

THE INTERPLAY BETWEEN VIETNAMESE EFL STUDENTS' ARTIFICIAL INTELLIGENCE LITERACY AND TOOL USAGE FOR ACADEMIC WRITING

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ABSTRACT

Artificial intelligence has rapidly been integrated into education, which has substantially impacted academic writing, especially among EFL students. This study investigates Vietnamese EFL students' artificial intelligence literacy and tool usage for writing, and the correlation between these two aspects. A quantitative study using a questionnaire was conducted with 214 English major students at a private university. The results reveal that students had a moderate level of artificial intelligence literacy, with higher competence in awareness and usage but weaker skills in critical evaluation and ethical considerations. Similarly, artificial intelligence tool usage in writing was found to be moderate. Notably, students mainly employed the tools for grammar and spelling correction, paraphrasing, and time-saving functions. Moreover, the study identified a moderate but significant positive correlation between artificial intelligence literacy and tool usage. The findings underscore the need for enhancing students' artificial intelligence literacy level, especially critical evaluation, and ethical awareness to promote students' engagement with artificial intelligence-assisted writing tools.

KEYWORDS

Artificial intelligence literacy
 Artificial intelligence tool usage
 Artificial intelligence -assisted writing
 Academic writing
 Vietnamese EFL students

MỐI TƯƠNG QUAN GIỮA MỨC ĐỘ HIỂU BIẾT VÀ VIỆC SỬ DỤNG CÁC CÔNG CỤ TRÍ TUỆ NHÂN TẠO TRONG VIẾT HỌC THUẬT CỦA SINH VIÊN VIỆT NAM HỌC TIẾNG ANH NHƯ MỘT NGOẠI NGỮ

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TÓM TẮT

Trí tuệ nhân tạo đã được tích hợp nhanh chóng vào giáo dục, tạo ra tác động đáng kể đến việc viết học thuật, đặc biệt đối với sinh viên học tiếng Anh như một ngoại ngữ. Nghiên cứu này khám phá mức độ hiểu biết và mức độ sử dụng các công cụ trí tuệ nhân tạo của sinh viên Việt Nam trong viết học thuật, và mối tương quan giữa hai yếu tố này. Một nghiên cứu định lượng đã được thực hiện thông qua khảo sát với 214 sinh viên chuyên ngành tiếng Anh tại một trường đại học tư thục. Kết quả cho thấy sinh viên có mức độ hiểu biết trí tuệ nhân tạo ở mức trung bình, với khả năng nhận thức và sử dụng trí tuệ nhân tạo cao hơn, trong khi kỹ năng đánh giá phản biện và nhận thức đạo đức về trí tuệ nhân tạo còn hạn chế. Tương tự, việc sử dụng công cụ trí tuệ nhân tạo trong viết học thuật cũng ở mức trung bình, chủ yếu để kiểm tra ngữ pháp, chính tả, diễn đạt lại câu và tiết kiệm thời gian. Hơn nữa, nghiên cứu đã xác định một mối tương quan dương mức trung bình nhưng có ý nghĩa thống kê giữa mức độ hiểu biết và việc sử dụng các công cụ trí tuệ nhân tạo trong viết học thuật. Những phát hiện này nhấn mạnh sự cần thiết phải nâng cao hiểu biết về trí tuệ nhân tạo của sinh viên, đặc biệt là khả năng đánh giá phản biện và nhận thức đạo đức, nhằm thúc đẩy việc sử dụng hiệu quả các công cụ trí tuệ nhân tạo hỗ trợ viết.

TỪ KHÓA

Hiểu biết trí tuệ nhân tạo
 Sử dụng công cụ trí tuệ nhân tạo
 Trí tuệ nhân tạo hỗ trợ viết
 Viết học thuật
 Sinh viên Việt Nam học tiếng Anh như một ngoại ngữ

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1. Introduction

The advancement of artificial intelligence (AI), especially generative AI (GenAI), has had a significant impact on education in general and in academic writing in particular. AI tools such as ChatGPT provide immediate feedback, which is essential for language learners [1]. This can help to enhance grammar, vocabulary, and general writing structure [2]. Similarly, as noted in [3], AI tools can produce ideas for new topics, detect instances of plagiarism, recognize linguistic mistakes, provide various expressions or vocabulary options, offer instant and personalized feedback, translate, summarize works, and use gamification to increase motivation and engagement. Utilizing AI technologies in the writing process also has the benefit of being widely accessible, allowing students to practice at their own leisure and pace [4]. All things considered, AI tools provide EFL students with a great advantage, enhancing their writing skills through personalized feedback, increased linguistic accuracy, accessibility, and motivation. Previous studies reveal how EFL students use AI tools to support their writing skills. A survey was conducted to investigate Omani EFL students' practices in using AI for writing [5]. The results found that students frequently employed them to translate words, phrases, and sentences, as well as to check grammar and spelling. The study [6] investigated Thai and Vietnamese EFL learners' experiences in using ChatGPT for second language (L2) writing. They disclosed that students mostly utilized ChatGPT for brainstorming, organizing ideas, improving outlines, clarifying concepts, and editing their manuscripts for relevance and accuracy. It was found in [7] that Vietnamese students use ChatGPT to improve their English argumentative essay writing skills to a moderate extent.

However, the effectiveness and ethical usage of these AI tools is contingent on students' AI literacy level [8]. AI literacy refers to essential skills required to comprehend core knowledge and concepts regarding AI [9], [10]. It entails the efficient use of AI as a tool in online, domestic, and professional contexts and is a set of competences that enable people to evaluate, and interact with AI [11]. AI literacy is simply the capacity to recognize, comprehend, generate concepts, and critically assess AI technologies, their applications, and ethical implications [12]. The study [13] underscores four critical aspects of AI literacy: awareness, usage, evaluation, and ethics. AI awareness refers to a person's evaluation of the AI's present decision, comprehension of that decision, and prediction of future decisions. It is evident that using AI requires not only technical skills, but also an awareness of its ramifications, potential, and limitations. AI usage refers to the use and application of AI technology to efficiently fulfill activities [13]. With regards to AI evaluation, it is necessary for people to acquire critical thinking skills in order to avoid copying and pasting what they have learned from AI. People should be cautious of potential bias, misinformation, or misleads. Finally, AI ethics addresses issues such as securing student information, ensuring equal access to AI tools, and minimizing potential exploitation or overreliance on them. Furthermore, students should be morally conscious of the benefits and drawbacks of AI use and accept responsibility for their decisions in order to use AI ethically. Several studies [8], [12], and [14] have been conducted to explore EFL students' AI literacy level. All findings uncovered that students possessed moderate AI literacy level. In addition, students showed greater proficiency in using and understanding their abilities but weaker skills in critical evaluation and ethical considerations.

In general, despite the benefits of AI tools in academic writing and the importance of AI literacy in using them effectively, there is a scarcity of research specifically investigating the AI literacy level of Vietnamese EFL students and the extent to which they use AI tools to support their academic writing. This study, therefore, first aimed to fill this gap by exploring AI literacy level and AI tool usage of English major students at a private university in Ho Chi Minh city, Vietnam. In addition, this study purported to figure out the correlation between students' AI literacy and uses of AI tools in writing. In order to achieve these purposes, this study sought to answer the following questions:

1. What is the level of AI literacy among Vietnamese EFL students?
2. To what extent do Vietnamese EFL students use AI tools for their academic writing?
3. Is there a correlation between AI literacy level and AI tool usage for academic writing among Vietnamese EFL students? If there is, how is that correlation?

2. Methodology

2.1. Participants and settings

This study employed quantitative approach to collect and analyze data. It was conducted at the faculty of English, Ho Chi Minh City University of Economics and Finance where students are required to complete three writing courses in the curriculum. In addition, they need to accomplish writing assignments in other courses such as Research Methodology, Cross-cultural Communication and so on.

As a result of convenience sampling method, 214 English major students agreed to complete the questionnaires. Before that, they were given a consent form with a thorough explanation regarding the research. Overall, there were 78% females ($n = 167$) and 22% males ($n = 47$). Out of the 214 participants, third-year students constituted the largest group, with 87 responses (40.7%). This was followed by second-year students, who accounted for 48 responses (22.4%), and first-year students, contributing 41 responses (19.2%). The smallest group was fourth-year students, with 38 responses (17.7%). All students reported that they had used AI tools such as ChatGPT, Grammarly, Quillbot, to support their academic writing.

2.2. Research instruments

In order to investigate students' AI literacy level and uses of AI tools for academic writing, this study utilized a close-ended questionnaire to collect data. In terms of AI literacy level, the AI literacy scale (AILS) from [13] was adopted. It encompassed 4 subscales (awareness, usage, evaluation, and ethics) with 12 5-point Likert items (1- Strongly disagree, 2- Disagree, 3- Neutral, 4- Agree, 5- Strongly agree). Meanwhile, the AI tool usage section was adopted from [5] with 11 5-point Likert items (1- Never, 2- Rarely, 3- Sometimes, 4- Usually, 5- Always). In addition, students' personal information was identified through the questions related to their gender, academic year, and their familiarity with AI tools. The questionnaire was translated into Vietnamese and was validated by three experts in ELT. It was also piloted with 5 students to facilitate student responses and avoid misconceptions, resulting in more accurate data. In addition, Cronbach's alpha was employed to assess the reliability with a result of 0.85, indicating strong internal consistency.

2.3. Data collection and analysis

The questionnaire for the study was administered online utilizing Google Forms, and participants were given a link to access it. The participants provided their consent forms, which were attached to the questionnaire, to confirm their participation in the study. The questionnaire links remained accessible for a period of two weeks. After the data were collected, SPSS (version 25) was utilized to analyze them. Descriptive and inferential statistics were applied to identify students' AI literacy level and uses of AI tools for academic writing as well as the correlation between these variables.

3. Results and Discussion

3.1. Vietnamese EFL students' AI literacy level

For the first research question regarding Vietnamese EFL students' AI literacy level, Table 1 shows that students had a moderate level of AI literacy ($M = 3.03$, $SD = 0.93$). To be more specific, students scored the highest in usage ($M = 3.12$, $SD = 0.89$) and awareness ($M = 3.10$,

SD = 0.92), suggesting their familiarity and confidence in using AI tools. However, evaluation (M = 2.98, SD = 0.85) and ethics (M = 2.92, SD = 0.90) witnessed comparatively lower scores. This indicates students' weaker critical and ethical engagement with AI tools.

Table 1. Descriptive statistics of AI literacy

Subscales	Mean	Standard Deviation	Interpretation
Awareness	3.10	0.92	Moderate
Usage	3.12	0.89	Moderate
Evaluation	2.98	0.85	Moderate
Ethics	2.92	0.90	Moderate
Overall AI Literacy	3.03	0.93	Moderate

Table 2 illustrates detailed analysis of AI literacy subscales. In terms of students' awareness, students demonstrated a good ability to identify AI-integrated applications (M = 3.15, SD = 0.88). This suggests that students were basically familiar with commonly used AI tools. However, the lower score on how AI can assist them (M = 3.00, SD = 1.01) indicates that some students still struggle to understand the practical benefits of AI in academic settings.

Table 2. Detailed analysis of AI literacy subscales

	Statements	Constructs	Mean	Standard Deviation	Interpretation
1	I can distinguish between smart devices and non-smart devices.	Awareness	3.08	0.92	Moderate
2	I do not know how AI technology can help me. <i>(Reversed)</i>	Awareness	3.00	1.01	Moderate
3	I can identify the AI technology employed in the applications and products I use.	Awareness	3.15	0.88	Moderate
4	I can skillfully use AI applications or products to help me with my daily work.	Usage	3.12	0.89	Moderate
5	It is usually hard for me to learn to use a new AI application or product. <i>(Reversed)</i>	Usage	2.98	0.95	Moderate
6	I can use AI applications or products to improve my work efficiency.	Usage	3.14	0.91	Moderate
7	I can evaluate the capabilities and limitations of an AI application or product after using it for a while.	Evaluation	2.98	0.85	Moderate
8	I can choose a proper solution from various solutions provided by a smart agent.	Evaluation	2.96	0.93	Moderate
9	I can choose the most appropriate AI application or product from a variety for a particular task.	Evaluation	2.97	0.87	Moderate
10	I always comply with ethical principles when using AI applications or products.	Ethics	2.94	0.82	Moderate
11	I am never alert to privacy and information security issues when using AI applications or products. <i>(Reversed)</i>	Ethics	2.90	1.05	Moderate
12	I am always alert to the abuse of AI technology.	Ethics	2.92	0.90	Moderate

With regards to usage of AI, the highest score was for improving work efficiency (M = 3.14, SD = 0.91). Meanwhile, many students reported difficulty in learning new AI technologies (M = 2.98, SD = 0.95). For the evaluation, while students fairly felt confident in selecting AI tools for specific tasks (M = 2.97, SD = 0.87), their ability to evaluate AI-generated solutions (M = 2.96, SD = 0.93) was lower. Last but not least, regarding ethics, even though students could moderately recognize the importance of using AI responsibly (M = 2.94, SD = 0.82), they appeared less concerned about privacy and security risks (M = 2.90, SD = 1.05).

These results align well with previous studies [8], [12], and [14] in which students possess moderate level of AI literacy and tend to improve operational skills before acquiring deeper critical and ethical awareness. This could be attributed to the focus of AI exposure in students' learning environments. That is to say, many AI tools are designed for ease of use, offering automated suggestions for grammar correction, paraphrasing, and text generation, which require

minimal user intervention [15]. As a consequence, students may become proficient in technically using AI tools but remain passive users who do not critically question AI-generated content. In other words, students have a tendency to over-rely on AI-generated responses without verifying their accuracy or considering alternative sources of information [16], [17]. Moreover, ethical considerations in AI usage represent another key area of weakness among students. The results indicate that there is a lack of students' awareness in relation to ethical issues including privacy issues, data security, and academic dishonesty. This evidence corroborates earlier findings, which claims that students often use AI tools without fully understanding the ethical implications of AI in education [12], [18]. One possible cause for this problem might be because there are not enough explicit institutional guidelines on AI usage which can help students use AI tools more ethically. In short, although students have demonstrated abilities in operating AI tools, they need further instruction in evaluating content from AI and recognizing the ethical consequences of AI use [19].

3.2. Vietnamese EFL students' uses of AI tools in academic writing

Regarding students' AI tool usage, as can be seen in Table 3, the overall findings reveal that students showed a moderate level of AI tool usage ($M = 3.15$, $SD = 0.82$).

The most common utilization of AI tools belonged to checking grammar and spelling, saving time, paraphrasing and generating ideas. To be more specific, grammar checking was the most commonly used feature ($M = 3.20$, $SD = 0.79$), followed closely by spelling checks ($M = 3.18$, $SD = 0.81$).

Table 3. Descriptive statistics of AI tool usage for writing

	Statements	Mean	Standard Deviation	Interpretation
1	I use AI writing tools to write my exercises and assignments.	3.05	0.88	Moderate
2	I use AI writing tools to refine and paraphrase texts.	3.08	0.85	Moderate
3	I use AI writing tools to translate words, phrases, and sentences.	3.02	0.90	Moderate
4	I use AI writing tools to check the spelling of words.	3.18	0.81	Moderate
5	I use AI writing tools to check for grammatical errors.	3.20	0.79	Moderate
6	I use AI writing tools to edit my style of writing.	2.97	0.87	Moderate
7	I use AI writing tools to write paragraphs and essays.	2.95	0.92	Moderate
8	I use AI writing tools to create a full list of the sources/references used.	2.88	0.95	Moderate
9	I use AI writing tools to summarize texts/paragraphs to be used in my writing.	2.90	0.97	Moderate
10	I use AI writing tools to save time when writing.	3.12	0.84	Moderate
11	I use AI writing tools to generate ideas to be used in writing.	3.06	0.89	Moderate
	Overall AI tool usage	3.15	0.82	Moderate

Also, students reported using AI tools to save time during the writing process ($M = 3.12$, $SD = 0.84$). What is more, many students used AI tools to refine and paraphrase texts ($M = 3.08$, $SD = 0.85$) and to generate new ideas for their writing ($M = 3.06$, $SD = 0.89$). On the other hand, the less frequent uses of AI tools lied in source or reference management and summarization. Specifically, the least frequently used feature was creating a list of sources/references ($M = 2.88$, $SD = 0.95$). In addition, AI tools for summarizing texts/paragraphs were also among the less commonly employed features ($M = 2.90$, $SD = 0.97$).

The findings are congruent with existing literature [5]-[7] which disclose that students moderately use AI tools and perceive AI as a proofreading and revision tool rather than a crucial part of the academic writing process. Literally, there have been plenty of AI-assisted writing tools such as Grammarly, QuillBot, and ChatGPT that are developed to assist students in correcting grammar, paraphrasing, and suggesting clarity. This makes them easily accessible and applicable to students' immediate writing needs [20], [21]. These AI tools provide fast and convenient solutions to linguistic challenges, reducing the cognitive load associated with proofreading and editing. However, their limited adoption for more complex writing functions such as referencing

and summarizing indicates that students may lack awareness of how AI can be used to support the full writing process, including research and content organization. An additional reason might be their worries about reliability and academic integrity of summarizing and managing references using AI tools. As noted in [22], AI-generated citations and references are often inaccurate. This will lead to students' hesitancy of employing AI for sourcing academic references.

3.3. Correlation between AI literacy level and AI tool usage for academic writing

In order to examine the correlation between students' AI literacy level and their uses of AI tools for writing, a Spearman's rank-order correlation analysis was conducted. Table 4 illustrates the correlation coefficients between students' AI literacy level and their AI tool usage for writing.

Table 4. Spearman's correlation between AI literacy level and AI tool usage

Variables	Spearman rho (r)	p-value
AI literacy level	1.000	-
AI tool usage	0.3009	0.007

The results disclose a moderate positive correlation ($r = 0.3009$) between students' AI literacy level and their AI tool usage in writing. In addition, there was a statistical significance in the correlation between these variables ($p < 0.05$).

This study is pioneering in addressing the correlation between AI literacy level and AI tool usage for writing. The moderate positive correlation revealed in this study indicates that students with higher AI literacy level tend to more frequently utilize AI tools in their academic writing. As demonstrated in [23], individuals' digital literacy level is an important factor influencing their adoption and utilization of technology in both personal and professional situations. It is often known that the degree of digital literacy affects people's attitudes regarding technology [24]. As a result, the acceptance of advancing technology such as AI tools, is closely tied to individuals' digital literacy levels. In other words, students with higher digital literacy level have more positive perceptions of the benefits and usability of AI tools, which influenced their desire to adopt AI-based tools [25]. However, the moderate rather than strong correlation implies that although AI literacy is an important factor in AI tool usage, it does not completely decide the frequency of employing AI tools in their writing. Other contextual factors, such as institutional policies, academic integrity concerns, and personal attitudes towards AI's content might impact students' engagement with AI tools.

4. Conclusion

This quantitative study explored Vietnamese EFL students' AI literacy level, their usage of AI tools for writing, and the correlation between these two factors. The results found that there was a moderate level of students' AI literacy. Noticeably, students showed greater level in AI awareness and usage rather than critical evaluation and ethical considerations. Likely, the frequency of using AI tools for their academic writing was moderate, with a higher tendency for grammar checking, paraphrasing, and time-saving functions. In addition, this study uncovered a moderate but significant correlation between AI literacy and AI tool usage. This indicates that higher AI literacy level might lead to greater AI adoption in academic writing.

The findings of this study have numerous significant implications for the use of AI in language education. First, students' moderate AI literacy level highlights the need for additional AI literacy instruction, particularly in the areas of critical AI evaluation and ethical considerations. While students are skilled at utilizing AI for fundamental language improvement, they require training on how to utilize AI strategically in academic writing, particularly for higher-order tasks like summarizing, referencing, and content organizing. Second, educators should incorporate AI literacy into writing programs so that students can learn both AI literacy and writing skills. Third, this study emphasizes the necessity of explicit institutional policies on the use of AI in classrooms in order to allay students' concerns about AI ethical issues.

Universities can enable students to utilize AI tools efficiently while upholding academic integrity by implementing clear AI policies.

In spite of its contributions, this study has a number of shortcomings. The first constraint lies in the context which was limited to Vietnamese EFL students in a particular setting. This implies that the results could not be generalized to other situations. Future studies could be carried out across other contexts to examine the variations of AI literacy and AI tool usage. Second, this study mainly used self-reported data, which could be biased and erroneous. To gain more unbiased insights on students' AI involvement, future research should triangulate the data using additional research instruments including observations and interviews. Third, although the study found a moderate relationship between the use of AI tools and AI literacy, it did not consider other possible contributing factors. Further research could use qualitative or mixed-method approaches to investigate the underlying motivations, obstacles, and perceptions that influence students' AI adoption behaviors.

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