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Cultivating AI literacy in language education: theoretical discussions and practical applications

https://doi.org/10.1515/jccall-2025-0023
Published online November 3, 2025

The rapid advancement of artificial intelligence (AI), particularly in the form of generative AI tools, has ushered in a new era for language education. These technologies offer unprecedented opportunities to enhance personalised learning (Zhang et al. 2024), streamline instructional workflows and foster innovative pedagogical practices. However, their integration also raises critical questions about ethical use, teacher-student-AI dynamics and the need for specialised competencies to navigate AI-driven educational landscapes (Lee et al. 2025). Against this backdrop, this special issue focuses on bringing together cutting-edge studies to address these challenges and opportunities.

This special issue features four research articles, one review article and two book reviews, collectively offering a comprehensive exploration of AI literacy from multiple perspectives: theoretical frameworks, empirical practices, and critical reflections. Together, they illuminate the multifaceted nature of AI literacy in language education and provide actionable insights for educators, researchers and policymakers.

1 Theoretical foundations and conceptual frameworks

At the core of this special issue is a focus on defining and operationalising AI literacy. Pérez-Paredes et al. (2025) propose a critical AI literacy (CAIL) framework tailored to students of applied linguistics and language education. Drawing on a focus group

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study with Spanish undergraduates, they identify four key dimensions: technical understanding, critical thinking, ethical awareness and practical application. Their work emphasises the need for discipline-specific AI literacy, arguing that language educators must leverage their expertise in discourse analysis, corpus linguistics, and pedagogical theory to critically engage with AI tools. This framework bridges generic AI literacy models with the unique demands of language education, highlighting how linguistic knowledge can inform the evaluation of AI-generated content and its alignment with pedagogical goals.

Complementing this, Liu et al. (2025) explore AI literacy in China's shadow education sector, a context characterised by exam-oriented practices and market-driven pressures. Through interviews with nine EFL practitioners, they develop a five-dimensional framework encompassing (1) a human-centred mindset; (2) AI knowledge; (3) application and evaluation skills; (4) ethical considerations; and (5) systemic/societal implications. Their findings reveal that shadow education tutors prioritise AI's utility for task automation (e.g., lesson planning, grading) but face challenges related to institutional constraints and parental expectations. This work underscores the importance of contextualising AI literacy frameworks to account for non-formal educational settings, where practicality and efficiency often take precedence over theoretical depth.

2 Practical applications and pedagogical innovations

Several studies in this special issue showcase how AI literacy can be integrated into classroom practices. He and Tinsley (2025) document a pedagogical intervention at a Sino-British transnational university, where EAP students were trained to use generative AI for academic writing. Their activities focused on understanding AI's strengths and limitations, engineering effective prompts, enhancing assessment literacy, and upholding academic integrity. The authors highlight the value of process-based learning, where students learn to use AI as a collaborative tool. For example, students could compare AI-generated drafts with their work and refine prompts to align with disciplinary writing norms. This practice-oriented approach not only improves students' AI literacy but also strengthens their critical thinking and self-regulation skills.

Similarly, You and Zhang (2025) investigate how pre-service English teachers in Chinese Hong Kong develop AI literacies through ChatGPT-facilitated pedagogy. Using Darvin and Norton's (2023) investment model, they show that AI literacy development is intertwined with identity negotiation: participants leveraged AI-

generated "native-like" language to enhance their perceived professional legitimacy as non-native English teachers (NNETs) but also grappled with anxieties about AI replacing human instructors. Their findings emphasise the need for teacher education programs to address both technical skills (e.g., prompt engineering) and psychological dimensions (e.g., identity construction) of AI literacy, empowering future educators to position AI as a complement to, rather than a substitute for their expertise.

3 Ethical considerations and critical reflections

Ethics emerges as a recurring theme, with multiple studies highlighting the need for the responsible use of AI. Liu's (2025) review of 19 empirical studies on language teachers' collaboration with ChatGPT identifies key ethical challenges, including AI-generated inaccuracies ("hallucinations"), bias in training data, and threats to academic integrity. The author argues that ethical AI literacy requires teachers not only to verify AI outputs but also to critically examine how algorithmic biases (e.g., cultural or linguistic hegemony) may perpetuate inequities in language education. This aligns with Pérez-Paredes et al. (2025) who call for CAIL that emphasises interrogating power structures embedded in AI tools, such as the privileging of "standard" English varieties over World Englishes.

The book reviews in this special issue further contextualise these discussions. Fang and Zhang (2025) review UNESCO's AI Competency Framework for Teachers, praising its human-centred approach and emphasis on ethical principles but noting the need for localisation to address regional disparities in AI access and teacher training. Guo (2025) critiques the book *Technology and English Language Teaching in a Changing World* for its limited focus on cutting-edge AI tools, arguing that practical guides must keep pace with technological advancements to remain relevant. Together, these reviews highlight the tension between global frameworks and local realities, underscoring the importance of adaptive, context-sensitive AI literacy initiatives.

4 Conclusion and future directions

This special issue demonstrates that AI literacy in language education is not a static set of skills but a dynamic, context-dependent construct that integrates technical proficiency, critical thinking, ethical awareness and identity negotiation. As AI continues to reshape educational practices, future research could focus on the development of AI literacy frameworks tailored to diverse settings (e.g., formal vs.

shadow education, primary vs. higher education). Longitudinal studies are required to investigate how AI literacy evolves over time and its long-term impact on teaching efficacy and student outcomes. In addition to fostering AI literacy among learners, the enhancement of teachers' AI literacy is quite often overlooked. However, before implementing AI tools on a large scale in language classrooms, teachers must be well prepared psychologically, pedagogically, and technologically (Wu and Miller 2025). Besides, issues related to equity and inclusion should be emphasised to address the disparities in AI access and ensure that AI tools empower, rather than marginalise, learners and educators from diverse linguistic and cultural backgrounds (Yang et al. 2024). Also, the recent trend of situating learners in immersive learning presents new opportunities for research on integrating AI and immersive literacies (Wu and Lee 2025; Wu et al. 2024). By cultivating AI literacy as a collective endeavour that engages teachers, students, researchers and policymakers, we can harness the transformative potential of AI to create more inclusive, effective and ethical language education systems.

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