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AI Integration in Pronunciation Instruction: Insights from Secondary School EFL Teachers



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Abstract

There has been growing interest in the potential of artificial intelligence (AI) in language education. However, little research has explored its application in pronunciation instruction. To address this gap, this qualitative study investigates Vietnamese secondary school English as a Foreign Language (EFL) teachers' beliefs about AI integration in English pronunciation teaching as well as the perceived benefits and challenges. Data were collected through focus group interviews with 24 EFL teachers (four teachers per group) from three Vietnamese secondary schools who had experience using AI-based pronunciation tools. A thematic analysis approach was employed to interpret the data. The findings revealed that teachers mainly employed ELSA Speak for gamified pronunciation practice and ChatGPT for teaching materials. Additionally, teachers held both positive and negative beliefs regarding using AI in teaching pronunciation. They recognized several benefits of integrating AI into pronunciation instruction, including more engaging pronunciation activities, individualized corrective feedback, increased opportunities for practice, enhanced support for communicative pronunciation tasks, and potential improvements in learners' listening and speaking skills. However, they also identified challenges such as limited teacher knowledge of AI use, unstable internet connection, and insufficient parental support. By examining teachers' perspectives, this study contributes to the emerging literature on AI-assisted pronunciation instruction and offers practical implications for educators, curriculum developers, and educational technology designers.

Keywords: artificial intelligence, pronunciation instruction, beliefs, secondary school EFL teachers

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Introduction

In recent years, the integration of artificial intelligence (AI) into language education has reshaped the way languages are taught and learned, with the primary goal of enhancing teaching effectiveness and learning outcomes. AI technologies hold significant potential for improving second/foreign language (L2) acquisition by providing personalized learning experiences, offering diverse assessment methods, increasing the amount of corrective feedback, and fostering interactive learning environments across various educational contexts (Hopcan et al., 2022; Zhang & Aslan, 2021). Beyond the benefits for learners, AI also offers considerable advantages for language teachers, including designing engaging and efficient lesson plans, generating creative content tailored to individual students' needs, developing visually appealing presentations with minimal time investment, and implementing faster, more accurate assessment tools (Kasneci et al., 2023).

A growing body of research has explored AI applications in language education. Previous studies on AI in language education have mainly investigated its role in supporting vocabulary (e.g., Alsadoon, 2021) and grammar learning (Baker et al., 2020; Li & Hegelheimer, 2013) as well as improving learners' outcomes in different skills such as reading (Hidayat, 2024) and writing (Song & Song, 2023). Research on speaking has also noted the potential of AI to increase learner engagement, provide automated corrective feedback, and enable personalized learning experiences (Fathi et al., 2024; Zou et al., 2023). In addition, some research has studied teachers' perceptions regarding the use of Generative Artificial Intelligence (GenAI) in English language teaching (Choi et al., 2025), revealing a mix of beliefs and attitudes toward the use of GenAI in language education.

In pronunciation instruction, there are a great number of AI-powered tools designed specifically for pronunciation learning (Vančová, 2023), potentially enhancing pronunciation learning outcomes. While such AI tools are potentially beneficial for pronunciation instruction (Mompean, 2024), the effectiveness of these tools in classroom contexts greatly depends on teachers' cognitions (Liu et al., 2024) since educators' beliefs play a pivotal role in shaping pronunciation teaching practices (Borg, 2015). However, little research has explored how secondary school teachers perceive the integration of AI-based tools into pronunciation instruction, especially in the educational settings in Asian countries (Vietnam included) where English is spoken as a foreign language and where learners do not receive effective pronunciation instruction (Nguyen & Newton, 2020; Nguyen et al., 2021), so the investigation of teachers' experiences, beliefs and perceived benefits and challenges regarding AI-integrated pronunciation instruction is necessary. This investigation can inform the design of professional development programs, guide curriculum and material development, and support institutional and policy decisions regarding the adoption of educational technologies in pronunciation instruction at secondary schools. The study seeks to answer the following research questions:

1. What experiences did secondary school EFL teachers have with using AI-based tools in L2 pronunciation instruction?
2. What beliefs do secondary school EFL teachers hold towards the integration of AI-based educational tools in pronunciation instruction?
3. What perceived benefits and challenges do secondary school EFL teachers identify in adopting AI-based tools for L2 pronunciation teaching?

Literature Review

Teacher Cognition and Technology Acceptance

This study is grounded in teacher cognition research, which highlights the complex interplay of teachers' beliefs and experiences in shaping their instructional practices (Borg, 2015). Within this

perspective, teachers' beliefs and experiences have a strong influence on how they conduct language lessons in the classroom; therefore, they are widely recognized as key mediators of teaching and learning quality (Ellis, 2008). For the purposes of this study, we use Eisenhart et al.'s. (1988) definition of a belief as "an attitude consistently applied to an activity" (p. 54). They suggested that beliefs, by affecting the way in which we perceive reality, guide both our thoughts and our behaviors. Thus, the term "beliefs" in this study can be synonymous with "attitudes".

Moreover, Teo (2011) proposed and tested a model to explain teachers' behavioural intention to use technology, revealing that perceived usefulness, attitude towards use, and facilitating conditions have direct influences on behavioral intention to use technology such as their willingness to adopt technology in their teaching practice. Accordingly, teachers who perceive technology to be useful and believe in its' potential to enhance their productivity tend to have a greater intention to use it. Moreover, teachers' positive attitudes also have a positive and direct influence on teachers' behavioral intention. For example, when teachers hold positive feelings towards the use of technology, these feelings reinforce their intention to use technology. Additionally, conditions including practical aspects of technology use, such as the availability and accessibility of technical support, can facilitate or hinder the teachers' use of technology, influencing their decision on whether they should use it.

Based on those studies, this research investigates secondary school EFL teachers' experiences, beliefs, the perceived benefits, and factors hindering AI-integrated pronunciation instruction to offer an appropriate lens for the secondary EFL teachers' intention of AI use in their pronunciation instruction practice.

L2 Pronunciation Instruction and Technology

Pronunciation is widely recognized as a fundamental aspect of successful oral communication as it significantly affects how well learners are understood in spoken interactions (Foote & Trofimovich, 2018; Jones, 2018; Levis, 2021; Rogerson-Revell, 2011). Both language teachers and students share the view that pronunciation instruction is an essential component of effective language teaching and learning (Derwing & Munro, 2015; Foote et al., 2012). The primary focus of contemporary pronunciation pedagogy is on enhancing learners' comprehensibility and intelligibility rather than achieving native-like accuracy (Derwing & Munro, 2015; Levis, 2022). Therefore, recent studies have emphasized the importance of pronunciation instruction with a range of activities focusing on both forms and meanings to enhance learners' comprehensibility and intelligibility such as the communicative pronunciation teaching framework proposed by Celce-Murcia et al. (2010). Research has shown that many ESL/EFL teachers continue to rely on repetition drills and corrective feedback when teaching pronunciation (Couper, 2019; Foote et al., 2016; Nguyen & Newton, 2019) largely due to insufficient teacher training (Bai & Yuan, 2019; Nguyen & Newton, 2020; Nguyen, 2023). Corrective feedback, which refers to teachers responding to learner erroneous utterances (Ellis, 2006), has been shown to be beneficial for pronunciation learning in terms of segmental and suprasegmental aspects (Lyster et al., 2013; Saito, 2021; Saito & Lyster, 2012).

Over the past few decades, there has been a significant rise in the use of technology to support language education, commonly referred to as Computer-Assisted Language Learning (CALL), with numerous studies being conducted in Asian educational contexts such as China (Tran, 2025; Zhang, 2019; Zhou & Goh, 2025), Hong Kong (Choi et al., 2025), and Iran (Khojasteh et al., 2025). In pronunciation instruction, Computer-Assisted Pronunciation Training (CAPT) has also experienced substantial growth, serving both language teachers and learners (Pennington & Rogerson-Revell, 2019). CAPT tools are valued primarily for their ability to expand opportunities for learners to engage in pronunciation practice (Gilakjani & Sabouri, 2017), offer instant and individualized feedback on spoken output (Levis, 2007; Liakin et al., 2015), and support greater learner independence and motivation (Hsu,

2024; McCrocklin, 2014). Despite the potential benefits technologies can bring to learners' language learning, its adoption and effectiveness vary according to different social influences and contextual conditions such as parental support (Chen et al., 2019; Pham, 2024; Teo, 2011). As digital technologies continue to evolve rapidly, AI has emerged as a recent and potentially transformative innovation in pronunciation instruction (Liu et al., 2022), a development to which the next section now turns.

AI Technologies in Pronunciation Instruction

AI, which involves a range of techniques, methodologies, and strategies designed to carry out specific tasks, operates through processes such as data mining, machine learning, and natural language processing (Almelhes, 2023). Recent studies have explored the role of AI in developing language learning competencies such as listening and reading (Hidayat, 2024; Suryana et al., 2020), and speaking and writing skills (Song & Song, 2023; Zou et al., 2023). In pronunciation instruction, several investigations have examined the effectiveness of widely used AI-powered tools, such as automatic speech recognition (ASR), intelligent personal assistants (IPAs), and language learning applications in supporting learners' pronunciation improvement (Bajorek, 2017). These AI tools have shown potential in enhancing segmental and suprasegmental production with improved accuracy (Abdelhalim & Alsehibany, 2025; McCrocklin, 2019), improving accentedness, intelligibility comprehensibility (Fathi et al., 2025; Mroz, 2020; Sun, 2023), providing a low-stress environment for language learning and practice, and increasing willingness to communicate (Dennis, 2024; Fathi et al., 2024; Tai & Chen, 2023). Moreover, they have been found to foster learners' engagement, motivation, and autonomy in pronunciation learning (Abdelhalim & Alsehibany, 2025; Liakin et al., 2015; McCrocklin, 2019; Meşe et al., 2025). However, some concerns regarding the adoption of AI in pronunciation teaching have been identified in some research such as learners' dissatisfaction with the lack of real human interaction when learning with AI (Al-Zahrani, 2024; Çakmak, 2022; Jeon et al., 2024), the unreliability of AI tools (Jeon et al., 2024), and insufficient teachers' knowledge and its consequence of teachers' resistance to AI use (Arslan, 2025; Özkan et al., 2024). Therefore, Guan et al. (2025) revealed that the holistic integration of AI in EFL education which includes a balanced interaction among teachers, students and AI can help effectively foster the effectiveness of AI use in language education. In this case, AI does not replace but complements and enhances traditional human-based teaching pedagogy.

One of AI technologies used in language education is Automatic Speech Recognition (ASR) which can identify inaccuracies and offer instant feedback to support pronunciation improvement and speaking ability (Levis & Suvorov, 2013). Feedback from ASR can focus on segmentals and suprasegmentals (Ngo et al., 2024) as well as fluency, comprehensibility, intelligibility, and accentedness (e.g., Fathi et al., 2025; Zuberek, 2016). However, such feedback is usually inefficient in language classrooms with a great number of students without ASR use (Elimat & AbuSeileek, 2014). Furthermore, ASR-based technologies can provide learners with native pronunciation models (Richards, 2015) and serve as a substitute for a native communication partner in communicative pronunciation activities (Bashori et al., 2024). Another AI technology, Intelligent Personal Assistants (IPAs), can interact with users through spoken language, performing instructional functions in language instruction (Moussalli & Cardoso, 2019). They can mimic human dialogue with language learners for different purposes such as providing pronunciation models in drill-based practice, engaging learners in short question-answer dialogues (e.g., asking for information or daily conversational exchanges), or supporting role-play and task-based speaking activities both inside and outside the classroom. Hence, IPAs have been found to positively impact learners' pronunciation and speaking (Dizon & Tang, 2020; Moussalli & Cardoso, 2021).

Several AI tools beneficial to pronunciation instruction have been examined in the literature. Among these, ELSA Speak and Duolingo are particularly popular as they mainly employ ASR-based technologies to provide pronunciation games and personalized pronunciation feedback (Becker & Edalatishams,

2019; Hirschi, 2020). These tools have been found to improve pronunciation competence, enhance learners' engagement and autonomy in pronunciation learning (Nushi & Sadeghi, 2021; Tran & Vu, 2024; Gusrianto & Iswahyuni, 2025), and make pronunciation lessons fun, enjoyable, interesting, and motivating to students. They also help improve their confidence and reduce pronunciation anxiety (Widi et al., 2025). Besides, ChatGPT has been shown to be able to support pronunciation practice with instant feedback, explanations, and demonstrations of target pronunciation features (Le et al., 2025; Mompean, 2024).

Previous Studies

Recent studies have explored language teachers' perceptions of integrating AI into various aspects of language instruction such as investigations into teachers' perceptions of the role of AI in promoting learner engagement (Zainuddin, 2024) and their attitudes toward the rise of AI-powered writing tools (Zimotti et al., 2024). Regarding pronunciation instruction, several studies have examined the effectiveness of AI applications and learners' perceptions of AI-supported pronunciation learning (Abdelhalim & Alsehibany, 2025; Dennis, 2024). Dennis (2024) employed pre- and post-tests and surveys to assess the effectiveness of an AI-powered speech recognition tool and identify tertiary EFL learners' perceptions. Findings showed that learners' pronunciation and speaking fluency improved significantly, and that they valued the AI tool's personalized feedback. In 2025, Abdelhalim and Alsehibany conducted a mixed-methods study to investigate the effectiveness of using AI tools in teaching pronunciation to university EFL learners. The results indicated significant improvements in the production of segmental elements and motivation. At the secondary education level, Bashori et al. (2024) investigated the impact of AI on students' pronunciation production and reported notable improvements in their pronunciation skills with reduced accentedness and increased comprehensibility. However, much less is known about the teachers' beliefs.

In the Vietnamese context, the most recent study is perhaps by Le et al. (2025) who conducted a qualitative study to investigate Vietnamese EFL lecturers' perceptions of the role of ChatGPT in facilitating language acquisition. The results from semi-structured interviews revealed that nine instructors recognized the role of ChatGPT in fostering continuous learning, enhancing motivation and engagement, and improving pronunciation skills through an interactive platform with instant feedback. While offering useful insights into teachers' favorable attitudes, the study focused on university lecturers, leaving secondary EFL teachers' beliefs in Vietnam underexplored. This gap is critical because the secondary EFL teachers' perceptions directly influence whether and how AI is adopted in pronunciation instruction at secondary schools, especially in Asian contexts where language curricula place greater emphasis on vocabulary and grammar compared to pronunciation and large class sizes as well as limited technological resources may affect AI implementation. These insights can guide teacher educators, curriculum designers, and policymakers in making informed decisions about how to support AI-integrated pronunciation instruction in secondary EFL settings, where large numbers of teachers and learners are involved. The present study is therefore timely, contributing to the international literature on the intersection of teachers' beliefs, technology integration, and pronunciation instruction at the secondary level, while also addressing the need for professional development to better prepare teachers for AI-enhanced pronunciation teaching.

Research Methods

Research Setting and Participants

The study took place in three Vietnamese secondary schools where current EFL teachers volunteered to participate. At the secondary level, English is a mandatory subject which is taught within three 45-minute periods per week during a 15-week semester and the classroom is the main place for

Vietnamese EFL learners to be exposed to interaction in spoken English. Secondary EFL teachers deliver prescribed pronunciation tasks in the textbooks as an integrated section within lessons on other language areas and skills, such as vocabulary, grammar, and listening, rather than teaching stand-alone pronunciation lessons. The expected outcome of English proficiency for secondary students in Vietnam is equivalent to the B1 level of the Common European Framework of Reference for Languages.

A convenience sampling method was used to choose participants based on their ease of access (Creswell, 2012). An invitation email was sent to 51 Vietnamese secondary EFL teachers from three different secondary schools, asking whether they had any experience using AI in pronunciation teaching and if they were interested in participating in the research. They were provided with an overview of the study's objectives and procedures, emphasizing their voluntary participation and confidentiality. As a result, 28 teachers responded, and 26 agreed to participate in the study voluntarily. Two teachers later withdrew, resulting in a final sample of 24 teacher participants (nine males and 15 females) ranging in age from 28 to 41. Of these, 18 held a Master's degree in TESOL/Applied Linguistics, while the remaining six held a Bachelor's degree in TESOL/TEFL. All participants had more than five years of experience teaching English at the secondary schools.

Ethical Considerations

All participants received and signed an informed consent form before taking part in the study. Their participation was entirely voluntary, and they were informed of their right to withdraw at any stage. To maintain confidentiality, pseudonyms were assigned to participants (P1-P4 within each group), and no identifying information was included in the transcripts or the reports. All data, including audio recordings and transcripts, were securely stored and used solely for research purposes.

Data Collection and Procedure

A qualitative research approach was adopted to gather data for this study since qualitative methods enable researchers to gain in-depth insights into participants' experiences and viewpoints (Merriam, 2009). Data were collected through focus group interviews (FGIs), with 24 participants being divided into six focus groups (four teachers each) on a voluntary basis. Each group interview was semi-structured with seven structured open-ended questions, followed by some follow-up questions. The interview questions centered on: (1) whether they used AI tools, (2) what AI tools they used, (3) the purposes for which they used the tools, (4) what beliefs they hold about the use of AI tools in pronunciation teaching, (5) their perceived benefits of AI-integrated pronunciation instruction, and (6) challenges they faced during AI-integrated pronunciation instruction. The interview questions were piloted with four teachers not in the main study, then their feedback informed minor revisions. To ensure participants could express themselves comfortably, all interviews were conducted in Vietnamese. The interviews lasted for approximately 50 minutes each and were audio-recorded with a digital recorder with participants' consent.

Data Analysis

Thematic analysis was adopted to qualitative data which involved an iterative, cyclical, and inductive process of searching for themes and categories in the data set and subsequently refining them (Creswell & Poth, 2017). The author carefully transcribed the interviews, and the transcripts of the interviews were emailed back to the teachers for confirmation and/or revisions. Next, the author read the transcripts several times to gain a thorough understanding of the data. Initial codes were generated inductively by identifying meaningful segments of text related to teachers' experiences and their beliefs about AI in pronunciation teaching, as well as their perceived benefits and challenges of AI integration

pronunciation teaching. For example, a teacher's statement such as *"I am fond of using Duolingo to teach pronunciation because its bright colors, cheerful sounds, and animations made pronunciation practice lively and appealing"* was coded as "learner motivation", belonging to the theme "positive beliefs", whereas a comment like *"I was frustrated that they didn't answer because they were waiting for the app's feedback when I called their names"* was coded as "reduced teacher-student interaction", belonging to the theme "negative beliefs". These initial codes were collated into broader categories and refined into the three overarching themes that structured the findings: (1) teachers' experiences of AI-integrated pronunciation teaching, (2) teachers' beliefs, and (3) teachers' perceived benefits and challenges of using AI in pronunciation instruction. The themes then were refined through an iterative process of re-reading and refining the thematic categories. To minimize research subjectivity and bias, hard copies of handwritten codes were kept available at all times, allowing for navigation and cross-checking claims (Richards, 2015).

Findings

This section presents the viewpoints of Vietnamese secondary school EFL teachers on the role of AI in teaching and learning pronunciation. The analysis revealed the teachers' experience in using AI in pronunciation teaching, their beliefs incorporating AI-based tools into pronunciation instruction, and their perceived benefits and challenges of AI use in pronunciation instruction. To illustrate these findings, the most representative excerpts from the teachers' interview responses are included. The next section offers a detailed discussion of each theme based on the participants' insights.

Teachers' Experiences in Using AI in Pronunciation Teaching

To better understand how teachers had integrated AI into their pronunciation instruction, participants were asked to report the AI tools they had used and their purposes. Table 1 summarizes the range of tools mentioned, the number of teachers who used each, and the purposes of use.

Table 1 *AI Tools that the Teachers Used to Use in Their Pronunciation Instruction*

AI Tool	Purpose of Use	Number of Teachers
ELSA Speak	Game-based listen-and-repeat practice on segmentals in class	23
	Game-based listen-and-repeat practice on suprasegmentals in class	19
	Conversation practice with AI in class	17
	Homework assignments	20
Duolingo	Game-based listen-and-repeat practice on segmentals in class	16
	Homework assignments	12
BoldVoice	Game-based listen-and-repeat practice on segmentals in class	6
	Conversation practice with AI in class	4
ChatGPT	Generating dialogues	14
	Generating tongue twisters	5
	Generating minimal pairs	8
Wayground	Generating explanatory videos	10
	Generating songs with interactive questions	4

Teachers often reported experience with more than one AI tool, and for each tool, sometimes they reported using it for multiple purposes. Overall, five AI tools were reported to be used in pronunciation instruction. The most frequently reported tool for students' practice was ELSA Speak. Twenty-three teachers used it for *game-based listen-and-repeat practice on segmentals*, while nineteen teachers employed it for *suprasegmental practice* such as stress and intonation. In addition, twenty teachers assigned practices on ELSA for *homework*, allowing students to continue practicing beyond classroom time. Notably, seventeen teachers also reported using the app for *conversation practice with AI*, which highlights its role not only as a tool for listen-and-repeat tasks but also as a platform for communicative pronunciation tasks. Another AI app that was mainly used for pronunciation practice was Duolingo. Sixteen teachers used Duolingo for *game-based listen-and-repeat practice on segmentals*, reflecting its capacity to provide engaging, gamified drills at both word and sentence levels. In addition, half of the teachers assigned Duolingo as *homework practice*, often as a supplementary tool to reinforce classroom learning. Turning to BoldVoice, teachers reported comparatively less use, though the app still found a place in some classrooms. Only six teachers indicated using it for *game-based listen-and-repeat practice on segmentals*, while four used it for *conversation practice with AI*. This shows that although BoldVoice was not widely adopted among the teachers, it offered opportunities for both controlled practice of individual sounds and simulated conversational contexts. Besides, game-based activities represented the primary use across all three applications, with 23 teachers using ELSA Speak, 16 using Duolingo, and six teachers using BoldVoice for this purpose.

In addition, ChatGPT was primarily used by many teachers to generate text-based materials for pronunciation instruction. Fourteen teachers employed it for *generating dialogues*, which could be used as speaking scripts. Eight teachers used it for *generating minimal pairs*, focusing on contrasting sounds for segmental practice. Only five teachers reported using ChatGPT for *generating tongue twisters*, which served as drills for practicing sound patterns and fluency. Wayground was reported as another AI tool for creating interesting supplementary materials. Ten teachers used it to *generate explanatory videos* that provided both auditory input and visual representations of sound articulation, such as animated mouth movements or diagrams illustrating how specific pronunciation features are produced. Interestingly, four teachers reported using Wayground for *generating songs with interactive questions*, enabling students to practice sound discrimination through music. They stated that the songs really helped students feel relaxed and excited while practicing the sounds.

Teachers' Beliefs about AI Use in Pronunciation Instruction

The thematic analysis revealed that teachers expressed various beliefs about the integration of AI into pronunciation instruction, with positive beliefs reported more frequently than negative ones. A detailed summary of their responses can be found in Table 2.

As shown in Table 2, all the teacher-participants agreed that AI tools made pronunciation lessons more engaging than the normal lessons with just teachers' oral explanation, by providing visually rich and interactive materials that helped clarify challenging features such as diphthongs, word stress, and intonation. Seven teachers believed learners' greater engagement could be seen in their greater attention and enjoyment in pronunciation learning time. Moreover, 20 teachers also claimed that pronunciation lessons were interesting when students could practice pronunciation with AI gamification features including a wide range of interesting activities designed with a fun interface such as with animated repetition drills for vowels and consonants, interactive minimal pair tasks where learners listened and repeated contrasting words, and intonation-matching activities that used visual pitch contours to guide

Table 2 Teachers' Beliefs about AI in Pronunciation Instruction

Themes	Codes	Number of Teachers	Representative Excerpts
Positive beliefs	Engaging pronunciation lessons	24	<i>...I could find my students more interested in learning with AI pronunciation videos for explanation than when I only explained orally... (P3, FGI2)</i> <i>I am fond of using Duolingo in pronunciation teaching because its bright colors, cheerful sounds, and animations made pronunciation practice lively and appealing... (P4, FGI3)</i>
	Increased learner motivation	18	<i>...the AI scores and rewards motivated them to keep repeating the sound until she mastered it to get a reward... (P4, FGI6)</i>
	Greater learner confidence	21	<i>Practicing speaking sounds and sentences to AI app helped my students feel more confident than speaking to their peers as they could speak without fear of losing face with their friends... (P5, FGI4)</i>
	Improved pronunciation abilities	22	<i>...They listened and repeated after the American native voice in the app again and again until it got correct, and I've noticed their speech sounded more American, with less Vietnamese accents and more comprehensible over time. (P1, FGI1)</i>
	Awareness of technological advances	24	<i>...AI tools helped my students become more familiar with current speech technologies... (P3, FGI4)</i>
Negative beliefs	Reduced teacher-student interaction	18	<i>...I got frustrated that they didn't answer because they were waiting for the app's feedback when I called their names. (P2, FGI5)</i>
	Low tool reliability	24	<i>...I could hear that their pronunciation productions were mostly 70% correct, but the AI app had misrecognized their performances. They were sad as the app didn't understand their efforts. (P4, FGI4)</i>
	Digital access inequality	20	<i>When I assigned AI pronunciation activities such as word stress practice, the children from low-income families without smartphones just sat and watched others practicing on their own smartphones or tablets... (P3, FGI2)</i>

practice. By applying these pronunciation-focused activities into gamified tasks, the teachers witnessed students found pronunciation lessons less tedious, as highlighted in two teachers' statements:

I love using AI-generated videos as I could find my students more interested in learning with AI pronunciation videos for explanation than when I only explained orally. The visuals showed clearly how the sounds or stress should be produced, so they enjoyed pronunciation learning time more. (P3, FGI2)

I am fond of using Duolingo in pronunciation teaching because its bright colors, cheerful sounds, and animations made pronunciation practice lively and appealing.

Students were engaged in pronunciation activities because the app turned it into a playful experience rather than a boring exercise. (P4, FGI3)

Furthermore, 18 teachers believed that AI enhanced learner motivation, with students demonstrating greater willingness to learn and practice pronunciation features both in class and at home. They explained that increased motivation stemmed from the rewarding nature of AI pronunciation games, where learners could monitor their progress through scores, badges, and encouraging feedback from the system. When they successfully produced difficult vowels, consonants, or stress patterns, they received immediate rewards, which gave them a sense of achievement. This motivated students to continue practicing, complete additional challenges, and strive for higher scores, thus sustaining their efforts in pronunciation learning. This was exemplified by a teacher who said:

When practicing the diphthong /ʊə/ in words such as 'tour', some students first scored only 50%. On their second attempt they improved to more than 50% and then they tried three more times until they finally reached nearly 100% and received a reward. I saw that the AI scores and rewards motivated them to keep repeating the sound until they mastered it to get a reward. They looked happy when they won the rewards, and I was also very happy to see that. (P4, FGI6)

In addition, 21 teachers reported the use of AI could foster learner confidence by offering a safe and non-judgmental environment for practice pronouncing the target features, enabling students to be more willing to speak with less fear of embarrassment and losing face compared to speaking to their friends in conventional pronunciation instruction. One teacher explained that:

Practicing speaking sounds and sentences to AI app helped my students feel more confident than speaking to their peers as they could speak without worries of embarrassment with their friends. Normally, when they made pronunciation mistakes in front of classmates, they felt shy and spoke less. But with the app, no one was laughing at them, so they could repeat the stress, and intonation patterns many times. I think it was more enjoyable for them to practice under less pressure. (P5, FGI4)

Additionally, 22 teachers further highlighted that AI tools contributed to improvements in their students' pronunciation abilities, particularly in producing clearer articulation, reducing strong Vietnamese accentedness, and becoming more comprehensible to the listeners. Of these, 14 teachers assumed that the instant corrective feedback from AI apps allowed students to listen carefully and repeat after native-model voices multiple times, even outside the classroom, gradually resulting in enhanced pronunciation with improved comprehensibility and reduced accentedness. For instance, one teacher said:

What I liked most was AI gives my students instant feedback when they said a sound wrong or put the stress in the wrong place. They listened and repeated after the American native voice in the app again and again until it got correct, and I've noticed their speech sounded more American, with less Vietnamese accents and more comprehensible over time. (P1, FGI1)

Finally, all teachers acknowledged that AI integration increased students' awareness of modern speech technologies, helping them appreciate the role of AI in supporting their pronunciation development in a fun way, as expressed by one teacher:

It was very encouraging that AI tools helped my students become more familiar with current technologies for language learning. After several times of using AI apps for

learning pronunciation, they realized these apps could support their pronunciation learning, and some even showed interest in exploring more AI tools on their own. (P3, FGI4)

On the other hand, teachers also held some negative beliefs about AI use in teaching pronunciation. Eighteen teachers believed that over-reliance on AI tools reduced teacher-student interaction in class, as students often became absorbed in AI pronunciation games and focused heavily on achieving the highest scores and rewards. To maximize their performance, they concentrated on producing sounds in line with the AI's feedback and comments, which left less room for communication with their teachers. One teacher illustrated this by stating:

I remembered the time when my students played the AI games for consonant clusters, they kept repeating the words containing the sounds quickly to get the next score. I got frustrated that they didn't answer because they were waiting for the app's feedback when I called their names. (P2, FGI5)

Additionally, all teachers expressed doubts about the reliability of AI feedback and responses. Ten teachers noted that strong Vietnamese accents of those from some rural areas of Vietnam such as central areas were sometimes misrecognized by AI, especially when practicing with sentence reading or conversations with AI, leading to very low scores or incorrect evaluation of AI for the learners' pronunciation. They were worried that these issues might confuse or discourage learners. This aspect led those teachers to use AI tools cautiously and in combination with their own feedback. For example, when the AI marked a student's stress or intonation as incorrect, a teacher stepped in to reassure the student the pronunciation was actually acceptable, or demonstrate the correct model for improvement, evident in one teacher's comment:

You know, last year, some students in grade 10 from Hue, Binh Dinh and Quang Ngai tried to raise and lower their voice as the app guided for sentence stress and intonation many times, but the system still gave them less than 20%. When they came to me, I could hear that their pronunciation productions were mostly 70% correct, but the AI app had misrecognized their performances. They were sad as the app didn't understand their efforts. (P4, FGI4)

In addition, 20 teachers were concerned about issues of unequal access of smart devices, saying that some students, especially those from economically disadvantaged backgrounds, lacked personal smart devices. This limited their opportunities to fully benefit from AI-supported pronunciation practices. One teacher noted:

When I assigned AI pronunciation activities such as word stress practice, the children from low-income families without smartphones just sat and watched others practicing on their own smartphones or tablets. The school couldn't support them with personal devices either, so they missed out on many chances to have fun practice with AI and its personalized feedback while many of their friends could. I am worried that this issue can create inequality in pronunciation practices among the students. (P3, FGI2)

Advantages and Challenges of AI Integration in Pronunciation Instruction

As seen in Table 3, all teachers reported that AI tools provided a greater amount of personalized corrective feedback which was tailored to each learner's individual pronunciation errors and performance. This immediate and individualized feedback allowed students to identify their mistakes quickly, practice

more repetitions, and gradually improve their accuracy. Nineteen teachers highlighted that AI feedback not only supported students' self-correction but also promoted learner autonomy, as students were able to continue practicing independently outside of class hours. To illustrate, one teacher said:

AI tools offered immediate feedback on sounds, stress, and intonation, so students could self-correct and practice independently. This kind of instant correction was something I could not always provide in a large class. Students didn't always have to wait for me since the app showed them what was wrong and how to fix it, which made them more responsible for their own learning, both in the classroom and at home. (P3, FGI6)

Table 3 Teachers' Reported Benefits and Challenges of AI Integration in Pronunciation Instruction

Themes	Codes	Number of Teachers	Representative Excerpts
Benefits	Personalized feedback	24	<i>AI tools offered immediate feedback on sounds, stress, and intonation, so students could self-correct and practice independently... (P3, FGI6)</i>
	Pronunciation practice	22	<i>When learning pronunciation without AI apps, my students just listened to me and repeated after me once or twice, but with the AI app, they could practice a vowel or consonant as much as they want by themselves... (P1, FGI3)</i>
	Communicative activities	18	<i>With the AI role-play tasks, my students could practice conversations with AI assistants about a topic... (P1, FGI2)</i>
	Listening and speaking skills	12	<i>...After practicing many times with AI, I gradually noticed improvements in both their listening and speaking skills when they communicated with me. (P4, FGI1)</i>
Challenges	Limited training	20	<i>...I've never been shown how to use AI tools properly and systematically for pronunciation teaching... (P1, FGI6)</i>
	Internet connection issues	17	<i>Sometimes, during a pronunciation game, the app just froze because the Wi-Fi dropped... (P2, FGI4)</i>
	Lack of parental support	16	<i>Some parents told me they didn't want to allow their children to use smartphones at school because they were afraid their kids would get distracted with social media like TikTok instead of learning pronunciation. (P1, FGI1)</i>

Second, 22 teachers reported that AI integration created greater opportunities for students with access to smart devices to engage in pronunciation practice, compared to traditional lessons without AI. They explained that AI tools enabled learners to practice more frequently, both during class and beyond classroom hours. Of these, 17 teachers noted that the apps supported repeated practice at each learner's own pace, which was particularly helpful for shy students or those needing extra time to build confidence. The teachers valued the way AI extended pronunciation practice into homework, reinforcing pronunciation learning through regular exposure. For instance, a teacher expressed:

When learning pronunciation without AI apps, my students just listened to me and repeated after me once or twice, but with the AI app, they could practice a vowel or consonant as much as they want by themselves. They kept listening to AI, repeating those

elements and practicing them with a variety of AI activities until they had improvements in their pronunciation. (P1, FGI3)

Third, 18 teachers claimed that AI tools facilitated communicative pronunciation activities in which teachers required learners to attend activities focusing on both form and meaning of their speech such as role play or problem solving. AI tools could enable interactive and contextual speaking tasks because AI assistants can provide dialogues, role plays, and prompts to encourage students to produce features like intonation, stress, and linking. This helped bridge the gap between controlled practice and real use, improving fluency and spoken interaction, making pronunciation instruction more communicative and engaging. For example, a teacher commented:

With the AI role-play tasks, my students could practice conversations with AI assistants about a topic such as buying tickets. The app asked questions, and they had to answer using the right stress and intonation patterns they learnt. They had to focus on both what they were saying and how they should say it in communicative tasks. This might help foster their pronunciation and oral skills. (P1, FGI2)

Finally, half of the teachers reported that AI tools could help foster students' listening and speaking skills. They believed that listening to native-like pronunciation models and communicating with AI assistants might help develop students' English listening and speaking abilities. In addition, they claimed the combination of listening and speaking to AI assistants enabled learners to better internalize accurate speech patterns, resulting in clearer pronunciation and greater overall oral fluency. A teacher responded:

When students listened to the AI's voice, they tried to notice and copy the way sounds, linking, intonation, and stress were produced in speech. After practicing many times with AI, I gradually noticed improvements in both their listening and speaking skills when they communicated with me. (P4, FGI1)

Besides, there are some challenges perceived to hinder the application of AI in teaching pronunciation in secondary EFL classrooms. A major challenge reported by 20 teachers was their limited knowledge of how to use AI tools effectively. While the teachers were aware of basic functions of AI for pronunciation learning such as providing listen-and-repeat drills or serving as a communicative partner, they admitted they lacked training or guidance on how to integrate AI successfully and appropriately into their pronunciation teaching and align it with pedagogical goals. Of these, 14 teachers also expressed uncertainty about selecting appropriate apps, designing suitable tasks that complemented their classroom instruction, or checking if AI feedback of each AI tool is useful for learners' pronunciation development. The 14 teachers stated that a lack of professional development in AI integration often led to the underuse or ineffective use of these tools, thereby limiting their potential impact on student learning. As a teacher stated:

I would like to have more AI integration in my pronunciation instruction, but I only know the simple things like listen-and-repeat or checking single words' pronunciation because I've never been shown how to use AI tools properly and systematically for pronunciation teaching. I'm not sure which apps are best for each pronunciation teaching and how to connect AI learning activities with my teaching goals. (P1, FGI6)

Another significant challenge mentioned by 17 teachers was Wi-Fi unavailability or unstable internet connection. They reported that these internet connectivity issues often disrupted the use of AI-powered pronunciation applications during lessons, especially when real-time feedback was required. Such

interruptions discouraged both teachers and students to use AI in pronunciation instruction and reduced the feasibility of consistently integrating AI into pronunciation practice. For example, a teacher recalled:

Sometimes, during a pronunciation game, the app just froze because the Wi-Fi dropped. The students, who had been excited to repeat the last sentence with correct intonation patterns to win an award, immediately lost interest and showed disappointment. (P2, FGI4)

Finally, 16 teachers stated lack of parental support for students' use of smart digital devices also hindered AI use in pronunciation instruction. They explained that many parents were concerned about their children's misuse of smart phones or tablets, consequently leading to lack of concentration in study at school. Of these, 10 teachers also noted that some parents were either unaware of the educational benefits of AI-assisted pronunciation apps or hesitant to allow their children to use AI applications due to their concerns of their children's data privacy. This lack of understanding and support from families hinders the use of AI integration in pronunciation instruction. For instance, one teacher claimed:

Some parents told me they didn't want to allow their children to use smartphones at school because they were afraid their kids would get distracted with social media like TikTok instead of learning pronunciation. (P1, FGI1)

Discussion and Implications

ELSA Speak emerged as the most frequently used tool among teachers, reflecting their favorable attitudes toward its effectiveness in supporting pronunciation learning. This positive perception is consistent with previous studies reporting learners' favorable attitudes toward ELSA Speak (Gusrianto & Iswahyuni, 2025; Tran & Vu, 2024). Such preferences may stem from the app's versatility, offering a range of activities that include game-based practices targeting both segmental and suprasegmental features, as well as providing opportunities for communicative interaction with AI. These uses resonate with Nushi and Sadeghi's (2021) findings, which emphasized ELSA's potential in enhancing learners' pronunciation and oral competence, while also serving as a potential supplementary teaching aid for instructors (Nushi & Sadeghi, 2021; Tran & Vu, 2024).

In addition, teachers also reported using Duolingo and BoldVoice, primarily for game-based practice within classroom contexts. This teaching practice aligns with teachers' expressed positive beliefs that fun gamified features of AI tools are effective in enhancing learners' engagement and motivation in pronunciation instruction. These findings are supported by prior research documenting the enhancement in learner engagement and motivation in pronunciation learning through AI use (Abdelhalim & Alsehibany, 2025; Meşe et al., 2025). Besides, the use of ChatGPT and Wayground for generating engaging pronunciation instruction materials also reflected the role of GenAI in assisting language teachers by saving their time and efforts in designing and creating instructional materials (Choi et al., 2025).

Teachers further highlighted a belief that AI tools can build learners' confidence in pronunciation practice, which is similar to the increased confidence thanks to learning with AI claimed by students in Jeon et al. (2024). By interacting with AI, students were believed to practice more freely and confidently with little anxiety of being judged by peers and teachers. This belief echoes earlier findings that emphasize AI's role in creating a supportive and low-stress learning environment, boosting confidence in speaking the target language (Liakin et al., 2015; McCrocklin, 2019). In such contexts, learners are more willing to make repeated attempts at producing target pronunciation features, which, in turn, supports teachers' views of learners' pronunciation improvements. This echoes the findings of Dennis

(2024), Fathi et al. (2024), and Tai & Chen (2023) which also indicated that greater confidence in speaking and stronger willingness to communicate can be gained through AI-integrated pronunciation learning, contributing to learners' pronunciation improvement.

However, AI cannot offer human-like interaction (Çakmak, 2022) and teacher-student interaction in AI-integrated pronunciation instruction was noted to be reduced by the teachers. This is consistent with the finding on the loss of human interaction in AI-integrated learning (Al-Zahrani, 2024), resulting in possible learners' dissatisfaction with emotionless and robotic AI tools during tasks that necessitate human interaction (Jeon et al., 2024). Accordingly, a balance between human interaction and AI use within pronunciation instruction should be encouraged (Guan et al., 2025; Mompean, 2024). Additionally, teachers also expressed a negative belief concerning AI tools' limited ability to recognize students' speech, particularly when learners spoke with strong local Vietnamese accents, which often resulted in ineffective feedback such as incorrect evaluation of learners' pronunciation production. Such reliability issues of AI technologies used in language education were also reported by Jeon et al. (2024). In response to such challenges, Moussalli and Cardoso (2019) suggested that Alexa can help mitigate communication breakdown issues since it can understand strongly accented speech of learners from different languages. Hence, further research should be conducted to investigate the effectiveness of Alexa in supporting pronunciation instruction in secondary-school level.

Furthermore, AI's personalized corrective feedback was perceived as beneficial for learners' pronunciation learning in this study, reflecting the essential role of corrective feedback in L2 pronunciation instruction (Lyster et al., 2013; Saito & Lyster, 2012). Since pronunciation teaching often relies on repetition drills and corrective feedback (Nguyen & Newton, 2019), AI can effectively supplement teachers' techniques by increasing both the amount and accessibility of feedback for every student. However, AI feedback may lack the detailed and nuanced explanations that human instructors can provide (Dennis, 2024); hence, training on AI-integrated pronunciation instruction should carefully balance AI utilization with learners' diverse needs, attitudes, and the continuing role of instructors. Additionally, teachers reported using AI tools to support both controlled and communicative pronunciation practices. Such integration facilitates explicit instruction that blends corrective feedback with form-focused and meaning-oriented activities, making AI-incorporated approaches potentially effective in improving learners' pronunciation and communicative competence (Celce-Murcia et al., 2010; Foote & Trofimovich, 2018), which corresponds with the findings of teachers' positive belief about AI on improved pronunciation and its benefits for fostering students' listening and speaking skills. Building on these findings, the study highlights the need for further research into systematically integrating AI technologies within the communicative pronunciation teaching framework of Celce-Murcia et al. (2010), thereby maximizing the pedagogical potential of AI in pronunciation instruction.

However, teachers' limited training on AI-integrated pronunciation instruction is reported to hinder their use of AI in this area, echoing Arslan's (2025) study findings that Turkish EFL instructors also admitted lacking sufficient technical and pedagogical knowledge for using AI in language teaching. This lack of knowledge might cause concerns and resistance toward AI integration into their language lessons among teachers (Özkan et al., 2024). Therefore, secondary EFL teachers should be provided with more training programs to develop necessary skills for effective AI integration in pronunciation teaching. Moreover, teachers identifying a lack of parental support for students' access to smart devices was perceived to be another challenge in teaching pronunciation with AI. This finding contradicts that of Chen et al. (2019) in four different nations (China, Mexico, Japan, and Cambodia) which reveals that parents are motivated to support their children's language learning using mobile technology. This is possibly due to social and cultural differences, whereby Vietnamese parents are often concerned about digital threats that may conflict with traditional cultural values (Pham, 2024). Thus, more initiatives should be organized to raise parents' awareness of AI's benefits in pronunciation

learning and provide practical strategies to minimize the parents' worries associated with secondary students' digital device accessibility. In addition, secondary schools should strengthen their technological infrastructure to ensure that all students have equal technological access to facilitate successful AI incorporation in language learning (Pham, 2024).

Overall, the teachers acknowledged the usefulness of AI in pronunciation teaching, perceiving its potential to enhance instruction and improve learners' pronunciation outcomes. The predominance of positive attitudes over negative ones suggests a generally favorable orientation towards AI integration. This tendency is consistent with Teo's (2011) assertion that positive attitudes can influence teachers' behavioral intentions, implying that these teachers may be more inclined to adopt AI tools in pronunciation teaching practice. However, while favorable attitudes are encouraging, they do not guarantee actual implementation as teachers also highlighted contextual barriers, such as issues of Wi-Fi accessibility, lack of parental support for students' use of digital devices, and insufficient training in AI integration. These challenges echo the findings from Teo (2011) that stress the crucial role of contextual factors on teachers' decisions on their actual use of technology. Therefore, the present findings should be interpreted with caution that while teachers may view AI positively, without addressing existing contextual challenges, AI adoption may remain aspirational rather than sustainable. This study can serve as a valuable reference for further research on the interplay between teacher attitudes, contextual constraints, and the successful integration of AI in pronunciation instruction.

Conclusion and Limitations

This study has provided insights into secondary teachers' experiences and beliefs about AI-integrated pronunciation instruction in the Vietnamese EFL context. Teachers reported using various AI tools, with ELSA Speak most frequently employed for gamified practice and ChatGPT for materials. They held positive beliefs that AI could make lessons engaging, boost learner motivation and confidence, improve pronunciation accuracy, and enhance learners' awareness of technological advances in pronunciation learning. At the same time, they expressed different negative beliefs, including reduced teacher-student interaction, AI tool reliability, and digital access inequality. Teachers also recognized several benefits of AI integration, including the provision of personalized feedback, more opportunities for pronunciation practice, support for communicative activities, and the improvements in listening and speaking skills; nevertheless, they also identified challenges such as limited training, unstable internet connectivity, and a lack of parental support, hindering successful AI use in pronunciation instruction. These insights may also be relevant and applicable to similar contexts, particularly EFL education across Asia.

Despite its valuable contributions, this study has limitations. The small, context-specific sample and reliance on a single data source may restrict generalizability, although efforts were made to ensure reliability. Future research should adopt mixed-methods designs to triangulate data, combine teachers' perspectives with classroom observations, and include larger and more diverse samples. Experimental studies are also needed to evaluate the effectiveness of AI-supported pronunciation instruction and to identify teachers' knowledge gaps and training needs. Finally, collecting students' perspectives would provide a fuller understanding of the benefits and challenges of AI incorporation in pronunciation teaching.

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