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ARTIFICIAL INTELLIGENCE (AI) USE IN ACADEMIC WRITING FOR EFL/ESL STUDENTS IN HIGHER EDUCATION: A SYSTEMATIC REVIEW

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Abstract
The emergence of Artificial Intelligence (AI) as a large language model (LLM) gives new hopes for addressing challenges faced by higher education students who learn English as Foreign Language (EFL) and Second Language (ESL) in writing scientific papers. However, assuming AI as a new hope in education is imprudent since its advancement could give both challenges and affordances in students' academic writing. To date, studies that mainly focused on this area are limited, highlighting a need for further exploration. Hence, this study aims to examine to what extent AI could enhance EFL and ESL students in academic writing and its impacts to their writing. Systematic literature review was conducted, following the Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) 2020 guidelines to synthesize studies over the past year (2023-2025). The findings revealed that AI can significantly assist students particularly in offering personalized feedback, facilitating ideas and content development, as well as providing automated tools. However, it also gives challenges such as plagiarism and disengagement. Therefore, AI integration should be followed by ethical regulations that are updated and dynamics following the fast-moving AI systems and are monitored regularly for its implementation. It is also important to build students' academic integrity by positioning students' critical thinking and commitment in academic principles and ethics as a central role in research.
Keywords: Artificial intelligence, academic writing, L2 learners, writing assistant, AI regulations

INTRODUCTION

Academic writing is a fundamental aspect in which higher education students are able to deliver their ideas based on scientific research methods. This form of writing allows researchers or educators to present data-driven arguments that involve deep concept analysis and leads to thoroughly explained theory or conclusion that give eligible insights to solve global problems (Khalifa & Albadawy, 2024). This writing also involves key aspects such as well-structured paragraphs, cohesive ideas, and wide vocabulary range (Hyland, 2002).

However, academic writing can be challenging mainly for students who learn English as Foreign Language (EFL) and Second Language (ESL). Paltridge (2004) indicated that L2 students encountered challenges in writing research due to unfamiliarity with the standards and inability to fully meet expectations in this level of writing including text organization, argumentative flow, cohesion, and vocabulary selection. Moreover, mastering the formal tone, specific terminology, and maintaining academic integrity throughout the referencing and citing process can also be tough and time consuming (Morris, 2018) mainly for students who have not owned English as their first language. Hence, the emergence of artificial intelligence (AI) can be a valuable tool for helping EFL/ESL students in academic writing. AI-powered writing assistants can support students with grammar, structure, and citations to enhance the quality of their writing (Khalifa & Albadawy, 2024).

The prior focus of AI, especially the emergence of ChatGPT, was to simulate human conversation. However, its abilities go beyond further in writing context by generating entirely new content like poems, stories, or novels, and perform a wide range of tasks within its capabilities (Tlili et al., 2023). This advancement raised a serious concern regarding plagiarism, as students use AI's ability to generate texts in various genres including academic writing and claim them as their own (Hyland, 2025). Some educational institutions also banned the use of AI that leads to academic dishonesty (Tlili et al., 2023). Therefore, to overcome this challenge, systematic literature review needs to be conducted to acknowledge to what extent AI can be used to support EFL/ESL students' writing skills mainly in academic writing.

Utilizing artificial intelligence (AI) driven programs can provide interactive and personalized tools to improve students' writing skill (Song & Song, 2023). According to the UNESCO (2024) regulations, students can use AI for requesting feedback for improvement and correction of pronunciation or examples of writing. In academic writing context, AI is beneficial for assisting the development of ideas and research design, also providing review, editing, and publishing support (Khalifa & Albadawy, 2024). Those accessibilities need to be clarified ethically and transparently so that the essence of learning and writing can be achieved, yet students can maximize the use of AI as a tool for enhancing their academic writing.

Systematic literature reviews the use of AI in academic writing for higher education students have primarily focused on students' writing assistant. Salvagno et al., (2023) conducted systematic review on how AI can assist in the writing process of a scientific paper including literature review, identify research questions, provide an overview of the current state of the field, and assist with tasks, such as formatting and language review. A recent study from Khalifa & Albadawy (2024) supported the prior findings by conducting systematic review that discovered AI as a valuable tool for supporting idea development and research design by facilitating invaluable perception and enhancing methodologies. Their research shows that AI can be a valuable assisting tool for higher education students to improve their academic writing content quality. Another systematic review conducted by Kooli (2023) found that there were various ethical challenges of AI in academic research such as its misuse and exploitation. Overall, many studies have explored the use of AI in academic research as writing assistant and the ethical use for higher education students in general, but little is known about how EFL/ESL students in higher education use AI tools and how these tools affect their research writing. EFL/ESL students often face greater language challenges in academic writing. As Mustafa et al. (2022) pointed out, they mostly struggle with the lack of writing proficiency and linguistic barriers which requires them to compose coherent, well-organized, and grammatically correct written text. This makes it essential to understand how

AI can support their writing development. Therefore, this study aims to address this gap by examining the use of AI for EFL/ESL higher students in academic writing context.

The purpose of this research is to explore the existing research on the use of AI in academic writing for EFL/ESL students in higher education. To fill the gap of previous studies, this systematic review focuses only on empirical studies of AI use for EFL/ESL higher students in academic writing context. By focusing on EFL/ESL students in higher education, this study aims to: (1) analyze to what extent AI can enhance EFL/ESL higher education students' academic writing and (2) explore the impacts of AI use on academic writing to EFL/ESL students. Furthermore, systematic review was chosen as the more structured approach offering an extensive and impartial summary of multiple relevant studies within a single document (Aromataris & Pearson, 2014) that is aligned to the aims of the study to provide a comprehensive analysis of AI use for EFL/ESL higher students in academic writing context.

METHOD

Systematic literature review was conducted following the Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) 2020 guidelines by Page et al. (2021) which is applicable for any subject-field mainly in education that is able to strengthen the transparency, consistency, and completeness of the reporting of systematic literature review (Sohrabi et al., 2021). Therefore, the use of PRISMA aligns with the aims of the study to provide systematic and rigorous analysis of the affordances and impacts of AI use on academic writing to ESL/EFL students in higher education.

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria that the researcher used were based on six points: database, data, language, setting, sample, and publication. For the database, SCOPUS database was used to gather the papers because it has significantly boarded its scope in years and ensures only the highest quality data through rigorous content selection and re-evaluation (Baas et al., 2020). Additionally, ERIC database was also used due to the rigorous peer review process admitted and directly sponsored by the Institute of Education Sciences (IES) of the U.S. Department of Education as a reputable and reliable journal database. Required papers must be published in these databases from 2023 to 2025 because ChatGPT (GPT-3.5), a Large Language Model (LLM), was released in October 2022 by OpenAI (San Francisco, CA). Since then, ChatGPT has significantly impacted scientific writing and research (De Angelis et al., 2023) and subsequent LLMs such as Perplexity AI (December 2022), Llama (February 2023), Deepseek (January 2025), and any other models become such trend in academic discipline. Aligned with it, the included papers were only written in English due to the emergence and the domination of this language used in academic publishing with 98% of articles are written in English including those written also by EFL researchers (Ramírez-Castañeda, 2020). Therefore, selecting English-language publications ensures access to the majority of relevant studies that align with the aims of the study. Given that most LLMs are primarily trained on English data (Qin et al., 2025), EFL/ESL students are ideal participants to examine AI's ability to address structural and linguistic challenges they experience in academic writing. Only empirical journal articles were included to ensure evidence-based findings. Besides, regarding the setting and sample, this study focuses on publications that include EFL/ESL students in higher education that are involved in academic writing context as an under-researched area which requires further exploration. Furthermore, papers not meeting these criteria were excluded from this systematic review. The inclusion and exclusion criteria were presented in Table 1.

Table 1: Inclusion and Exclusion Criteria

Criteria	Inclusion	Exclusion
Database	SCOPUS and ERIC	Other database
Data	Papers were published from 2023 to 2025	Papers were published before 2021
Language	English	Research other than English
Setting	Studies that focused on the use of AI in academic writing on EFL/ESL higher education students	Studies that focused on the use of AI in other than academic writing and other than on EFL/ESL higher education students
Sample	Students in higher education	Studies with participants other than higher education students
Publication	Empirical research journal articles	Technical reports, guidelines, book, book chapters, research synthesizes, review, and other than stated requirement were excluded

Search Strategy

For search strategy, the researcher looked into all the variables of the study including artificial intelligence, academic writing, EFL/ESL students, and higher education. Considering other related words which have the same meanings for each variable might appear, therefore, the researcher used other related keywords: (1) “artificial intelligence” with “generative AI”, (2) “academic writing” with “essay writing” and “academic research”, (3) “EFL students and ESL students” with “L2 learners” and “English language learners”, (4) “higher education” with “university” and “tertiary”. In the SCOPUS database, the keywords for EFL/ESL higher education students were divided into two categories – EFL or ESL students and higher education to seek more relevant articles. The keyword for filtering journals was also used to meet the inclusion criteria for empirical research articles. Following the index system in each database, the selected keywords were compiled into Table 2.

Table 2: Search Strategy

Database	Syntax	Results
SCOPUS	TITLE-ABS-KEY("artificial AND intelligence" OR "generative AI") AND ("academic writing" OR "essay writing" OR "academic research") AND ("EFL students" OR "ESL students" OR "L2 learners" OR "English language learners") AND ("higher education" OR university OR tertiary) AND (LIMIT-TO (DOCTYPE , "ar")	277
ERIC	("artificial intelligence" OR "generative AI") AND ("academic writing" OR "essay writing" OR "academic research") AND ("higher education" OR university OR tertiary)	56

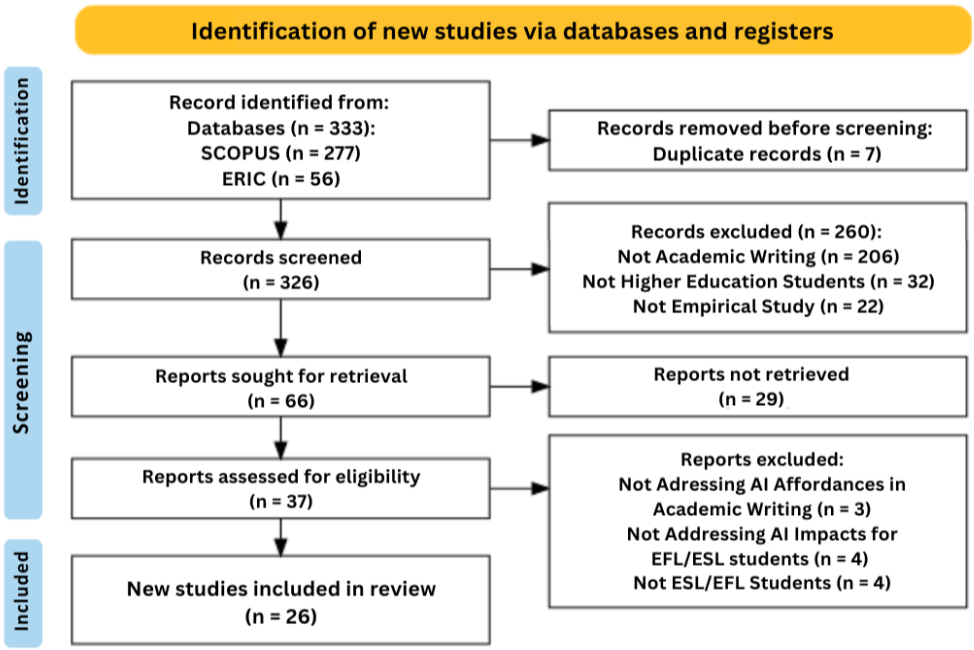
Total papers	333

However, the keywords for ERIC database were different from SCOPUS since the same search strategy was applied to ERIC but the results were sparse (n= 3). It was because of the database's narrower scope and indexing system. Therefore, the modified keywords which contain the main points were applied, but the results did not show any significant difference. As a result, the keywords for EFL/ESL student context, ("EFL students" OR "ESL students" OR "L2 learners" OR "English language learners") and ((LIMIT-TO (DOCTYPE , "ar"), were omitted and were focusing on the artificial intelligence in academic writing for higher education that was aligned better with the database context.

Study Selection

The study selection followed the PRISMA 2020 guidelines. The obtained most relevant journal articles were 333 papers from SCOPUS (n = 277) and ERIC (n = 56) databases. These articles underwent a rigorous screening process, which involved several stages: identification, removal of duplicate records, an initial screening based on titles and abstracts to exclude studies that did not meet with the inclusion criteria, retrieval for full-text versions of the studies, and eligibility assessment to determine the final studies that were included in the review. This selection process was illustrated in Figure 1.

Figure 1: PRISMA flow diagram of the present review



Identification

The preliminary step of identification involved searching relevant papers across SCOPUS and ERIC databases to ensure comprehensive coverage of studies. The search strategy employed a set of predefined keywords (see Table 2) and was limited to journal articles published in English within the last three years. The initial searching process was conducted in SCOPUS that yielded 277 records of papers, then followed by ERIC, which yielded 56 papers, resulting in a total of 333 papers. This searching process was completed in April 2025. Furthermore, the obtained articles from SCOPUS were exported in RIS type, while

from ERIC database were exported in (.nbib) type. Afterward, those files were exported to Mendeley for further screening.

Initial Screening

In Mendeley, the records underwent an initial screening process manually to exclude studies that clearly did not align with the research objectives. First, duplicate papers were automatically reported in this reference management software that yielded seven papers. Combined with manual verification of papers' titles, authors, and year of publication, those papers were removed, resulting in 326 papers for further screening. The remaining records were extracted to Excel then screened based on titles and abstracts, applying broad inclusion and exclusion criteria (see Table 1). Studies that were irrelevant to and not discussing academic writing (n=206), those outside the scope of higher education (n=32), and those were not empirical studies (n=22), resulting in a total 260 studies, were excluded. Each decision for exclusion was recorded in Excel.

Retrieval

The remaining studies (n=68) that passed the initial screening were retrieved in full text to be assessed in detailed eligibility assessment. Full-text articles were accessed primarily through institutional subscriptions and were carefully tracked repeatedly. 24 papers were restricted due to the researcher's lack of access, while five papers could not be accessed due to technical issues, as the full-text links failed to open, resulting in a total 29 papers were not retrieved. These records were excluded, with reason for non-retrieval documented.

Eligibility Assessment

The remaining 37 studies were screened thoroughly and repeatedly for eligibility assessment. During this assessment, the full texts were examined in detail to determine their compliance with inclusion and exclusion criteria (see Table 1) and also research questions. These criteria keep the objectives of the study relevant, including the requirements that studies could address the affordances of AI use in academic writing context and/or its impacts to ESL/EFL students on higher education in their findings and discussions. Full-text screening was conducted systematically and revisited to ensure consistency in the application of eligibility criteria, with exclusion decisions were compiled (see Figure 1) and sorted to Excel to maintain transparency. There were three studies that did not address AI's affordances, four studies that did not explore AI impacts for EFL/ESL students in higher education, and three studies either did not focus on EFL/ESL students or give a specified sample whether the participants were ESL/EFL students in higher education. Therefore, those eleven papers were excluded, resulting in 26 papers that were deemed eligible and included in data analysis.

Data Analysis

The data analysis process began with extracting relevant data from result and discussion sections of each study into Google Document to systematically address the research questions. In this application, the researcher made an analysis table that consists of five points: (1) Data, which contained verbatim sentences from included studies that aligned with the objectives; (2) Source, which identified the corresponding paper number; (3) Category, which coded the data into thematic category; (4) Code, which served as a labeling system to indicate between the data, their thematic category, and their source of studies; and (5) Comment, which summarized the analytical interpretation and provided conclusion to support the formulation of the findings. The example of the data analysis process was presented in Table 3.

Table 3: Example of Data Analysis

Data	Source	Category	Code	Comment
… ChatGPT is effective in assisting writers to utilize AI for proofreading their articles, employing strategies such as supplementing, merging, and adjusting to edit the content.	P1	Revision strategy	RS-P1	AI supports students' revision by assisting them with proofreading and content editing.
The students recognised several strengths of ChatGPT in the context of academic writing, including its efficient responsiveness to human instructions and proficiency in language revision.	P2	Planning and Organizing Strategy	POS-P2	AI's efficient practical use where students understand how to use AI properly to support their writing.

As an example, a verbatim sentence aligned with the study's objectives was extracted from Paper 1 (P1) as *data* and categorized into "Revision Strategy". This category refers to the affordance of AI to identify the areas needed for improvement in students' writing (Xu & Jumaat, 2024), which conceptually matched the data. The categories were derived from the included studies or adapted from other relevant studies when there was no existing category that aligned with the overall data's concept and meaning. The category then was applied to other *data* with similar meanings. Furthermore, this data was coded as RS-P1, indicating that Paper 1 reflected *Revision Strategy*. In this process, each study could represent one or more themes, depending on its diverse focuses. Moreover, each data was further interpreted and summarized in the *comment* to support the findings, and this process continued until all studies were analyzed. Additionally, when the researcher encountered difficulties in categorizing certain data, the meanings of relevant keywords were re-examined to achieve conceptual consistency and ensure alignment with the established categories.

The first author conducted the primary coding, while the second author independently coded 30% of the data to ensure the reliability and consistency. The coding results were then compared to identify any discrepancies. Any disagreements were resolved by revisiting the data and discussing the conceptual relevance of each code. In addition, final decisions were made when both of the authors reached consensus on the most appropriate categorization. For example, the initial codes of data from P1 (see Table 3) were: "Copyediting" and "Making Revisions". After discussing and revisiting the data, these categories were later changed into a broader theme, "Revision Strategy", that could capture the overarching concepts.

During the coding process, when the existing category did not align with the overall data's concept and meaning to address the research questions, the new category was adapted from other related studies. For example, one existing category labeled "Digital Readiness", which represents students' preparedness to use digital tools for academic and professional purposes (Oubibi et al., 2025), was found to be too broad for the data. Meanwhile, the data primarily emphasized students' awareness of using AI ethically in academic writing, which aligned more closely with the concept of "Academic Integrity", an adapted category from other related studies.

For the final process, the themes in the category section of the analysis table were identified and refined to align with the research questions. For the first research question regarding to the extent AI can enhance EFL/ESL higher education students' academic writing, the analysis yielded four themes: *Content Development and Revision Strategy, Planning and Organizing Strategy, Knowledge Inquiry,* and *Automation Benefits*. The second research question related to the impacts of AI use on academic writing to EFL/ESL students produced three themes: *Plagiarism, Disengagement,* and *Academic Integrity*. These themes formed an analytical framework for the findings section, ensuring that the analysis was both rigorous and grounded in the reviewed studies.

RESULTS AND DISCUSSIONS

The Extent AI Can Enhance EFL/ESL Higher Education Students' Academic Writing

After analyzing the retrieved papers for eligibility, there are four AI's affordances found for addressing to what extent AI can enhance EFL/ESL higher education students' writing skills in academic writing. These affordances are content development & revision strategy, planning & organizing strategy, knowledge inquiry, and automation benefits. These regarded the way AI used as a tool for enhancing and supporting ESL/EFL students' writing skills in academic research.

Content Development and Revision Strategy

The first affordance of AI in improving students' academic writing is content development and revision strategy. 17 out of 26 studies reported that students primarily use AI to enhance their writing quality by providing feedback and revision. These capabilities position AI as a content development tool, as it conducts in-depth analysis by highlighting students' strengths and identifying the areas for improvement (Khojasteh et al., 2025). As Kurt & Kurt (2024) pointed out, AI serves as a valuable tool for improving quality of students' writing by giving comprehensive feedback as follows:

> *The depth of ChatGPT feedback … including surface-level issues such as grammar, vocabulary, or spelling and global-level issues like content and organization. (RS-12)*

The depth and effectiveness of AI's feedback were evidenced in its role in revision strategy. These strategies refer to how AI assists students with proofreading, content editing, and addressing their grammar, vocabulary, and structural challenges (Xu and Jumaat, 2024; Maphoto et al., 2024). Banihasem et al. (2024) also reported that AI could provide a more comprehensive summary than peers that helped students to quickly identify their mistakes and call for action. This suggests that AI enhances students' writing quality by providing more effective and detailed feedback. These were aligned with previous studies reported that AI-based tool feedback provided more detailed evaluation and description, while human feedback was better in understanding the clear direction for enhancement, personalization and guidance, as well as supportive tone in providing feedback to students' writing (Solak, 2024; Steiss et al., 2024). However, formative feedback should not only give students improvement on their writing but also encourage them to grow and learn. Therefore, the integration of AI for these affordances requires a greater role of teachers to make more interactive and collaborative feedback for students writing (Hyland, 2025).

Planning and Organizing Strategy

Moving on to the second affordance of AI that is planning and organizing strategies for enhancing students' academic writing. The planning strategies include how AI aids students to plan their writing goals, steps, and gathering related information to their research (Xu & Jumaat, 2024). Nine out of 26 studies reported that AI helped students in gathering related information to support them in brainstorming and organizing the alternative ideas for their research. Besides, organizing strategies provide them with conceptualizing content and structure of the research. Aligned with it, the following evidence provide a study by Xu & Jumaat (2024) demonstrated that these strategies enhance speed and efficiency of students' writing:

> *... ChatGPT aids writers in effectively planning their writing goals and steps, searching for information, and conceptualizing content and structure before writing, thus enhancing the speed and efficiency of the writing process. (POS-P1)*

These findings highlight how planning and organizing strategies play an important role to keep students' writing on the right track. Bulqiyah et al. (2020) revealed the writing process including planning and organizing ideas was one area in EFL students' difficulties of writing their essay. These strategies help students, mainly L2 learners, who face difficulties about how to start, what points they should write on their research, and how to organize it. This structured-based planning strategies led to longer text that will increase numerous persuasive argumentations as well as the overall quality of the text (Limpo & Alves, 2018).

Knowledge Inquiry

Turning now to the affordance of AI as knowledge inquiry, seven out of 26 studies revealed that AI can be an effective search engine tool for gathering information and ideas. This affordance refers to AI as a tool to directly find information related to students' topics in academic writing (Shen & Chen, 2025). Moreover, gathering related sources helps students to verify the definition and find simplification theories for their research including giving easier explanations with examples and rephrasing meanings (Zhang et al., 2025). A study conducted by Shen & Chen (2025) reported that they used AI for knowledge inquiry purpose as follows:

> *...'Some concepts can be overwhelming and technical in textbooks, while ChatGPT can offer shorter and clearer definitions.' (KI-P10)*

Besides, Kim et al. (2025) reported that students used AI to help seeking ideas and gain more insights for their research. This ability widens students' perspective in writing their research and overcome knowledge blocks that will interfere with their writing process. It's aligned with previous studies that found AI supported researchers in fostering information-seeking and synthesizing interdisciplinary information through human-like interaction (Zheng & Stewart, 2024; Hirvonen et al., 2024). Another similar study by Saeidnia et al. (2024) examined how AI was used for information seeking of dementia patients with distinguished participants, formal (family members of dementia patients) and informal caregivers (neurologists and expert nurses). This study found that AI could be a beneficial tool for information sources for informal caregivers by providing some of the clinical questions, but it did not meet the standard for clinical answers the formal caregivers needed. This shows there's still some areas of knowledge AI still has not fully mastered, requiring students to evaluate critically when applying such information to their research.

Automation Benefits

Another identified affordance of AI was the capability of AI for automation benefits, which was reported in two out of 26 included studies. Automation benefits refers to how AI can be used to automate data coding or citation formatting as well as other repetitive tasks which are typically time consuming (Khizar et al., 2025). This was valuable to reduce human error in the processes and handle large datasets as well as for faster completion of tasks. It is aligned with a study conducted by Khizar et al. (2025) demonstrating that AI, specifically ChatGPT, was used to simplify data pre-processing and reduce human labour as follow:

> *…"ChatGPT is an excellent tool because it reduces manual labour and makes the research processes more efficient" (participant H) … according to Participant E, "...just ask ChatGPT to please resolve the error [...] which we cannot resolve manually" (participant E). (AB-P19)*

These benefits help students to preserve consistent formatting and style for their research (Ozfidan et al., 2024). It is aligned with previous studies, demonstrating AI could decrease screening workload by 60% (Tsou et al., 2020) and save time over 80 hours (Gates et al., 2020). A study by BaHammam (2023) also found that the automation features of AI in scientific research such as formatting and citation could free up researchers' time and energy. This suggests that AI serves as an effective complementary tool instead of the central role of research. As Darko et al. (2020) pointed out, AI can be used to enhance the conventional methods that are time consuming instead of replacing the existing process researchers did in their studies.

The Impact of AI Use on Academic Writing to EFL/ESL Students

The AI use in academic writing creates effects for students' behaviours, abilities, and performances. The second research question provides comprehension of the impacts of using AI on academic writing mainly for EFL/ESL students. The impacts were divided into two categories: the bad and the good. The bad impacts of AI use can give opportunities for students to plagiarize and get disengagement, while the good impact can build students' digital awareness in a way to use AI for their academic writing.

Disengagement

The first bad impact regarding the use of AI for students' academic writing was disengagement. Eight out of 26 studies reported that AI may discourage students from applying critical learning strategies for their research due to its general and superficial responses. The following evidence is a study by Zhang et al. (2025) which revealed how students did not apply deeper strategies due to AI's limited responses:

> *…ChatGPT sometimes provided general, superficial responses in discussion and exploration, which demotivated learners from applying strategies, especially Understanding, Analysing and Crafting. (D'P7)*

The automated feedback given by AI leads to students' disengagement that hinders students' critical thinking and cognitive challenges. Chan et al. (2024) reported the way students felt dissatisfied and unmotivated after receiving feedback given by AI. This because the feedback did not emotionally resonate with students unlike human feedback, which left them uninspired and made them less likely to act on it. This aligned with previous study by Fan et al. (2024) indicated that AI technologies potentially encourage students to passively rely on it which led to "metacognitive laziness", hindering their capability to do self-regulation and deeper engagement in learning. They also found that AI can enhance students' short-term tasks significantly, but it may not foster motivation and knowledge transfer. Moreover, Zhan & Yan (2025) also found that AI tends to encourage students feeling disengagement due to

prompt misunderstanding, irrelevant information and feedback given. Besides, the ability to make effective prompts that are aligned to their needs also contributes to students' engagement (Bearman et al., 2024). Therefore, when a student does not know how to address suitable prompts, the information or feedback given by AI might be irrelevant to their needs. This would make them frustrated and confused, which then led to disengagement.

Plagiarism

Moving on to the second bad impact of AI on students' academic writing, three out of 26 included studies reported plagiarism as a concern. According to The Oxford English Dictionary, plagiarism refers to "the action of copying another person's ideas, words, or work and pretending that they are your own." Xu & Jumaat (2024) reported that students tend to copy-paste AI's work to their research without critically refining or editing is considered plagiarism. A study by Hamamra et al. (2024) uncovered students only copied and pasted the essay generated by AI due to the numerous ideas and the complicated explanation used as follows:

> *...'I thought that even our instructors will not be able to use the language used by ChatGPT'. Another student said that 'many students including myself perceive ChatGPT as the source of knowledge'. (P'P1)*

Besides, Khojasteh et al. (2025) reported that students commit plagiarism when they do not fully comprehend AI's feedback and just simply copy and paste it without critically evaluating it. In addition, AI aids students in addressing writing challenges but does not replace their role as the writer. Facilitating students to reflect their difficulties in understanding the feedback and help them address it allows them to prevent this academic dishonesty. This encourages students to build academic integrity that leads to fostering their ethical decision-making skills (Sefcik et al., 2020). Therefore, addressing plagiarism is not a lone wolf, teachers also play an important role in this challenge since the failure of teachers to identify AI-generated text encourages students to engage in plagiarism without fear of the consequences that actually disadvantage themselves (Mohammadkarimi, 2023).

Academic Integrity

Although concerns regarding disengagement and plagiarism remain, AI also demonstrated a beneficial effect on students' academic writing, particularly in fostering academic integrity. This consideration related to the ethical usage of technology mainly in academic context referred to academic integrity (Balalle & Pannilage, 2025). 11 out of 26 studies reported that students were aware of plagiarism by acknowledging that AI only as a supporting tool instead of the central role of the writer. Students were aware to maintain originality of their writing process as follows:

> *...they should assume responsibility for managing and overseeing the entire writing process, completing the initial draft themselves. (AI'P2)*

The data revealed that the emergence of AI builds students' awareness in using digital tools as a complementary substitute to their academic research process. Besides, students were also double-checking and critically evaluating AI generated text to ensure the originality of their writing (Yao et al., 2025; Shen & Chen, 2025). They consider not to rely too heavily on AI and tend to acknowledge their abilities in the learning and writing process. Therefore, this behaviour helps students to maintain originality of their writing without violating academic ethics. Besides, it also contributes to the development of students' positive academic emotions that promote greater engagement in writing and improve students' self-efficacy (Oubibi et al., 2025).

Furthermore, the emergence of AI as LLMs (Large Language Models) has a potential to encounter EFL students' challenges in academic writing and research that requires scientific and high standard English language. When AI is used properly, it can be a valuable writing assistant to support students' writing more effectively and efficiently without compromising the ethical and originality. Teachers also play an important role to remind students that they are the main author of their work, AI only as a medium to help them address challenges they face in the writing process. In addition, the study indicated that the AI's potential in enhancing EFL/ESL students' academic writing can be optimized through responsible and ethical use. The availability of its beneficial tools can significantly assist students particularly in offering personalized feedback, facilitating idea and content development, as well as providing automated tools that could effectively complete repetitive tasks and large datasets which are time consuming. Yet, the effectiveness of these technologies depends on how they are employed by students. While stakeholders' institutional guidelines and policies are necessary to direct how to use AI appropriately, it is equally important to build students' academic integrity. To build this integrity in research, it requires a commitment to academic principles and ethics by positioning human cognition and analytical thinking as a central role in the research process (Khatri & Karki, 2023). By fostering academic integrity, it helps students develop their critical thinking and creativity which will not compromise the originality of their writing.

CONCLUSION

The study investigated to what extent AI enhances students' writing skills and the impacts for students in academic writing. Moreover, the findings highlighted AI as a valuable tool for assisting students' writing process in order to foster their content quality in research. However, the availability of AI gave positive and negative effects for students' behaviors and performances. Students with strong academic integrity may achieve prosperous accomplishments effectively through positive academic emotions that lead to students' engagement and self-efficacy. On the other hand, students with lower academic integrity may not be aware of the ethical policy that leads to plagiarism and disengagement. Furthermore, the implications of these findings are imperative, suggesting that AI enables students in developing academic writing processes from the very beginning including planning and organizing structured ideas, gathering related information and theories, and revising the structural challenges.

In Indonesia, the guidelines from the Ministry of Education (2024) regarding ethical guidelines for the use of AI in higher education focusing on maintaining students' academic integrity could be a starting point for developing more dynamic and specified regulations. This regulation should be implemented not only in higher education but also in K12 education to foster AI awareness and understanding from an early stage. However, it does not end at this point, the realization and implementation of the regulations should be monitored regularly. Education stakeholders need to be actively involved to foster students' digital literacy and academic integrity by facilitating more seminars and training following the updated tools of AI in academic context.

The study acknowledges limitations, including limited participant scope which only focus on EFL/ESL students and narrowed academic discipline focus. Future research could address these limitations for exploring another participant scope into native students to highlight the difference in using AI for their academic writing as well as analyzing the implications for

teachers since educators play a crucial role in guiding students' use of AI or to what extent stakeholders or policy makers contribute in addressing students' academic integrity.

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