

The Roles of Ai Literacy, Critical Engagement, And Self-Regulated Revision in EFL Academic Writing

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Abstract: The increasing integration of generative artificial intelligence into higher education in Uzbekistan creates both opportunities and challenges for EFL academic writing instruction. This article examines three interrelated competencies required for productive AI-assisted writing: AI literacy, critical engagement, and self-regulated revision. AI literacy enables students to understand, use, evaluate, and ethically manage AI tools; critical engagement helps them question generated content and feedback rather than accept it automatically; and self-regulated revision supports purposeful planning, monitoring, decision-making, and reflection during text improvement. Drawing on international research and recent studies conducted in Uzbekistan, the article proposes an integrated pedagogical model for incorporating generative AI into academic writing instruction.

Keywords: AI literacy, generative AI, EFL academic writing, Uzbekistan, critical engagement, self-regulated learning, self-regulated revision, academic integrity, learner autonomy, AI feedback, critical thinking, academic writing.

Introduction: Artificial intelligence has become an increasingly visible component of higher education. Generative AI systems can produce and revise text, explain concepts, suggest ideas, summarize information, provide language feedback, and engage users in extended dialogue. These functions have significant implications for university teaching, particularly in disciplines where students are required to produce academic writing in English.

The issue is especially relevant in Uzbekistan. The country is actively expanding its digital and artificial intelligence infrastructure, and the national Strategy for the Development of Artificial Intelligence Technologies until 2030 establishes the broader goal of accelerating the introduction and responsible application of AI across different sectors [10]. At the same time, higher education is undergoing continued digital transformation, creating conditions in which students are increasingly likely to encounter AI technologies during their university studies.

English-language education represents an important part of this transformation. Students studying English as a foreign language (EFL), English for Academic Purposes (EAP), English for Specific Purposes (ESP), and subjects taught through English-medium instruction are expected to develop academic writing abilities that allow them to participate successfully in university study, research, international communication, and professional development.

Academic writing, however, is particularly demanding for EFL students. It requires learners to coordinate multiple processes simultaneously: generating and selecting ideas, organizing arguments, synthesizing sources, maintaining coherence, using appropriate academic vocabulary, controlling grammatical structures, revising drafts, and complying with academic conventions.

Generative AI may provide support at nearly every stage of this process. Students can use AI to brainstorm possible topics, explore alternative organizational

structures, receive explanations of language problems, obtain feedback on drafts, compare formulations, and revise written work.

Recent research conducted in Uzbekistan already demonstrates the increasing relevance of these practices. Begmatova and Saydazimova investigated traditional and AI-assisted approaches to academic writing instruction with first-year EAP students in an English-medium university in Uzbekistan and reported important differences in linguistic development and students' engagement with academic writing features [6]. Xodabande, Qosimov, and Umarova, working with university EFL students in Uzbekistan, found that students initially tended to use ChatGPT as a substitute for difficult writing work but gradually developed more purposeful uses when teacher mediation, prompt modelling, reflection, and clear AI-use rules were introduced [7].

METHODS

The study is theoretical and methodological in nature. It draws on international scholarship concerning AI literacy, critical AI literacy, self-regulated learning, EFL academic writing, AI-generated feedback, and learner engagement with generative AI.

Particular attention is given to recent empirical research conducted in Uzbekistan because the use of AI in language education needs to be considered within specific institutional, linguistic, and educational contexts rather than understood only through research conducted elsewhere.

The analysis therefore draws on four groups of sources.

The first group includes conceptual research on AI literacy, particularly the framework proposed by Ng et al., which identifies understanding, use, evaluation, and ethical awareness as central dimensions of AI literacy [1].

The second group focuses on critical AI literacy in second-language writing. Wang and Wang's APSE model emphasizes critical awareness, critical positionality, strategic interaction with AI, and evaluation of AI affordances [2].

The third group concerns self-regulated learning and EFL writing. Research by Teng and Zhang demonstrates that self-regulated L2 writing involves cognitive, metacognitive, social-behavioural, and motivational

dimensions [3; 4].

The fourth group consists of recent research into AI use and academic writing in Uzbekistan, including studies of AI-assisted academic writing instruction, ChatGPT-mediated university writing, technology acceptance among pre-service English teachers, and established academic writing practices in Uzbek higher education [6–9].

On the basis of this literature, the article proposes an integrated pedagogical model connecting AI literacy, critical engagement, and self-regulated revision.

The integration of AI into EFL academic writing should be understood within the wider digital transformation occurring in Uzbekistan.

The national Strategy for the Development of Artificial Intelligence Technologies until 2030 was approved in 2024 and established the development and implementation of AI as a national priority [10]. The growing emphasis on digital competence and AI-related knowledge has direct implications for higher education because university graduates will increasingly encounter artificial intelligence in academic, professional, administrative, and technological environments.

This development creates an important responsibility for universities.

Students should not simply learn how to access AI systems. They need to develop the ability to decide when AI use is appropriate, evaluate the quality of generated information, identify limitations, protect intellectual ownership, and remain responsible for decisions made with AI assistance.

This distinction is particularly important in language education.

Research involving pre-service English language teaching students across universities in Uzbekistan has already demonstrated considerable interest in ChatGPT and identified factors such as perceived usefulness, ease of use, habit, and personal innovativeness as important influences on students' intentions to adopt the technology [8].

Technology acceptance, however, should not be confused with educational competence.

A student may frequently use ChatGPT while possessing limited ability to evaluate its output.

Similarly, a student may know how to formulate effective prompts but lack awareness of source reliability, academic integrity, authorship, bias, or over-reliance.

For this reason, the next stage of AI integration in university English instruction needs to move from AI access to AI literacy.

AI literacy provides the first component of the proposed model.

Ng et al. identify four broad dimensions of AI literacy: understanding AI, using AI, evaluating AI, and addressing ethical issues associated with AI [1].

These dimensions can be adapted directly to EFL academic writing.

Students need a basic conceptual understanding of what generative AI can and cannot do.

They do not necessarily need advanced knowledge of machine learning architecture. However, they should understand that a large language model generates responses on the basis of learned patterns and probabilities and should not be treated as an infallible database or academic authority.

This understanding is necessary because AI-generated language may appear extremely confident even when the content is inaccurate, incomplete, misleading, or unsupported.

Students need clear guidance regarding authorship, plagiarism, source use, privacy, acknowledgement of AI assistance, and institutional requirements.

If students use AI to generate an entire paper and submit it as independent academic work, the problem is not simply technological. It concerns academic authorship and responsibility.

By contrast, using AI to explain why a self-written sentence is unclear may function as legitimate formative assistance, depending on institutional and assignment policies.

The important pedagogical objective is to enable students to understand the difference.

AI literacy establishes the knowledge and competencies necessary for responsible use, but effective academic writing requires an additional dimension: critical engagement.

Critical engagement means that students do not treat

AI as an unquestionable authority.

Instead, they interact with AI output as something that needs to be interpreted, evaluated, challenged, compared, and sometimes rejected.

Wang and Wang's model of critical AI literacy for L2 writing identifies four interconnected dimensions: critical awareness of AI, critical positionality, critical strategies for interacting with AI, and critical evaluation of AI affordances [2].

For EFL academic writers in Uzbekistan, these dimensions have direct pedagogical relevance.

Students need to understand both the advantages and limitations of AI-assisted writing.

For example, AI may be highly effective at identifying obvious grammatical problems but less reliable when judging whether an argument accurately represents a student's disciplinary knowledge.

Likewise, AI can generate academically styled paragraphs without knowing whether the student actually understands or supports the argument.

Critical awareness prevents the learner from equating linguistic sophistication with academic quality.

Research in EFL writing demonstrates that self-regulation is multidimensional. Teng and Zhang identify cognitive, metacognitive, motivational, and social-behavioural strategies as significant components of self-regulated L2 writing [3].

Furthermore, strategy-based self-regulated writing instruction has been associated with improvements in writing performance, strategy use, and academic self-efficacy [4].

Generative AI introduces both opportunities and risks for these processes.

Used strategically, AI can support self-regulation.

Used passively, it can remove the need for it.

One of the greatest educational risks of generative AI is that assistance can gradually become substitution.

Consider the following writing process:

1. AI selects the topic.
2. AI generates the thesis.
3. AI creates the outline.
4. AI writes the paragraphs.
5. AI provides references.

6. AI revises the text.
7. AI corrects the grammar.
8. AI writes the conclusion.

The student may submit a polished essay but has participated minimally in the actual processes of academic writing.

This creates an important paradox:

AI can improve the text while weakening the writer.

Recent evidence from Uzbekistan illustrates this tension. Xodabande, Qosimov, and Umarova observed that students in an Uzbek university writing course initially used ChatGPT to substitute for difficult writing processes, particularly paragraph generation, correction, and rewriting. With teacher mediation, however, their use became more task-specific and reflective [7].

This suggests that AI-supported academic writing should not be evaluated only by the quality of the final product.

Teachers should also consider what intellectual work students perform during the process.

Revision is one of the areas where AI can most productively support academic writing.

However, effective AI-assisted revision should remain student-regulated.

A self-regulated revision cycle can include:

Goal setting, self-evaluation, feedback seeking, critical evaluation, revision decision, independent revision, monitoring, reflection

Goal Setting

Students identify what they want to improve.

Instead of: Check my essay.

they formulate: I want to improve the logical relationship between my thesis and my body paragraphs.

Self-Evaluation

Before asking AI, students identify weaknesses themselves.

For example: I think my second paragraph contains useful evidence, but the connection with the thesis may be unclear.

Targeted Feedback Seeking

The student then asks: Evaluate whether paragraph 2 clearly supports my thesis. Identify the problem but do not rewrite the paragraph.

Critical Evaluation

The student examines the AI response and decides whether it is valid.

Revision Decision

The student chooses to accept, modify, reject, or verify the suggestion.

Independent Revision

The student revises the text rather than requesting a complete replacement.

Monitoring

The original and revised versions are compared.

Reflection

The student identifies what was learned and what can be transferred to future assignments.

This process makes AI part of self-regulation rather than a replacement for it.

Connecting the Three Components

AI literacy, critical engagement, and self-regulated revision should not be taught as three unrelated skills.

They form a developmental sequence.

AI Literacy asks: What can this technology do, and how should I use it responsibly?

Critical Engagement asks: Should I trust, accept, modify, reject, or verify what AI has produced?

Self-Regulated Revision asks: How can I use this feedback to improve my own writing and become more independent?

Together they create a model of responsible AI-assisted academic writing: understand, interact, evaluate, decide, revise, reflect

This sequence places the student rather than the technology at the centre of the writing process.

This integrated model has particular relevance to Uzbekistan for several reasons.

First, AI use among university students is expanding as digital technologies become more integrated into education. Recent research involving 456 pre-service ELT students from universities across Uzbekistan demonstrates substantial interest in ChatGPT and

highlights the importance of perceived usefulness and ease of use in technology adoption [8].

Second, academic writing has already become an important component of English-medium and internationally oriented university education in Uzbekistan. Research on academic English instruction in Uzbekistan has documented intensive writing practices involving summaries, essays, reflections, and process-oriented instruction [9].

Third, recent research conducted in an English-medium university in Uzbekistan suggests that AI-assisted academic writing can contribute to linguistic development, including aspects of lexical diversity, semantic complexity, and cohesion, while also demonstrating the continued importance of teacher feedback and guided discovery [6].

Fourth, local qualitative research suggests that students' relationship with AI can develop from substitution toward more purposeful appropriation when instructors provide explicit pedagogical mediation [7].

These findings support a move away from the simple question: "Should Uzbek university students use AI?" The more useful question is: "What competencies do Uzbek university students need in order to use AI without weakening independent academic writing?"

RESULTS AND DISCUSSION

The present article argues that AI literacy, critical engagement, and self-regulated revision provide three essential components of the answer.

The three competencies should be developed through practice rather than through theoretical explanations alone.

Activity 1. AI Output Audit

Students provide an AI system with an academic question.

They then analyze the generated answer according to:

- factual accuracy;

- relevance;

- evidence;

- academic style;

- possible bias;

- unsupported claims;

- source reliability.

Students identify at least one aspect that should be independently verified.

Primary competence: AI literacy.

Activity 2. Find the Unsupported Claim

The teacher provides an AI-generated academic paragraph.

Students underline statements requiring evidence and search for reliable academic sources.

They classify each claim as:

verified / partly supported / unsupported / inaccurate

This is particularly useful for preventing students from treating AI-generated content as an academic source.

Primary competencies: AI literacy and critical engagement.

Activity 3. Real or Fabricated Reference?

Students receive a list of AI-generated references.

Some references are genuine; others contain incorrect authors, titles, journals, years, or DOIs.

Students must verify each source through academic databases.

This develops the principle:

No reference enters the paper until the original source has been located and checked.

CONCLUSION

Generative artificial intelligence is likely to remain an important part of the academic and professional environments in which university students in Uzbekistan study and work. Consequently, attempting to develop academic writing skills without addressing students' interaction with AI may increasingly separate classroom instruction from actual writing practices.

At the same time, simple integration of AI tools is insufficient. Effective AI-assisted EFL academic writing requires the development of three interconnected competencies: AI literacy, critical engagement, and self-regulated revision. AI literacy enables students to understand the possibilities, limitations, and ethical implications of generative technologies. Critical engagement enables them to question, evaluate, verify, modify, or reject AI-generated information and feedback.

Self-regulated revision enables them to establish goals,

seek targeted assistance, make independent revision decisions, monitor improvement, and transfer learning to future writing tasks. For higher education in Uzbekistan, this integrated approach can provide an alternative to both uncritical AI adoption and complete prohibition. Students should not be trained simply to produce more effective prompts or more polished AI-assisted essays. They need to become academic writers capable of remaining intellectually responsible when powerful technological assistance is available. Teachers therefore need to design instruction in which AI supports thinking without replacing it, provides feedback without controlling revision, and increases learner autonomy rather than technological dependence.

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