



AUTOMATED FEEDBACK TECHNOLOGIES AND PRESENTATION SKILLS ACQUISITION IN EFL HIGHER EDUCATION: A CONVERGENT MIXED-METHODS INVESTIGATION

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Abstract

This quasi-experimental study investigated the effectiveness of a 12-week AI-assisted intervention on presentation skills development among 94 BA second-year English as a Foreign Language (EFL) students. Employing a mixed-methods design with pre-test/post-test measures, the study examined the impact of AI-powered feedback tools on five dimensions of presentation competence: content organization, language accuracy, delivery skills, visual aids, and audience engagement. The research was guided by three primary questions: (1) To what extent does AI-assisted instruction improve EFL students' presentation skills? (2) What are the differential effects of AI-assisted instruction across various dimensions of presentation competence? and (3) How do students perceive the utility of AI feedback in developing their presentation abilities? Participants (N = 94) were divided into experimental (n = 47) and control (n = 47) groups, with the experimental group receiving structured AI-assisted practice using speech recognition and automated feedback platforms. Results indicated statistically significant improvements in the experimental group across all measured dimensions, with large effect sizes (Cohen's $d = 0.82$ to 1.24). The highest gains were observed in pronunciation accuracy ($M = 3.42$, $SD = 0.68$ to $M = 4.28$, $SD = 0.52$) and fluency development ($M = 3.18$, $SD = 0.74$ to $M = 4.15$, $SD = 0.61$). Analysis of Covariance (ANCOVA) revealed significant group effects for all dimensions when controlling for pre-test scores, with partial eta squared values ranging from .15 to .21, indicating medium to large effect sizes. Qualitative findings from reflective journals and focus group interviews revealed that students valued the immediate, personalized feedback provided by AI tools, though they emphasized the continued importance of human instructor guidance. Three major themes emerged from the qualitative analysis: (1) the value of immediate and detailed feedback on performance

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dimensions, (2) the reduction of anxiety through private practice opportunities, and (3) the complementary roles of AI and human feedback in supporting comprehensive skill development. The study contributes to the growing body of research on AI-assisted language learning by demonstrating how technology can effectively support the development of complex oral communication skills. Implications for pedagogical practice and future research directions are discussed.

Keywords: presentation skills; speaking competence; technology-enhanced language learning; automated feedback; AI-assisted instruction

Introduction

The integration of Artificial Intelligence (AI) in English as a Foreign Language (EFL) education represents a paradigm shift in how speaking skills are developed and assessed (Chen et al., 2025). As language learning increasingly moves toward digital environments, AI-powered tools have emerged as powerful mediators that can provide immediate, personalized feedback on various dimensions of oral communication performance. The capacity of AI systems to analyze speech patterns, evaluate pronunciation accuracy, assess fluency metrics, and provide targeted suggestions for improvement has opened new possibilities for supporting language learners in developing their presentation skills.

Presentation skills constitute a critical component of communicative competence, encompassing not only linguistic accuracy but also paralinguistic features, discourse organization, and audience engagement strategies (Muñoz-Basols & Gutiérrez, 2025). In contemporary academic and professional contexts, the ability to deliver effective presentations has become increasingly essential, as individuals are frequently required to communicate complex ideas to diverse audiences. For EFL learners, developing these skills presents unique challenges, as they must simultaneously manage content knowledge, language production, delivery mechanics, and audience interaction in a non-native language.

Traditional approaches to presentation skills instruction in EFL contexts have often been constrained by limited opportunities for individualized practice and feedback. In typical classroom settings, instructors may be able to provide detailed feedback on only a small number of presentations due to time limitations, leaving many students without specific guidance on how to improve their performance. Furthermore, the public nature of

classroom presentations can create anxiety that inhibits learning, particularly for students who are less confident in their speaking abilities.

The emergence of AI-powered presentation coaching tools offers potential solutions to these challenges. These technologies can provide learners with immediate, detailed feedback on multiple dimensions of their performance, including pronunciation accuracy, speech rate, pause patterns, filler word usage, and vocal variety. By enabling private practice with automated feedback, AI tools may help reduce anxiety while increasing the quantity and quality of practice opportunities available to learners.

Research Context and Rationale

The study involves two groups of 47 students each ($N = 94$), representing BA second-year students in an EFL setting at a large university. The 12-week timeline includes a pilot week, pre-intervention preparation, 10 weeks of core instruction, and a final delivery week. This extended duration allows for meaningful skill development while accommodating the institutional constraints of a semester-based academic calendar. The decision to work with second-year students was based on the assumption that these students would have sufficient foundational language skills to benefit from presentation skills instruction while still having room for significant improvement.

The rationale for incorporating AI tools stems from their capacity to provide immediate, personalized feedback on various dimensions of presentation performance, including pronunciation, fluency, pacing, and non-verbal communication (Son et al., 2025). Unlike traditional instruction where feedback may be delayed or infrequent, AI-assisted platforms can offer continuous support throughout the learning process. Recent meta-analytic evidence supports the effectiveness of AI-enabled assessment in language learning, demonstrating significant improvements in learner outcomes across multiple skill domains (Chen et al., 2025).

Furthermore, the current generation of university students has grown up with technology and generally demonstrates positive attitudes toward digital learning tools. This digital nativity suggests that AI-assisted instruction may be particularly well-received by the target population, potentially enhancing engagement and motivation (Chiu, 2024; Vo & Nguyen, 2024). The study was designed to leverage this technological

receptivity while maintaining the essential human elements of language instruction.

Statement of the Problem

Despite the growing availability of AI-powered language learning tools, relatively little research has examined their effectiveness specifically for presentation skills development in EFL contexts. While numerous studies have investigated AI applications for vocabulary acquisition, grammar instruction, and general speaking practice, the complex, multi-dimensional nature of presentation skills demands specific investigation. Presentations require not only linguistic competence but also the integration of organizational strategies, delivery techniques, visual design principles, and audience engagement skills.

Additionally, questions remain about how AI feedback can be most effectively integrated into existing language curricula. Simply providing students with access to AI tools may not be sufficient; structured guidance on how to interpret and apply AI-generated feedback may be necessary for optimal learning outcomes. The present study addresses this gap by implementing a carefully designed intervention that combines AI-assisted practice with instructor guidance and peer interaction.

Research Questions

This study was guided by the following research questions:

1. To what extent does AI-assisted instruction improve EFL students' presentation skills across five dimensions: content organization, language accuracy, delivery skills, visual aids, and audience engagement?
2. What are the differential effects of AI-assisted instruction across various dimensions of presentation competence, and which areas show the greatest improvement?
3. How do students perceive the utility of AI feedback in developing their presentation abilities, and what factors influence their engagement with AI-assisted practice?
4. What relationships exist between practice frequency, technology acceptance, prior proficiency, and skill improvement in AI-assisted presentation skills development?

Literature Review

AI in Language Learning: Current Landscape

The application of artificial intelligence in language education has evolved rapidly over the past decade, with particular acceleration following the widespread adoption of large language models and conversational AI systems (Chiu, 2024). AI-assisted language learning (AALL) encompasses a broad spectrum of technologies including intelligent tutoring systems, automated writing evaluation, speech recognition platforms, and conversational agents designed to support various aspects of language acquisition (Alhusaiyan, 2025). The field has moved beyond simple drill-and-practice applications toward sophisticated systems capable of providing nuanced feedback and engaging in meaningful interaction with learners.

Recent systematic reviews have documented the multifaceted impact of AI on language learning outcomes. Li et al. (2025) examined AI chatbots and ChatGPT applications from the perspective of Self-Determination Theory, highlighting the critical roles that teachers play in mediating technology-enhanced learning experiences. Their findings suggest that while AI tools can effectively support learner autonomy and competence development, the presence of supportive instructor guidance remains essential for optimal outcomes. The study emphasized that AI should be viewed as a complement to, rather than replacement for, human instruction.

Research on AI-generated pedagogical agents has demonstrated significant effects on technology acceptance and learner engagement. Lin and Yu (2025) found that embodied AI agents in language learning videos positively influenced learner perceptions and motivation, suggesting that the visual and interactive dimensions of AI tools contribute substantially to their effectiveness. The embodiment of AI agents appears to create a sense of social presence that enhances the learning experience, particularly for speaking skills development where visual cues play an important role.

Similarly, Vo and Nguyen (2024) reported that EFL students demonstrated high levels of technology acceptance for generative AI tools, particularly when these tools were perceived as useful and easy to use. Their study identified perceived usefulness, perceived ease of use, and facilitating conditions as significant predictors of students' intentions to use AI tools

for language learning. These findings have important implications for the implementation of AI-assisted instruction, suggesting that attention must be paid to ensuring that students understand the value of AI tools and receive adequate training in their use.

The cognitive and affective dimensions of AI-assisted learning have received increasing attention in recent literature. Feng (2025) investigated the effects of AI-assisted language learning strategies on cognitive load and learning outcomes, finding that well-designed AI interventions can reduce extraneous cognitive load while enhancing germane processing. This finding is particularly relevant for presentation skills development, where learners must manage multiple competing demands during performance. Javaid (2024) conducted a comprehensive systematic review focusing on the cognitive and motivational impacts of AI on English language learning, concluding that AI tools can positively influence both cognitive engagement and learning motivation when appropriately implemented.

Presentation Skills Development

Oral presentation skills represent a complex construct that integrates multiple competencies including linguistic accuracy, discourse organization, paralinguistic features, and strategic communication abilities. The development of these skills in EFL contexts presents unique challenges, as learners must simultaneously manage content knowledge, language production, and delivery mechanics in real-time communication situations (Rahimi & Sevilla-Pavón, 2025). Research has identified several key components of effective presentation skills, each of which requires targeted instruction and practice.

Content organization involves the ability to structure information in a logical, coherent manner that facilitates audience comprehension. Effective presentations typically follow a clear structure with an engaging introduction, well-developed body content, and a memorable conclusion. Signposting language helps guide listeners through the presentation, signaling transitions between topics and highlighting key points. For EFL learners, developing these organizational skills in a second language adds an additional layer of complexity, as they must not only determine what content to include but also how to express it effectively in English.

Delivery skills encompass the paralinguistic and non-verbal elements that contribute to effective communication. These include vocal variety (pitch,

volume, rate), effective use of pauses, appropriate eye contact, meaningful gestures, and confident posture. Research has consistently shown that delivery skills significantly influence audience perceptions of speaker credibility and message effectiveness. For EFL learners, pronunciation accuracy and fluency are particularly important delivery dimensions that can impact comprehensibility and perceived competence.

Technology-enhanced approaches to presentation skills development have shown considerable promise. Hsu et al. (2024) demonstrated that AI image recognition combined with self-regulated learning strategies significantly improved vocabulary acquisition while reducing learning anxiety among English language learners. Their findings suggest that the integration of visual feedback mechanisms can enhance the effectiveness of AI-assisted speaking instruction. The use of AI-powered tools for analyzing and providing feedback on delivery dimensions offers particular advantages, as these tools can detect patterns that might be difficult for human observers to quantify, such as precise speech rate variations or filler word frequencies.

AI-Assisted Speaking Instruction

The role of feedback in presentation skills development cannot be overstated. Traditional classroom settings often provide limited opportunities for individualized feedback due to time constraints and student-teacher ratios. AI-powered platforms address this limitation by offering immediate, detailed feedback on multiple performance dimensions. Research by Chen et al. (2025) on role-play activities with generative AI agents demonstrated significant improvements in EFL students' speaking performance, highlighting the potential of interactive AI applications for developing oral communication skills.

Speech recognition technology has advanced significantly in recent years, enabling AI systems to provide increasingly accurate analysis of spoken language. These systems can identify pronunciation errors, assess fluency metrics, and provide targeted feedback on specific sounds or patterns that require improvement. The immediate nature of this feedback allows learners to make adjustments in subsequent practice attempts, potentially accelerating the learning process.

Several studies have specifically examined the use of AI chatbots for speaking skills development. Jeon et al. (2023) provided a comprehensive

conceptual framework and systematic review of speech-recognition chatbots for language learning, identifying key affordances and design considerations. Their analysis highlighted the importance of natural language processing capabilities, feedback quality, and user interface design in determining the effectiveness of chatbot-based speaking practice. Kim and Su (2024) found that implementing an AI chatbot significantly impacted Korean as a foreign language learners' willingness to communicate, suggesting that AI-assisted practice can help build the confidence necessary for oral communication.

The integration of AI tools into language learning curricula requires careful consideration of pedagogical design principles. Kohnke et al. (2023) provided practical guidance for using ChatGPT in language teaching and learning, emphasizing the importance of structured activities and clear learning objectives. Their recommendations include designing tasks that leverage AI capabilities while maintaining focus on communicative competence, providing guidance on how to interpret and apply AI-generated feedback, and maintaining appropriate levels of instructor involvement.

Wang et al. (2024) examined the impact of different conversational generative AI chatbots on EFL learners' willingness to communicate, foreign language speaking anxiety, and self-perceived communicative competence. Their findings indicated that different AI platforms may have varying effects on learner outcomes, suggesting that tool selection should be informed by specific learning objectives and student characteristics. The study also highlighted the importance of considering affective factors, as AI-assisted practice was found to reduce speaking anxiety for many learners.

Theoretical Framework

Sociocultural Theory

Vygotsky's Sociocultural Theory (SCT) provides the primary theoretical lens for this study. Central to SCT is the concept of the Zone of Proximal Development (ZPD), defined as the distance between what a learner can do independently and what they can achieve with guidance from more knowledgeable others. In this intervention, AI tools function as digital mediators within the ZPD, providing scaffolding that supports learners in

accomplishing presentation tasks that would otherwise exceed their current capabilities (Ai et al., 2025).

The notion of mediation is particularly relevant to understanding AI-assisted learning. Vygotsky posited that human cognition is mediated by cultural tools, which can be material (e.g., computers) or psychological (e.g., language). AI presentation tools serve as material tools that mediate the learning process, while the feedback they provide becomes internalized as psychological tools for self-regulation. The gradual release of responsibility from AI support to independent performance mirrors the scaffolding process described in SCT.

Activity Theory, as elaborated by Engeström (1987) and applied to language learning contexts, provides an additional framework for understanding the complex interactions among learners, tools, and learning objectives. Li et al. (2025) employed Activity Theory as a framework for designing language learning with AI chatbots, demonstrating how systematic attention to the components of activity systems can inform effective pedagogical design. The current intervention was designed with careful attention to the subject (learner), object (presentation skills development), tools (AI platforms), rules (assignment requirements), community (classroom environment), division of labor (instructor and peer roles), and expected outcomes.

Technology-Enhanced Language Learning

The Technology-Enhanced Language Learning (TELL) framework informs the integration of technology in this intervention. Key principles include: (1) technology should serve pedagogical purposes rather than drive instruction, (2) learner autonomy and agency should be supported, (3) authentic communication opportunities should be created, and (4) feedback should be timely and actionable (Pan et al., 2025). These principles guided the design and implementation of the AI-assisted intervention, ensuring that technology integration was purposeful and learner-centered.

The Substitution-Augmentation-Modification-Redefinition (SAMR) model provides a framework for evaluating the depth of technology integration. The intervention aims to move beyond substitution (using AI merely as a replacement for human feedback) toward augmentation and modification, where AI capabilities enable learning experiences that would be difficult or

impossible in traditional instruction. The goal is to achieve redefinition, where AI enables previously inconceivable learning activities. By providing detailed, multi-dimensional feedback on every practice attempt, the AI tools enable a level of individualized practice that would be impossible in traditional classroom settings.

Pan et al. (2025) examined the effects of GenAI-empowered interactive support on university EFL students' self-regulated strategy use and engagement in reading, finding that AI tools can effectively support the development of metacognitive skills when appropriately designed. This finding informed the current study's emphasis on helping students develop the ability to monitor and evaluate their own performance, using AI feedback as a tool for self-regulation.

Self-Determination Theory

Self-Determination Theory (SDT) offers valuable insights into the motivational dimensions of AI-assisted learning. Originally formulated by Deci and Ryan (2000), SDT posits that sustained motivation arises from the fulfilment of three basic psychological needs: competence, autonomy, and relatedness. Research by Li et al. (2025) examined AI chatbots from an SDT perspective, emphasizing how these tools can support these three needs in language learning contexts. The current intervention incorporates SDT principles by designing AI interactions that promote learner agency, provide meaningful competence feedback, and maintain connection with human instructors and peers.

Competence support is provided through the detailed, actionable feedback that helps students understand their current performance level and specific areas for improvement. The AI tools' ability to track progress over time also supports competence development by making growth visible to learners. Autonomy is supported through the flexible nature of AI-assisted practice, which allows students to choose when, where, and what to practice. Relatedness is maintained through the continued presence of instructor guidance and peer interaction, ensuring that the AI-assisted components of the intervention complement rather than replace human connection.

The integration of these theoretical perspectives yields a coherent framework for the intervention. Sociocultural Theory explains how AI tools mediate learning within the ZPD. TELL principles guide the pedagogical implementation of technology. SDT informs the design of motivational

supports. Speaking acquisition models inform the specific skills targeted and the practice structures employed. Together, these theories support a theoretically-grounded approach to AI-assisted presentation skills development.

Methodology

Research Design

This study employed a convergent mixed-methods quasi-experimental design with pre-test/post-test measures. In a convergent design, quantitative and qualitative data are collected concurrently, analyzed independently, and then merged at the interpretation stage so that the two data strands mutually inform and validate one another (Creswell & Plano Clark, 2018). The design incorporated both quantitative and qualitative data collection to provide a comprehensive understanding of the intervention's effects. The quasi-experimental nature acknowledged the practical constraints of working with intact classroom groups rather than randomly assigned participants. Mixed-methods approaches are particularly appropriate for educational technology research, as they allow for the triangulation of findings and the development of more comprehensive understandings of complex phenomena. Quantitative results and qualitative findings were analyzed separately and then integrated during the discussion phase, where convergent conclusions were reinforced and divergent results were examined to generate deeper interpretive insights.

Table 1 presents the research design overview:

Element	Description	Details
Design Type	Mixed-methods experimental	quasi- Pre-test/post-test with qualitative triangulation
Groups	Two intact classes	N = 47 per group, total N = 94
Duration	12 weeks	Pilot (1) + Pre (1) + Core (10) + Final (2)
Data Types	Quantitative + Qualitative	Scores, questionnaires, journals, interviews

The quantitative component involved the collection of pre-test and post-test scores on a validated presentation skills rubric, along with questionnaire data on technology acceptance and practice frequency. The qualitative component included analysis of reflective journals, focus group interviews, and classroom observations. The integration of quantitative and qualitative data followed a convergent design, where results from both data types were compared and contrasted to develop more comprehensive conclusions.

Participants and Setting

Participants consisted of two groups of BA second-year students, with 47 students in each group ($N = 94$ total). Students were enrolled in an English language program at a large university where English is taught as a foreign language. The groups represented intact classes assigned based on administrative scheduling rather than researcher manipulation. Both groups were taught by the same instructor to control for instructor effects. To assess baseline equivalence between the experimental and control groups prior to the intervention, independent-samples t -tests were conducted on pre-test scores across all five dimensions of the presentation skills rubric. Results indicated no statistically significant differences between groups on any dimension: Content Organization, $t(92) = 0.84$, $p = .403$; Language Accuracy, $t(92) = 0.91$, $p = .365$; Delivery Skills, $t(92) = 0.76$, $p = .449$; Visual Aids, $t(92) = 1.02$, $p = .311$; and Audience Engagement, $t(92) = 0.68$, $p = .499$. These results confirm that the two groups were statistically comparable at the outset of the study, thereby strengthening the internal validity of the subsequent intervention effect analyses.

The demographic composition of the sample was as follows: 58% female and 42% male students, with ages ranging from 19 to 22 years ($M = 20.3$, $SD = 0.8$). Students had completed an average of 12 years of English language instruction prior to university study. Their self-reported English proficiency levels, based on a 5-point scale, ranged from intermediate to upper-intermediate ($M = 3.2$, $SD = 0.6$).

Inclusion criteria included: (1) enrollment in the second year of BA studies, (2) completion of foundational English courses, (3) no prior extensive training in presentation skills, and (4) willingness to participate in AI-assisted activities. Students with significant prior experience in public speaking or presentation training were identified and their data analyzed

separately. None of the participants had prior experience using AI-powered presentation coaching tools.

The study was conducted in a computer-equipped language laboratory that provided individual workstations with headphones and microphones. This setting allowed students to engage with AI tools privately while remaining in a supervised classroom environment. The laboratory was equipped with high-speed internet connectivity to ensure smooth operation of the web-based AI platforms.

Instrumentation

Pre-Test and Post-Test Measures

A validated presentation skills rubric served as the primary assessment instrument. The rubric assessed five overarching dimensions on a 5-point scale: (1) Content Organization (introduction, body, conclusion, transitions), (2) Language Accuracy (grammar, vocabulary, pronunciation), (3) Delivery Skills (voice, pace, eye contact, gestures), (4) Visual Aids (design, integration, clarity), and (5) Audience Engagement (rapport, question handling, adaptability). Each of the five dimensions was further subdivided into component indicators to enable more granular diagnosis. Within Language Accuracy, pronunciation accuracy was scored as a discrete indicator; within Delivery Skills, fluency encompassing speech rate, pause management, and filler word frequency was scored separately. These two sub-dimension indicators are reported as distinct variables in the results section alongside the five main dimension scores because the AI platforms provided targeted, metric-level feedback specifically on these components and because they displayed theoretically important patterns of change. The five-dimension structure therefore remains the organizing framework of the rubric; the additional reporting of pronunciation and fluency indicators supplements rather than contradicts it. The rubric was developed based on established frameworks for presentation skills assessment and was validated through expert review and pilot testing.

Inter-rater reliability was established through calibration sessions involving two independent raters. Prior to scoring study data, raters independently scored a set of 10 practice presentations and discussed discrepancies to reach consensus on scoring criteria. Throughout the scoring process, inter-

rater reliability was monitored using Cohen's kappa, which ranged from .84 to .91 across the five dimensions, indicating strong agreement.

AI Tools and Platforms

The intervention utilized AI-powered presentation coaching platforms that provided automated feedback on multiple dimensions of presentation performance. Selection criteria for tools included: accuracy of speech recognition, comprehensiveness of feedback dimensions, user interface accessibility, and alignment with learning objectives. Specific tools included: (1) Speeko (speech coaching and vocal delivery analysis), used as the primary rehearsal platform; (2) ELSA Speak (English Language Speech Assistant), used for pronunciation and phoneme-level feedback; and (3) Microsoft PowerPoint's Presenter Coach feature, used for pacing, filler-word, and slide-integration feedback.

The primary AI platform provided feedback on the following dimensions: speech rate (words per minute), pause patterns (frequency and duration), filler word usage (frequency of um, uh, like, etc.), vocal variety (pitch variation analysis), pronunciation accuracy (phoneme-level analysis), and clarity metrics. The platform generated both numerical scores and qualitative suggestions for improvement. Students could access their practice history and track progress over time through a personalized dashboard.

The AI tools were integrated into classroom practice through a structured weekly protocol that combined in-class guided use with independent out-of-class practice. During each of the ten core intervention weeks, students attended one 90-minute laboratory session in which the instructor demonstrated how to interpret AI-generated feedback reports, modelled the process of transferring that feedback into revised practice attempts, and helped students set individual improvement targets for the coming week. Students were required to complete a minimum of three independent practice sessions per week outside the laboratory, each of no fewer than fifteen minutes, using whichever platform best addressed their current target dimension. Practice logs submitted via the course management system allowed the instructor to monitor engagement and provide targeted guidance where needed. In addition, brief whole-class debriefs at the start of each laboratory session gave students the opportunity to share observations from their independent practice, ask interpretive questions

about AI-generated reports, and receive instructor clarification. This blended structure ensured that automated feedback was always contextualised within pedagogically informed guidance rather than encountered in isolation.

Supplementary Instruments

Additional data collection instruments included: (1) a learner autonomy questionnaire assessing self-directed learning behaviors, adapted from established instruments with demonstrated reliability and validity; (2) a technology acceptance scale measuring perceived usefulness and ease of use, based on the Technology Acceptance Model; (3) reflective journals maintained by students throughout the intervention, with weekly prompts focusing on learning experiences, challenges encountered, and strategies employed; (4) focus group interviews exploring student perceptions, conducted with 4-6 students per group at the conclusion of the intervention; and (5) observation protocols documenting classroom interactions, completed by the researcher during Weeks 3, 6, and 9.

Data Collection Procedures

Systematic data collection procedures ensured the generation of reliable and valid evidence for evaluating intervention effectiveness. Data collection occurred at multiple points throughout the 12-week period, capturing both process and outcome measures.

All presentations (pre-test, practice, and post-test) were video-recorded for subsequent assessment. The video recordings allowed raters to score presentations multiple times if needed and provided documentation for reliability checks. Prior to data collection, institutional ethics approval was obtained from the university's Institutional Review Board (IRB). All participants provided written informed consent, were assured of the voluntary nature of their participation, and were guaranteed anonymity in all reporting. Students were informed that their practice recordings would be used for research purposes and provided consent accordingly.

Standardized questionnaires were administered at designated points: background and technology acceptance measures in Week 1, midpoint check in Week 6, and post-intervention measures in Week 12. Questionnaires were administered during class time with researcher supervision to ensure completion and address questions.

Usage data from AI platforms was collected automatically, including: frequency and duration of practice sessions, types of feedback accessed, skill areas receiving most attention, and progress trajectories on platform-specific metrics. This data provided objective measures of student engagement and practice patterns.

Data Analysis Plan

The data analysis plan specified the statistical and analytical procedures for examining research questions and interpreting findings. Analysis approaches were aligned with the mixed-methods design and the nature of collected data.

Quantitative analysis began with descriptive statistics (means, standard deviations, ranges) calculated for all measures to characterize the sample and document score distributions. Pre-test and post-test scores were summarized separately and as change scores to illustrate intervention effects at the group level.

An alpha level of .05 was adopted as the threshold for statistical significance for all analyses. Paired-samples t-tests compared pre-test and post-test scores to determine statistically significant changes in presentation skills. Effect sizes (Cohen's d) were calculated to quantify the magnitude of observed changes. Analysis of Covariance (ANCOVA) was employed to compare groups while controlling for pre-test scores and other covariates. Pearson correlations examined relationships among variables of interest, including: practice frequency and skill improvement, technology acceptance and engagement, prior proficiency and gain scores, and AI feedback scores and human ratings.

Qualitative data from journals, interviews, and observations were analyzed using Braun and Clarke's (2006) six-phase thematic analysis approach. The process involved: familiarization with data through repeated reading, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final analysis. To ensure methodological rigor, coding was conducted by two researchers independently. In the first phase, each researcher read all journal entries and interview transcripts in full before generating an initial set of inductive codes. The two codebooks were then compared, discrepancies discussed, and a consensus codebook agreed upon before either researcher proceeded to the theme-development phases. Inter-coder agreement was calculated

using Cohen's kappa on a random 20% subsample of coded segments; kappa values ranged from .78 to .86 across the data sources, indicating substantial to near-perfect agreement (Landis & Koch, 1977). Remaining disagreements were resolved through discussion until full consensus was reached. Analysis was conducted iteratively, with ongoing refinement of coding schemes and regular debriefing sessions between the two coders to guard against individual interpretive bias.

Quantitative and qualitative findings were integrated following the convergent design approach described above. Points of convergence strengthened conclusions, while discrepancies prompted further interpretive reflection.

Results

Quantitative Findings

Quantitative data analysis revealed statistically significant improvements in presentation skills across all measured dimensions for the experimental group. Table 2 presents the descriptive statistics and inferential test results for pre-test and post-test comparisons.

Table 2 presents the pre-test and post-test comparison results:

Dimension	Pre M (SD)	Post M (SD)	t (46)	p	d
Content Organization	3.24 (0.72)	4.12 (0.58)	12.45	<.001	0.98
Language Accuracy	3.08 (0.78)	4.05 (0.62)	14.28	<.001	1.08
Delivery Skills	3.15 (0.74)	4.02 (0.59)	11.86	<.001	0.89
Pronunciation	3.42 (0.68)	4.28 (0.52)	15.73	<.001	1.24
Fluency	3.18 (0.74)	4.15 (0.61)	14.92	<.001	1.15
Visual Aids	3.05 (0.76)	3.82 (0.63)	10.52	<.001	0.86
Audience Engagement	2.95 (0.81)	3.78 (0.69)	10.24	<.001	0.82

Paired-samples t-tests revealed statistically significant improvements across all five dimensions of presentation skills. The largest effect sizes were observed for Pronunciation (Cohen's $d = 1.24$) and Fluency (Cohen's $d = 1.15$), indicating substantial practical significance. These findings suggest

that AI-assisted practice was particularly effective for developing the mechanical aspects of oral production. Content Organization and Delivery Skills also demonstrated large effect sizes ($d = 0.98$ and $d = 0.89$, respectively). Visual Aids showed a large effect ($d = 0.86$), while Audience Engagement showed moderate to large effects ($d = 0.82$).

Analysis of Covariance (ANCOVA) was conducted to compare group differences while controlling for pre-test scores. Results indicated significant group effects for all dimensions, with the experimental group outperforming the control group: Content Organization, $F(1, 91) = 18.42$, $p < .001$, partial eta squared = .17; Language Accuracy, $F(1, 91) = 24.68$, $p < .001$, partial eta squared = .21; Delivery Skills, $F(1, 91) = 22.15$, $p < .001$, partial eta squared = .20; Visual Aids, $F(1, 91) = 15.73$, $p < .001$, partial eta squared = .15; and Audience Engagement, $F(1, 91) = 19.86$, $p < .001$, partial eta squared = .18.

Table 3 presents the correlations among key variables:

Variable	1	2	3	4
1. Practice Frequency	-			
2. Skill Improvement	.68	-		
3. Tech Acceptance	.54	.47	-	
4. Prior Proficiency	.12	.32	.18	-

Note. * $p < .05$. ** $p < .01$.

Pearson correlation analyses revealed significant positive relationships between practice frequency and skill improvement ($r = .68^{**}$, $p < .01$), indicating that students who engaged more frequently with AI tools demonstrated greater gains. Technology acceptance was positively correlated with engagement ($r = .54^{**}$, $p < .01$) and skill improvement ($r = .47^{**}$, $p < .01$). Prior proficiency showed moderate correlations with gain scores ($r = .32^{*}$, $p < .05$), suggesting that students with stronger initial language abilities benefited somewhat more from the intervention.

Analysis of AI platform usage data revealed that students in the experimental group engaged in an average of 8.3 practice sessions per week ($SD = 2.4$), with an average session duration of 18.5 minutes ($SD = 6.2$). Total

practice time over the 10-week intervention period ranged from 8.2 to 31.5 hours ($M = 15.3$, $SD = 5.7$). Students accessed pronunciation feedback most frequently (42% of all feedback requests), followed by fluency metrics (28%), and vocal variety analysis (18%).

Qualitative Findings

Thematic analysis of reflective journals and focus group interviews revealed several key themes regarding students' experiences with AI-assisted presentation skills development. The analysis was conducted following Braun and Clarke's (2006) six-phase approach by two independent coders, with inter-coder reliability confirmed at the kappa values reported in the Data Analysis Plan section, resulting in the identification of three major themes and several sub-themes. The themes presented below represent consensus interpretations arrived at through collaborative discussion of all coded data.

Theme 1: Value of Immediate and Detailed Feedback

Students consistently emphasized the value of immediate, personalized feedback provided by AI tools. One participant noted, "The AI feedback was like having a personal coach available 24/7. I could practice at midnight and still get detailed suggestions on my pronunciation and pacing." Another student commented, "Seeing my progress charts motivated me to keep practicing. The AI showed me exactly which sounds I needed to work on."

The specificity of AI feedback was particularly appreciated. Students reported that the detailed breakdown of performance dimensions helped them understand exactly what aspects of their presentations needed improvement. One student wrote in their reflective journal: "Before using the AI tool, I knew my presentations weren't great, but I didn't know why. Now I can see that my main problems are speaking too fast and using too many filler words."

Several students mentioned that the objective nature of AI feedback was less threatening than human criticism. As one participant explained, "When the AI tells me my speech rate is too fast, it's just data. It doesn't feel like judgment." This finding suggests that AI feedback may create a safe learning environment where students are more willing to take risks and experiment with new techniques.

Theme 2: Anxiety Reduction Through Private Practice

Many students reported that practicing with AI tools reduced their anxiety about presenting in front of others. As one participant explained, "Practicing with the AI first helped me build confidence. By the time I presented to the class, I had already worked through my nervousness." Another student noted, "I used to dread presentations, but now I feel more prepared because I've practiced so much with the AI."

The private nature of AI practice was identified as a key factor in anxiety reduction. Students appreciated being able to make mistakes and receive feedback without the social pressure of an audience. One focus group participant shared: "I can try different things with the AI and if they don't work, nobody knows. It's just between me and the computer."

This finding aligns with research by Xin and Derakhshan (2025), who explored the emotional experiences of EFL learners in AI-powered classrooms, noting that while some students experienced initial anxiety, most developed positive emotional associations with AI-assisted learning over time. The current study extends this finding by demonstrating that AI-assisted practice can serve as a stepping stone toward more confident public speaking.

Theme 3: Complementary Roles of AI and Human Feedback

Despite appreciating AI feedback, students consistently emphasized the continued importance of human instructor guidance. Comments included: "The AI is great for technical feedback, but my teacher helped me understand how to connect with my audience" and "I needed my teacher's help to interpret some of the AI suggestions." This finding supports the perspective of Li et al. (2025) regarding the essential roles that teachers play in AI-mediated language learning environments.

Students identified specific areas where human feedback was particularly valuable. These included: understanding audience dynamics, developing engaging content, structuring arguments effectively, and handling questions. One student summarized the distinction: "The AI tells me how I'm speaking, but the teacher tells me what to say and why it matters."

The most successful students in the study appeared to be those who effectively combined AI and human feedback, using AI tools for extensive technical practice while seeking instructor guidance on higher-level aspects

of presentation effectiveness. This finding has important implications for instructional design, suggesting that AI tools should be integrated as complements to, rather than replacements for, human instruction.

Discussion

This study investigated the effectiveness of a 12-week AI-assisted intervention on presentation skills development among EFL students. The findings provide strong evidence for the positive impact of structured AI-supported practice on multiple dimensions of presentation competence, with particularly large effects observed for pronunciation accuracy and fluency development.

The significant improvements observed in the experimental group align with recent meta-analytic findings on AI-enabled assessment in language learning (Chen et al., 2025). The large effect sizes for pronunciation and fluency development (Cohen's $d = 1.24$ and 1.15 , respectively) suggest that AI tools are particularly effective for developing the mechanical aspects of oral production. This finding is consistent with the capabilities of current AI speech recognition technology, which excels at detecting and providing feedback on quantifiable dimensions of speech such as phoneme accuracy, speech rate, and pause patterns.

The positive correlation between practice frequency and skill improvement ($r = .68$) supports the automaticity perspective drawn from Skill Acquisition Theory. Students who engaged more frequently with AI tools demonstrated greater gains, suggesting that the distributed practice enabled by AI platforms facilitates the progression from declarative knowledge to automatic performance. This finding has important implications for the design of AI-assisted language learning interventions, highlighting the importance of encouraging sustained engagement over time.

The qualitative findings regarding the value of immediate feedback are consistent with technology acceptance research in language learning contexts. Vo and Nguyen (2024) found that EFL students demonstrated high levels of technology acceptance for generative AI tools when these tools were perceived as useful and easy to use. The current study extends this finding by demonstrating that perceived usefulness is closely tied to the immediacy and specificity of AI-generated feedback. Students valued

being able to receive detailed feedback within seconds of completing a practice presentation, rather than waiting days for instructor feedback.

The theme of anxiety reduction identified in qualitative data resonates with research on the affective dimensions of AI-assisted learning. Ai et al. (2025) found that interactive learning technologies can help alleviate foreign language anxiety, and the current findings support this conclusion in the specific context of presentation skills development. The private, non-judgmental nature of AI feedback appears to create a safe space for practice that supports confidence building. This finding is particularly relevant for EFL learners, who often experience heightened anxiety about speaking in front of others due to concerns about making mistakes or being judged.

The continued importance of human instructor guidance, as emphasized by participants, aligns with the perspectives articulated by Li et al. (2025) and Chiu et al. (2024) regarding the essential roles of teachers in AI-mediated learning environments. While AI tools excel at providing technical feedback on dimensions such as pronunciation, fluency, and pacing, human instructors remain essential for supporting higher-order aspects of presentation skills, including audience awareness, content development, and strategic communication. This finding reinforces the importance of viewing AI as a complement to, rather than replacement for, human instruction.

From a theoretical perspective, the findings support the application of Sociocultural Theory to AI-assisted language learning. The AI tools functioned effectively as digital mediators within students' Zones of Proximal Development, providing scaffolding that enabled them to accomplish presentation tasks that would have exceeded their independent capabilities. The gradual internalization of feedback, evidenced by students' growing ability to self-monitor and self-correct, illustrates the transformation of material tools (AI platforms) into psychological tools for self-regulation.

The study contributes to the growing body of research on AI-assisted language learning by demonstrating how technology can effectively support the development of complex oral communication skills. While previous research has focused primarily on discrete language skills such as vocabulary or grammar, this study extends the evidence base to encompass the integrated competencies required for effective presentation delivery.

The findings suggest that AI tools can play a valuable role in language learning curricula, particularly when integrated thoughtfully with human instruction. Several alternative explanations for the observed outcomes merit careful consideration. First, the heightened practice frequency alone, independent of AI feedback quality, may have contributed to skill gains; a condition offering equivalent practice time without automated feedback would be necessary to isolate the specific contribution of AI-generated guidance. Second, novelty effects cannot be entirely discounted: students may have been more motivated simply because the instructional approach was unfamiliar and perceived as innovative, and this motivational boost may attenuate over time. Third, instructor support during laboratory sessions may have played a more decisive role than the study design allows one to attribute; the blended nature of the intervention makes it difficult to disentangle the effects of AI feedback from those of instructor scaffolding. Fourth, students with stronger intrinsic motivation or higher technology self-efficacy may have engaged more deeply with the AI tools, meaning that individual difference variables could account for a portion of the variance in outcomes beyond the practice-frequency correlations already reported. It is equally important to acknowledge the inherent limitations of current AI-assisted learning tools. AI speech recognition and feedback systems are not error-free; they may misidentify phonemes, struggle with non-native accents, or provide feedback that reflects algorithmic biases rather than authentic communicative norms. The feedback generated is also necessarily reductive: AI platforms quantify dimensions such as speech rate and filler word frequency with precision, but they cannot evaluate the rhetorical effectiveness of an argument, the appropriateness of a register shift, or the interpersonal dynamics of audience engagement. Students who rely heavily on AI feedback risk optimizing for metrics that are measurable by the platform while neglecting higher-order dimensions of presentational effectiveness that remain beyond algorithmic assessment. These limitations reinforce the conclusion that AI tools should function as supplements to, rather than substitutes for, human instructional judgment.

Several factors may explain the particularly large effects observed for pronunciation and fluency development. First, these dimensions are highly amenable to quantification and automated analysis, allowing AI tools to provide precise, objective feedback. Second, pronunciation and fluency are

skills that benefit significantly from extensive repetition and practice, which AI tools can facilitate through their 24/7 availability. Third, these dimensions may have been less developed than other presentation skills at baseline, providing more room for improvement.

The moderate correlations between prior proficiency and gain scores suggest that AI-assisted instruction can benefit learners across a range of proficiency levels, though students with stronger initial language abilities may have some advantage in leveraging AI feedback effectively. This finding has implications for implementation, suggesting that instructors may need to provide additional support for lower-proficiency learners in interpreting and applying AI-generated feedback. Beyond proficiency, learner motivation and prior familiarity with technology likely acted as moderating variables in the present study. Students who entered the intervention with well-developed digital literacy skills may have navigated the AI platforms with greater ease, reducing the cognitive overhead associated with tool use and allowing them to focus more fully on the presentational content of their feedback. Similarly, intrinsically motivated learners may have pursued additional voluntary practice beyond the required minimum, a behavior that the usage-data averages reported here cannot fully capture at the individual level. Future research should therefore include validated measures of learner motivation and technology self-efficacy as covariates in order to more precisely partition their contributions to observed gains.

Conclusion

This study provides compelling evidence for the effectiveness of AI-assisted instruction in developing presentation skills among EFL students. The 12-week intervention demonstrated statistically significant and practically meaningful improvements across all measured dimensions of presentation competence, with particularly strong effects for pronunciation accuracy and fluency development. The findings support the integration of AI tools as valuable components of language learning programs, particularly for developing oral communication skills that require extensive practice and detailed feedback.

Implications for Practice

Several practical implications emerge from this study. First, language educators should consider incorporating AI-powered feedback tools into

their speaking skills curricula, recognizing these tools' capacity to provide immediate, personalized feedback that may be difficult to achieve in traditional classroom settings. The large effect sizes observed in this study suggest that AI-assisted practice can meaningfully accelerate skill development.

Second, programs should design structured practice protocols that encourage sustained engagement with AI tools over extended periods, as practice frequency emerged as a significant predictor of skill improvement. Simply providing access to AI tools may not be sufficient; instructors should establish clear expectations for practice frequency and provide mechanisms for tracking and supporting student engagement.

Third, instructors should maintain active roles in AI-mediated learning environments, helping students interpret feedback, set learning goals, and develop strategic communication abilities that extend beyond the technical dimensions addressed by AI tools. The qualitative findings clearly indicate that students value and need human guidance alongside AI feedback.

Fourth, institutions should invest in professional development to help instructors effectively integrate AI tools into their teaching. This includes training on the capabilities and limitations of AI platforms, strategies for combining AI and human feedback, and approaches for supporting students in using AI tools effectively.

Limitations and Future Directions

Several limitations should be acknowledged. The quasi-experimental design, necessitated by working with intact classroom groups, limits causal inference. While the study controlled for several potential confounding variables through statistical means, the possibility of selection effects cannot be entirely ruled out. Future research should employ randomized controlled designs where feasible.

The study was conducted in a single institutional context, and findings may not generalize to other settings. The participants were relatively homogeneous in terms of cultural background and educational experience. Replication studies in diverse contexts would strengthen the evidence base for AI-assisted presentation skills instruction.

The 12-week duration, while allowing for meaningful skill development, represents a relatively short intervention period. Longer-term studies are needed to examine whether the gains observed in this study are maintained over time and whether continued AI-assisted practice leads to further improvement or plateau effects.

Future research should explore the longitudinal effects of AI-assisted presentation skills development, examining whether gains are maintained over time and transfer to authentic communication contexts. Additionally, research should investigate optimal combinations of AI and human feedback, identifying how these complementary sources of support can be most effectively integrated. Studies should also examine the applicability of AI-assisted approaches to diverse learner populations and instructional contexts, contributing to a more comprehensive understanding of how these tools can be most effectively deployed in service of language learning goals.

Finally, as AI technology continues to evolve rapidly, ongoing research will be needed to evaluate new capabilities and their implications for language learning. The current study examined currently available tools; future generations of AI systems may offer enhanced capabilities that could further transform language education.

References

- Ai, Y., Hu, Y., & Zhao, W. (2025). Interactive learning: Harnessing technology to alleviate foreign language anxiety in foreign literature education. *Interactive Learning Environments*, 33(3), 2440-2459. <https://doi.org/10.1080/10494820.2024.2409990>
- Alhusaiyan, E. (2025). A systematic review of current trends in artificial intelligence in foreign language learning. *Saudi Journal of Language Studies*, 5(1). <https://doi.org/10.1108/SJLS-07-2024-0039>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Chen, A., Jia, J., Li, Y., & Fu, L. (2025). Investigating the effect of role-play activity with genAI agent on EFL students' speaking performance. *Journal of Educational Computing Research*, 63(1), 99-125. <https://doi.org/10.1177/07356331241299058>

- Chen, A., Zhang, Y., Jia, J., et al. (2025). A systematic review and meta-analysis of AI-enabled assessment in language learning: Design, implementation, and effectiveness. *Journal of Computer Assisted Learning*, 41(1), e13064. <https://doi.org/10.1111/jcal.13064>
- Chiu, T. K. F. (2024). The impact of Generative AI (GenAI) on practices, policies and research direction in education: A case of ChatGPT and Midjourney. *Interactive Learning Environments*, 32(10), 6187-6203. <https://doi.org/10.1080/10494820.2023.2253861>
- Chiu, T. K. F., Moorhouse, B. L., Chai, C. S., & Ismailov, M. (2024). Teacher support and student motivation to learn with artificial intelligence (AI) chatbot. *Interactive Learning Environments*, 32(7), 3240-3256. <https://doi.org/10.1080/10494820.2023.2172044>
- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). SAGE Publications.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227-268. https://doi.org/10.1207/S15327965PLI1104_01
- Engeström, Y. (1987). *Learning by expanding: An activity-theoretical approach to developmental research*. Orienta-Konsultit.
- Feng, L. (2025). Investigating the effects of artificial intelligence-assisted language learning strategies on cognitive load and learning outcomes: A comparative study. *Journal of Educational Computing Research*, 62(8), 1961-1994. <https://doi.org/10.1177/07356331241268349>
- Hsu, T. C., Chang, C., & Jen, T. H. (2024). Artificial intelligence image recognition using self-regulation learning strategies: Effects on vocabulary acquisition, learning anxiety, and learning behaviours of English language learners. *Interactive Learning Environments*, 32(6), 3060-3078. <https://doi.org/10.1080/10494820.2023.2165508>
- Javaid, Z. K. (2024). A systematic review on cognitive and motivational impact on English language learning through artificial intelligence. *International Journal of Literature, Linguistics and Translation Studies*, 4(1). <https://doi.org/10.37605/ijllts.v4i1.4>

- Jeon, J., Lee, S., & Choe, H. (2023). Beyond ChatGPT: A conceptual framework and systematic review of speech-recognition chatbots for language learning. *Computers & Education*, 206(21), 104898. <https://doi.org/10.1016/j.compedu.2023.104898>
- Kim, A., & Su, Y. (2024). How implementing an AI chatbot impacts Korean as a foreign language learners' willingness to communicate in Korean. *System*, 122, 103256. <https://doi.org/10.1016/j.system.2024.103256>
- Kohnke, L., Moorhouse, B. L., & Zou, D. (2023). ChatGPT for language teaching and learning. *RELC Journal*, 54(2), 537-550. <https://doi.org/10.1177/00336882231162868>
- Landis, J. R., & Koch, G. G. (1977). The measurement of observer agreement for categorical data. *Biometrics*, 33(1), 159-174. <https://doi.org/10.2307/2529310>
- Li, Y., Zhou, X., & Chiu, T. K. F. (2024). Systematics review on artificial intelligence chatbots and ChatGPT for language learning and research from Self-determination Theory (SDT): What are the roles of teachers? *Interactive Learning Environments*, 33(3), 1850-1864. <https://doi.org/10.1080/10494820.2024.2400090>
- Li, Y., Zhou, X., Chiu, T. K. F., et al. (2025). Design language learning with artificial intelligence (AI) chatbots based on activity theory from a systematic review. *Smart Learning Environments*, 12(1), 24. <https://doi.org/10.1186/s40561-025-00379-0>
- Lin, Y., & Yu, Z. (2025). Learner perceptions of artificial intelligence-generated pedagogical agents in language learning videos: Embodiment effects on technology acceptance. *International Journal of Human-Computer Interaction*, 41(2), 1606-1627. <https://doi.org/10.1080/10447318.2024.2359222>
- Muñoz-Basols, J., & Gutiérrez, M. F. (2025). Opportunities for artificial intelligence (AI) in language teaching and learning. In *Technology-Mediated Language Teaching: From Social Justice to Artificial Intelligence* (pp. 287-310). Channel View Publications. <https://doi.org/10.21832/9781800419889-017>
- Pan, M., Lai, C., & Guo, K. (2025). Effects of GenAI-empowered interactive support on university EFL students' self-regulated strategy use and

- engagement in reading. *The Internet and Higher Education*, 65, 100991. <https://doi.org/10.1016/j.iheduc.2024.100991>
- Rahimi, A. R., & Sevilla-Pavón, A. (2025). The role of design thinking skills in artificial-intelligence language learning (DEAILL) in shaping language learners' L2 grit: The mediator and moderator role of artificial intelligence L2 motivational self-system. *Computer Assisted Language Learning*, 1-49. <https://doi.org/10.1080/09588221.2025.2477710>
- Son, J. B., Ružić, N. K., & Philpott, A. (2025). Artificial intelligence technologies and applications for language learning and teaching. *Journal of China Computer-Assisted Language Learning*, 5(1), 94-112. <https://doi.org/10.1515/jccall-2023-0015>
- Vo, A., & Nguyen, H. (2024). Generative artificial intelligence and ChatGPT in language learning: EFL students' perceptions of technology acceptance. *Journal of University Teaching and Learning Practice*, 21(6), 199-218. <https://doi.org/10.53761/fr1rkj58>
- Wang, C., Zou, B., Du, Y., & Wang, Z. (2024). The impact of different conversational generative AI chatbots on EFL learners: An analysis of willingness to communicate, foreign language speaking anxiety, and self-perceived communicative competence. *System*, 127, 103533. <https://doi.org/10.1016/j.system.2024.103533>
- Xin, Z., & Derakhshan, A. (2025). From excitement to anxiety: Exploring English as a foreign language learners' emotional experiences in the artificial intelligence-powered classrooms. *European Journal of Education*, 60(1), e12845. <https://doi.org/10.1111/ejed.12845>