



The Role Of Ai Literacy In Developing Efl Students' Academic Writing Skills

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ABSTRACT

The rapid integration of generative artificial intelligence into higher education has significantly changed the ways in which students approach academic writing. For learners of English as a foreign language (EFL), artificial intelligence can provide valuable support in brainstorming, planning, drafting, language correction, feedback, and revision. However, effective use of these technologies requires more than technical familiarity. Students need AI literacy that enables them to understand the capabilities and limitations of AI tools, formulate appropriate requests, critically evaluate generated content, verify information, preserve authorial responsibility, and use AI ethically. This article examines the role of AI literacy in developing EFL students' academic writing skills and discusses its application at different stages of the writing process. Particular attention is given to critical evaluation, academic integrity, source verification, learner autonomy, and the preservation of individual academic voice.

KEYWORDS: AI literacy, artificial intelligence, generative AI, EFL, academic writing, writing skills, critical thinking, academic integrity, learner autonomy, AI-assisted writing, digital literacy.

INTRODUCTION

The development of artificial intelligence has brought significant changes to contemporary higher education. Generative artificial intelligence tools are now capable of producing texts, summarizing information, explaining concepts, suggesting organizational structures, correcting language, and providing immediate feedback on written work. As a result, university students increasingly encounter artificial intelligence not only as a technological innovation but also as a potential component of their everyday academic practices.

The influence of artificial intelligence is particularly significant in academic writing. Writing at university level requires students to formulate arguments, organize ideas logically, use an appropriate academic register, integrate sources, demonstrate critical thinking, revise drafts, and maintain linguistic accuracy. These requirements can be especially demanding for students learning English as a foreign language because they must simultaneously manage disciplinary knowledge and the linguistic resources necessary to express that knowledge appropriately.

Generative AI tools may reduce some of these difficulties by providing rapid linguistic and organizational support. Studies of AI-assisted second-language writing have reported potential benefits in areas such as formative feedback, language correction, brainstorming, revision, and the organization of ideas [3; 4]. However, access to an AI tool does not automatically result in improved writing competence. If students accept generated text without analysis, rely on AI to produce entire assignments, or fail to verify information, the technology may reduce rather than strengthen opportunities for independent academic development.

This situation has increased the importance of AI literacy. AI literacy involves more than knowing how to open an AI application or enter a prompt. Ng et al. conceptualize AI literacy around several interconnected dimensions, including understanding AI, using AI, evaluating AI, and addressing ethical issues related to its use [1]. Within academic writing, these dimensions become closely connected with students' ability to make informed decisions about when AI should be used, what kind of assistance should be requested, how generated responses should be evaluated, and where the boundaries between legitimate support and inappropriate substitution of student work should be drawn.

Recent research in EFL and English for Academic Purposes contexts similarly suggests that AI literacy should include critical awareness of the capabilities and limitations of AI, strategic use of tools, evaluation of generated material, and ethical decision-making [5–8].

The purpose of this article is to examine the role of AI literacy in developing EFL students' academic writing skills, identify the competencies required for responsible AI-assisted writing, and propose practical ways of integrating AI literacy into university writing instruction.

Materials And Methods

The study is theoretical and methodological in nature. It is based on the analysis and synthesis of recent research concerning AI literacy, generative AI in higher education, second-language academic writing, and the pedagogical integration of AI tools into English for Academic Purposes and EFL contexts.

The methodological approach includes a comparative analysis of existing models of AI literacy and their relevance to academic writing, identification of major opportunities and risks associated with AI-assisted writing, and methodological modelling of classroom activities designed to develop both writing competence and responsible AI use.

The theoretical framework draws particularly on the AI literacy model proposed by Ng et al. [1], UNESCO's human-centred recommendations concerning generative AI in education [2], empirical studies of AI-assisted ESL and EFL writing [3–5], and more recent approaches to integrating critical AI literacy into academic and second-language writing instruction [6–8].

AI literacy can be understood as a combination of knowledge, practical skills, critical judgement, and ethical awareness that enables individuals to interact with artificial intelligence effectively and responsibly.

In academic writing, AI literacy should not be reduced to prompt writing. Although the ability to communicate effectively with an AI system is useful, a student who can produce sophisticated prompts but cannot recognize inaccurate information, inappropriate academic style, fabricated references, biased content, or ethical problems cannot be considered fully AI-literate.

For EFL students, AI literacy in academic writing can be organized around five closely related competencies:

1. understanding the basic capabilities and limitations of generative AI;
2. using AI strategically during appropriate stages of writing;
3. critically evaluating AI-generated content;
4. maintaining academic integrity and authorial responsibility;
5. reflecting on how AI use influences learning and writing development.



These competencies shift attention from the question “Can a student use AI?” to the more educationally important question “Can a student use AI critically, purposefully, and responsibly while continuing to develop as an independent writer?”

Research with EFL students has demonstrated why this distinction is necessary. Hossain, Çelik, and Hınız found that students could be familiar with AI tools and use them for activities such as translation and grammar checking while still having limited understanding of the technology and its broader implications [5]. Therefore, frequency of use should not be treated as evidence of AI literacy.

Academic writing is a process rather than a single act of text production. It commonly involves idea generation, planning, drafting, revision, editing, source use, and final evaluation. AI literacy can influence each of these stages, but the pedagogical value of AI depends on how the tool is used.

One of the most appropriate applications of generative AI is support during the pre-writing stage. EFL students frequently struggle to begin an academic assignment because they may have difficulty narrowing a topic, generating relevant questions, identifying possible perspectives, or organizing initial ideas.

An AI tool can function as a brainstorming partner. For example, instead of asking: Write an essay about online education.

a student may ask:

I am preparing an argumentative essay about online education in higher education. Suggest five controversial issues that could be developed into focused essay questions. Do not write the essay.

This type of interaction preserves student responsibility. AI provides possibilities, while the learner evaluates and selects among them.

Students can also use AI to compare possible thesis statements, explore alternative organizational structures, or identify questions that should be investigated through reliable academic sources.

However, AI literacy requires students to understand that generated ideas are suggestions rather than authoritative academic knowledge. A proposed argument may be superficial, irrelevant, biased, or unsupported. The student remains responsible for determining whether it is appropriate.

Effective academic writing requires clear organization. Students need to understand the relationship between a thesis statement, main arguments, supporting evidence, counterarguments, and conclusions.

AI can help students examine organizational possibilities without producing the assignment itself.

For example, a student might provide a self-written thesis statement and ask:

What logical questions should each body paragraph answer if I want to defend this thesis?

The purpose here is not to obtain ready-made paragraphs but to receive scaffolding that helps the student organize independent thinking.

A useful AI-literacy principle is therefore:

AI may support the architecture of thinking, but it should not replace the thinking that the architecture is designed to organize.



Teachers can reinforce this principle by requiring students to explain why they accepted, rejected, or modified AI-generated planning suggestions.

The drafting stage creates more complex questions because generative AI can easily produce fluent academic-looking prose.

For an EFL writer, such text can be attractive because it may appear more grammatically accurate and sophisticated than the student's own writing. Nevertheless, replacing student-generated paragraphs with AI-generated ones can significantly reduce opportunities for language development.

The educational purpose of academic writing is not simply the production of an error-free document. Writing is itself a process through which students learn to formulate ideas, establish relationships between concepts, construct arguments, and develop linguistic competence.

Therefore, AI should preferably function as scaffolding rather than as a substitute author.

Students might appropriately ask:

I want to explain that social media has both academic benefits and disadvantages. Give me three possible ways of expressing contrast in formal English.

They might then select an appropriate structure and write their own sentence.

This differs substantially from:

Write my paragraph about the advantages and disadvantages of social media.

The first request supports language development. The second transfers the central writing process to the AI system.

Developing AI literacy therefore means teaching students to recognize the difference between assistance and replacement.

One of the strongest pedagogical possibilities of generative AI is its potential to provide immediate feedback.

Students can submit a self-written paragraph and ask the AI to identify problems related to organization, clarity, cohesion, grammar, or academic register without asking it to rewrite the paragraph.

For example:

Read my paragraph as an academic writing tutor. Do not rewrite it. Identify one problem with organization, one problem with cohesion, and two language problems. Explain each problem and let me revise it myself.

This form of interaction encourages students to remain actively involved in revision.

Research into ChatGPT as a formative feedback tool has indicated that AI-supported feedback can contribute positively to academic writing development when incorporated into a structured learning process [3]. Nevertheless, students need feedback literacy: the ability to interpret feedback, assess its relevance, and decide whether suggested changes actually improve the text.

AI feedback should not be treated as automatically correct. A system may suggest unnecessary changes, alter intended meaning, recommend an inappropriate register, or replace a clear sentence with an unnecessarily complex one.

Consequently, an AI-literate writer asks not simply:

"What did AI tell me to change?"

but:

"Why is this change being suggested, and does it actually make my writing better?"

Revision and editing are often treated as the same activity, although they involve different processes. Revision focuses primarily on meaning, organization, argument, coherence, and development. Editing focuses more specifically on language-level issues such as grammar, vocabulary, punctuation, spelling, and sentence structure.

AI tools can support both processes, but students should learn to distinguish them.

A student revising a paragraph might ask:

Does every sentence in this paragraph clearly support the topic sentence? Identify any sentence that seems irrelevant and explain why.

During editing, the student might ask:

Identify grammatical errors in this paragraph, classify each error, but do not correct it until I attempt the correction myself.

The second approach transforms AI from an automatic correction tool into a learning resource. If a system immediately rewrites every incorrect sentence, students may receive a better final product but learn relatively little about their recurring language problems. If they first identify, classify, and attempt to correct errors themselves, the same technology can contribute to language awareness.

Critical evaluation is one of the most important dimensions of AI literacy.

The fluent and confident language produced by generative AI can create an impression of reliability. However, linguistic fluency and factual accuracy are not the same.

Critical AI literacy in L2 writing has increasingly been conceptualized around precisely this kind of awareness, strategic interaction, evaluation, and ethical judgement [7; 8].

The use of AI for references represents one of the highest-risk areas of AI-assisted academic writing.

Students may ask an AI system to “give five academic references” and then copy the resulting titles into their paper. This practice is problematic because generative systems may produce incorrect bibliographical details or references that cannot be verified.

AI literacy therefore requires a simple but essential rule:

An AI-generated reference is not a source until the student has independently located and verified the original publication.

Students should use academic databases, journals, university libraries, and other reliable scholarly search systems to confirm bibliographic information.

If AI suggests a potentially useful author or research topic, the student can treat it as a lead for further research, but not as evidence in itself.

Instructors can make source verification an explicit component of academic writing instruction rather than assuming students already understand it.

The integration of AI has complicated traditional understandings of academic integrity.

The central question is no longer simply whether students used AI, but how they used it and which intellectual work remained their own.

Appropriate uses may include brainstorming, receiving explanations, exploring alternative structures, obtaining feedback on self-written drafts, identifying grammar problems, or practising paraphrasing.

More problematic uses include generating an entire paper, inventing or disguising evidence, producing analysis that the student does not understand, or submitting AI-generated language as independent work where institutional rules prohibit such assistance.



UNESCO emphasizes a human-centred approach in which AI should support rather than displace human agency in education [2]. This principle is particularly important in writing instruction.

Students need clear institutional and course-level guidance regarding acceptable and unacceptable uses of AI. Simply instructing students “not to cheat with AI” provides insufficient guidance because the boundary between legitimate assistance and inappropriate authorship may vary across tasks and institutions.

Studies of EFL students’ experiences with AI-assisted academic writing have highlighted the importance of balancing technological support with authenticity and human judgement [4].

Teachers should therefore help students understand that academic voice does not mean avoiding all AI assistance. It means maintaining intellectual ownership over claims, reasoning, organization, evidence, interpretation, and final linguistic decisions.

The increasing availability of AI does not reduce the importance of the academic writing teacher. Instead, the teacher’s role becomes more complex.

Teachers need to act as writing instructors, AI-literacy educators, ethical guides, and designers of assessment.

First, instructors need to explain both the potential and limitations of AI. Students should understand why an AI response may be useful for one purpose but inappropriate for another.

Second, teachers need to model critical interaction with AI. For example, an instructor can generate a paragraph during class and analyze it collaboratively with students, identifying effective language as well as unsupported claims, weak reasoning, inappropriate vocabulary, or fabricated references.

Third, teachers need to design writing tasks that reward process rather than only final textual quality.

If assessment focuses exclusively on a polished final essay, students have strong incentives to outsource much of the writing process. Process-based assessment can instead include outlines, annotated sources, drafts, peer feedback, AI interaction records, revision explanations, or brief oral discussions of the submitted work.

Finally, teachers themselves require AI literacy. Effective instruction is difficult if educators do not understand how students use these systems or what kinds of outputs contemporary AI tools can generate.

Research on integrating AI literacy into English for Academic Purposes has demonstrated the value of explicit instruction that combines traditional academic skills with critical and ethical AI use [6].

Developing AI literacy can provide several educational benefits.

First, it can help students use technological support more strategically. Instead of asking AI to perform entire assignments, they learn to divide the writing process into specific problems that require different forms of assistance.

Second, AI literacy can strengthen critical thinking because students are required to evaluate generated information rather than merely consume it.

Third, it can improve feedback literacy. Students learn that receiving feedback is not a passive process and that recommendations must be interpreted and evaluated.



Fourth, it can contribute to learner autonomy. When used appropriately, AI can provide support outside classroom hours, allowing students to ask language questions, practise revision, and investigate recurring problems independently.

Fifth, AI literacy can contribute to digital and academic responsibility, skills that are likely to remain relevant as artificial intelligence becomes increasingly integrated into professional and educational environments.

Empirical research in EAP settings has found that explicit integration of AI literacy can improve students' confidence in using AI, their ability to evaluate generated output, and their understanding of ethical use [6]. Research specifically involving EFL academic writers similarly points to the need for structured instruction rather than assuming that familiarity with AI automatically produces responsible use [5].

Despite its potential, AI-assisted academic writing presents several significant challenges. Students may gradually become dependent on AI for brainstorming, sentence construction, vocabulary choice, and correction. Over-reliance may reduce opportunities to develop independent writing strategies.

AI may produce incorrect facts, nonexistent references, or plausible but unsupported explanations. The more fluent the response appears, the more difficult these problems may be for inexperienced learners to recognize.

Excessive rewriting can produce standardized academic prose that no longer reflects the student's own linguistic development or intellectual position.

Institutions differ in their policies concerning AI. Students need clear guidance regarding which forms of AI assistance are acceptable.

Students may have unequal access to advanced AI tools, paid services, devices, or stable internet connections. Assessment practices should therefore avoid making access to particular commercial technology a prerequisite for academic success.

Students should be cautious about uploading personal data, unpublished research, confidential information, or other sensitive material into external AI systems. UNESCO's guidance emphasizes privacy, transparency, human agency, and ethical consideration in the educational use of generative AI [2].

These limitations reinforce the argument that AI literacy, rather than unrestricted AI adoption, should become the educational priority.

Results And Discussion

The growing presence of generative artificial intelligence has made traditional distinctions between "writing with technology" and "writing without technology" increasingly difficult to maintain. Spell-checkers, grammar tools, translators, predictive writing systems, and generative AI represent different levels of technological mediation, and students are likely to encounter such tools throughout their academic and professional lives.

Therefore, completely excluding AI from EFL writing instruction may fail to prepare students for contemporary academic practice. At the same time, unrestricted use may undermine the processes through which writing competence is developed.

AI literacy provides a possible middle position.



The aim is neither to prohibit technology nor to allow it to replace student thinking. Instead, students learn to determine what AI can contribute, what it cannot reliably provide, and which intellectual responsibilities must remain human.

Recent research on critical AI literacy in L2 writing supports this shift from a purely functional understanding of AI use toward critical awareness, strategic interaction, evaluation, ethical decision-making, and authorial responsibility [7; 8].

This distinction is especially important for EFL students. Their linguistic insecurity may make AI-generated English appear inherently superior to their own writing. Teachers should therefore reinforce the idea that the purpose of academic writing instruction is not to produce a text that sounds as if it were written by a machine or a native-speaking professional writer. The purpose is to help the learner develop the ability to express increasingly sophisticated academic ideas independently, accurately, critically, and responsibly.

AI becomes educationally valuable when it contributes to this development.

Conclusion

Artificial intelligence has created new opportunities and new challenges for teaching academic writing in EFL contexts. Generative AI can assist students with brainstorming, planning, language exploration, feedback, revision, and editing. However, access to these functions does not guarantee improved academic writing competence.

AI-literate EFL students should be able to understand the capabilities and limitations of AI, select appropriate uses for different stages of writing, formulate purposeful requests, critically evaluate AI-generated responses, verify factual information and sources, maintain academic integrity, protect their authorial voice, and reflect on the effects of AI on their own learning.

For this reason, AI literacy should not be treated as an optional technological skill separate from academic writing. It can be integrated directly into writing pedagogy through fact-checking activities, source verification, feedback evaluation, comparative revision, prompt analysis, reflective writing, and process-based assessment.

The role of the teacher remains central. Students require explicit guidance to distinguish productive scaffolding from excessive dependence and legitimate assistance from inappropriate substitution of intellectual work.

Thus, the educational objective should not be to teach EFL students how to make artificial intelligence write better texts for them. It should be to teach students how to use artificial intelligence in ways that help them become better, more critical, independent, and responsible academic writers.

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