

# Cultivating Critical AI Literacy in an ESL Academic Writing Classroom: A Reflective Inquiry

Ruonan Yang

*Department of Teaching and Learning, The Ohio State University, USA*

Youngjoo Yi\*

*Department of Teaching and Learning, The Ohio State University, USA*

## Correspondence

Email: [yi.57@osu.edu](mailto:yi.57@osu.edu)

### Abstract

With the rapid rise of Artificial Intelligence (AI), AI literacy has become a critical issue in higher education, shifting the focus from basic use to ethical and critical engagement. Drawing on the AI literacy framework (Warschauer et al., 2023) and the critical APSE model (Wang & Wang, 2025), this practitioner-inquiry examines classroom practices designed to foster critical AI literacy in an English as a Second Language (ESL) academic writing course. The findings reveal three key instructional practices that contribute to the development of critical AI literacy: (1) developing prompt literacy, (2) critically evaluating AI-generated outputs by composing counter-text, and (3) drafting AI use disclosure statements. These findings highlight pedagogical approaches that support students' ethical, reflective, and critical engagement with AI tools in academic writing contexts.

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## Introduction

With the growing impact of Artificial Intelligence (AI) in higher education, we as language educators have addressed new pedagogical demands related to teaching, learning, and assessment. For instance, while integrating AI use policies into our courses, Ruonan (the first author) implemented instruction on ethical and critical use of AI tools into academic writing within her ESL writing classroom, and Youngjoo, a teacher educator (the second author), designed new assignments to engage pre- and in-service teachers with AI tools for instructional material development (e.g., lesson

plans and rubrics). These efforts emerged from our urgent instructional decision-making rather than from a sustained, systematic pedagogical approach.

In response to students' learning needs and our limited initial approaches, we engaged in a more systematic inquiry. Adopting a practitioner-inquiry approach, this study examines Ruonan's teaching practices as she designed and implemented AI-related classroom activities to cultivate *critical AI literacy* in her ESL writing classroom. As we highlight real classroom practices in the ESL writing classroom, we emphasize both the opportunities and challenges of fostering students' ethical and critical engagement with AI-assisted writing.

### **Critical AI Literacy**

AI literacy encompasses "basic competencies to know and understand, use and apply, as well as evaluate and create AI" (Ng et al., 2021, p. 10). In the field of second language (L2) writing, Warschauer et al. (2023) proposed the pedagogical framework for promoting AI literacy by focusing on five elements (i.e., understand, access, prompt, corroborate, and incorporate AI in writing), which seems to further elaborate the conceptualization of AI literacy by Ng and her colleagues (2021). These five elements of AI literacy include (1) *understanding* the "basics of AI writing tools' functions, strengths, weaknesses, and biases" (2) *accessing* AI tools effectively, (3) *prompting* AI to produce relevant and useful outputs, (4) *corroborating* "the accuracy of AI-generated content", and (5) *integrating* AI-generated content "ethically and effectively" (pp. 3-4).

This paper narrows the scope to *critical AI literacy* that emphasizes critical engagement, ethical awareness, and reflective judgment. Wang and Wang's (2025) recent conceptualization of *critical AI literacy* significantly informed our research. According to them, critical AI literacy consists of four components, including Critical AI Awareness (A), Critical AI Positionality (P), Critical AI Strategies for human-AI interaction (S), and Critical Evaluation of AI Affordances (E), which is known as an APSE model. These four interrelated components collectively support critical engagement with AI. This study adopts Wang and Wang's conceptualization of critical AI literacy for ESL academic writing pedagogy.

### **Practitioner Reflective Inquiry**

This study adopts a practitioner-inquiry approach, as one key component in reflective self-study (Cochran-Smith & Lytle, 2009), to comprehensively examine and improve Ruonan's instructional practices for cultivating critical AI literacy in her ESL academic writing classroom. In this inquiry, Ruonan played a dual role as an instructor of the L2 writing course and a researcher, while Youngjoo served as a "critical friend" to

help Ruonan interrogate assumptions, deepen her reflective practice, provide more nuanced interpretations of the data, and co-author this article (Brewer et al., 2021, p. 76).

This inquiry was situated in an undergraduate ESL academic writing course at a Midwestern U.S. university. The course provides instruction mainly on critical reading and argumentative writing development. Critical AI literacy, as the focus of this study, was also integrated during the revision phase of a multi-stage argumentative paper (Weeks 8–9), with the prior seven weeks building on students' foundational literacy skills in rhetorical concepts and argumentation strategies. During the revision phase, students engaged with AI tools and were instructed to seek feedback from AI and leverage their critical thinking and independent decision-making abilities to evaluate AI-generated feedback. Our data were gathered from multiple sources, including classroom observations, teaching artifacts, and reflective research journals. We conducted inductive data analysis, following Hsieh and Shannon (2005), to identify pedagogical affordances and challenges.

### **Findings and Discussion**

This section explains a three-stage instructional implementation for cultivating critical AI literacy. For each stage, one key instructional practice was implemented, as described below (see the Appendix).

#### *Stage 1: Developing Prompt Literacy in AI-Assisted Writing*

One of the most important components of critical AI literacy is *prompt literacy*, which is defined as “the trained ability or knowledge to appropriately and effectively formulate and adjust prompts, including visual or auditory stimuli, based on specific contexts and purposes” (Kang & Yi, 2023, p. 1). To support students' prompt literacy development, Ruonan first provided a general sample prompt for students to seek feedback on content, organization, and language from AI tools while asking AI to preserve their original meaning. After using the sample prompt, many students found the feedback too general and insufficient to further improve their writing. This experience made students realize that the quality of AI feedback depended largely on how clear and specific their prompts were.

To support students in developing prompt literacy, Ruonan offered explicit instruction about how to construct and refine prompts to better align with students' writing goals and the course learning outcomes for argumentative writing. First, students were asked to self-evaluate their drafts to identify the strengths and weaknesses in such areas as thesis statement, paragraph structure, and the use of evidence. Then, Ruonan demonstrated how to translate identified writing concerns

into content-focused, specific prompts for students. To scaffold students in this process, Ruonan also provided templates for students to use or adapt when seeking AI's feedback. For instance, to facilitate thesis development, a sample prompt was given, such as: "Please give feedback on my thesis statement, evaluating whether it is specific and arguable." Students were encouraged to use these templates while also integrating their own questions into their prompts. Building on the initial prompts, students then refined their prompts in an iterative manner by revising them in order to make their prompts more specific and focused. In doing so, they sought to receive feedback that directly addressed their writing needs and goals.

During these prompt literacy practices, we also observed two critical challenges: (1) power dynamics between humans and AI as authority, and (2) the uneven development of prompt literacy among students. First, some students found it difficult to question or refute AI feedback because they positioned AI as an expert who was more capable than themselves. These students did not engage in a dialogic interaction with AI tools. Second, students' prompt literacy appeared to develop unevenly, which may not be too surprising. While some were able to refine prompts effectively through iterative interaction, others struggled with prompt refinement, thereby receiving less useful or targeted feedback. These challenges gave us valuable insights into designing pedagogical instruction for developing prompt literacy.

### *Stage 2: Critically Evaluating AI-Generated Outputs by Composing Counter-Text*

Critical evaluation of AI-generated feedback is another key component of cultivating critical AI literacy. In this activity, students first compared the writing with elicited AI-generated feedback to their original drafts by identifying and documenting differences between the two drafts on a structural worksheet provided by Ruonan. Then, they critically evaluated the AI-generated feedback and made intentional decisions to accept, modify, or reject each suggestion from AI. Students were further required to compose *counter-texts* to articulate their reasons for rejecting AI-generated feedback. We found that students' responses to AI feedback were influenced by the types of feedback they received and its alignment with their writing goals. Specifically, students tended to accept suggestions related to correctness, such as grammar, punctuation, and word choices, and to modify the feedback on sentence structure to improve the flow and style; however, they rejected feedback that erased their voices or distorted their original meaning. This finding indicates that students appreciated AI's feedback for increasing accuracy, yet they remained cautious about its risk of erasing or distorting their authorial voices or intended meaning. Through engaging in the critical evaluation of AI feedback, students appeared to recognize AI's strengths and limitations, critically evaluate AI feedback, incorporate feedback to improve their writing and achieve the writing goals, and preserve their own voice and

writing styles. Together, these practices indicate that students engaged with core dimensions of critical AI literacy, such as “Critical AI Awareness” and “Critical AI Positionality” in the APSE model (Wang & Wang, 2025).

Students’ ability to critically evaluate AI-generated feedback shows a similar pattern of uneven development to what we identified in prompt literacy. The analysis of students’ worksheets indicated that students with higher English writing proficiency adopted a more critical perspective and leveraged their decision-making ability when evaluating AI feedback, while students with lower proficiency tended to accept the feedback without engaging in critical evaluation. These findings suggest that critical evaluation of AI-generated feedback cannot be assumed to develop automatically. Instead, more tailored pedagogical scaffolding is warranted to support students in developing the competence to evaluate AI outputs critically.

### *Stage 3: Drafting an AI Use Disclosure Statement*

In the final stage, Ruonan implemented a writing task, that is, composing *an AI use disclosure statement*, in order to enhance students’ ethical awareness of AI. Students were required to disclose their AI usage by documenting the AI tools they used, the prompts they crafted, the AI suggestions they received, and how they evaluated the AI feedback and decided to accept, revise, or reject it in their final drafts. This activity aims to elicit students’ decision-making process and reinforce the ethical boundaries in human–AI collaboration, which reflects the concept of “Critical AI positionality” in the APSE model (Wang & Wang, 2025).


To scaffold this process, Ruonan first shared a disclosure statement that she drafted, illustrating how AI was used and how she approached and addressed ethical challenges such as AI hallucinations. In addition, she facilitated small-group discussions of academic integrity, embedding transparency, responsibility, and ethical decision-making in AI-assisted academic writing. Overall, this practice made students’ decision-making process about AI more visible and enhanced transparency in how students evaluated and revised their drafts in response to AI outputs. Moreover, it enhanced students’ self-reflexive engagement, nurtured a sense of responsibility when engaging with AI tools, and positioned ethical and transparent AI use as a crucial element of critical AI literacy.


### **Conclusion**

Developing critical AI literacy allows students to engage in dialogic human–AI communication and collaboration, question AI’s assumptions and biases, critically evaluate AI-generated feedback, and leverage self-agency to maintain their authorial voices in academic writing. Overall, students will likely engage with AI more critically

and responsibly and experience more ethical and empowered academic writing practices. The practices for cultivating critical AI literacy will open new pathways to future pedagogical instruction in critical AI literacy within academic writing classrooms, particularly for bilingual and multilingual learners.

### **ORCID**

 <http://orcid.org/0009-0004-1688-6632>

 <http://orcid.org/0000-0001-9190-8601>

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Ruonan Yang: Conceptualization, Methodology, Investigation, Writing - Original Draft, Visualization

Youngjoo Yi: Conceptualization, Methodology, Writing - Review & Editing, Supervision

### **Generative AI Use Disclosure Statement**

The authors occasionally consulted AI tools (ChatGPT or Copilot) to double-check grammatical structures and enhance word choices and transitional phrases.

### **Ethics Declarations**

**World Medical Association (WMA) Declaration of Helsinki-Ethical Principles for Medical Research Involving Human Participants**

Not applicable.

### **Competing Interests**

We declare no conflicts of interests.

**Data Availability**

Not applicable.

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**Appendix**

***Three-Stage Instructional Implementation for Cultivating Critical AI Literacy***

**Stage One: Developing Prompt Literacy in AI-Assisted Writing**

**1. Provided general prompt:**

Can you make some suggestions for editing the thesis statement in the introduction paragraph?

**2. Self-assessment guideline questions for thesis statement:**

- Have I included a thesis statement?
- Is my thesis statement specific and focused?
- Is my thesis statement arguable?
- Does my thesis statement serve as a roadmap to preview the main ideas of each body paragraph?

**3. A sample refined prompt:**

Please give feedback on my thesis statement, especially whether it is specific and arguable.

**Stage Two: Critically Evaluating AI-Generated Outputs by Composing Counter-Text**

**Part I. Identifying Differences**

**1. Language Mechanics (Grammar & Punctuation)**

Please find one example of a grammar or punctuation edit.

- Original:
- Revised:
- What changed? Explain in your own words:

**2. Style and Expression (Vocabulary & Sentence Structure)**

Please find one example where the wording or sentence structure was improved or changed.

- Original:
- Revised:
- What changed? Explain in your own words:

**Part II. Evaluating AI Feedback**

Please critically evaluate the AI feedback on your argumentative writing.

- Is the AI feedback accurate and aligned with the rubric (claim, evidence, reasoning, organization, clarity)? How do you know?
- What parts of the AI feedback are helpful? Be specific.
- What parts are inaccurate, unclear, or missing important points? Why?

**Part III. Composing Counter-Text**

Choose one AI-generated feedback you disagree with or revise. Please write a short counter-text that includes:

- What AI-generated feedback did you receive?
- What aspect does it focus on (claim, evidence use, mechanics, etc.)?
- Why do you reject or modify it?

**Stage Three: Drafting an AI Use Disclosure Statement**

For this assignment, please document your AI use as transparently as possible. In your statement, please explain:

1. What AI tool(s) have you used?
2. What prompts did you draft when using AI?
3. What feedback did AI provide?
4. How did you evaluate the AI-generated feedback?
5. What made you decide to accept, modify or reject AI's suggestions?