

# AI as a co-teacher in language education: A review of roles, application, and affordances

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## ABSTRACT

The use of artificial intelligence (AI) in education has increased considerably in recent years, and so has its adoption in language education. This article discusses how AI can serve as a co-teacher in a human-AI co-teaching model, where human teachers and AI collaborate to provide effective instruction that supports student learning. The article employs a qualitative literature review to synthesize existing scholarship on AI's role as a co-teacher in educational contexts. Drawing on secondary sources, it argues that the human-AI co-teaching model is the way forward for language education amid the increasing adoption of AI in education. The article provides definitions of AI as a co-teacher, discusses the changing roles and responsibilities of human teachers, and shows how AI can be utilized in the human-AI co-teaching model. In addition, the article discusses the affordances and teacher professional development needed to ensure the effectiveness of adopting AI as co-teachers. Limitations of this model and suggestions for future research are also discussed to provide directions for curriculum development, policy support, and further studies on this important and emerging area of research.

**Keywords:** artificial intelligence, AI as co-teachers, changing teacher roles, language education

## INTRODUCTION

Across the world, schools face a serious shortage of teachers in K-12 and beyond. UNESCO (2023) estimated the gap at 69 million, and Africa and Southern Asia are reported to endure the heaviest burden. UNESCO (2024) further reported that rising enrollments and fewer people entering the profession have left many classrooms understaffed. The result has led schools to struggle to meet the demand for teachers. In the language-learning industry, more than 3 billion people are second-language learners, with over 1.5 billion studying English worldwide (Kent State University, 2025). In this context, new forms of teaching partnerships with artificial intelligence (AI) have been widely tested and discussed in the scholarly literature (Araya, 2024; Radhika et al., 2023; Sessa & Aiello, 2024; Shubhanshi, 2026; Wei, 2023). In other words, schools need new ways to leverage large class sizes, innovate instruction, and reduce teachers' workloads while ensuring students continue to learn efficiently.

History shows us that education has always relied on support from other academics and professionals in the classroom. They were assistants and additional instructors and played a role in teaching by sharing their fresh perspectives,

knowledge, and specialized skills (Honigsfeld & Dove, 2008). Today, research points in the same direction. Many studies have suggested that co-teaching and digital interaction can increase students' learning success by enhancing student participation, motivation, and teacher collaboration, especially in language programs (Pang et al., 2025a; Scruggs et al., 2007). Several studies reported positive outcomes of co-teaching, including its effectiveness in supporting diverse learning needs (Scruggs et al., 2007), encouraging inclusive practices for underserved communities (Friend et al., 2010), and helping new teachers develop specialized knowledge (Hudson & Glomb, 1997). Co-teaching positively supports diverse learning needs (Scruggs et al., 2007), promotes inclusive practices for underserved communities (Friend et al., 2010), and aids new teachers in developing specialized knowledge (Hudson & Glomb, 1997). In recent years, virtual-human co-teaching has been perceived as promising for online education (Declercq et al., 2024). Specifically, Bangulzai et al. (2025) investigated AI-human co-teaching in higher education using a quantitative survey design and found that teachers' emotional readiness and digital skills significantly predict their acceptance of AI tutors. In an English as a Foreign Language (EFL) classroom, this would mean pairing content teachers with language specialists or grouping students so that

both English learners and native speakers receive the support they need to succeed.

The practice of co-teaching began in the 1960s. It was an early response to the call for inclusive education and the push to integrate students with disabilities into mainstream classrooms in K-12 contexts. The idea was widely adopted by many schools in the 1980s and 1990s, especially after the passage of the Individuals with Disabilities Education Act in the United States, which has enabled students with disabilities to learn in the least restrictive environment (Nápoles, 2025). In its basic form, co-teaching refers to how two teachers share one classroom. They plan lessons together, deliver instruction side by side, and take joint responsibility for student learning (Samuel, 2020). Over the years, educators from many disciplines and grade levels have successfully experimented with different co-teaching models in middle schools (Strogilos & King-Sears, 2019), higher education (Low et al., 2025; Morelock et al., 2017), and special education (King-Sears, 2022). Some implemented one teacher leading while another observes or assists in the instruction process. Others divided the class into stations, ran lessons in parallel, or took turns leading different groups while aligning with the curriculum agenda. What made these approaches work was the principle that these teachers collaborated to bring their knowledge and expertise to meet the needs of their students (Texas Education Agency, 2021).

Later, co-teaching expanded beyond its original focus on students with disabilities. It entered general classrooms and even higher education. In universities, for example, it has been used to bring together different areas of expertise, to enrich the learning experience, and to give students more individual support (Smith & Winn, 2017). Courses such as seminars and symposia show how flexible the practice has become over time (Morelock et al., 2017). In English as a Second Language (ESL) classrooms, co-teaching has also shown its value. It helps teachers across levels create useful materials and practices for English learners, supports all students in reaching academic standards, and also builds stronger collaboration between ESL and mainstream teachers (Honigsfeld & Dove, 2008).

More recently, the rise of AI has further compelled schools and universities to rethink how to effectively teach students in this ever-growing digital era. The so-called 'AI boom' is here to stay. It has opened many possibilities that change both *what* and *how* students learn in and beyond the four walls of their classrooms. Although early adoption in education was limited (Zawacki-Richter et al., 2019), many scholars, over the last few years, have claimed that AI has brought real opportunities but also some serious challenges for education (Ji et al., 2023; Sok & Heng, 2023; Sol et al., 2025). Belda-Medina and Calvo-Ferrer's (2022) preliminary study reported favorable findings regarding future educators' perceptions of AI chatbots for language learning in terms of usability. Fast forward, AI can make learning even more personal and more efficient by changing the way lessons are designed and delivered to students (Fyka, 2024; Pang et al., 2025a). Research has then repeatedly shown that ChatGPT and similar systems can be used as co-teachers to offer students practice, activities, individualized learning resources, and real-time feedback to help them advance (Howlader et al., 2025; Niloy et al., 2025; Sumakul et al., 2022).

This paper addresses the question of how AI is entering the space of co-teaching or collaborative teaching in language education settings. The focus is not on replacing teachers or even taking away the jobs of human co-teachers, but on discussing how AI can work alongside them. We will begin providing information about the research methods, search strategies, and data sources that inform the analysis in this study. Then the paper will define what it means to think of AI as a co-teacher in language classes. From there, we will look at why schools and educators might employ AI in this way, and then consider how the role of the human teacher is being redefined in the case of English language teaching. The paper will also elaborate on the strengths and the limitations of AI as a co-teacher. Finally, the discussion turns to what AI co-teaching means for teacher preparation, classroom practice, and the directions that future research might take.

## METHODOLOGY

This study used a qualitative literature review (Denney & Tewksbury, 2013) to study how AI functions as a co-teacher in language education. The purpose is to synthesize existing research and explain how the concept of "AI co-teacher" is defined, used, and distinguished from AI tutors. Hence, we adopt a structured narrative approach to assist in deep and flexible examination of concepts, roles, and practices. However, the review process applied procedures for selecting and analyzing studies to maintain transparency and consistency. Relevant studies were identified through searches in Scopus, ERIC, and Google Scholar using keywords such as "AI co-teacher," "AI AND co-teaching," "AI in collaborative teaching," "AI tutor," and "intelligent tutoring systems." The search focused on recent publications from 2022 to 2025. The review included peer-reviewed journal articles and conference papers written in English that examine AI working with human teachers in instructional processes. Special attention was given to studies where AI supports or collaborates with teachers, so the review stays focused on AI as a co-teacher in language education.

The selected studies were analyzed using thematic analysis. Key information from each study, such as research context, AI role, teaching function, and outcomes, was extracted and organized into a data table. The studies were then coded to identify repeated patterns and ideas. These codes were grouped into broader themes through comparison across studies. The analysis identified several main themes including definitions of AI as a co-teacher, the roles AI plays in teaching, changes in the role of human teachers, benefits and professional learning for teachers, and the limitations of AI as a co-teacher. The findings are also supported by an example model of human-AI co-teaching to further illustrate how this approach can be applied in language education.

## RESULTS

### Defining an AI Co-Teacher in Language Education

The idea of AI as a co-teacher is still very new in the literature on AI (Beavers, 2025; Belda-Medina & Calvo-Ferrer,

**Table 1.** Roles and responsibilities of human teachers and AI in AI-enhanced co-teaching across six approaches

Approaches	Responsibilities of Human Teachers	Responsibilities of AI Co-Teacher
1. Station Teaching	Organize content into segments, and manage small group rotations.	Assist with lesson planning, content delivery at stations, and track student progress.
2. Parallel Teaching	Divide the class and simultaneously deliver the same lesson.	Provide differentiated instruction or materials as needed.
3. Alternative Teaching	Teach the main group while targeting a small group for specific needs.	Deliver targeted remedial or enrichment activities.
4. Teaming	Both teachers lead the class together and deliver content.	Provide real-time assessments and feedback.
5. One Teaching, One Observing	Teach the lesson while the other collects data on student engagement and understanding.	Analyze collected data to adjust teaching strategies.
6. One Teaching, One Assisting	Lead the teaching while the other provides support, managing the classroom and assisting students.	Support in managing classroom activities and student inquiries.

Adapted from Texas Education Agency (2021)

2022; Shubhanshi, 2026). Many studies reported AI as a translator (Zhao et al., 2024), a study buddy (Imran & Almusharraf, 2024), a co-planner (Kacsó & Huszti, 2024), a tutor (Pang et al., 2025a), an exam grader (Lee & Song, 2024), a counselor (Fulmer, 2019), a learning analyst (Salas-Pilco et al., 2022), or a learning assistant and companion (Muzammil, 2025; Punar Özçelik & Yangın Ekşi, 2024). However, far fewer have seriously looked at AI as a true partner in teaching or AI as a co-teacher. When using the term "AI co-teacher," scholars are speaking of an intelligent system or large language model that collaboratively works beside a human instructor and shares part of the responsibility for teaching in and outside of the classroom (Araya, 2024; Oldham, 2024; Radhika et al., 2023; Sessa & Aiello, 2024; Shubhanshi, 2026). In practice, a human teacher would lead a reading lesson from the national curriculum, while the AI co-teacher provides vocabulary practice or pronunciation drills that match each student's level and learning pace. In higher education, the same principle applies. A human teacher may guide a seminar discussion and students' presentations, and the AI may extend the learning with pre-class summaries and extra relevant content or provide follow-up quizzes that continue after the session ends.

For AI to act in this way, it needs to do more than answer commands like a machine. It needs to have unique abilities to identify students' weaknesses and strengths, create learning plans, track their progress and report performance, and give feedback on lessons such as writing, grammar, vocabulary, or pronunciation in real time (Ji et al., 2023; Pang et al., 2025a; Schmidt & Strasser, 2022). Though many of these tasks remain hard for early AIs to do well, today's language models (i.e., GPT5) can bridge the gap between promise and practice. For example, beyond complementary strengths such as pattern recognition and analytics, Shubhanshi (2026) claimed that AI co-teachers can be used in co-planning, co-instruction, and co-assessment. In crisis contexts (e.g. COVID-19 pandemic and the war in Ukraine), Svobodová et al. (2024) proposed that AI co-teachers can assist instructors in dividing students into smaller groups, adapting learning materials and tasks, and providing real-time or asynchronous feedback. They also assisted in monitoring participation, simulating scenarios (e.g., teamwork, problem-solving), and recommending formative assessment activities and materials.

In language classrooms, these AI co-teachers might take the form of chatbots (i.e., ChatGPT or Gemini), AI agents, adaptive platforms (i.e., character AI, Khanmingo, or Doulingo Max), or other simulations that serve as pronunciation partners, cultural guides, or writing coaches (Pang et al., 2024, 2025a). In practice, a teacher might lead 40 minutes of

instruction and then invite students to spend 20 minutes as they work on assigned tasks or projects with an AI co-teacher with regard to research, drills, conversation practice, or error correction for essay writing. For a weekly-based format, teachers may set aside one day for AI-based activities to give students time for independent projects or interactive assessments. Naming AI as a co-teacher matters here. The title signals respect and helps students treat their work with AI as a serious part of the learning process, not just a random add-on.

### Roles of AI as a Co-Teacher in Language Education

One important consideration of approaching AI as a co-teacher is in co-planning. In this role, AI can support human teachers in lesson design and preparation by creating activities, adapting teaching materials, and providing differentiated options for diverse learners (Shubhanshi, 2026). Teachers, therefore, should plan AI-integrated language lessons that directly address learners' motivation, self-regulation, and learning achievements (Wei, 2023). AI should also be used to study student performance and later inform lesson design (Ji et al., 2023). Fyka (2024) noted that AI can generate grammar tasks and lesson plans that move away from one-size-fits-all instruction. In teaching the English language, for instance, teachers may work with AI to plan lessons and adapt the curriculum that directly responds to curriculum goals (Pang et al., 2024).

Another area is co-instructing or using AI alongside the teacher during lessons. In this area, AI can provide practice drills, pronunciation feedback, or conversation simulations to complement the teacher with explanations and interaction. Phanwiriyarat et al. (2025) described that the use of Duolingo Max in a gamified speaking course can extend speaking, listening, vocabulary, and pronunciation practice among language learners. Pang et al. (2025a) also explained that AI tools like ChatGPT, with an expertise in language, conversation, image generation, video-calling, and multilingual ability, can be used by language tutors in and outside of classrooms in real time. These unique abilities can be used by language teachers in support of a station model (see **Table 1**), as the teacher leads discussion at one station and the AI manages grammar or vocabulary practice at another (Morelock et al., 2017).

Third, teachers and language programs can also use AI in co-assessment, as in diagnostics, test development, assessing activities, and reporting. In diagnostics, for example, AI can pre-score essays, flag frequent errors, and cluster mistakes by category to inform instructional adjustments (Pang et al., 2025a; Salas-Pilco et al., 2022). In test development, AI can

draft rubrics, generate exemplars, and even create adaptable materials that teachers can further refine to match classroom goals (Pang et al., 2024). During assessment activities, AI can offer real-time feedback to individual students or as a whole class in areas such as fluency practice, quizzes or reading tasks, writing drafts, and discourse features such as cohesion markers or lexical diversity (Schmidt & Strasser, 2022; Sol et al., 2025). Finally, in reporting and progress tracking, AI can visualize learners' growth in vocabulary, fluency, and complexity; archive feedback logs for portfolios; and create dashboards to inform both learners and teachers about ongoing achievement (Ghafouri et al., 2024).

The fourth aspect in approaching AI as a co-teacher is co-mentorship; the aim is to connect AI to learner autonomy and motivation with ongoing supervision of human teachers. Little (2007) defined autonomy as learners' ability to set goals, choose strategies, and monitor their own progress. Fulmer (2019) argued that AI can be used as a counsellor to provide reminders, sustain motivation, raise ethical awareness, and behaviour-change elements. These areas are particularly useful for pupils, teachers, and programs in developing AI literacy in modern language education (Pang et al., 2025b). Furthermore, Punar Özçelik and Yangın Ekşi (2024) established that AI can create positive spaces for extended advice for personal learning and research outside class. As a result, these create opportunities for strong L2 motivation, self-regulation, and learning achievements (Wei, 2023).

Morelock et al. (2017) also noted that an adaptable and practicable arrangement enables diverse skill sets to come together to empower the learning experience. However, approaching AI as a co-teacher is less about replacing teachers and more about structuring collaboration between a human teacher and technological assistance. These complementary roles and strengths in AI-enhanced co-teaching are shown in **Table 1**. In these approaches, AI undertakes routine tasks like evaluation and feedback, while the teacher works with students on activity engagement, discussion, critical thinking, and creativity. In a station model, at one station, the AI co-teaches grammar practice and makes instant corrections. At another, the teacher leads a debate or discussion session to build fluency, argumentation, or practice selected language points.

### Shifting Roles and Responsibilities of Human Teachers in the Age of AI

The integration of an AI co-teacher in language education classrooms is transforming the way teachers teach and learners learn, forcing human teachers to adapt their roles and responsibilities. AI technologies have been broadly used in a variety of fields, and foreign language education is no exception (Sok & Heng, 2023). Despite some challenges, AI's continuous innovative evolution has brought great positive impacts on modern foreign language education (Novawan et al., 2024), influencing foreign language learners, teachers, teaching approaches, teaching modes, and assessment methods (Hou, 2020). As a result, teachers' roles have been redefined as a response to the current development of AI.

Traditionally, education is teacher-centered, with teachers as the primary source of knowledge (Ghafar, 2023) who serve as knowledge authority (Yokubjonova, 2025). However, with

support from new technologies such as AI, the teacher's role of being a sole instructor has been transformed to be a facilitator (Manzoor et al., 2025). Therefore, education has shifted to be a process by which students have opportunities to construct knowledge through collaboration with their peers and check their learning progress through the use of personalized tutoring and feedback (Yaseen et al., 2025) with facilitation from their teacher (Alamelu et al., 2025). For example, a study by Yuna et al. (2025) revealed that compared with teachers using traditional methods without assistance from AI, teachers facilitating students' learning by employing AI tools were more effective in managing their learners' engagement and learning progress than those who merely rely on traditional methods.

AI tools such as ChatGPT exemplify this shift by transforming teacher roles from sole instructors to facilitators of learning (Low et al., 2025). Although AI cannot substitute some of teachers' roles, it can assist teachers in performing their role of being human facilitators who refine their learners' moral and ethical development more productively (Gentile et al., 2023) since it helps teachers with completing many time-consuming tasks, which enables teachers to function as quality learning facilitators. In higher education contexts, Xia et al. (2024) and Luo et al. (2025) noted that teachers can leverage AI by utilizing it to automate administrative tasks, assess learners' work, and streamline grading. Therefore, teachers can increase the effectiveness of learning assessments and their time by using AI to help them as data analysts instead of manual graders. Teachers can monitor learners' learning progress, keep track of the content of lessons consumed by learners, and provide scaffolding supports for pupils through the use of built-in analytics (Salas-Pilco et al., 2022).

The role of the teacher is, therefore, shifting from a solo instructor to a collaborative partner who works alongside AI to support student learning. For example, AI can manage routine tasks such as grammar correction or progress tracking, while the teacher focuses on guiding discussions and fostering critical thinking (Ji et al., 2023). This partnership allows classrooms to become more interactive, as human expertise and AI efficiency combine to enrich language learning experiences (Qureshi, 2025; Sumakul et al., 2022). Through the provision of immediate feedback and differentiated instruction from AI tools, learners become motivated and self-directed learners who possess a high level of autonomy and agency in their learning process (Mohebbi, 2025; Szabó & Szoke, 2024). In this sense, learners are equipped with productive learning skills and introduced to more effective learning strategies and approaches (Gentile et al., 2023). According to Asad and Ajaz (2024) and Nazaretsky et al. (2022), these qualities assisted by generative AI can empower the teachers to be critical and autonomous lifelong learners through formal professional development and personal learning.

In addition, with AI's support, teachers can abandon teaching practices that require learners to consume the same content, complete the same tasks, and take the same tests at the same time. Instead, they can generate a variety of personalized learning content based on their learners' needs and progress for their learners, which enables them to master learning points meaningfully from in-class learning activities

**Table 2.** The changing roles of teachers in the context of AI as co-teachers

Traditional roles	New roles	Sources
Teacher-centric educator	Student-centric educator	Ghafar (2023); Yokubjonova (2025); Manzoor et al. (2025); Yaseen et al. (2025); Alamelu et al. (2025); Yuna et al. (2025); Low et al. (2025); Sok and Heng (2023); Novawan et al. (2024); Hou (2020)
Sole instructor	Facilitator of learning	Manzoor et al. (2025); Low et al. (2025); Yaseen et al. (2025); Alamelu et al. (2025); Yuna et al. (2025); Gentile et al. (2023)
Manual grader	Data analyst	Xia et al. (2024); Luo et al. (2025); Salas-Pilco et al. (2022)
Solo teacher	Collaborative partner	Ji et al. (2023); Qureshi (2025); Sumakul et al. (2022); Holstein and Aleven (2022); UNESCO (2019); Atchley et al. (2024)
Static/passive learner	Self-directed/Lifelong learner	Asad and Ajaz (2024); Nazaretsky et al. (2022)
One-size-fits-all educator	Differentiated instruction specialist	Holstein and Aleven (2022); Gentile et al. (2023)
Knowledge distributor	Learning facilitator	Gentile et al. (2023); Low et al. (2025); Manzoor et al. (2025)
Content deliverer	Emotional support provider	Pang et al. (2025a); Tan et al. (2025); Tripathi et al. (2025)

**Table 3.** Application of a human-AI co-teaching model

Day	Lesson Focus (Textbook)	Human Teacher Role	AI Co-Teacher Role (ChatGPT/Gemini)
Day 1	Unit 1A: Introduction & Profiles	Introduces the theme “ <i>Meeting New Friends</i> ”, explains vocabulary, models dialogues, and facilitates peer introductions.	Acts as a conversation partner for students, provides pronunciation feedback, and generates extra sample introductions.
Day 2	Unit 1A–1B: Reading & Comprehension	Guides students through reading texts (Rajesh, Anna, Lina), checks understanding, and explains cultural differences.	Simplifies passages, provides glosses, creates comprehension quizzes, and generates extra reading questions.
Day 3	Unit 1B: Grammar Practice	Teaches grammar points ( <i>third-person singular</i> –s), leads controlled practice activities, and monitors group work.	Provides grammar drills, instant error correction, and pronunciation practice of verb endings (–s, –z, –iz).
Day 4	Unit 1B: Writing & Reflection	Facilitates guided writing tasks (e.g., Mother’s Day card, family routines) and organizes sharing and reflection.	Suggests sentence starters, checks grammar and vocabulary in student writing, generates feedback, and personalizes homework tasks.

Note. This human-AI co-teaching model is designed based on one lesson in the Grade 11 English textbook (Lesson 1: Meeting New Friends). The model suggests that the lesson should take four hours to complete over the course of one week (1 hour per day).

and beyond (Gentile et al., 2023). In essence, teachers can assign learners to complete different learning activities and tasks based on their individual progress. Hence, with AI as a teaching partner, teachers are believed to have the capability to move from one-size-fits-all teachers to differentiated instruction specialists (Holstein & Aleven, 2022).

The use of technology in education is unavoidable. However, technology does not come to replace human instructors (EFL CAFE, 2024; Fitria, 2023). Instead, it changes teachers’ roles and responsibilities into collaborative partners (Mollick, 2024). UNESCO (2019) indicated that some of the everyday routine tasks can be completed by AI, but the teaching profession cannot be completely replaced by machines. This means teachers still have a role to play in the classroom, but their roles are changing. In fact, education in the modern world needs collaboration between technology, such as AI technologies, and human instructors (Atchley et al., 2024). Hence, teachers are no longer viewed as knowledge authorities whose role is to disseminate knowledge to learners (Gentile, et al., 2023). Instead, they play the roles of mentors and facilitators (Holstein & Aleven, 2022). This suggests the increasing role of AI as a co-teacher.

In the AI era, the teacher’s roles are expanding from simply delivering content to providing emotional and social support. Pang et al. (2025a) noted that teachers are increasingly viewed as mentors who attend to students’ mental well-being. Despite concerns over critical thinking and ethics (Malik & Shah, 2025; Pang et al., 2025b), Tan et al. (2025) and Tripathi et al. (2025) explained that AI may guide students through practice exercises, and teachers can build trust, encourage resilience,

and respond to emotional needs, ensuring that learning remains humane and meaningful. **Table 2** shows the changing roles of teachers in the context of AI as co-teachers.

### An Applied Model of AI Co-Teaching: A Case of a Grade 11 English Textbook in Cambodia

An example of how a model of AI co-teaching is applied is shown in **Table 3**. This application of the AI co-teaching model is informed by the five co-teaching models, such as station teaching, parallel teaching, team teaching, alternative teaching, and one-teach-one-assist (Texas Education Agency, 2021). It is designed for an English textbook used in Cambodian high schools (**Figure 1**). The textbook is the Grade 11 English textbook developed by the Ministry of Education, Youth, and Sport, Cambodia. In this AI-collaborative teaching model, the teacher takes the lead. Practically, the teacher presents the lesson, explains tasks in context, facilitates learning interaction and discussion, interprets cultural references, and assesses and evaluates learning. An AI co-teacher, ChatGPT or Gemini, can step in to give students extra practice, quick feedback, and individual support. Each lesson lasts one hour. About 40 minutes are for the human teacher to lead, and 20 minutes are for students to work with an AI co-teacher. That AI time can be done in class or as homework. This approach aims to keep the lesson flow smooth and align with the national curriculum objectives. It also gives students more chances to practice on their own and makes space for both structured teaching and personal learning support.

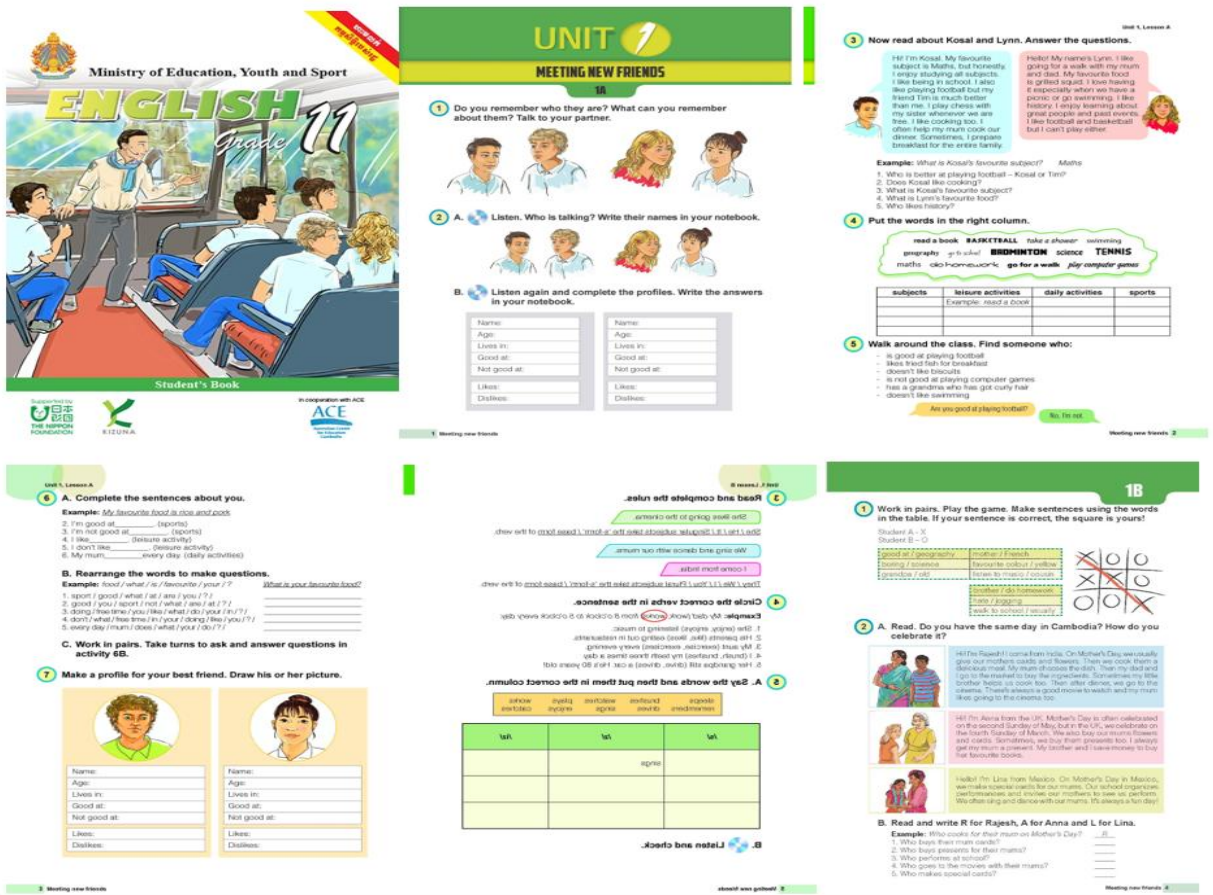


Figure 1. The Grade 11 English textbook used in Cambodian high schools (MoEYS, 2016)

### Affordances and Professional Development for Language Instructors

To ensure the effectiveness of the human-AI co-teaching model, AI affordances and professional development for language teachers are required. As Sok and Heng (2024) noted, despite some risks such as concerns about privacy and integrity issues and overdependence on AI tools, ChatGPT offers a lot of benefits in higher education. It can help with assessment, provide instructional support, extend remote learning, and improve academic writing and productivity. To take advantage of the benefits of AI tools, such as ChatGPT, it is important to ensure affordances and AI capacity building for teachers. In this respect, AI as a co-teacher in language education will only succeed if schools build strong foundations that support AI adoption. For example, students need reliable internet, computer labs, and devices such as laptops or Chromebooks so that AI can be part of everyday learning (Pang et al., 2024; Pokrivcakova, 2019; Silva et al., 2024). Teachers and administrators need preparation in both the technical use of AI and the pedagogy that guides its place in instruction (Ji et al., 2023). The curriculum should also adapt to the increasing use of AI in language education. Furthermore, institutions and state agencies should also establish policies that provide guidance on evaluation, ethical use, resource support, and community involvement in relation to AI use for education and beyond (Sok & Heng, 2024).

In addition to the AI affordances, teacher professional development plays an essential role in this process (see Table

4). On the one hand, teachers need strong knowledge of second language acquisition, classroom strategies, and assessment to support diverse learners (Richards & Farrell, 2005). On the other hand, they also need skills to bring digital tools into lessons, including those powered by AI. Pokrivcakova (2019) explained that training needs to help teachers design lessons where human instruction and AI support are in balance. Ji et al. (2023) stressed that teachers should be ready to interpret AI feedback and apply it in their classrooms. Sol et al. (2025) called for the provision of AI training to teachers and students to ensure the effective adoption of AI for language education. In particular, this training should include the use of concrete, classroom-ready prompt exemplars for co-planning, co-instructing, co-assessment, and co-mentorship, alongside clear teacher verification steps (e.g., checking accuracy, contextual relevance, and cultural appropriateness of AI outputs) to address reliability and localization concerns. To support the development of these classroom-ready prompts and teacher verification steps, specialized AI training should be provided to teachers to enhance their AI skills and literacy. Intercultural competence is another key area because language teachers work with students from many cultural and linguistic backgrounds (Byram, 2021). Moreover, reflective practice and collaboration among teachers are recommended (Darling-Hammond et al., 2017), and teachers are also encouraged to share experiences and adapt strategies to fit the changing context of teaching and learning driven by AI (Pang et al., 2025a).

**Table 4.** Professional development for language teachers in human-AI co-teaching contexts

Themes	Focus Areas	Illustrative Examples
Foundations of AI in language education	Understanding AI's capabilities/limits; overview of ChatGPT and Gemini	Comparing AI tasks with human teaching roles
Designing human-AI role sharing	Structuring 40 min teacher-led, 20 min AI-supported lessons	Teacher teaches comprehension; AI provides reading glosses
Assessment and classroom management with AI	Monitoring engagement, troubleshooting issues	Rotating groups between teacher-led and AI-supported tasks
Pedagogical applications in language skills and assessments	Speaking, reading, writing, and listening tasks	AI as a pronunciation coach; AI generates comprehension quizzes
Ethical, equity, and policy considerations	Data privacy, digital divide, policy alignment	Discussing MOEYS policy, device availability
Teacher identity and pedagogical shifts	Moving from "deliverer" to "facilitator"	Teacher leads discussion; AI gives grammar drills
Practical skills and lesson planning	Prompt creation, evaluating AI outputs	Writing AI prompts for Unit 1 activities
Reflective practice and continuous learning	Peer-sharing, documenting AI experiences	Teachers exchange AI teaching strategies

Source: Authors' synthesis of relevant literature

### Limitations of AI as Co-Teachers in Language Education

Despite advantages, there are also considerable limitations of AI as co-teachers in education. One of the key shortcomings is the limited reliability of content generated by AI (Celik et al., 2022). Most AI-generated contents are drawn from Western data, which could lead to shortages of localization, resulting in limited cultural and contextual relevance in other cultures (UNESCO, 2025). Dugošija (2024) also indicated that AI-powered education can minimize human interactions and neglect significant aspects of language education, such as societal interaction, cultural contexts, and rapport. AI is believed to have some contributions that are linked to orienting learners to master standardized English language and predetermined ideologies (Crompton et al., 2024). Hence, the inapplicability of AI employment in different contexts is one major drawback of AI.

In essence, raw data with predetermined AI algorithms may lead to repetition of biased content creation (Ferrara, 2024; Olanipekun, 2025). EFL CAFE (2024) further elaborated on risks of bias in AI from training data, error or hallucinations (cases when AI gives wrong, misleading output), fairness (how AI might disadvantage students from certain cultural or linguistic backgrounds), and the need for human oversight so misconceptions are not internalized by learners. Simply put, inputs gained from imprecise data can cause AI to generate inaccurate outputs (UNESCO, 2019). In addition, excessive reliance on AI technology in language education can also lead to minimal human interaction, which may negatively impact the social and communicative side of language learning (Dugošija, 2024). This may lead language learners to be demotivated to employ AI in their language learning since AI-assisted interactions are unnatural (Crompton et al., 2024).

Another challenge is that the presence of AI-powered education may cause inequalities to be deeper. Disadvantaged people and marginalized people tend to be excluded from this new-modeled education (UNESCO, 2019). Therefore, this development is exacerbating technological divides due to inconsistent availability of sophisticated technology and good internet connections among users of AI-powered technology (Lazanyuk, et al., 2025). There are also concerns related to schools', teachers', and learners' ability to have access to high-cost digital tools to utilize AI to complete various tasks (Iqbal

et al., 2024). A study by Vesna et al. (2025) found that lack of digital devices, lack of digital literacy, and financial disparities have caused digital divides in AI-assisted education model provision to persist, making it challenging for marginalized learners, especially those living in rural areas and studying at underfunded schools, to equally benefit from the advancement of AI technology.

Ethical concerns are also a major challenge for the employment of an AI co-teacher in language education. Dugošija (2024) cautioned that the use of AI in language education may face challenges in users' privacy and algorithmic unfairness. Moreover, there are also concerns about the unethical exploitation of users' personal data for commercial benefits, political records, and social observation (UNESCO, 2025). For instance, Crompton et al. (2024) found that learners experienced a few types of fear with using AI: (1) fear of being unaware of how AI operated, (2) fear of disclosing their personal information while being unsure how it would be stored and who could access their personal data, and (3) fear of having minimal natural emotions and environments because of the artificial world AI provided.

### CONCLUSION AND FUTURE DIRECTIONS

This article has discussed how human teachers and AI can collaborate through a human-AI co-teaching model. It has been shown that the roles and responsibilities of human teachers in the context of the increasing adoption of AI in education, including language education, have drastically changed. It is therefore critical to redefine human teacher roles and responsibilities, and ensure AI affordances to increase the effective use of AI in education. It is also important to build capacity, especially AI literacy, among teachers and students, as well as concerned stakeholders such as policymakers and administrators. Without sufficient affordances and infrastructure such as digital devices, internet connectivity, and other supporting facilities, it will be difficult, if not impossible, to take advantage of AI for language education in particular and education in general.

For sustained adoption of AI as co-teachers, schools and programs need to provide reliable internet, computer labs, and access to student devices, such as tablets and laptops, as the

first steps. The curriculum also has to integrate AI co-teachers into language courses so that it becomes part of everyday learning. Teachers and administrators should have professional development that prepares them both technically and pedagogically, while communities, parents, and students should also develop basic AI literacy. Without AI literacy or the capacity to adapt AI to different educational contexts, AI may not be utilized in an effective and efficient manner. At the policy level, institutions and governments must provide clear guidelines, allocate funding, and invite community voices. Policies or guidelines for the ethical and responsible use of AI in education are also needed and should be revised to be aligned with new empirical evidence on AI use in education and other related disciplines.

However, the adoption of AI in education raises important controversies that cannot be ignored. Ethical concerns, including data privacy, bias in AI outputs, and academic integrity, require clear institutional guidelines and continuous monitoring from all levels. Digital inequality is another major challenge. Students in under-resourced contexts may have limited access to devices or stable internet, which can widen existing learning gaps. Therefore, policies must not only promote AI use but also ensure equitable access and responsible implementation.

In addition, AI has clear limitations. Overreliance on AI tools may reduce learners' critical thinking and creativity if students depend on generated answers rather than engaging in the learning process. AI feedback can also be inaccurate, overly generic, or culturally inappropriate. For this reason, teacher oversight remains essential. Teachers must verify AI outputs, adapt them to local contexts, and ensure that AI use supports, rather than replaces, active learning.

Looking forward, we can expect AI as a co-teacher to develop along two paths. On the one path, current AI tools (i.e., ChatGPT, Gemini, and many more) will continue to be refined into systems that are more reliable and sensitive to classroom contexts. On the other path, new applications and AI agents will be developed from research-based multilingual environments and literature as platforms that serve learners across cultural and geographic boundaries. However, success in education is never merely about mastering content; it is also about exercising empathy, encouragement, respect, and sustained motivation. If we want AI to take a meaningful role, AI agents should be designed to model these qualities to suit language learners and their cultures. In other words, useful AI co-teachers do not stop at marking errors but take notice of progress, provide supportive comments, and guide students toward constructive next steps. To guide this process, researchers should expand the evidence base through classroom trials, the impacts of AI co-teachers on students' learning outcomes, learning attitudes and motivations, teacher training studies, and policy analysis. They should also extend the matter to include ethics, integrity, creativity, critical thinking, and the role of community support in improving learning outcomes across settings.

In addition, to strengthen the evidence base, future research should move beyond conceptual discussions and incorporate a robust evaluation plan. Specifically, researchers can adopt quasi-experimental or experimental designs comparing teacher-only instruction with human-AI co-

teaching models (e.g., the proposed 40/20 instructional split and role-sharing framework). The following measurable outcomes may be considered:

1. Writing accuracy gains which can be measured through pre- and post-tests using analytic rubrics (e.g., grammar, vocabulary, coherence) can assess the effectiveness of AI-supported feedback in improving learners' written performance.
2. Speaking fluency development which can be measured through indicators such as speech rate, pause frequency, and utterance length can evaluate how AI-supported practice contributes to oral proficiency.
3. Learner autonomy which can be measured through validated self-report scales or behavioral indicators (e.g., frequency of independent AI tool use, self-regulated learning strategies) can capture the extent to which AI fosters independent learning.

These outcomes should be explicitly aligned with the affordances and professional development discussed earlier. Overall, this evaluation framework can enable researchers and practitioners to systematically test whether the proposed human-AI co-teaching model, particularly the balance of responsibilities between teachers and AI, leads to measurable improvements in learning outcomes. It would also provide actionable insights for refining instructional design, teacher training, and policy implementation across diverse educational contexts.

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