that the review is comprehensive and minimizes bias. It includes a clear search strategy, predefined inclusion and exclusion criteria, and a rigorous assessment of the quality of the studies included (Pope et al., 2007). The narrative aspect allows for a more flexible and descriptive synthesis of the findings, offering a broader understanding of the topic by integrating qualitative insights from the studies (Snilstveit et al., 2016). While systematic reviews offer a reproducible framework for identifying relevant studies, narrative reviews provide deeper insights into contextual nuances and emerging trends. The hybrid nature of this methodology offers a balanced approach, enabling researchers to capture a comprehensive and nuanced understanding of the topic

(Dixon-Woods et al., 2006). A hybrid approach combines the structured methodology of a systematic review with the interpretive depth of a narrative review. This balance helps researchers maintain transparency while also exploring complex ideas and patterns across studies (Snyder, 2019). Moreover, the systematic elements ensure a comprehensive and unbiased review of the literature, while the narrative synthesis allows for an exploration of meanings, themes, and contextual dynamics (Grant & Booth, 2009). A systematic narrative hybrid review for this study allows for a comprehensive analysis of diverse studies on AI-assisted writing tools in English language teaching (ELT). The combination of systematic rigor and narrative synthesis enables the study to highlight not only the research outcomes but also in-depth insights into learners' perceptions and experiences. By using this approach, the review offers a comprehensive insight into the role and influence of AI in ELT writing instruction from the students' point of view. The systematic part of the study ensures that a wide range of studies were chosen systematically as there are clear inclusion and exclusion criteria. Furthermore, the narrative part of the study provides a deeper understanding of qualitative insights, contextual factors, and student voices. As a hybrid review provides a structured reliability of a systematic approach, while the interpretive power of narrative reviews is particularly suited for educational research focused on human experiences, perceptions, and beliefs. The study followed a deductive (top-down) process of content analysis to synthesize and analyze existing literature and theoretical frameworks. This approach starts by selecting relevant theories or conceptual frameworks that will guide the review process. The researchers employed these theoretical lenses to create a set of predefined categories or codes, which are then applied to the body of literature being reviewed. The goal is not to generate new data but to categorize and interpret existing studies in relation to the chosen theories. By doing so, the researchers' aim was to assess how well-established theories applied to the collected studies identify gaps, confirm earlier findings, or propose new theoretical directions. This method provides a structured way to critically review and synthesize the existing body of knowledge, focusing on understanding the consistency or divergence of findings across different studies rather than generating new empirical insights (Booth, et al., 2016).

Selection of the studies

The databases ERIC and Ulakbim, along with Google Scholar (a widely-used academic search engine rather than a database) were searched to access a broader range of relevant studies. The advanced search functions were used with the filters set to open-access articles published between January 1, 2020, and January 20, 2025. Search terms included word strings such as “AI,” “AI writing,” “AI-assisted writing,” or “AI tools” in combination with “EFL,” and additional keywords such as “learner beliefs,” “student perspectives,” “learner perspectives,” or “student beliefs.” These keywords were first searched in the titles, and then in the abstract sections. Additionally, ResearchGate was consulted as an alternative source to retrieve full-text versions of articles that were unavailable through ERIC and Ulakbim. Other academic databases such as Web of Science and Scopus were not included in the search due to institutional limitations regarding full-text access and search functionality. These databases were chosen due to their wide accessibility and comprehensive research coverage in education and technology (Bozkurt, 2020). As a result, a total of 19 studies were selected after this multi-stage screening process, ensuring alignment with the research objectives. This iterative search strategy aligns with best practices in literature reviews, as recommended by Snyder (2019), who highlights the importance of gradually refining search terms to ensure relevant and high-quality study selection.

Inclusion criteria

- Open-access, ensuring free and full access for analysis.
- Published between January 2020 and January 2025 to reflect current trends and technological developments.
- Written in English to maintain consistency in language and ensure accurate analysis.
- Conducted in EFL (English as a Foreign Language) contexts, aligning with the study's focus.
- Focused on student perceptions, beliefs, attitudes, or experiences, excluding

purely technical evaluations.

- Investigated the use of AI, AI writing tools, AI-assisted writing, or generative AI (e.g., ChatGPT, Grammarly).
- Published in peer-reviewed academic journals, ensuring scholarly rigor.
- Provided empirical evidence (qualitative, quantitative, or mixed methods).
- Contained relevant keywords in the title or abstract, facilitating keyword-based screening.

Exclusion criteria

- Not open access (e.g., behind paywalls).
- Published before 2020.
- Written in languages other than English.
- Focused on ESL, native English, or bilingual immersion contexts.
- Centered on teacher-only perspectives or tool developers' viewpoints.
- Dealt with technical performance or tool design, not student experience.
- Included both student and teacher views without clear student-specific findings.
- Theses, dissertations, reports, or conference proceedings (grey literature).
- Full-text access not provided.
- Lacked relevant keywords in the title or abstract related to AI and writing.

Table 1.

Summary of article selection process

Database-Source	Search Strings Used	Articles Found
Ulakbim	-"AI writing student perspectives EFL" (36) -"AI writing learner perspectives EFL" (17) -"AI writing student beliefs EFL" (8) -"AI writing learner beliefs EFL" (4)	65
ERIC	-"AI writing student" (67) -"AI writing learner" (27) -"AI writing perspective" (10)	104
Google Scholar	-"AI student perspective writing"	7

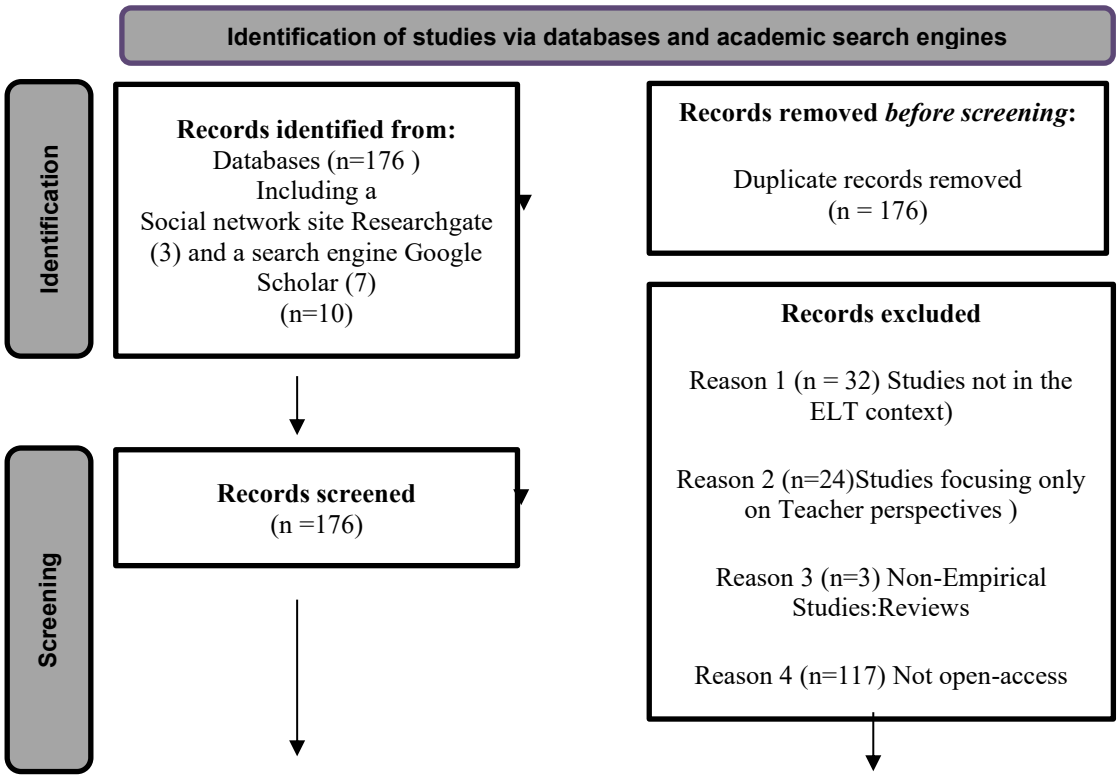
ResearchGate	-Used to access full texts not available in ERIC/Ulakbim	(Not additional)
Total Texts Scanned		176
After Title & Abstract Review	Relevant articles identified	27
After Full-Text Analysis	Articles meeting final inclusion criteria	**19**

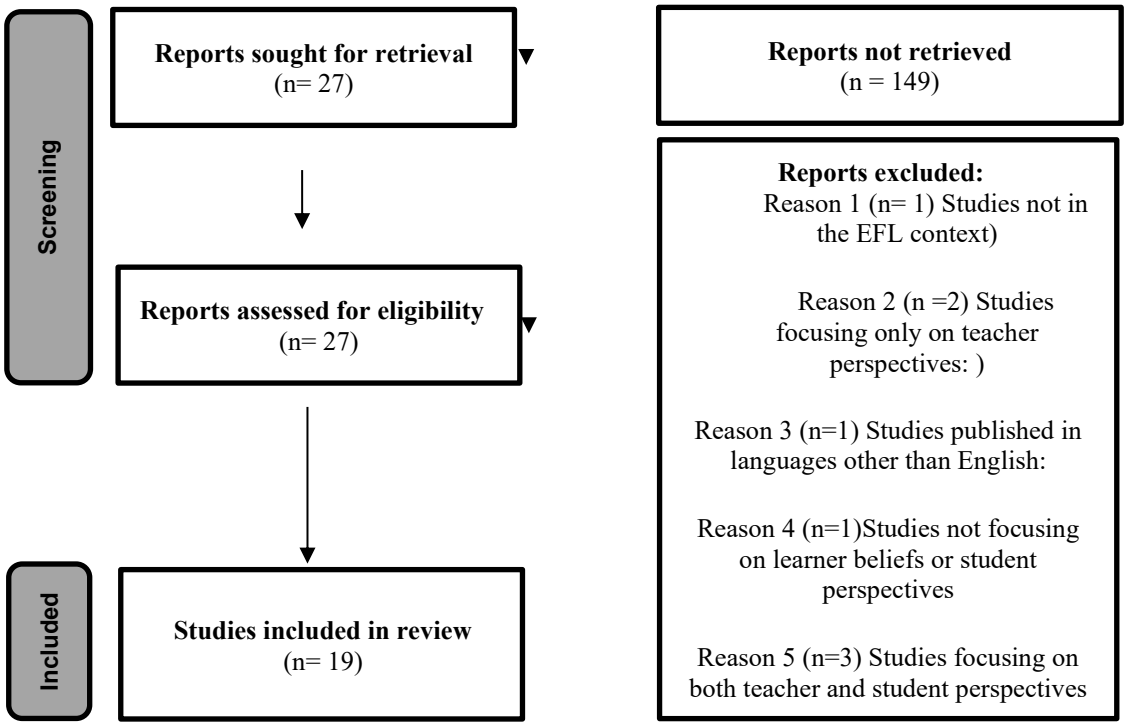
Table 1. below provides a concise summary of the article selection process, including the databases (Ulakbim, ERIC), search engine (Google Scholar) and academic social site (ResearchGate) used, keyword strings applied, the number of articles retrieved at each stage, and the final number of studies included after full-text analysis. It outlines the systematic approach taken to ensure the relevance and quality of the studies selected for the review.

The PRISMA chart below shows the flow of the selection process in detail.

Figure 1.

PRISMA flow chart showing the selection process of the studies





Selected based on the inclusion and exclusion criteria, Table 2 below presents the articles examined in this study, including information on the authors, AI tools referenced, the countries of origin, and the source type (article). It showcases a range of AI tools, such as ChatGPT, Grammarly, and Google Translate, across different countries like China, Japan, Indonesia, and Saudi Arabia, reflecting the extensive adoption of AI in education.

Table 2.

Articles analyzed in the study

N	Authors	AI Tools Mentioned	Country
1	Kim, J., Yu, S., Detrick, R., & Li, N. (2024)	ChatGPT	China
2	Gayed, J. M., Carlon, M. K. J., Oriola, A. M., & Cross, J. S. (2022)	AI-based writing assistant (AI KAKU)	Japan
3	Artiana, N., & Fakhrurriana, R. (2024)	ChatGPT	Indonesia
4	Malik, A. R., Pratiwi, Y., Andajani, K., Numertayasa, I. W., Suharti, S., Darwis, A., & Marzuki, M. (2023)	Artificial Intelligence (AI)	Indonesia
5	Thangthong, P., Phiromsombut, J., & Imsa-ard, P. (2024)	Grammarly, Quillbot	Thailand
6	Ozfidan, B., El-Dakhs, D. A. S., & Alsalim, L. A. (2024)	ChatGPT, Grammarly, Google Translate	Saudi Arabia
7	Liang, J., Huang, F., & Teo, T. (2024)	Grammarly	China
8	Duong, T.-N.-A., & Chen, H.-L. (2025)	AI chatbot (WAB)	Vietnam

9	Polakova, P., & Ivenz, P. (2024)	ChatGPT	Czech Republic
10	Launonen, P., Talalakina, E., & Dubova, G. (2024)	ChatGPT	Finland
11	Gasaymeh, A.-M.M., Beirat, M.A., & Abu Qbeita, A.A. (2024)	ChatGPT, Jasper AI, Copy.ai, Writesonic, Rytr, Wordtune, Grammarly, ShortlyAI, QuillBot, INK Editor, Scribe	Jordan
12	Kramar, N., et al. (2024)	Google Translate, Turnitin, Grammarly, ChatGPT	Ukraine
13	Teng, M. F. (2024)	ChatGPT	China
14	Friatin, L. Y. (2025)	Canva AI Magic Writer	Indonesia
15	Alkamel, M. A. A., & Alwagieh, N. A. S. (2024)	ChatGPT	Yemen
16	Anani, G. E., Nyamekye, E., & Bafour-Koduah, D. (2025	ChatGPT, Grammarly	Ghana
17	Nadhifah, A. S., Syukur, H. N., Haryanto, M. F., Luthfiyyah, R., & Rozak, D. R. (2024)	AI tools (not specifically mentioned)	Indonesia
18	Yelliza, Siska, M. K. Ikhsan, & Satria, W. (2024)	Diffit, Brisk, Mendeley	Indonesia
19	Tran, H. N., & Nguyen, L. T. (2024)	ChatGPT	Vietnam

Data analysis

The data analysis in this study employs a two-pronged approach that integrates SWOT analysis and descriptive content analysis, aimed at evaluating AI-assisted writing tools in academic contexts, specifically in EFL writing instruction. This combined methodology allows for a comprehensive exploration of the strengths, weaknesses, opportunities, and threats associated with AI tools, as well as a detailed categorization and synthesis of qualitative findings from the selected studies.

SWOT analysis

SWOT analysis serves as the primary framework for evaluating the AI-assisted writing tools. This strategic assessment tool helps identify internal and external factors influencing the use of AI in academic writing. The internal strengths include factors like efficiency, improved writing quality, and increased accessibility for non-native speakers. Weaknesses, on the other hand, encompass over-reliance on AI, concerns regarding the loss of creativity, and ethical issues related to AI-generated content. The external opportunities that arise from AI integration in academic writing include personalized learning experiences, enhanced collaboration among students, and broader

access to writing support. Meanwhile, the threats identified through SWOT analysis include academic integrity issues, such as plagiarism, and digital equity concerns, particularly in under-resourced educational settings (Gürel & Tat, 2017). Through this framework, the study highlights the advantages and challenges of integrating AI tools in writing instruction, offering insights on their effective use and potential risks.

Descriptive content analysis

Descriptive content analysis was employed to analyze and categorize qualitative data from the reviewed literature systematically. This qualitative research technique involves categorizing, structuring, and interpreting text to identify recurring themes and trends (Elo & Kyngäs, 2008). The themes that emerged in the literature, such as "Efficiency in the Writing Process," "Support for Non-Native Speakers," "Over-reliance on AI," and "Ethical Concerns," were mapped into the SWOT framework to provide a more structured and comprehensive understanding of the impact of AI-assisted writing tools. The content analysis follows a top-down approach, beginning with predefined themes based on the literature and gradually expanding to more specific subthemes as the data is processed.

Integration of SWOT and content analysis

By combining SWOT analysis and descriptive content analysis, the study provides a holistic assessment of AI-assisted writing tools in academic contexts. SWOT analysis offers strategic insights into the strengths, weaknesses, opportunities, and threats of AI tools, while content analysis provides a systematic, qualitative exploration of the key themes associated with AI integration in writing instruction. The integration of these two methodologies ensures a well-rounded and rigorous analysis, offering both practical and theoretical implications for educators, policymakers, and researchers in English language teaching.

The data analysis process is both transparent and replicable, as it follows a clear methodological approach that can be applied in future studies. As in qualitative research, the concept of trustworthiness is pivotal to ensure the rigor and validity of a study, the systematic categorization of themes and verification applied to the study's ensured dependability and confirmability, along with reinforcing the accuracy and consistency

of the findings. Lincoln and Guba (1985) introduced four criteria to assess trustworthiness: credibility, transferability, dependability, and confirmability. To enhance credibility, the study employed cross-verifying process for the categorization of subthemes using ChatGPT, ensuring consistency and minimizing researcher bias. Transferability was addressed by providing a detailed description of the research context, data sources, and analysis procedures, allowing readers to assess the applicability of the findings to similar EFL contexts. Dependability was reinforced through a transparent and systematic analysis process, utilizing well-established methods such as SWOT analysis and descriptive content analysis, which can be replicated in future studies. Finally, confirmability was strengthened by relying on data-driven theme development and external verification through AI support, ensuring that the findings reflect the data itself.

Findings

This section delineates the principal findings of the study, offering a comprehensive analysis of the integration of artificial intelligence (AI) tools into academic writing. Initially, an overview of the distribution of articles over the years is presented, revealing patterns in scholarly interest and research development. Subsequently, the AI tools referenced across the selected studies are identified and analyzed, followed by an examination of the frequency and geographical distribution of countries represented in the corpus. Particular attention is given to the diversity of AI tool utilization across different national contexts, highlighting variations in adoption, application, and educational integration.

The findings further explore the perceived benefits of AI-assisted writing tools, particularly in terms of enhancing writing efficiency, improving language proficiency, and increasing accessibility for a broader range of learners. Conversely, critical challenges and ethical concerns are addressed, including issues related to plagiarism, questions of authorship authenticity, and the potential erosion of critical thinking skills among students.

In addition, the section examines student perceptions of AI's role in academic writing, encompassing both supportive and critical perspectives. A detailed content analysis of AI tools is conducted through the integration of a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis, providing a structured evaluation of AI's role within academic writing practices. The section concludes with recommendations for the ethical and responsible use of AI technologies in academic settings, emphasizing the necessity of balancing technological innovation with the preservation of academic rigor and integrity.

Table 3.

The AI tools mentioned in the selected studies

AI Tools	Frequency	Percentage (%)
ChatGPT	11	57.89
Grammarly	6	31.58
Google Translate	2	10.53
AI-based writing assistant (AI KAKU)	2	10.53
Brisk	1	5.26
Diffit	1	5.26
Canva AI Magic Writer	1	5.26
Turnitin	1	5.26
Scribe	1	5.26
INK Editor	1	5.26
QuillBot	1	5.26
Wordtune	1	5.26
Shortly AI	1	5.26
Rytr	1	5.26
Writesonic	1	5.26
Copy.ai	1	5.26
Jasper AI	1	5.26
AI chatbot (WAB)	1	5.26
Mendeley	1	5.26

As seen in Table 3 above, ChatGPT is the most commonly mentioned AI tool, appearing in 11 articles, representing 57.89% of the total mentions. This suggests ChatGPT is widely recognized and utilized in the educational context of the study. Grammarly is , mentioned in 6 articles (31.58%), indicating that it is a popular tool, especially for writing assistance. Google Translate and AI KAKU are mentioned in 2 articles (10.53%), suggesting it's still a relevant tool for translation and language support in education, though not as widely used as ChatGPT or Grammarly. Several other tools, such as ShortlyAI, Brisk, Diffit, Canva AI Magic Writer, Turnitin, Scribe, INK Editor, QuillBot, Wordtune, and others, are each mentioned in just 1 article, making up a

smaller portion of the tools referenced (5.26% each). These tools are either less commonly used or serve niche purposes in specific academic or professional contexts. The diversity of tools in the table shows that while ChatGPT and Grammarly dominate, there is still a variety of AI tools that continue to be explored across different research contexts.

Table 4.

The frequency of countries in the selected studies

Countries	Frequency
Indonesia	5
China	3
Vietnam	2
Japan	1
Thailand	1
Saudi Arabia	1
Czech Republic	1
Finland	1
Jordan	1
Ukraine	1
Yemen	1
Ghana	1

As seen in Table 4 above, Indonesia has the highest occurrence with five articles, indicating it is the most active country in the study regarding the use of AI tools in educational contexts. China comes second with 3 articles, suggesting a significant but somewhat smaller presence in comparison to Indonesia. Vietnam follows with 2 articles, showing some engagement with AI tools in education, though less prevalent than Indonesia and China. Other countries, such as Japan, Thailand, Saudi Arabia, Czechia , Finland, Jordan, Ukraine, Yemen, and Ghana, are each represented by 1 article, reflecting a smaller yet diverse group of countries exploring AI tools in education. Overall, the table highlights that Indonesia and China are the most prominent countries in the study, while other countries are represented with a single article each, demonstrating a global interest in AI's educational applications but with varying levels of involvement.

Table 5.

Diversity of AI tools across countries

Countries	AI Tools Mentioned	Tools List
Jordan	11	ChatGPT, Jasper AI, Copy.ai, Writesonic, Rytr, Wordtune, Grammarly, ShortlyAI, QuillBot, INK Editor, Scribe
Indonesia	5	ChatGPT, Grammarly, Google Translate, QuillBot, Mendeley
China	4	ChatGPT, Grammarly, Google Translate, AI-based writing assistant (AI KAKU)
Ukraine	4	Google Translate, Turnitin, Grammarly, ChatGPT
Saudi Arabia	3	ChatGPT, Grammarly, Google Translate
Ghana	2	ChatGPT, Grammarly
Vietnam	2	ChatGPT, an AI chatbot (WAB)
Thailand	2	Grammarly, Quillbot
Japan	1	AI-based writing assistant (AI KAKU)
Czech Republic	1	ChatGPT
Finland	1	ChatGPT
Yemen	1	ChatGPT

According to Table 5 above, Jordan stands out with 11 tools listed, showing a diverse use of AI tools including ChatGPT, Jasper AI, Writesonic, and others for various writing and editing tasks. Indonesia has the second highest number of AI tools listed (5), including well-known tools like ChatGPT, Grammarly, and Google Translate, as well as others such as QuillBot and Mendeley. China and Ukraine follow with 4 tools, including ChatGPT, Turnitin, Grammarly, Google Translate, and a local AI-based writing assistant called AI KAKU. Saudi Arabia is mentioned with 3 tools, while Vietnam, Thailand, and Ghana each mention 2 tools. Vietnam uses ChatGPT and an AI chatbot (WAB), while Thailand uses Grammarly and QuillBot, and Ghana uses Chatgpt and Grammarly. Japan, Czechia, Finland, and Yemen have the fewest tools mentioned, AI KAKU in Japan and ChatGPT in Yemen, Czechia and Finland.

The themes of the data were integrated in accordance with the SWOT analysis frame, while the subthemes were created thematically via gathering similar and repeated codings that represent all the small units of the examples derived from the study. The subthemes extracted from the studies were also pre-determined and a top-down process was followed where the subthemes were compared with the existing literature, which also ensures the reliability of the study.

The table below provides a structured analysis of the role of AI-driven writing tools in writing contexts using the SWOT (Strengths, Weaknesses, Opportunities, and Threats) framework. It categorizes the various ways AI tools influence the writing process, drawing on existing literature to support each point. The table serves as an overview of key themes that will be discussed in greater detail in the findings section.

Table 6.

Content analysis of AI tools in academic writing with the integration of SWOT analysis

Themes	Subthemes	Examples gathered from the studies
Strengths	Efficiency in the writing process	AI tools like ChatGPT and Grammarly help accelerate drafting, editing, and refining content, allowing students to complete assignments more quickly (Artiana & Fakhrurriana, 2024; Kim et al., 2024).
	Improvement in writing quality	AI-powered tools improve sentence structure, coherence, and fluency in academic essays (Malik et al., 2023; Polakova & Ivenz, 2024).
	Support for non-native speakers	AI tools assist non-native speakers by suggesting appropriate word choices and improving sentence structure (Duong & Chen, 2025; Kim et al., 2024).
	Idea generation and overcoming writer's block	AI tools assist in brainstorming, providing outlines, and suggesting alternative phrasings, making the writing process less stressful (Gasaymeh, Beirat, & Abu Qbeita, 2024; Ozfidan et al., 2024).
	Support for academic integrity	AI tools help with plagiarism detection, citation generation, and multilingual writing, ensuring the originality and accessibility of content (Malik et al., 2023; Kramar et al., 2024).
Weaknesses	Impediment of autonomous writing skills	AI-driven writing tools can impede students' capacity to cultivate autonomous writing abilities, analytical reasoning, and original thought (Kim et al., 2024; Malik et al., 2023; Teng, 2024).
	Inaccuracy and lack of contextual depth	AI-generated content may contain inaccuracies or lack the depth needed for specialized academic fields (Kim et al., 2024; Kramar et al., 2024; Malik et al., 2023).
	Struggles with complex topics and interdisciplinary research	AI tools often fail with nuanced arguments or interdisciplinary topics, limiting their usefulness in higher education (Malik et al., 2023; Ozfidan et al., 2024).
	Ethical concerns	Concerns about plagiarism and authorship arise when students rely on AI-generated content, with tools like QuillBot potentially enabling academic misconduct (Kim et al., 2024; Thangthong et al., 2024).
	Struggles with individual writing styles	AI tools may provide generic or inappropriate suggestions that do not fit individual writing styles or academic disciplines (Ozfidan et al., 2024; Malik et al., 2023).
Opportunities	Personalized writing assistance	AI can provide tailored feedback based on students' needs, improving writing quality and acting as "co-writing" assistants (Polakova & Ivenz, 2024).
	Support for	AI tools foster collaboration, allowing students to refine their

	collaborative learning	writing through peer feedback and teamwork (Duong & Chen, 2025; Thangthong et al., 2024).
	Ethical training and responsible AI use	Workshops and training programs can teach students how to use AI tools responsibly, focusing on avoiding over-reliance and ensuring academic integrity (Kim et al., 2024; Polakova & Ivenz, 2024).
	Cross-cultural academic collaboration	AI tools can help bridge language barriers and foster cross-cultural collaboration in academic writing (Alkamel & Alwagieh, 2024; Kramar et al., 2024; Malik et al., 2023).
	Development of specialized tools for disciplines	Future AI advancements may lead to tools specifically designed for academic writing in different disciplines (Kramar et al., 2024).
Threats	Academic integrity issues	AI tools raise issues related to plagiarism, dishonesty, and the risk of students submitting AI-generated content as their own work (Artiana & Fakhrurriana, 2024; Gayed et al., 2022; Kim et al., 20249.
	Over-reliance on AI tools	Excessive dependence on AI tools such as ChatGPT and Grammarly may impede the growth of critical thinking and writing abilities (Malik et al., 2023; Thangthong et al., 2024).
	Bias and inaccuracy in AI-generated content	AI-generated content may be biased or inaccurate, leading students to adopt incorrect or misleading ideas, especially in specialized academic fields (Artiana & Fakhrurriana, 2024; Malik et al., 2023).
	Resistance to AI adoption	There is resistance from educators and students, with concerns about the loss of traditional academic practices and the authenticity of AI-generated content (Launonen et al., 2024; Polakova & Ivenz, 2024).
	Access and equity issues	Unequal access to AI tools in rural or underprivileged areas creates disparities in academic performance, worsening the digital divide (Gayed et al., 2022; Ozfidan et al., 2024).
	Security and privacy concerns	Students and educators are concerned about data privacy and the risks of sharing sensitive academic information with AI platforms (Liang et al., 2024; Thangthong et al., 2024).
	Loss of writing skills	Overuse of AI tools could result in a decrease in essential writing and editing skills, as students may rely on technology instead of practicing these skills themselves (Liang et al., 2024; Thangthong et al., 2024).
	Technological limitations	Technical limitations such as inaccurate suggestions, glitches, or slow performance may diminish the effectiveness of AI tools (Duong & Chen, 2025; Kim et al., 2024).
	Ethical and manipulation concerns	There are ongoing debates over the ethical implications of AI-generated content, including manipulation and fairness (Ozfidan et al., 2024; Polakova & Ivenz, 2024).

The strengths of AI tools in improving academic writing efficiency, precision, and cognitive assistance

AI-powered writing tools have emerged as transformative aids in academic writing, offering a range of benefits that enhance efficiency, writing quality, and user engagement. One of the primary strengths of AI tools is their ability to accelerate the

writing process by assisting with drafting, editing, and refining content (Artiana & Fakhrurriana, 2024; Kim et al., 2024). By providing immediate feedback and suggestions, these tools help students complete assignments more quickly and effectively (Launonen et al., 2024). Another significant advantage of AI writing tools is their role in improving writing clarity, organization, and fluency. Research has shown that AI-powered platforms enhance sentence structure, coherence, and logical flow in academic essays (Malik et al., 2023; Polakova & Ivenz, 2024). Additionally, they help students expand their vocabulary and improve grammatical accuracy, reducing errors and making writing more polished (Thangthong et al., 2024; Liang et al., 2024). For non-native speakers, AI tools offer substantial language support by suggesting appropriate word choices and refining sentence structures, thus bridging the gap between different proficiency levels (Duong & Chen, 2025; Kim et al., 2024). Beyond structural improvements, AI tools also serve as valuable aids for brainstorming and helping to break through creative barriers. AI tools alleviate cognitive load through brainstorming aids and real-time suggestions, streamlining the writing process (Gasaymeh et al., 2024; Ozfidan et al., 2024). In particular, ChatGPT has been acknowledged for its contribution to improving student motivation, engagement, and self-directed learning by providing tailored feedback that fosters continuous improvement (Polakova & Ivenz, 2024; Teng, 2024). Furthermore, AI tools contribute to academic integrity and research support by assisting with plagiarism detection, citation generation, and multilingual writing. Tools like Grammarly, Turnitin, and Google Translate help students refine their academic work while ensuring originality and accessibility to diverse sources (Kramar et al., 2024; Malik et al., 2023). Their scalability also makes them valuable for large classes, offering personalized assistance without overwhelming instructors (Launonen et al., 2024). Overall, AI-powered writing tools have revolutionized the academic writing landscape by improving efficiency, language accuracy, structural coherence, and user confidence. Their accessibility and adaptability make them indispensable resources for students across various proficiency levels and disciplines, fostering more effective and independent writing practices.

Challenges of generative AI in academic writing: Impact on critical thinking, originality, and ethics

Based on multiple SWOT analyses from different studies conducted across various countries, several key weaknesses of AI writing tools, including ChatGPT, Grammarly, and AI-assisted paraphrasing tools, have been identified. Excessive use of AI tools may reduce students' ability to develop independent writing skills, critical thinking, and creativity, as highlighted in studies from China and Indonesia (Friatin, 2025; Kim et al., 2024; Malik et al., 2023; Teng, 2024). Some students struggle to modify AI-generated text to align with academic writing expectations, leading to standardized or formulaic outputs (Artiana & Fakhrurriana, 2024). The reliance on AI tools could discourage students from fully engaging in the writing process, affecting personal voice and originality (Gayed et al., 2022, Japan et al., 2025). Additionally, AI-generated content may contain inaccuracies, misleading information, or lack contextual depth, particularly in specialized academic fields (Kim et al., 2024; Kramar et al., 2024; Malik et al., 2023). Some AI tools struggle with complex topics, interdisciplinary research, or nuanced arguments, which limits their reliability in higher education settings (Malik et al., 2023; Ozfidan et al., 2024). Grammarly and Google Translate may provide overly simplistic suggestions or literal translations that fail to capture the intended academic meaning (Kramar et al., 2024). Ethical issues also emerge around plagiarism, authorship, and the proper use of AI-generated content in academic work (Kim et al., 2024; Ozfidan et al., 2024; Teng, 2024). Paraphrasing tools like QuillBot have been flagged as potential enablers of academic misconduct, as they can be misused to disguise plagiarism (Thangthong et al., 2024). AI-generated writing often lacks deep analytical insights, human-like feedback, and the ability to assess qualitative aspects of academic writing (Polakova & Ivenz, 2024). Students unfamiliar with AI tools may face difficulties in navigating their features effectively, leading to underutilization or improper use (Gasaymeh et al., 2024; Gayed et al., 2022). Some AI tools, such as Canva AI Magic Writer, require highly specific commands to generate effective responses, which can be challenging for users unfamiliar with prompt engineering (Duong & Chen, 2024). Moreover, AI tools do not always adapt well to individual writing styles or academic disciplines, resulting in generic or inappropriate suggestions (Malik et al., 2023; Ozfidan

et al., 2024). Machine-based assessments may overlook key aspects of writing quality that human evaluators prioritize, such as argument strength, coherence, and logical flow (Gayed et al., 2022). Some AI tools focus more on grammar and vocabulary but do not enhance complex writing elements like style, voice, or content depth (Thangthong et al., 2024). While AI-powered writing tools offer substantial benefits, their limitations highlight the importance of integrating them strategically into academic settings. Excessive dependence on AI may impede students' growth of independent writing abilities, while ethical issues regarding AI-generated content remain a topic of discussion. Future studies should aim to create AI tools that enhance, rather than replace, critical thinking and creativity in academic writing.

Emerging opportunities of AI in improving academic writing skills and fostering collaboration

AI tools offer numerous opportunities for integration into educational curricula, particularly in writing courses, where they can enhance skills like grammar checking, idea generation, and feedback (Anani et al., 2025; Gayed et al., 2022; Kim et al., 2024). These tools can support individualized learning, fostering personalized development for students (Launonen et al., 2024). AI's capacity to offer personalized writing support, adjusting feedback to students' needs, can enhance writing quality and can be used as co-writing assistants, giving feedback based on individual students' writing styles and levels (Polakova & Ivenz, 2024). Teachers can incorporate AI tools to enhance classroom learning, providing additional support and fostering collaboration, while also encouraging peer feedback and collaborative learning to help students refine their writing (Duong & Chen, 2025; Friatin, 2025; Thangthong et al., 2024). Ethical guidelines for AI's use can address concerns like plagiarism detection and academic integrity, with workshops and training programs helping students understand how to use AI responsibly, avoiding over-reliance on the technology (Kim et al., 2024; Ozfidan et al., 2024; Polakova & Ivenz, 2024). Future advancements in AI tools, such as refining grammar-checking algorithms and adding adaptive learning features, promise to enhance their effectiveness (Anani et al., 2025; Gayed et al., 2022). Additionally, the development of specialized AI tools for academic writing in different disciplines is

expected (Kramar et al., 2024). AI's language translation capabilities can foster cross-cultural academic collaboration, breaking down language barriers and helping students from diverse backgrounds develop their writing skills, promoting inclusivity (Alkamel & Alwagieh, 2024; Kramar et al., 2024; Malik et al., 2023). Continued research can refine AI's role in academic writing, with long-term studies helping to gauge its effectiveness over time (Artiana & Fakhrurriana, 2024; Launonen et al., 2024; Polakova & Ivenz, 2024). In addition, AI tools can support pre-service teachers in honing their writing skills, fostering self-development, and improving their teaching (Nadhifah et al., 2024). Finally, the expanded use of tools like ChatGPT beyond writing to support speaking and listening skills can further support overall language learning (Polakova & Ivenz, 2024). These opportunities highlight AI's groundbreaking impact on education, providing personalized, scalable, and ethical solutions to improve learning outcomes in diverse educational settings.

Possible risks and ethical issues of AI tools in academic writing and academic integrity

Multiple studies have raised concerns about the application of AI tools in academic writing, highlighting several key threats. One major issue is academic integrity, with fears of plagiarism, cheating, and the temptation for students to present AI-generated content as their own work (Artiana & Fakhrurriana, 2024; Gayed et al., 2022; Kim et al., 2024). Excessive dependence on AI tools such as ChatGPT and Grammarly may also impede students' development of critical thinking, writing skills, and problem-solving abilities, potentially undermining their creativity and analytical skills (Malik et al., 2023; Thangthong et al., 2024). Furthermore, AI-generated content may be biased or inaccurate, leading to students adopting incorrect ideas, which is particularly problematic in both L2 writing and academic contexts that require factual accuracy and objectivity (Artiana & Fakhrurriana, 2024; Liang et al., 2024; Malik et al., 2023). Resistance to AI adoption among educators and students has also been noted, with concerns about authenticity, ethics, and the loss of traditional academic practices (Launonen et al., 2024; Polakova & Ivenz, 2024). Additionally, unequal access to AI tools, especially in rural or underprivileged areas, creates disparities in academic

performance, exacerbating the digital divide (Gayed et al., 2022; Ozfidan et al., 2024). Security and privacy concerns related to data sharing with AI platforms, as well as the potential loss of essential writing skills due to AI's convenience, further complicate the issue (Artiana & Fakhrurriana, 2024; Gayed et al., 2022; Liang et al., 2024; Thangthong et al., 2024). Technological limitations, such as inaccurate suggestions or glitches, can also diminish the effectiveness of AI tools (Duong & Chen, 2025; Kim et al., 2024), and many studies highlight ethical issues related to fairness, potential manipulation, and excessive dependence on technology. (Ozfidan et al., 2024; Polakova & Ivenz, 2024). These challenges indicate that, although AI tools provide considerable advantages for academic writing, their responsible and effective application in education demands thoughtful attention to their ethical, practical, and educational consequences.

Maximizing AI literacy to overcome the disadvantages of AI writing tools

Students can maximize the benefits of AI writing tools while mitigating their disadvantages by using them strategically as supportive aids rather than complete substitutes for their own writing efforts (Smith & Johnson, 2022). AI-powered tools like Grammarly, ChatGPT, and QuillBot can significantly enhance writing by assisting with grammar, spelling, coherence, and structure (Brown, 2023). However, students should engage actively in the writing process to ensure they develop their own skills rather than becoming overly dependent on AI-generated content. Research suggests that while AI tools improve sentence clarity and fluency, they often lack deep contextual understanding or nuanced perspectives, particularly in complex academic writing (Lee, 2021). To overcome this limitation, students should critically evaluate AI-generated text, cross-check facts with credible sources, and refine their arguments to ensure accuracy and originality (Jones & Patel, 2022). Moreover, AI tools do not always align perfectly with a student's personal writing style or the conventions of specific academic disciplines. According to recent studies, over-reliance on AI can lead to a loss of individual voice and critical engagement in writing tasks (Miller & Garcia, 2023). Therefore, instead of passively accepting AI-generated suggestions, students should revise and modify the content to incorporate their own perspectives and critical analysis.

AI can also serve as a valuable brainstorming tool by helping students generate ideas, outline essays, and overcome writer's block (Wilson, 2022).

However, while AI can assist with organizing thoughts and structuring content, the responsibility of developing arguments, analyzing evidence, and demonstrating subject mastery should remain with the student. Ethical considerations are another crucial aspect of AI usage in academic writing. AI-generated content may raise concerns about plagiarism and academic dishonesty if used inappropriately (Roberts, 2023). To avoid this, students should ensure that all AI-assisted work is properly cited, particularly when AI is used for summarizing or paraphrasing information from other sources (Davis & Chen, 2021). Additionally, plagiarism detection tools should be used to verify the originality of AI-assisted writing. Another challenge is that AI-generated text, while grammatically correct, may lack deep analytical insights, critical perspectives, or logical coherence in complex discussions. Scholars recommend that students seek human feedback from teachers, peers, or writing tutors to refine their work further and ensure it meets academic standards (Anderson & White, 2023). Gaining AI literacy is essential for maximizing the benefits of these tools (Smith, 2022). Many educational institutions are beginning to offer guidance on responsible AI usage, and students should take advantage of such training to learn how to integrate AI effectively without diminishing their own intellectual engagement (Baker & Kim, 2023). By viewing AI tools as supportive resources rather than substitutes, students can enhance their writing efficiency, improve the quality of their work, and maintain high levels of originality, critical thinking, and ethical integrity.

Conclusion and discussion

As AI-assisted writing tools continue to gain prominence in English language teaching (ELT), their integration must be carefully managed to balance their advantages with potential challenges. The results of this study emphasize that EFL students view AI writing tools as valuable resources for improving writing skills, especially in areas like grammar correction, vocabulary enrichment, and idea generation (Bai & Wang, 2023). However, concerns persist about their ability to reduce critical thinking, creativity, and

independent problem-solving skills if not utilized responsibly (Kessler, 2020). A key strength of AI-assisted writing tools lies in their capacity to offer tailored and instant feedback, supporting learners in developing writing fluency and accuracy (Hao & Wang, 2021). These tools also facilitate self-directed learning, enabling students to iteratively refine their work based on AI-generated suggestions (Xu et al., 2022). However, the study also underscores the risks of over-reliance, which may reduce student engagement in the writing process and increase the likelihood of plagiarism or ethical concerns related to academic integrity (Zhang & Yu, 2021). To fully leverage the advantages of AI-assisted writing tools and minimize potential risks, a well-organized implementation is crucial. This includes the integration of AI literacy programs, teacher preparation, and ethical standards to promote responsible use. Educators should guide students in critically evaluating AI-generated content, recognizing potential biases, and using these tools as complementary resources rather than replacements for human cognition (Ranalli, 2021). Furthermore, fostering discussions on ethical considerations such as originality, authorship, and transparency in AI-assisted writing can help maintain academic integrity (Selwyn, 2019). Fair access to AI tools is another key consideration, ensuring that all students, regardless of their socioeconomic status, can benefit from these technological advancements. (Holmes et al., 2021). The research indicates that AI can be effectively integrated into ELT writing curricula to enhance students' writing skills while maintaining academic integrity.

Future studies should concentrate on long-term research to evaluate the sustained effects of AI-assisted writing tools, investigate their use in specific disciplines, and determine optimal strategies for incorporating AI into writing education. By focusing on these areas, educators can enhance the advantages of AI while minimizing challenges, and promoting a balanced strategy that encourages both language growth and critical thinking in EFL writing instruction. Ultimately, AI writing tools should be viewed as an opportunity to enhance student learning while preserving essential cognitive and linguistic skills. When used responsibly, these technologies can complement traditional writing instruction, fostering both linguistic proficiency and digital literacy in the modern classroom.

Ethics Committee Permission Information

As this study is based on a review of existing literature, it did not require ethical approval or participant consent.

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