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Improve EFL Students' Oral English Expression Ability Based on Intelligent Learning Companions: Empirical Research

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Abstract: This study focused on the impact of intelligent learning companions (ILC) on Chinese EFL learners' oral English ability and technology perception. Using a quasi-experimental design, this study selected 51 EFL learners from a university in southeast China and randomly divided them into an experimental group (EG, n = 24) and a control group (CG, n = 27). During the 16-week intervention period, the experimental group adopted the intelligent learning companion teaching strategy supported by artificial intelligence technology (Relying on the IFlytek Spark Platform), while the control group adopted the learning companion strategy guided by teachers. The experimental group not only had better oral English scores (p = 0.001 < 0.05) but also showed a significant increase in technology perception (p = 0.01 < 0.05). The research provides a new perspective for effectively integrating artificial intelligence technology in oral English teaching. Also, it offers strong empirical support for theoretical study and practical application in enhancing the oral expression ability of the second language, English.

Keywords: intelligent learning companion; oral expression ability; technology perception; EFL student; AI-assisted oral English teaching

1. Introduction

As a core tool for cross-cultural communication, the frequency of English use has been increasing with the advancement of globalization. Whether in academic settings, daily conversations, or other scenarios, Oral English expression ability is of great significance to EFL learners. Most Chinese EFL learners' oral English expression ability still needs to be improved (Wei et al., 2025). Many learners lack enough practice in oral English learning classes and find it challenging to find appropriate language learning companions to improve their oral expression ability after class (Lai, 2025). Furthermore, traditional methods of oral English teaching often fail to meet students' diverse learning needs, resulting in deficiencies in their fluency, accuracy, and confidence in oral English expression (Mohamed, 2024).

For most EFL learners in China, the ability to express oral English is often a weak point. Even if EFL learners have accumulated a large amount of vocabulary and grammar knowledge, they still fall into the predicament of "more input and less output", "fear of making mistakes in expression", and "stuck thinking in dialogue" (Lai, 2025). This is related to the limitations of the learning environment and training methods (Benu & Nenotek, 2025). Meanwhile, the limited nature of teaching resources leads to many oral English practice activities not being

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thoroughly carried out. For instance, teaching time is limited, the ratio of teachers to students is unbalanced, and there is a lack of partners for learning oral English, etc. Especially in the large-class teaching environment, it is difficult for teachers to organize diverse oral English expression practices, which, to some extent, limits the improvement of students' oral English expression ability (Ranjbar et al., 2025)

In recent years, with the rapid development of artificial intelligence technology, intelligent dialogue systems have gradually entered the field of language learning. As emerging tools, intelligent learning companions can provide learners with personalized and interactive language training methods (Tiandem-Adamou, 2024). Research shows that intelligent learning companions help learners improve their language skills through immediate feedback, simulating real dialogue scenarios, and other means (Rong et al., 2025). However, there are few empirical studies on the effects of using intelligent technology as a learning companion in EFL oral teaching and learners' perceptions of its technology, especially studies taking Chinese EFL learners as the research subjects (Zhao, 2024). Therefore, further exploration of this field requires educational researchers.

Based on the above analysis, this study aims to explore the impact of intelligent learning companions on the oral English expression ability and technical perception of Chinese EFL learners. The research content includes pre-test and post-test of oral English scores, as well as pre-test and post-test questionnaires on technology perception. This study aims to address the following research questions: (1) Can intelligent learning companions effectively improve the oral English ability of EFL learners? (2) How does the technology perception of EFL learners towards intelligent learning companions influence their oral English ability improvement?

2. Literature Review

2.1. Oral English Expression Ability

Oral English expression ability is a complex cognitive behavior in which an individual uses language for immediate language output, involving pronunciation and intonation, logical thinking, vocabulary application, and the coordinated use of non-verbal signals (such as gestures and expressions) to effectively convey information and viewpoints (Hammond, 1988). Some problems still need to be solved in the current teaching of oral English expression. On the one hand, the traditional classroom centered on teachers has led to teachers monopolizing the right to speak. Students have limited opportunities for oral English expression (Liu, 2013). On the other hand, specific differences in learners' oral English expression levels make it challenging to carry out classroom interaction. Those at a low level avoid expressing themselves due to anxiety. High-level performers may lose interest in expressing themselves due to a lack of challenges (Baker & Baker, 2023).

Furthermore, according to the theory of native language context dependence, students find it challenging to break free from the constraints of native language thinking when expressing themselves orally in English (Karakuş, 2025), thereby hindering the development of their oral English expression ability. Existing research mainly focuses on teaching methods and the application of technology to enhance the ability to express oral English effectively. From the perspective of teaching methods, multimodal interactive forms such as teacher-student dialogue, group tasks, and classroom demonstrations have been proven to effectively promote students' language cognitive development (Morgenstern, 2023). From the perspective of technological application, in recent years, various emerging technologies have been introduced into teaching oral English expression, aiming to make up for the deficiencies of traditional teaching through technological means. Among them, virtual scene teaching (VST) provides students opportunities for oral English expression and listening practice, effectively enhancing learning interest (Han, 2022). This virtual scene can simulate real-life scenarios, allowing students to practice oral English in an immersive environment and thereby improve the accuracy of their oral English expression. Meanwhile, Speech Recognition and Feedback Systems (SRFS) are widely applied in oral English teaching. Such systems can analyze students' pronunciation in real time and provide correction suggestions to help improve pronunciation accuracy and oral fluency (Wang, 2025).

Although these technologies have made some achievements in improving oral English ability, most of the existing research focuses on the technology implementation itself, and there are relatively few studies on learners' perception of technology and its impact on oral English ability. With the development of artificial intelligence technology, intelligent learning companions have provided new ideas and methods for researching oral English expression ability. Intelligent Learning Companions can not only overcome the limitations of traditional teaching and technology application, but also provide students with a more effective oral English learning experience through personalized support (Mohamed, 2024).

2.2. Intelligent Learning Companion

The traditional mode of oral English teaching has many limitations. (1) Insufficient interaction between teachers and students will lead to students having difficulty obtaining immediate feedback and personalized guidance (Shi et al., 2024). (2) The opportunities for oral practice among students are minimal. This seriously restricts their ability to use the English language in real language environments, thereby hindering the improvement of students' oral English expression ability (Huang, 2024). (3) The use of technology as an "auxiliary tool" rather than an opportunity for "teaching reconstruction" failed to exert the supporting role of technology for personalized learning and collaborative learning (Lo et al., 2024).

Introducing intelligent learning companions has brought new hope to solve these problems. The research of Zhang (2025) shows that the Andy English Chatbot, with its instant feedback and personalized recommendation functions, helps learners gradually improve their oral expression ability in oral English practice. In addition, with the help of voice interaction and natural language processing technology, intelligent learning companions highly simulate real interpersonal communication scenarios and create an immersive interactive experience for learners (Kundu & Bej, 2025). It can also assess learners' oral performance in real time and provide detailed feedback and suggestions for improvement. This immediate feedback lets learners correct mistakes promptly, enhancing their oral English expression skills (Jeon, 2024).

The wide application of intelligent companions significantly improves the learners' English oral ability and has a profound positive impact on their perception of technology. Technology perception refers to learners' subjective evaluation of technology tools' usefulness and ease of use (Davis, 1989). Studies have shown that the intuitive user interface and natural language interaction functions of intelligent learning companions have significantly reduced the complexity of technical operations, enabling learners to get started and accept these tools easily (Baksh et al., 2024). For instance, Guo et al. (2024) found that intelligent learning companions satisfy learners' basic psychological needs, positive emotions, motivation, and perceived learning performance.

In addition, intelligent learning companions continuously optimize learners' technological perception by providing personalized learning paths and support (Liu et al., 2025). It can precisely and dynamically adjust the difficulty and type of learning content according to the progress and performance of learners, ensuring that learners are always in the best learning state (Qian et al., 2023). Hu's (2022) research also indicates that intelligent learning companions help learners enhance their oral English expression skills and promote their positive perception of technology. It has laid a solid foundation for future learning and technological application.

In conclusion, most existing research focuses on the technical implementation and lacks the target audience of EFL learners in China. At the same time, there is a lack of empirical evidence examining the impact of intelligent learning companions on spoken language ability and technology perception. This research is precisely designed to fill this gap.

3. The Design of Intelligent Learning Companion Strategy Construction Based on Artificial Intelligence Technology Support

3.1. The Construction of an Intelligent Learning Companion Strategy Supported by Artificial Intelligence Technology

Based on the proposed research questions, this study designs an intelligent learning companion teaching strategy supported by artificial intelligence technology to enhance students' fluency and interactivity in oral English expression through intelligent means. As illustrated in Figure 1. The feature of this model is to integrate artificial intelligence technology into the teaching process of oral English learning, and to solve the core problems, such as feedback lag and homogenization in oral English expression training through artificial intelligence technology. Specifically, after students complete their oral English speech training, they can immediately receive an intelligent analysis from the AI platform on pronunciation accuracy, language coherence, emotional expression, logical structure, and a generated diagnostic report. Based on this diagnostic report, students can conduct targeted training, forming a closed-loop optimization process of "training–assessment–improvement".

This study will adopt the IFlytek Spark Platform as the artificial intelligence learning platform. The platform mainly includes four core functions:

(1) Intelligent Diagnosis Function: The platform can conduct real-time evaluation of pronunciation accuracy, pronunciation fluency, and expression logic. It dynamically adjusts the oral English standards based on individual ability levels and provides personalized, real-time diagnosis.

(2) Personalized Recommendation Function: The platform can intelligently match learning difficulty levels, provide pronunciation correction and topic-based dialogue services, and aim to improve learners' oral English expression skills.

(3) Scenario Simulation Function: By constructing virtual scenarios (including daily conversations, group discussions, and public speeches), the platform enables learners to engage in realistic oral English communication, thereby strengthening their expression techniques and adaptability.

(4) Learning Feedback Function: The platform can generate detailed oral English training reports, covering progress trends, weak areas, and improvement suggestions, helping learners clarify their learning directions.

It is precisely because the IFlytek Spark Platform has the above four functions that it can support the four key stages of the intelligent learning companion teaching strategy model in oral English teaching practice:

(1) Intelligent diagnosis stage. At this stage, students can input learning materials in various forms, such as pictures, texts, and audio, into the intelligent learning companion. The intelligent learning companion will immediately generate a diagnostic report and independently analyze students' pronunciation, grammar, and vocabulary performance.

(2) Targeted training stage. In this stage, students independently choose training content according to the personalized plan recommended by the intelligent learning companion. At the same time, the intelligent learning companion provides instant feedback to guide practice and helps students make learning plans.

(3) Comprehensive drill stage. In this stage, students carry out oral English interactive practice in simulated real situations, comprehensively apply the learned knowledge and skills, and improve their oral English expression ability in complex situations. The intelligent learning companion conducts a multi-dimensional evaluation of students' oral English performance, then gives students personalized oral English practice suggestions based on the evaluation results.

(4) Independent optimization stage. In this stage, students independently review the drill performance through the analysis tools provided by the intelligent learning companion and make improvement plans. Teachers mainly play the role of learning facilitators in this process and provide guidance when necessary. Based on this strategy, the teacher realizes the teaching model, leading to the transformation of students' autonomous learning.

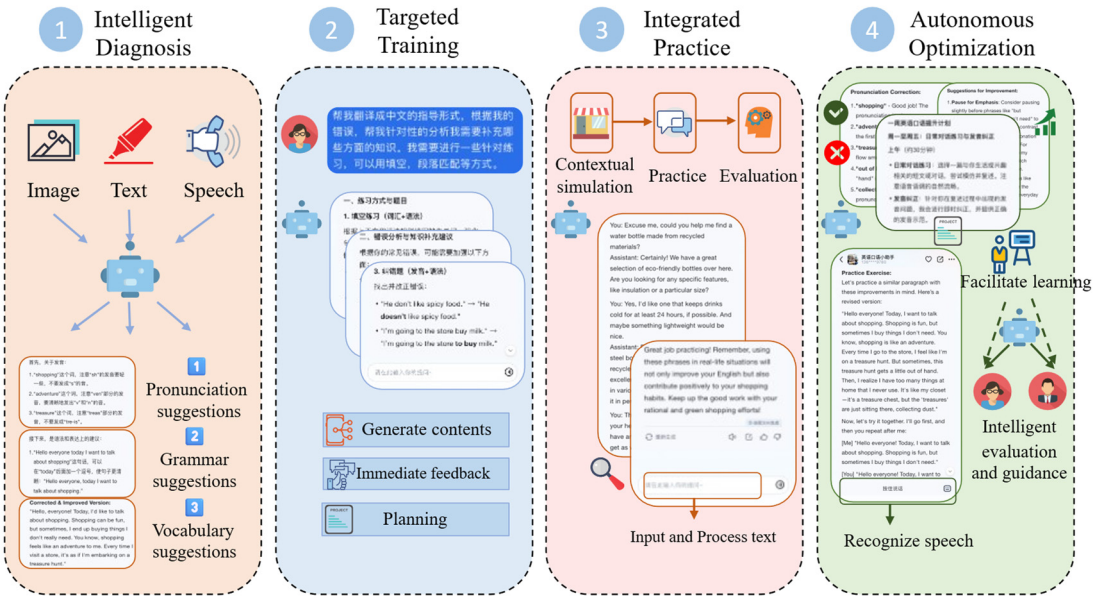

Figure 1. Teaching Strategies of Intelligent Learning Companions Supported by Artificial Intelligence Technology.

3.2. The Activity Design of Intelligent Learning Companions Based on the Support of Artificial Intelligence Technology

This study takes "shopping" as the theme of the oral English speech and applies the constructed strategy to the oral English speech activity. As illustrated in Figure 2, the IFlytek Spark Platform played a significant role in preparing this themed speech.

(1) In the theme conception stage. At this stage, the IFlytek Spark Platform provides hot-topic discussions and creates rich dialogue scenarios. For example, scenarios like "Double 11 Shopping Festival" and "Second-

hand Market" inspire students, guiding them to focus on core viewpoints such as "the consequences of impulsive shopping" and suggesting a clear speech structure. For instance, the IFlytek Spark Platform will prompt students: "You can develop your speech from the definition of impulsive shopping, common scenarios, and solutions."

(2) In the content writing stage. At this stage, the IFlytek Spark Platform helps students organize the English language, enrich materials, and optimize logic. The platform will point out English grammar errors in the first draft. For example, the sentence "Shopping is fun, but sometimes I buy things I do not need." suggests revising it to "Shopping can be enjoyable, but it often leads to impulse purchases that we later regret."

(3) In the performance display stage. At this stage, the IFlytek Spark Platform monitors students' English pronunciation and intonation in real-time, providing immediate feedback on pronunciation issues. For example, it reminds students: "Pay attention to the pronunciation of 'shopping mall'; the pronunciation of 'mall' should be clear," and provides a model pronunciation for students to repeat.

(4) In the improvement evaluation stage. At this stage, the IFlytek Spark Platform combines multi-dimensional data to put forward targeted suggestions. For example, it points out: "Your viewpoints are obvious, but you can add more personal experiences, such as how you avoid impulsive shopping," to help students polish their speech from the first draft to the final version.

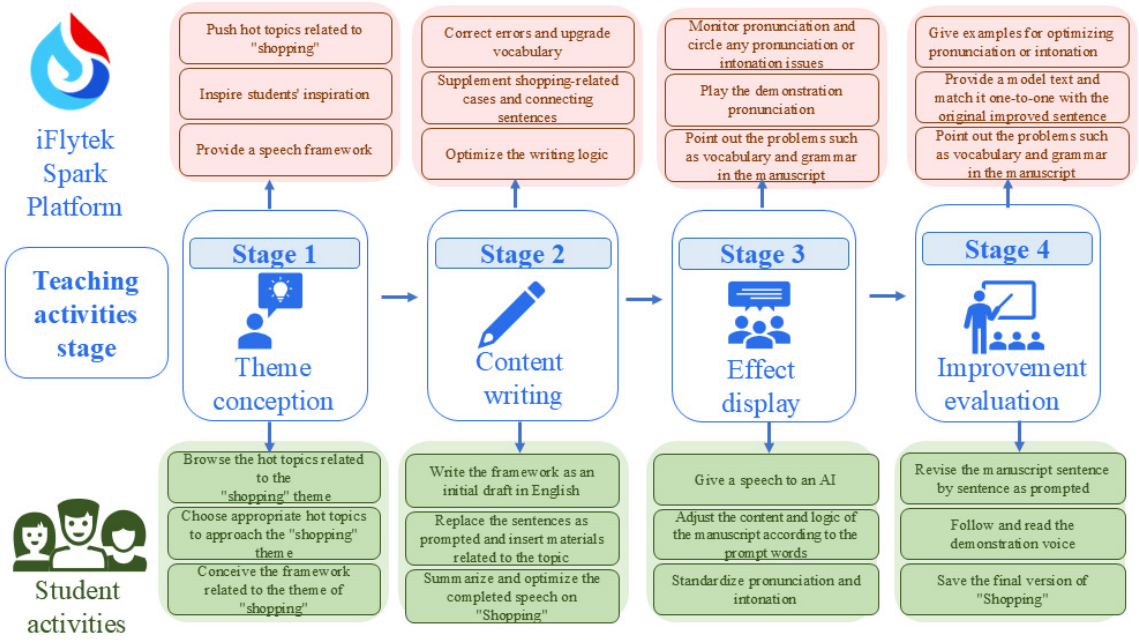

Figure 2. Activity Design of Intelligent Learning Companions Supported by Artificial Intelligence Technology.

4. Experimental Protocol

4.1. Experimental Subjects

This study conducted a pre-test of oral English scores, dividing the participants into two groups, and there was no significant difference in the pre-test scores ($p = 0.076 > 0.05$). This study adopted a unified teaching method in the oral English speech training process: the same teacher taught the content. In the subsequent experimental activities, the students in the experimental group (EG, $n = 24$) adopted the intelligent learning companion strategy supported by artificial intelligence technology. In contrast, the students in the control group (CG, $n = 27$) adopted the traditional learning companion strategy guided by teachers. The control group adopted the teacher-guided learning partner strategy, whose core lies in pairing students into fixed learning partner dyads under teachers' unified planning and real-time guidance. Following the identical four-stage training process of "theme conception–content drafting–presentation delivery–revision and evaluation" as the experimental group, the students completed oral practice through the "peer mutual assistance + teacher feedback" model, without using any artificial intelligence tools (e.g., IFlytek Spark Platform).

In this study, G*Power 3.1 software was employed to conduct a power analysis for two types of analytical methods: between-group difference tests and correlation analysis. All parameter settings were in accordance with the general norms of second language acquisition research. For the between-group difference tests, since G*Power does not support non-parametric tests, the independent samples *t*-test was used as an approximation to verify statistical power. With the effect size set at $d = 0.5$, significance level at $\alpha = 0.05$, and statistical power at power =

0.8, the calculated ideal sample size was 128 cases. Although the actual sample size was only 51 cases, the rationality of the conclusions was supported by three aspects: first, there exist precedents of small-sample studies (Yang et al., 2025); second, the baseline characteristics of each group showed homogeneity (pre-test results: $p > 0.05$); third, the Mann-Whitney U test, which is suitable for small-sample data, was adopted for analysis.For the correlation analysis between technology perception and oral proficiency, this study selected the Correlation Analysis → Bivariate Normal Distribution Model module in G*Power. With a one-tailed test specified, correlation coefficient set at $\rho = 0.3$, $\alpha = 0.05$, and power = 0.8, the calculated ideal sample size was 67 cases. In practice, only the experimental group data ($n = 24$) were selected for analysis, which is consistent with the precedents of similar studies in the field (Yang et al., 2025).

Implementation Details of the Teacher-Guided Learning Companions Strategy for the Control Group

(1) Theme Conception Stage

- Teachers provided the identical oral English themes as the experimental group (e.g., "shopping"), distributed printed theme background materials, and organized each learning partner dyad to discuss for 5 min to clarify the core viewpoints and structure of the speech.
- Teachers patrolled each group and provided guidance to dyads with stagnant thinking (e.g., "You can develop the content from two perspectives: 'harms of impulsive shopping' and 'methods of rational shopping'") to ensure all groups stayed focused on the theme.

(2) Content Drafting Stage

- Peer interaction: Learning partners took turns to verbally present the first draft of their speech and recorded problems in real time (e.g., "Grammatical error in 'I want eat a pizza'", "Vocabulary such as 'durable' and 'cost-effective' can be added when describing products").
- Teacher intervention: Teachers spot-checked one group every 10 min, provided supplementary feedback on problems not identified by partners (e.g., single sentence structure, logical discontinuity), and offered specific revision suggestions (e.g., "Optimize the simple sentences 'This bag is good. It is cheap.' into 'This bag is not only high-quality but also affordable'").
- Joint optimization: The two partners jointly revised the verbal expression content based on mutual feedback and teacher suggestions to form the second draft. Teachers randomly spot-checked 50% of the groups' optimized results to ensure effective revisions.

(3) Presentation Delivery Stage

- Peer simulation presentation: Learning partners conducted face-to-face simulated speech presentations, recorded pronunciation deviations (e.g., "unclear pronunciation of 'mall'", "pauses exceeding 3 s") and fluency issues, and provided verbal demonstrations by imitating the teacher's correction method (e.g., "The standard pronunciation of 'mall' is /mɔːl/; repeat after me three times").
- Teacher's centralized guidance: After all groups completed the presentation, teachers provided centralized demonstrations to the whole class targeting common problems (e.g., specific phonetic pronunciation errors, expression pauses), played standard pronunciation audio, and organized all learning partners to practice repeating. Subsequently, groups conducted simulated presentations again to consolidate the correction effect.

(4) Revision and Evaluation Stage

- Peer mutual evaluation: Based on the four-dimensional evaluation criteria (pronunciation standardization, expression fluency, vocabulary richness, grammar accuracy), learning partners scored each other's final presentations (full score 100 points, 25 points per dimension) and wrote 3 specific improvement suggestions (e.g., "Logical connectors such as 'firstly' and 'besides' can be added to enhance fluency").
- Teacher's comprehensive feedback: Teachers collected the mutual evaluation forms of each group, combined with their own observations, and provided a written feedback report for each group, pointing out individual problems (e.g., "A certain group has a high vocabulary repetition rate and needs to supplement topic-related synonyms") and advanced suggestions (e.g., "Personal shopping experiences can be added to enhance persuasiveness"). Groups were then organized to conduct the final round of optimization based on the reports.

4.2. Experimental Procedure

The first week was the training stage. Students in the experimental group first became familiar with the basic functions and related operations of the IFlytek Spark Platform. The second week is the pre-test stage. The two groups of students must complete the pre-test of their oral English scores and technology perception. The third to fifteenth weeks are the teaching practice stage. Students carry out learning activities based on the English oral speech topics given by the teacher, and a mid-term test is conducted in the eighth week. Week 16 is the post-test stage. The two groups of students must complete the post-tests on their oral English scores and technology perception. As illustrated in Figure 3.

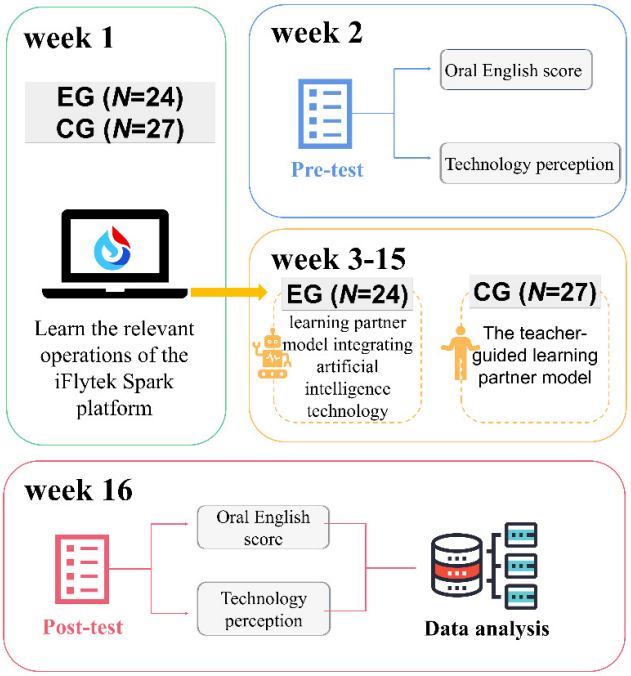

Figure 3. Experimental Procedure Diagram.

4.3. Experimental Tools

4.3.1. Oral English Score Evaluation Scale

The oral English score assessment scale used in this study was developed based on the "Chinese English Ability Scale" and applied practically (Yin et al., 2025; Ye et al., 2021). They developed a four-dimensional evaluation scale for pronunciation standardization, expression fluency, vocabulary richness, and grammar accuracy. Teachers evaluate students' oral English scores from the above four aspects, with each dimension accounting for 25% and a full score of 100 points.

4.3.2. Technology Perception Questionnaire

The Technology Perception Model (TAM) has been widely applied to explain the intention of teachers to use new technologies to enhance the quality of teaching activities (Davis,1989). According to Davis (1989), perceived usefulness (PU) and perceived ease of use (PEU) are the determinants of technology adoption. Therefore, based on the questionnaire of Hwang et al., (2013) this study adapted it to form the Technology Perception Scale, including PU and PEU dimensions. This scale consists of nine items in total. For example, "After learning on IFlytek Spark Platform, I can evaluate my oral expression more accurately.....". The Cronbach's coefficient α of this scale is 0.951 (alpha = 0.951), indicating a relatively high reliability.

5. Data Analysis

5.1. Analysis of Oral English Expression Scores

Given the relatively limited sample size of this study, the Shapiro-Wilk test was employed to verify the normal distribution characteristics of the data (Mukherjee & Bhonge, 2025). The test results indicated that the overall oral English scores of the two groups of students did not meet the normality assumption: only the post-test

scores of the experimental group conformed to the normal distribution ($p = 0.089 > 0.05$), while the pre-test scores of the experimental group ($p < 0.001$), pre-test scores of the control group ($p = 0.042$), and post-test scores of the control group ($p = 0.006$) all failed to meet the significance criterion for normal distribution ($p < 0.05$).

The results of the normality test at the dimensional level showed that the consistency of data distribution was still insufficient: in the control group, the scores of three dimensions, namely grammatical accuracy ($p = 0.066 > 0.05$), expression fluency ($p = 0.443 > 0.05$), and vocabulary richness ($p = 0.209 > 0.05$), conformed to the normal distribution, while only the pronunciation standardization ($p = 0.019 < 0.05$) failed to meet the normality assumption. In contrast, none of the dimensional scores of the experimental group met the requirements of normal distribution, among which grammatical accuracy ($p = 0.024 < 0.05$), expression fluency ($p = 0.008 < 0.05$), vocabulary richness ($p = 0.009 < 0.05$), and pronunciation standardization ($p = 0.021 < 0.05$) all reached the level of significant difference.

The core prerequisite for the application of parametric tests (e.g., independent samples *t*-test) is that the data follow a normal distribution, and a certain sample size requirement must be met. In this study, neither the overall oral English score data nor most dimensional indicators met the normality assumption; coupled with the relatively small sample size, the applicable conditions for parametric tests were no longer satisfied. The Mann-Whitney *U* test belongs to the category of non-parametric tests. Its core advantage lies in the fact that it does not rely on the assumption of normal data distribution, and has stronger statistical adaptability to small-sample data with non-normal distribution. It can effectively infer inter-group differences in situations where the distribution assumption is not established. Based on the above statistical prerequisites and data characteristics, this study adopted the Mann-Whitney *U* test to compare the inter-group differences in oral English scores between the two groups of students (see Table 1 for details).

In the post-test performance, there was a significant difference in the overall scores of the two groups of students ($p = 0.001 < 0.01$, $M_E = 81.25 > M_C = 72.37$). The pre-test effect size r = 0.248 (Small Effect); the post-test total score effect size r = 0.445 (Medium Effect), and the dimensional effect sizes range from 0.371 to 0.458 (all Medium Effects), indicating that the intelligent learning companion strategy has a substantive impact on improving students' oral English ability. Meanwhile, there was a substantial difference between the two groups of students in the dimensions of grammar accuracy ($M_E = 20.00 > M_C = 18.19$, $p < 0.01$), expression fluency ($M_E = 20.96 > M_C = 17.81$, $p < 0.01$), as well as vocabulary richness ($M_E = 20.33 > M_C = 18.48$, $p < 0.01$), and pronunciation standardization ($M_E = 20.08 > M_C = 17.89$, $p < 0.01$), all of which were significantly different from each other. Overall, the teaching strategies of intelligent learning companions supported by artificial intelligence technology can effectively improve students' Oral English expression ability.

Table 1. Mann-Whitney *U* Test Results of Oral English Scores of the two groups.

Variable	Group	*N*	*M*	*SD*	*z*	*p*	Effect Size r	Effect Strength
Pre-test total score	EG	24	65.03	24.93	−1.775	0.076	0.248	Small Effect
	CG	27	57.83	16.40				
Post-test total score	EG	24	81.25	8.659	−3.179	0.001 **	0.445	Medium Effect
	CG	27	72.37	10.277				
Grammar accuracy	EG	24	20.00	2.147	−2.645	0.008 **	0.371	Medium Effect
	CG	27	18.19	2.646				
Expression fluency	EG	24	20.96	2.726	−3.269	0.001 **	0.458	Medium Effect
	CG	27	17.81	3.476				
Vocabulary richness	EG	24	20.33	2.408	−2.678	0.007 **	0.376	Medium Effect
	CG	27	18.48	2.310				
Pronunciation standardization	EG	24	20.08	2.669	−2.668	0.008 **	0.375	Medium Effect
	CG	27	17.89	2.966				

** $p < 0.01$.

5.2. Technology Perception Analysis

This study employed the Shapiro–Wilk test to assess the normality of the data (Mukherjee & Bhonge, 2025). The results indicated that the data from both groups did not fully satisfy the assumption of normality: only the control group's pre-test ($p = 0.153 > 0.05$) and post-test ($p = 0.937 > 0.05$) scores were normally distributed, whereas the experimental group's pre-test ($p = 0.047 < 0.05$) and post-test ($p < 0.001$) deviated from normality. Consequently, the Mann–Whitney *U* test was used to compare technology perception between the two groups. As shown in Table 2, no significant difference was found for the pre-test scores ($p = 0.139 > 0.05$, $M_E = 35.50 > M_C = 32.22$), whereas the post-test difference was significant ($p = 0.01 < 0.05$, $M_E = 34.83 > M_C = 29.22$). The pre-test effect size r = 0.208 (Small Effect); the post-test effect size r = 0.357 (Medium Effect), reflecting that the

improvement in experimental group students' perception of intelligent learning companion technology has practical significance. The experimental group improved their technology perception through innovative teaching methods and technical tools, enhancing their oral English ability.

Table 2. Results of Mann-Whitney *U* test for technology perception.

Variable	Group	*N*	*M*	*SD*	*z*	*p*	Effect Size r	Effect Strength
Pre-test total score	EG	24	35.50	6.043	−1.479	0.139	0.208	Small Effect
	CG	27	32.22	6.363				
Post-test total score	EG	24	34.83	3.784	−2.547	0.01 **	0.357	Medium Effect
	CG	27	29.22	7.592				

** $p < 0.01$.

6. Discussion

The discussion on RQ1. All dimensional effect sizes are Medium Effects (r = 0.37~0.46), among which the effect size for expression fluency is the largest (r = 0.458), further confirming the prominent role of the intelligent learning companion's scenario simulation and immediate feedback functions in improving the fluency of language output. The results of this study show that the Experimental Group (EG) outperformed the Control Group (CG) in the post-test across the four key dimensions of oral English expression ability: Grammar Accuracy, Expression fluency, Vocabulary Richness, and Pronunciation Standardization. This indicates that the intelligent learning companion strategy enhances multi-dimensional oral English ability more effectively than the traditional teacher-guided strategy.

Studies have shown that whether students can receive immediate feedback from teachers or peers during the learning process will affect the internalization of speech knowledge and language application of students, and further influence the performance of oral English expression ability (Luquin, 2025). The intelligent learning companion teaching strategy supported by artificial intelligence technology proposed in this study accurately captures errors in students' English language output through intelligent algorithms, presents English grammar correction suggestions intuitively and immediately, and continuously attracts students' attention to the accuracy of English grammar. It promoted the students in the experimental group to perform better in the following four dimensions.

Grammatical accuracy is a core indicator for measuring the standardization of second language learners' language use, and accurate grammar can make oral expression more persuasive and professional (Katsarou et al., 2025). In this study, relying on the Intelligent Diagnosis Function of the IFlytek Spark Platform, the intelligent learning companion generates a diagnostic report immediately after students input oral training materials (e.g., sentence expressions in audio form) and conducts independent analysis on the grammatical dimension, accurately identifying issues such as omitted infinitives and sentence structure errors. For instance, when a student utters the grammatically incorrect sentence "I want eat a pizza", the intelligent learning companion can immediately point out the mistake and correct it to "I want to eat a pizza". Therefore, this strategy enables students to adjust grammatical errors in real time during oral English practice. A study by Jegede (2024) shows that students significantly reduce grammatical error rates in intelligent language learning environments with real-time feedback functionality. This aligns with the results of the present study, collectively verifying the advantages of intelligent real-time feedback in terms of grammatical accuracy in oral English expression.

Expression fluency is a core indicator for measuring the smoothness of language production in second language acquisition, as it determines whether language users can convey information naturally and efficiently (Wang et al., 2024). In this study, the intelligent learning companion enhances fluency by providing diversified conversation topics and interactive exercises: it helps students familiarize themselves with various oral English expression methods, activates cognitive processes similar to those used in real-world language use, and improves their ability to organize language and respond quickly.

For example, during the comprehensive drill stage of the "shopping" theme, the intelligent learning companion, relying on the Scenario Simulation Function of the IFlytek Spark Platform, constructs a virtual scenario of "inquiring about products during the Double 11 Shopping Festival". After students complete the basic expression of "asking about product discounts", the intelligent learning companion continues to pose interactive questions (e.g., "Would you like to know the delivery time for this discounted item?") to guide students to develop the conversation coherently. If students encounter pauses in expression, it also provides idea prompts, such as "You can talk about your urgent need for the item first," leveraging the Personalized Recommendation Function, helping students complete the communication smoothly. This fully aligns with the strategy design that "the comprehensive drill stage simulates real-life situations to improve adaptability". Similar results were also obtained in the study by Ma & Yang (2025).

Vocabulary Richness is an important indicator reflecting second-language learners' language repertoire and language application ability. A rich vocabulary can make oral expression more precise and vivid (Aprin et al., 2024). In this study, the intelligent learning companion is highly interactive. It can create a stress-free environment, helping students practice oral English in multiple contexts and enhancing their vocabulary richness during situational communication. This result is also corroborated by the research of Lin et al. (2022). For example, during the targeted training stage of the "shopping" theme, when students practice around "describing product features" and want to express "a cup of coffee with milk", the intelligent learning companion, relying on the Personalized Recommendation Function of the IFlytek Spark Platform, not only guides them to use descriptive English expressions like "a cup of coffee with milk" but also recommends related vocabulary associated with beverages such as "cappuccino" and "mocha" in combination with the "shopping" scenario. This method can increase students' vocabulary size and promote the flexible use of vocabulary in real-life contexts.

Pronunciation Standardization is a fundamental element of second-language oral output. Clear and standard pronunciation can enhance language comprehensibility and facilitate effective communication. A similar conclusion is also reflected in the relevant research by Ngo (2024). In this study, the intelligent learning companion utilizes speech recognition technology and massive standard speech data to analyze in real-time issues such as the pitch accuracy, intonation, and liaison in students' English pronunciation, and provides targeted suggestions. For example, during the effect demonstration stage of the "shopping" theme, relying on the Intelligent Diagnosis Function and Learning Feedback Function of the IFlytek Spark Platform, when a student reads "shopping mall", the intelligent learning companion will immediately remind "Pay attention to the pronunciation of 'shopping mall'; the pronunciation of 'mall' should be clear"; when a student expresses "not at all", it will also, in combination with standard speech data, prompt "'not' and 'at' need to be liaised, and the demonstration pronunciation is /ˌnɒt əˈtɔːl/" and provide a demonstration pronunciation for the student to repeat after, helping the student to correct pronunciation problems accurately. This is also the key advantage of the intelligent learning companion in improving students' pronunciation standardization.

The discussion on RQ2. The primary purpose of evaluating students' technology perception is to determine whether students can accept the intelligent learning companion and integrate it into oral English courses. This is because students are the direct users of technical tools and the ultimate reflectors of learning outcomes (Sun, 2025). The research results show significant differences in the perception of this technology among EFL (English as a Foreign Language) students after 16 weeks of exposure to the intelligent learning companion. The post-test technology perception effect size is 0.357 (Medium Effect), indicating that learners' positive cognitive transformation towards the technology is not a slight attitude fluctuation but a substantive cognitive upgrade, which also provides important psychological support for the improvement of oral English ability. Such differences were mainly reflected in the supportive attitudes of the majority and the opposing attitudes of a small minority.

From the perspective of most students, this indicates that EFL students generally support using the intelligent learning companion for oral English learning, which is consistent with previous research findings (Yang et al., 2025) but contradicts the results of Alvarez & Lane (2023). There are several reasons for this outcome: Most students had either never used an intelligent learning companion before or were unwilling to try it; even if some EFL learners were familiar with this technology, they initially failed to recognize its advantages in oral English learning. During the 16-week experience, as they had the opportunity to participate in various language learning activities, their views on the intelligent learning companion gradually changed, and some even regarded it as "a new learning strategy for oral English".

Another indicator of technology perception is EFL learners' intention to benefit from the intelligent learning companion. Most students held an open attitude towards using the intelligent learning companion in class, and this tendency stems from the core functional advantages of the technology itself. First, its real-time feedback and interactive incentive mechanisms help to reduce students' anxiety in oral expression and build their confidence in speaking up, which is consistent with the findings of Chen et al. (2025). This study pointed out that the real-time feedback and interactive incentive characteristics of pet-like learning companions can significantly improve foreign language learners' willingness to participate in class and reduce their anxiety in speaking up.

Additionally, some students plan to use the intelligent learning companion because they believe its application in other subjects will become more and more widespread, which also differs from Sun et al. (2024) finding that some students hesitated to adopt this technology quickly. Second, EFL learners believe that the intelligent learning companion can immediately correct pronunciation and supplement vocabulary, significantly improving oral expression's grammatical accuracy and fluency. This situation has been confirmed by the research of Yang et al. (2022).

In summary, most EFL learners showed a positive attitude towards its use after introducing the intelligent learning companion into oral English courses. At the same time, a small number failed to anticipate the benefits

brought by this technology. This result also provides a basis for judging whether students accept this technology and whether intelligent technology can be integrated into oral English courses as a learning companion.

7. Conclusions

This study explored the effects of intelligent learning companions on Chinese EFL learners' oral English ability and technology perception through a quasi-experimental design. The results show that intelligent learning companions significantly improve learners' key oral English ability dimensions such as grammatical accuracy, expression fluency, vocabulary richness, and pronunciation standardization. Meanwhile, learners' perception of the technology of intelligent learning companions further affects the improvement of their oral English expression ability. This proves that the intelligent learning companion is an effective tool for oral English, and the positive perception of technology makes learning easier and more effective. This study provides a new perspective for effectively integrating artificial intelligence technology in oral English teaching. Also, it provides strong empirical support for the theoretical research and practical application of improving the ability of oral English as a second language.

8. Limitations and Prospects

Although this study has achieved positive results, there are still some limitations. Firstly, the research sample size was relatively small. Only 51 EFL learners from a university in southeastern China were selected, and the experimental period was 16 weeks. This limited the universality and long-term effects of the research results. Future research can expand the sample size to cover learners from different regions and educational backgrounds to verify the application effect of intelligent learning companions in a broader population. Meanwhile, the experimental period can be extended to observe the long-term impact of the intelligent learning companion on students' oral English expression ability, and further evaluate its effect and stability at different learning stages.

Secondly, this study focuses on the impact of intelligent learning companions on students' oral English expression ability. At the same time, there are relatively few studies on their influence on students' learning motivation, learning strategies, and emotional attitudes. Future research can further explore the influence of intelligent learning companions on the psychological factors in students' oral English learning process, and how these factors are related to improving oral English expression ability. In addition, attention can be paid to the influence of intelligent learning companions on students' emotional attitudes, such as anxiety and self-confidence, and how these emotional factors play a role in oral English learning.

Finally, although this study adopted various data collection and analysis methods, assessing oral English expression ability mainly relied on teacher ratings and scale evaluations. Future research can incorporate more diversified assessment methods, such as peer evaluation, self-evaluation, and more natural oral English communication scenarios, to more comprehensively reflect the changes in students' oral English expression abilities.

Author Contributions

Y.-Y.Z.: Writing—original draft, Methodology, Investigation, Funding acquisition, Formal analysis, Conceptualization. Y.Z. and S.-Y.C.: Conceptualization, Writing—original draft, Writing—review & editing. Q.-F.Z. and Y.-R.Z.: Conceptualization, Methodology, Investigation, Writing—original draft, Writing—review & editing. All authors have read and agreed to the published version of the manuscript.

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Informed Consent Statement

Informed consent was obtained from all subjects involved in the study.

Data Availability Statement

The original data supporting the conclusions of this article are not publicly available because of the privacy requirements of the research participants, but may be available from the corresponding author upon reasonable request with the permission of the participants.

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Conflicts of Interest

The authors declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

References

Alvarez, J., & Lane, S. (2023). Rising against the machine: Appeasing the educators' fears of artificial intelligence taking over foreign language education. *UNC System Learning and Technology Journal*, *1*(1). https://journals.charlotte.edu/ltj.

Aprin, F., Peters, P., & Hoppe, H. U. (2024). The effectiveness of a virtual learning companion for supporting the critical judgment of social media content. *Education and Information Technologies*, *29*(10), 12797–12830. https://doi.org/10.1007/s10639-023-12275-6.

Baker, M. J., & Baker, W. H. (2023). Qualitative oral-presentation feedback: Comparisons from business professionals, instructors, and student peers. *Business and Professional Communication Quarterly*, *86*(1), 5–32. https://doi.org/10.1177/23294906221120015.

Baksh, F., Zorec, M. B., & Kruusamäe, K. (2024). Open-source robotic study companion with multimodal human–robot interaction to improve the learning experience of university students. *Applied Sciences*, *14*(13), 5644. https://doi.org/10.3390/app14135644.

Benu, N. N., Beeh, N., & Nenotek, S. A. (2025). Implementing deep learning in the EFL classroom: Strategies for fostering mindful, meaningful, and joyful language learning. *Journal of Language, Education, Literature, and Culture*, *3*(1). https://doi.org/10.33323/l.v3i1.64.

Chen, Z. H., Hsu, H. L., Huang, C. F., Liao, C. Y., & Chou, C. Y. (2025). Pet-like learning companions: Past research and future directions. *Research & Practice in Technology Enhanced Learning*, *20*, 33. https://doi.org/10.58459/rptel.2025.20033.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, *13*(3), 319–340. https://doi.org/10.2307/249008.

Guo, X.-R., Liu, S.-Y., Gong, S.-Y., Cao, Y., Wang, J., & Fang, Y. (2024). Promoting math learning in educational games with virtual companions providing learning supports. *Education and Information Technologies*, *29*(16), 22341–22370. https://doi.org/10.1007/s10639-024-12741-9.

Hammond, R. M. (1988). Accuracy versus communicative competency: The acquisition of grammar in the second language classroom. *Hispania*, *71*(2), 408–417. https://doi.org/10.2307/343089.

Han, L. (2022). Students' daily English situational teaching based on virtual reality technology. *Mobile Information Systems*, *2022*(1), 1222501. https://doi.org/10.1155/2022/1222501.

Hu, Y.-H. (2022). Effects and acceptance of precision education in an AI-supported smart learning environment. *Education and Information Technologies*, *27*(2), 2013–2037. https://doi.org/10.1007/s10639-021-10664-3.

Huang, M. (2024). Empowering oral proficiency in a large-scale class: Video-recorded oral presentations and mobile-assisted peer assessment in a Chinese middle school. *Computer Assisted Language Learning*, *37*(5–6), 1–21. https://doi.org/10.1080/09588221.2024.2382851.

Hwang, G.-J., Yang, L.-H., & Wang, S.-Y. (2013). A concept map-embedded educational computer game for improving students' learning performance in natural science courses. *Computers & Education*, 69, 121–130. https://doi.org/10.1016/j.compedu.2013.07.008.

Jegede, O. O. (2024). Artificial intelligence and English language learning: Exploring the roles of AI-driven tools in personalizing learning and providing instant feedback. *Universal Library of Languages and Literatures*, *1*(2). https://doi.org/10.70315/uloap.ullli.2024.0102002.

Jeon, J. (2024). Exploring AI chatbot affordances in the EFL classroom: Young learners' experiences and perspectives. *Computer Assisted Language Learning*, *37*(1–2), 1–26. https://doi.org/10.1080/09588221.2021.2021241.

Karakuş, İ. (2025). International students' experiences on speaking and writing skills in language learning processes in higher education. *PLoS ONE*, *20*(8), e0329331. https://doi.org/10.1371/journal.pone.0329331.

Katsarou, D.V., Mantsos, E., Papadopoulou, S., Sofologi, M., Efthymiou, E., Vasileiou, I., Megari, K., Theodoratou, M., & Kougioumtzis, G.A. (2025). Exploring AI technology in grammar performance testing for children with learning disabilities. *Education Sciences*, *15*(3), 351. https://doi.org/10.3390/educsci15030351.

Kundu, A., & Bej, T. (2025). Transforming EFL teaching with AI: A systematic review of empirical studies. *International Journal of Artificial Intelligence in Education*, *35*, 2281–2314. https://doi.org/10.1007/s40593-025-00470-0.

Lai, Z. C. (2025). Enhancing EFL oral proficiency through a ChatGPT-integrated BOPPPS learning framework. *International Journal of Online Pedagogy and Course Design (IJOPCD)*, *15*(1), 1–21. https://doi.org/10.4018/IJOPCD.383301.

Lin, V., Yeh, H. C., Huang, H. H., & Chen, N. S. (2022). Enhancing EFL vocabulary learning with multimodal cues supported by an educational robot and an IoT-based 3D book. *System*, *104*, 102691. https://doi.org/10.1016/j.system.2021.102691.

Liu, J., Wang, X., & Zhang, J. (2025). Investigating elderly individuals' acceptance of artificial intelligence (AI)-powered companion robots: The influence of individual characteristics. *Behavioral Sciences*, *15*(5), 697. https://doi.org/10.3390/bs15050697.

Liu, W. (2013). Role of teachers in oral English teaching. In *Proceedings of the International Conference on Information Engineering and Applications (IEA) 2012: Volume 4* (pp. 13–18). Springer London. https://doi.org/10.1007/978-1-4471-4853-1_2.

Lo, C. K., Yu, P. L. H., Xu, S., Ng, D. T. K., & Jong, M. S. Y. (2024). Exploring the application of ChatGPT in ESL/EFL education and related research issues: A systematic review of empirical studies. *Smart Learning Environments*, *11*(1), 50. https://doi.org/10.1186/s40561-024-00342-5.

Luquin, M. (2025). Enhancing accuracy through model texts: Long-term effects on EFL children's oral interaction. In M. d. P. García Mayo (Ed.), *Investigating Attention to Form and Individual Differences: Research with EFL Children* (pp. 155–183). Springer. https://doi.org/10.1007/978-3-031-80924-8_7.

Ma, G., & Yang, X. (2025). Fostering intercultural competence through AI driven tools: A case study of linguistic and cultural adaptability in Chinese EFL education. *Digital Technologies Research and Applications*, *4*(1), 158–169. https://doi.org/10.54963/dtra.v4i1.1131.

Mohamed, A. M. (2024). Exploring the potential of an AI-based chatbot (ChatGPT) in enhancing English as a foreign language (EFL) teaching: Perceptions of EFL faculty members. *Education and Information Technologies*, *29*, 3195–3217. https://doi.org/10.1007/s10639-023-11917-z.

Morgenstern, A. (2023). Children's multimodal language development from an interactional, usage-based, and cognitive perspective. *Wiley Interdisciplinary Reviews: Cognitive Science*, *14*(2), e1631. https://doi.org/10.1002/wcs.1631.

Mukherjee, H., & Bhonge, P. (2025). Assessing skew normality in marks distribution: A comparative analysis of Shapiro Wilk tests. *arXiv*. https://doi.org/10.48550/arXiv.2501.14845.

Ngo, T. T. N., Chen, H. H. J., & Lai, K. K. W. (2024). The effectiveness of automatic speech recognition in ESL/EFL pronunciation: A meta-analysis. *ReCALL*, *36*(1), 4–21. https://doi.org/10.1017/S0958344023000113.

Qian, J., Jiang, X., Ma, J., Li, J., Gao, Z., & Qin, X. (2023). Accompany children's learning for you: An intelligent companion learning system. *Computer Graphics Forum*, *42*, e14862. https://doi.org/10.1111/cgf.14862.

Ranjbar, M., Amirian, S. M. R., & Vaghayei, F. (2025). A qualitative analysis of the effect of group oral presentation and peer assessment on EFL learners' self-efficacy. *Current Psychology*, 44, 3747–3759. https://doi.org/10.1007/s12144-025-07410-0.

Rong, M., Yao, Y., Li, Q., & Chen, X. (2025). Exploring student engagement with artificial intelligence-guided chatbot feedback in EFL writing: Interactions and revisions. *Computer Assisted Language Learning*, 1–30. https://doi.org/10.1080/09588221.2025.2539979.

Shi, J., Sitthiworachart, J., & Hong, J. C. (2024). Supporting project-based learning for students' oral English skill and engagement with immersive virtual reality. *Education and Information Technologies*, *29*(11), 14127–14150. https://doi.org/10.1007/s10639-023-12433-w.

Sun, L. (2025). Enhancing intercultural competence of Chinese English majors through AI-enabled collaborative online international learning (COIL) in the digital era. *Education and Information Technologies*, *30*, 7995–8027. https://doi.org/10.1007/s10639-024-13143-7.

Sun, X., Dou, W., & Yang, Y. (2025). The socio-emotional dangers of using artificial intelligence (AI) technologies in second language (L2) education: Unveiling Chinese EFL teachers' perceptions and experiences. *Acta Psychologica*, *261*, 105956. https://doi.org/10.1016/j.actpsy.2025.105956.

Tiandem-Adamou, Y. (2024). Using generative artificial intelligence to support EFL students' writing proficiency in university in China. *Journal of Educational Technology and Innovation*, *6*(4), 213–235. https://doi.org/10.61414/jeti.v6i4.213.

Wang, W., Rezaei, Y. M., & Izadpanah, S. (2024). Speaking accuracy and fluency among EFL learners: The role of creative thinking, emotional intelligence, and academic enthusiasm. *Heliyon*, *10*(18), e37620. https://doi.org/10.1016/j.heliyon.2024.e37620.

Wang, X. (2025). Oral English pronunciation evaluation system based on PID algorithm. *Procedia Computer Science*, *261*, 1043–1049. https://doi.org/10.1016/j.procs.2025.04.683.

Wei, W., Zhao, A., & Ma, H. (2025). Understanding how AI chatbots influence EFL learners' oral English learning motivation and outcomes: Evidence from Chinese learners. *IEEE Access*, *13*, 56699–56716. https://doi.org/10.1109/ACCESS.2025.3478921.

Yang, G., Rong, Y. D., Wang, Y. L., Zhang, Y. Y., Yan, J. J., & Tu, Y. F. (2025). How generative artificial intelligence supported reflective strategies promote middle school students' conceptual knowledge learning: An empirical study from China. *Interactive Learning Environments*, 1–26. https://doi.org/10.1080/10494820.2025.2521339.

Yang, H., Kim, H., Lee, J. H., & Shin, D. (2022). Implementation of an AI chatbot as an English conversation partner in EFL speaking classes. *ReCALL*, *34*(3), 327–343. https://doi.org/10.1017/S0958344022000039.

Zhang, J. (2025). Integrating chatbot technology into English language learning to enhance student engagement and interactive communication skills. *Journal of Computational Methods in Sciences and Engineering*, *25*(3), 2288–2299. https://doi.org/10.1177/14727978241312992.

Zhao, C. (2024). AI-assisted assessment in higher education: A systematic review. *Journal of Educational Technology and Innovation*, *6*(4), 209–232. https://doi.org/10.61414/jeti.v6i4.209.