Artificial intelligence for language learning: Entering a new era

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Introduction

We are at a critical juncture in considering the role of artificial intelligence (AI) in language learning. The public release of ChatGPT and other large language models (LLMs), starting about 18 months ago, presents entirely new possibilities previously unanticipated. This special issue, which was launched six months before that release, thus serves as a key bridge, by highlighting some of the best language learning research with AI at the end of the previous era that we can build on while we transition to the exciting new potential of generative AI.

The eight articles in this special issue explore diverse applications of artificial intelligence in language learning, focusing on both outcomes and processes from the perspectives of learners and educators.

Regarding learning outcomes, a meta-analysis by Lee et al. (2024) synthesized findings across 17 projects and found that AI-guided individualized literacy instruction effectively enhanced learning. This meta-analysis provides a comprehensive overview of the current state of AI-assisted language instruction.

Two other articles in this special issue offer more detailed cases of using AI to support specific aspects of language learning. Huang et al. (2024) focused on decoding skills. Their study aimed to tackle the issue of traditional decoding teaching methods, which demand much of teachers’ time and expertise. They incorporated a chatbot to serve as a constantly available support, turning a flipped classroom with an in-person component into a fully online environment. Results showed that students’ learning gains were comparable to those in the flipped version. Kim (2024) examined a specific syntactic structure and used AI for "corrective recast." During students’ chats with the AI, when grammatical errors occurred, the AI chatbot would repeat the mistake to draw students’ attention and then request clarifications ("Can you please say it again?") to prompt students to correct their errors. The results showed that students achieved significant learning gains. Woo et al. (2024) dived deeper to examine the processes by which AI supports secondary students’ writing. They found that when integrating AI-generated text into their own compositions, the quality of students’ writing improved regardless of their prior writing ability.

There are, of course, nuances in interpreting these positive findings: it appears that even with AI’s facilitation, human components from both teachers and peers are still important in cultivating a successful learning environment. As Lee et al. (2024) pointed out, AI-based instruction is most effective when it incorporates teachers’ expertise and theoretical backgrounds as guiding logic to develop the instructions. Zheng et al. (2024) uncovered the importance of peer support: this article compares the outcomes of peer feedback and automated chatbot feedback in public speaking training, noting that while both are effective for improving learning, peer feedback led to higher levels of social engagement among students. The unique social dimension of learning from human partners is also corroborated by Dombi et al. (2024), where the researchers found that when students engaged with AI, their interactions were more transactional, while their interactions with a human partner were more relational.

Shifting the focus to educators, Liu et al. (2024) examined teachers’ perceptions of using a text simplification tool. This article documented teachers’ progression from initial simple reliance on the
technology to a more judicious and critical application. This mirrors the broader trajectory of technology adoption observed with other AI tools in educational settings, suggesting that educators may experience similar transitions in their use of emerging technologies like ChatGPT. Also focusing on how teachers negotiated with these technologies, Ji et al. (2024) took a different angle by examining how teachers orchestrated with AI chatbots, through different pedagogical dialogue moves, to engage students in classroom interactions.

Keeping this research background in mind, what then changes as we consider ongoing and future research on generative AI in language learning? We point to three important points for consideration.

First, the power of AI as an instructional tool is now greatly amplified. Creating AI-based interaction opportunities can be done much more simply with generative AI, and requires much less of the specialized programming experience witnessed in many of the studies in this special issue.

Second, AI as an instructional tool becomes much more flexible and powerful, allowing a much broader range of free-flowing language interaction than the tools discussed in this special issue. This requires special attention to both the potential affordances of this broader language use, as well as the challenge in nudging users toward pedagogically sound use of these tools and away from less productive or even risky ones.

Finally, and most importantly, these recent developments in large language models mean that AI is now much more than a pedagogical tool; rather, it is a key aspect of reading, writing, and knowledge production in every life, with the stakes especially high for second language learners. So, just as the Internet itself transformed CALL from a specialized tutorial for the few to an essential digital literacy for all (Warschauer, 1999), LLMs transform AI-based learning from a tool for tutoring or practicing language to an every-day means of reading, writing, and knowledge production critical for all learners, and especially English learners (see, e.g., Tseng & Warschauer, 2023; Warschauer, et al., 2023). We thus need to develop AI literacy by teaching learners how to understand, access, prompt, corroborate, and incorporate generative AI and the content it produces.

All of these things suggest much greater attention to AI is now required in all aspects of the language education profession, from teacher training, to curricular development, to the production of educational media and technology, to classroom teaching, to educational or linguistic research. Keeping the latter in mind, we suggest three types of research approaches will be productive, focusing on texts, practices, and outcomes.

Textual research can analyze the nature of generative AI-produced texts, including their syntactical, lexical, and rhetorical features; can compare texts written by generative AI and humans, including second language learners; and can compare corpora of texts produced before and after the release of ChatGPT, such as college admissions essays, university discussion posts, and school writing assignments.

Research on practices can include case studies of individual writers using generative AI or second language classrooms that incorporate it in instruction; surveys of users second language speakers; studies of how second language educators make use of generative AI tools for lesson preparation and instruction; studies of students’ attitudes, identities, and motivation in relationship to generative AI use; and students writing or language processes in using generative AI.

Outcome-based research can investigate the performance of tools, analyzing for example the quality of LLM-based feedback (e.g., Steiss et al., 2024) or scoring (e.g., Tate et al, 2024) or AI-detection software (e.g., Liang et al, 2024). It can compare the quality of written texts that learners produce without AI (e.g., Noy & Zhang, 2023). Or it can carry out experiments to compare pre- and post-tests of writing or language proficiency; digital literacy; or attitudes, motivation, and identity after having been assigned to use or not use generative AI in their classes.

Of course generative AI can also be used as an applied linguistics research tool, by aiding in transcribing interviews, summarizing literature, or doing content analysis of documents. We have no doubt that these lines of inquiry will generate a highly productive period of applied linguistic research, rivaling the explosion
of research on the Internet and language learning that began 30 years ago. And, just like back then, we are excited about the role that Language Learning & Technology can play in bringing this burgeoning field of research to the public.

References


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