THE IMPACT OF AI TOOLS ON EFL STUDENTS' SELF-EFFICACY IN ACADEMIC WRITING: A QUALITATIVE STUDY

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Abstract

This study investigates the impact of artificial intelligence (AI) tools on students' self-efficacy in academic writing. Using a qualitative approach, the data were collected through semi-structured interviews by targeting the seventh semester of English education study program students from Sriwijaya University who had experienced in using artificial intelligence (AI). The data analysis was analyzed by using thematic analysis. The results indicated that AI tools are significantly contribute to students' self-efficacy, writing efficiency, and motivation. Moreover, students noted that the improvements in academic performance, reduced anxiety, and enhanced learning engagement. However, concerns regarding over-reliance and reduced critical thinking were also identified. The findings suggest that while AI tools can be transformative in fostering writing self-efficacy, their integration must be balanced with pedagogical strategies that promote independent thinking. The study recommends curriculum integration of AI writing tools and continued research on their long-term effects on learning outcomes.

Keywords: Academic writing; AI Tools; EFL students; self-efficacy.

Introduction

Academic writing is more than just putting words on paper. It serves fundamental role in education, particularly for higher education students. Furthermore, it helps students think critically, share their ideas clearly, and organize information effectively (Richards & Miller, 2006). Moreover, academic writing helps students develop clarity and structure in their thinking. This requires the students to follow guidelines, such as using proper citations and structuring their arguments. It also strengthens research skills by encouraging students to find reliable sources, analyze information carefully, and connect different idea (Bailey, 2014). As a result, they gain a deeper understanding of their subjects and feel more confident contributing to discussions and sharing their own perspectives.

However, many EFL (English as a Foreign Language) students continue to struggle with academic writing (Leki, 2017; Yamchi, 2015). These struggles are particularly apparent in contexts where English is not the primary language of instruction. In addition, studies have shown common difficulties that students faced include limited vocabulary, lack of grammatical accuracy, poor organization of ideas, and challenges in referencing and citation (Mustafa et al., 2022; Taye & Mengesha, 2024). According to Sa'adah et al. (2022), many EFL university students report high levels of writing anxiety, often feeling overwhelmed by academic writing tasks and unsure about how to meet academic expectations. These difficulties are further intensified by a lack of sufficient feedback, time constraints, and limited access to writing support services (Chen et al., 2022).

One key factor hat significantly influences students' performance in writing is self-efficacy. According to Bandura (1977), self-efficacy is essentially the belief in someone's ability to succeed at specific tasks. In the context of learning, it plays a vital role in determining how students face the challenges. Some researchers claimed that self-efficacy can be defined as a concept that affects how people think, feel, motivate themselves, and behave (Bandura, 1977; Gist & Mitchell, 1992; Pajares, 1996). For language learners, especially English as a Foreign Language (EFL), believing in their own abilities can make a big difference (Wang et al., 2023). When students are confident in their skills, they are more likely to take risks, persist through challenges and engage fully in their learning (Gist & Mitchell, 1992). On the other hand, for those who has lower self-efficacy often struggle with writing anxiety and may avoid their writing task (Gist & Mitchell, 1992; Heslin & Khele, 2008). In addition, the students feel discouraged when they face obstacles, which can lead to lower grades and negative view of their own abilities (Klapp et al., 2025).

In recent years, artificial intelligence (AI) has become an important tool in education, particularly for helping students improve their writing skills. Writing poses a challenge for some students, whether it is finding the ideas, developing the arguments, dealing with vocabulary and grammar issues and also making citation (Hyland, 2015). To address these challenges, AI tools provide instant feedback and suggestions on writing (Alharbi, 2023), which can make students feel more confident about their writing abilities. These tools allow students to improve their writing without waiting for feedback from teachers or classmates (Kim & Kim, 2022), which makes the writing process more efficient. The feedback provided by AI not only aids in correcting errors but also empowers students to support their writing challenges more effectively, thus fostering a growth mindset relevant to students' academic writing (Erito, 2023).

Studies have shown that AI tools can significantly boost students' self-efficacy, especially in psychological impacts of AI on learners. For instance, a study by Huang et al. (2024) highlighted that EFL learners' acceptance of AI positively influences their well-being and confidence in their abilities, from teachers' perspectives. Similarly, Erito (2023) found that English for Specific Purposes (ESP) students perceived on the potential of AI to enhance their self-efficacy in English writing, especially in reducing their anxiety, giving the easiest way to get the feedback immediately and also increasing their motivation in learning. In the same vein, Parsakia (2023) emphasized that AI chatbots offers transformative potential for enhancing students' activity and engagement, particularly in Canada. Moreover, structured feedback mechanisms, such as Feed Forward, which combines retrospective feedback with forward-looking guidance, have been reported to significantly decrease writing anxiety across various writing conditions (Zarrinabadi & Rezazadeh, 2023).

Despite these positive findings, there are still concerns about the over-reliance on AI tools. Some researchers argue that excessive dependence on AI-generated feedback might limit students' ability to develop their critical thinking and independent problem-solving skills (Sardi et al., 2025; Zhai et al., 2024). Additionally, Luckin et al. (2016) noted that there is debate about whether AI tools can truly promote students deep learning or merely facilitate improvements in writing proficiency. They added AI should go beyond tool to foster critical thinking and self-reflection, with its impact depending on how it is integrated into education.

However, there remains a research gap regarding the impact of AI tools on EFL (English as a Foreign Language) students' self-efficacy, especially in the context of academic writing. While previous studies have explored the general utility of AI in language learning, few have specifically investigated how these technologies impact the students' confidence in their academic writing abilities. To address this gap, the present study aims to investigate the impact of AI tools on the self-efficacy of EFL

students in their academic writing. The central research question guiding this study is: *How do AI tools impact EFL students' self-efficacy in academic writing?* By answering this question, the study seeks to provide a clearer understanding of both the potential benefits and limitations of integrating AI tools into EFL academic writing instruction.

Literature Review

Artificial intelligence

Artificial Intelligence (AI) has made big transformation and become a key part of many areas. In simple terms, AI is when machines can act like humans by thinking and learning (Johnson-Laird, 2013). This means they can learn from experience, adjust to new information, and do tasks that usually need human intelligence, like solving problems, making decisions, or understanding language (Jackson, 2013). Modern AI has grown from older forms, like symbolic AI and neural networks, to include advanced systems such as machine learning, deep learning, and natural language processing (Górriz et al., 2020), which have expanded its abilities.

In practical usage, AI is divided into two types: Narrow AI and General AI. Narrow AI, also called Weak AI, is designed to do specific jobs such as translating languages, recognizing faces, or analyzing data with great accuracy (Mueller & Massaron, 2022). These systems are limited to one area and do not have the ability to think in general like humans do. In contrast, General AI, also known as Strong AI, would be able to do any intellectual task a human can (Johnson-Laird, 2013; Pennachin & Goertzel, 2007). In short, while General AI is still mostly a future idea, Narrow AI is already being used in many industries, including education.

AI in academic writing

AI tools have changed academic writing by making it easier and better. Tools like grammar checkers, style editors, plagiarism detectors, and intelligent writing assistants use machine learning to give instant feedback (Alharbi, 2023). For example, grammar checkers like Grammarly help students fix mistakes. Alharbi (2023) found that users improved their writing accuracy and coherence. Plagiarism detectors, such as Turnitin, ensure original work and have reduced plagiarism, according to (Alua et al., 2023; Izi et al., 2024). Intelligent writing assistants, like ChatGPT, support students by enhancing fluency and idea generation, as shown by Yuan et al. (2024). However, there are worries about students becoming too dependent on these tools, which might slow down their skill development (Lee et al., 2024; Marzuki et al., 2023). Ethical concerns and data privacy are also important. The researchers noted that educators need to use AI tools wisely while helping students build strong writing skills (Fitria, 2024; Putra, 2023; Wahyuningsih, 2024).

Self-efficacy

Self-efficacy is part of social cognitive theory. It focuses on people's belief in their ability to accomplish specific tasks (Bandura, 1977). Similarly, Pajares and Johnson (1998) stated that self-efficacy is a concept that emphasizes a person's assessment of their ability to successfully accomplish a task in a specific context. Self-efficacy is also an individual belief that interacts with behaviours and

social or environmental influences Pajares (1996). Thus, self-efficacy can be defined as a concept that affects how people think, feel, motivate themselves, and behave.

Bandura highlights four sources of self-efficacy: mastery experiences, vicarious experiences, social persuasion, and emotional states. In education, self-efficacy greatly impacts students' learning and academic performance. students with strong self-efficacy are often more motivated, resilient, and effective in managing academic challenges. Recently, studies suggest that AI tools in academic writing, such as those providing instant feedback, can increase students' self-efficacy by reducing anxiety and helping them feel more confident. For instance, immediate feedback from AI writing tools has been shown to improve students' confidence and perceived writing abilities (Liu et al., 2023; Song & Song, 2023).

Methodology

Research design and approach of the study

This study employed a qualitative research approach to explore the impact on students' self-efficacy in academic writing tasks. The research aimed to investigate the impact of AI tools on the self-efficacy of EFL students in their academic writing. The interview questions were designed based on Bandura (1977), which consists of four main sources of self-efficacy: (1) mastery experiences, (2) vicarious experiences, (3) social persuasion, and (4) physiological and emotional states. Following a qualitative research design, semi-structured interviews were conducted to collect in-depth data from participants. The interviews were audio-recorded, transcribed, and analyzed by using thematic analysis initiated by (Braun & Clarke, 2006) to identify patterns and themes related to students' self-efficacy in academic writing when using AI tools.

Research site and participants

The research was conducted at Sriwijaya University. Five participants were selected using purposive sampling to ensure a comprehensive representation of perspectives, capturing a wide array of experiences and opinions regarding AI in academic contexts. The study focused on undergraduate students enrolled in the English Education Study Program, specifically targeting seventh-semester students who possess both experience in academic writing and familiarity with AI applications.

Data collection and analysis

Data were collected through semi-structured interviews to explore deeper into students' experiences. The interview questions consisted of ten questions, categorized as follows: questions 1 through 3 addressed mastery experiences, questions 4 and 5 explored vicarious experiences, question 7 focused on social persuasion, and questions 6, 8, 9, and 10 pertained to physiological and emotional states. The interview questions underwent a validation process, including expert reviews. The interview process was conducted using the Zoom application. The data analysis involved thematic analysis of interview data, following (Braun and Clarke (2006) six-step process: (1) familiarising with data, (2) generating initial codes, (3) searching for themes, (4) reviewing themes, (5) defining and naming themes, and (6) producing the report. This approach helped the researcher to identify key themes and insights into students' perceptions and the impact of AI tools on academic writing.

Results

The impact of ai-tools on students' self-efficacy in academic writing

The thematic analysis of the interview data identified four key themes that reflect how AI tools impacted students' self-efficacy in academic writing. The descriptions of the results were described as follows:

Table 1. *The impact of ai-tools on students' self-efficacy in academic writing*

Themes	Sub-themes
Mastery Experience	Digital Tool Adaptation
Vicarious Experience	Learning Through Digital Platforms
	Peer Influence and Social Learning
	Motivation Through Inspiration from Academic Sources
	Skill Development
Social Persuasion	Constructive Feedback on Students' Writing Quality
Physiological and Emotional States	Dependency and Anxiety
	Confidence and Efficiency
	AI and Perceived Academic Impact

Additional details of the themes above are given below.

Mastery Experiences

Students recognize the significant impact AI tools have on their academic performance and writing efficiency. Several participants highlighted how AI assistance directly contributes to their mastery and success in academic writing. They noted,

> "I think AI plays a huge role in my success because even though I may still success in academic writing, I think it would took even more time for me, it would have taken me longer to finish my writing if I'm not use these AI." (P1)

> "I think AI has improved my academic performance, especially in writing assignment. I got my highest grades when I'm using those tools." (P2)

By enhancing students' confidence and giving them a sense of control over their work, artificial intelligence (AI) tools not only facilitate writing but also help them achieve academic success.

Vicarious Experiences

Vicarious experiences, often informed by observational learning and social modelling, play a critical role in enhancing students' understanding of new writing tools and trends. The participants articulated,

"I participate in AI webinars and workshops," (P3)
"I also watch YouTube tutorials from AI experts to understand new trends." (P5)

From the statements above, they highlighted a collective effort among students to harness available resources for personal and professional growth, demonstrating an adaptive and forward-thinking approach to the challenges of academic writing and education. Additionally, the role of vicarious experience in the learning process is increasingly recognized as a significant factor in skill acquisition and intellectual motivation, especially in the context of technology-enhanced education. The participants highlighted,

"I observed my friend demonstrate how to use Canva. I started experimenting with transfer learning in my own projects." (P5)
"I saw a research paper and it inspired me to explore AI more." (P1, P2)
"One of my lecturers has shown me how AI works, it makes me impressive" (P4)

Overall, the interviews illuminate the critical role that vicarious experiences play in shaping student engagement and learning outcomes.

Social Persuasion

The influence of social persuasion in the realm of academic writing has gained considerable attention, particularly with the advent of artificial intelligence (AI) tools designed to support writing processes. The participants said,

"AI feedback helps me identify and correct my mistakes quickly," (P1, P2, P3)
"It makes my writing way much better," (P4)
"The feedback really helps a lot because if I do a mistake, I can see where I went wrong," (P5)

Students express clear appreciation for the timely and constructive input provided by AI, which enhances their confidence, promotes skill development, and facilitates a more effective writing experience.

Physiological and Emotional States

The integration of artificial intelligence (AI) tools into academic practices is accompanied by significant physiological and emotional states that can influence student engagement and performance. The participants noted,

"Sometimes AI makes me over-rely," (P1)
"It takes me underestimate tasks, like I think AI can complete my job so I don't need to think harder." (P5)
"AI do such a similar diction and it can be detected with the other application," (P4)
"There is some misinformation so I need to recheck it twice" (P3)

In short, while AI tools offer unprecedented support in the writing process, they also present challenges that can induce dependency, complacency, and emotional strain. Moreover, insights from recent interviews reveal how the integration of AI technologies not only enhances the technical quality of writing but also serves as a catalyst for improved self-confidence and reduced anxiety among students. The participants said,

"Before AI, I was insecure about my writing, but now I feel more confident." (P2)
"I improve my writing with AI tools so it's faster and I can pass the deadline," (P5)
"AI helps me feel less overwhelmed" (P3)

In summary, the findings from the interviews underscore the profound impact of AI on students' physiological and emotional states in the context of academic writing. By fostering greater confidence, enhancing efficiency, and alleviating overwhelm, AI tools facilitate a more supportive writing environment that empowers students to achieve their academic goals. In the other hand, there were insights garnered from the interviews reveal a complex interplay between the use of AI and students' perceptions of their academic success. The participants noted,

"I got my highest grades when using AI tools," (P2)
"I can maintain my grade with less work," (P1)
"I don't think AI impacted my grades because the rest is still up to me" (P4)
"I can obtain my high spirit and AI helps me provide correct grammar," (P3)

From the statements above, while many students report improvements in grades and a sense of efficiency, there remains an awareness of the critical role that personal agency and effort play in the learning process.

Discussion

The findings from the interviews reveal a multifaceted impact of AI tools on students' academic writing experiences, particularly highlighting mastery experiences, vicarious experiences, social persuasion, and physiological and emotional states. Students increasingly recognize that AI tools have a profound impact on their academic performance and writing efficiency, directly contributing to their mastery and success in academic writing. Experts such as Song and Song (2023) have demonstrated that AI-based language models significantly improve linguistic accuracy, organization, and overall writing quality, while also providing immediate feedback that boosts students' confidence and sense of control over their work. Furthermore, AI enhances multiple aspects of academic writing, including idea generation, content structuring, editing, and ethical compliance, as noted by (Khalifa & Albadawy, 2024). As AI continues to evolve, it not only streamlines the writing process but also empowers

students to achieve academic success by fostering greater engagement, efficiency, and self-efficacy in their academic endeavors (Rezaiee & Kareshki, 2024).

The increasing recognition of vicarious experience as a significant factor in skill acquisition and motivation, particularly within technology-enhanced education, underscores its importance in modern learning contexts. From teachers' perspectives, Research by Botelho and Boubaker (2025) emphasizes that educational contexts benefit considerably when students engage in vicarious learning experiences, such as observing successful peers or mentors in action. They found that such observations can enhance self-efficacy and motivation, which are essential in skill development across various educational settings, including academic writing. Moreover, Okolie et al. (2022) contend that collaborative learning environments, which often foster vicarious experiences, are crucial in promoting generic skills among students. They assert that the social and interactive characteristics of students' experiences can significantly enhance educational outcomes, aligning well with the notion that collective engagement with resources leads to deeper understanding and skill acquisition.

The assertion regarding the influence of social persuasion through AI feedback on students' self-efficacy and confidence levels is supported by recent educational research. Studies highlight that timely and constructive feedback from AI tools significantly enhances students' writing abilities, which in turn boosts their motivation to engage in the writing process and improve their writing. For instance, Liao et al. (2024) discussed the implementation of AI-enabled visual feedback tools, demonstrating their ability to improve self-efficacy among students. Their findings indicate that dynamic, visual representations of learning progress provided through AI help students understand their strengths and weaknesses, fostering a growth mindset essential for improving writing skills. Moreover, Keller et al. (2024) emphasized that students with higher self-efficacy beliefs are more motivated to utilize feedback effectively, leading to more substantial revisions and enhanced academic performance. This reflects a core principle in educational psychology where social encouragement facilitated by AI-generated feedback. It affects students' confidence and engagement in academic writing tasks (Keller et al., 2024; Liao et al., 2024).

The integration of AI tools in higher education has shown promising effects on students' emotional and physiological well-being, particularly in decreasing anxiety associated with writing tasks. AI enhances efficiency, assists with grammar and structure, supports idea generation (Chen et al., 2020) and helps reduce the mental and physical strain of writing tasks (Kim & Kim, 2024). These tools can boost students' confidence and productivity, allowing them to focus more on critical thinking and creativity (Yang & Wu, 2012).

In conclusion, the insights derived from student interviews reveal a complex interplay between the use of AI tools and various aspects of the academic writing experience. While many students praise the improvements in grades and efficiency resulting from AI assistance, they also recognize the importance of personal agency and continuous effort in the learning process.

Conclusion and Recommendations/Implications

The purpose of this study was to investigate the impact of artificial intelligence (AI) tools on students' self-efficacy in academic writing. In conclusion, the findings demonstrated the complex interaction of psychological factors and technological support in students' experiences with academic writing, particularly among English as a Foreign Language (EFL) students. Furthermore, AI enhances mastery, motivation, and self-efficacy by improving writing quality, providing immediate feedback, and supporting idea generation and organization. Moreover, the integration of AI tools in their writing

process can reduce anxiety and contribute to their skill development. The adaptation of these tools reflects a transformative shift towards a more collaborative and supportive writing environment that can facilitate greater student engagement and empowerment.

Educational institutions should incorporate AI and other digital writing tools into the writing curriculum to help students use them effectively and ethically. Workshops and courses focused on utilizing these tools can empower students to improve their writing skills. Training programs for faculty on the latest advancements in AI and other educational technologies will improve their ability to support students. Moreover, future research should explore the long-term effects of AI tool utilization on student writing experiences, self-efficacy and academic outcomes. This will provide deeper insights into effective practices and allow for continuous improvement in AI integration.

Disclosure statement

No potential conflict of interest was reported by the authors.

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