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Reducing Speaking Anxiety and Enhancing Oral Performance through Google ASR: Evidence from an ESP Hospitality Course

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In alignment with Taiwan's 2030 national bilingual policy, this study explored the potential of Google's Automatic Speech Recognition (ASR) as a supplementary tool for English for Specific Purposes (ESP) instruction in a hospitality course. The research focused on two critical aspects of oral communication: reducing speaking anxiety and enhancing oral performance among technological university students. A total of 50 participants were randomly assigned to an experimental group that practiced with Google ASR and a control group that followed traditional practice. Both groups received identical instruction in hospitality English, including tasks such as making reservations, seating guests, and taking orders, but differed in their after-class practice methods. Data collection consisted of pre- and post-tests of oral performance, an English speaking anxiety questionnaire, a learning satisfaction survey, and semi-structured interviews. Quantitative results revealed that the ASR group achieved significantly higher oral performance, reported lower speaking anxiety, and expressed greater learning satisfaction compared with the control group. Qualitative findings further highlighted three key benefits: improved pronunciation awareness, reduced classroom anxiety through low-stakes practice, and enhanced confidence and motivation, with some learners transferring these gains to workplace communication. These findings provide empirical evidence that Google ASR can be an effective pedagogical tool for ESP contexts such as hospitality English, supporting both linguistic development and affective needs. The study underscores the value of integrating ASR into EFL instruction as a means to reduce speaking anxiety and enhance oral performance.

Keywords: Google's automatic speech recognition, English speaking anxiety, learning satisfaction, English for specific purposes (ESP), ESP course

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INTRODUCTION

In today's globalized environment, proficiency in a second language (L2) has become increasingly essential, particularly in professional fields requiring interpersonal communication. Clear pronunciation is a key component of oral intelligibility and successful interaction (Celce-Murcia et al., 2010). However, many English as a Foreign Language (EFL) learners continue to experience English speaking anxiety, which diminishes their willingness to communicate and negatively affects oral performance. Speaking anxiety is widely recognized as one of the most persistent affective barriers in language learning, limiting learners' engagement and hindering the development of communicative competence.

Although research on foreign language anxiety has expanded over the past decades, fewer studies have investigated effective pedagogical strategies that help learners regulate anxiety while simultaneously improving oral performance. With the rapid development of artificial intelligence (AI) and speech technologies, technology-enhanced learning environments have gained attention for their potential to provide personalized practice, immediate feedback, and reduced-performance-pressure contexts. Such environments may offer meaningful support for learners who struggle with confidence and fluency in L2 communication.

Recent advancements in AI-driven automatic speech recognition (ASR) have further highlighted the instructional value of speech technologies for oral language practice. Recent studies have provided empirical support for these benefits. Ngo et al. (2024) found that ASR-based pronunciation training significantly improved segmental accuracy and promoted autonomous learning behaviors. Similarly, Patil et al. (2025) reported that AI-driven ASR tools reduced speaking anxiety and enhanced learner motivation in higher education EFL settings. ASR tools allow learners to produce spoken output, receive instant feedback, and engage in repeated self-paced practice—conditions believed to facilitate improvements in both linguistic accuracy and speaking confidence. While these benefits have been demonstrated in general EFL contexts, far fewer studies have examined how ASR can be applied in English for Specific Purposes (ESP) settings. This gap is particularly relevant in hospitality English, where effective speaking skills, confidence, and intelligibility are essential for real-world service encounters.

To address these issues, the present study investigates the effects of Google's ASR-based practice on speaking achievement, speaking anxiety, and learning satisfaction among technological university students enrolled in an ESP hospitality course aligned with Taiwan's 2030 Bilingual Policy. By integrating ASR as a supplementary training tool, this study seeks to determine whether technology-mediated oral practice can enhance learners' communicative readiness for professional hospitality contexts.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Foreign Language Anxiety in EFL Contexts

Foreign language anxiety has long been recognized as a multidimensional construct that affects learners' cognitive processing, performance, and willingness to communicate in

a second language. Young (1992) describes language anxiety as a complex psychological phenomenon that manifests in instructional settings and impacts learners at different stages of the learning process (Desrochers & Gardner, 1981). Horwitz et al. (1986) conceptualize language learning anxiety as comprising three major components: communication apprehension, or the fear of speaking in front of others; fear of negative evaluation, which reflects concern about being judged by peers or teachers; and test anxiety, associated with pressure during evaluative tasks. These dimensions collectively influence learners' affective readiness and behavioral engagement in oral communication.

Research consistently shows that speaking anxiety negatively affects both academic and psychological aspects of learning (MacIntyre & Gardner, 1989; Gardner & MacIntyre, 1993; Alrabai, 2014; Oteir & Al-Otaibi, 2019). When anxiety becomes persistent, it may develop into a stable trait that reduces learners' participation and inhibits oral production (Oxford, 1999; Horwitz, 2001). Cognitive perspectives further provide insight into the mechanisms through which anxiety interferes with learning. High levels of anxiety can compromise attentional resources, disrupt encoding and retrieval processes, and impede the intake of linguistic input (MacIntyre & Gardner, 1994; MacIntyre, 1995). These findings indicate that reducing speaking anxiety is essential for fostering productive oral communication in EFL contexts.

Technology-Enhanced Learning and ASR in EFL/ESP

Technology-enhanced learning environments increasingly play a significant role in supporting language learning. Interactive digital tools have been found to increase motivation, collaboration, and self-regulated learning while reducing affective barriers (Firdaus at al., 2023). Within this broader technological scope, artificial intelligence–driven automatic speech recognition (ASR) systems have emerged as valuable tools for oral language development.

Recent studies have demonstrated that ASR supports pronunciation accuracy, fluency, and self-correction by providing real-time feedback and allowing repeated practice in low-pressure environments. Ngo et al. (2024) found that ASR-based training enhanced learners' segmental pronunciation accuracy and fostered autonomous learning behaviors, while Patil et al. (2025) reported that ASR significantly reduced learners' speaking anxiety and increased learning motivation by offering a nonjudgmental practice context. These findings highlight the dual cognitive and affective benefits of ASR-supported instruction.

Despite these advantages, most research on ASR has focused on general EFL learning. Only a limited number of studies have explored its application within English for Specific Purposes (ESP) contexts, where language use is embedded in professional, task-oriented communication. ESP fields such as hospitality require learners to manage domain-specific expressions, pragmatic conventions, and service-oriented dialogue patterns—skills that differ substantially from general conversational English. The scarcity of ASR research in ESP domains indicates that opportunities remain for investigating how ASR can support learners' professional communication readiness and reduce affective barriers within workplace-oriented language tasks.

Theoretical Framework

The present study is grounded in affective and cognitive theories of second language learning. Krashen's (1981) Affective Filter Hypothesis posits that emotional factors such as anxiety, confidence, and motivation influence learners' ability to process and acquire language input (Krashen, 1981; MacIntyre & Gregersen, 2012). A high affective filter may block or distort linguistic information, particularly during speaking tasks that induce pressure or fear of judgment. This framework suggests that learning environments that lower anxiety and promote psychological safety are beneficial for oral language development.

Complementing this perspective, MacIntyre and Gardner's (1994) cognitive-processing model explains how anxiety interferes with attention, working memory, and information retrieval. When learners experience anxiety, cognitive resources are diverted toward self-monitoring and worry, reducing efficiency in producing accurate and fluent speech. These theoretical perspectives together provide a basis for understanding the pedagogical value of ASR: by enabling private, repeated, and feedback-rich practice, ASR may help reduce affective barriers and free cognitive resources for meaningful oral production.

Research Gap and Purpose of the Study

Although previous studies affirm the benefits of ASR for improving pronunciation, enhancing motivation, and reducing speaking anxiety, research remains limited in the domain of ESP instruction, particularly in hospitality English, where learners must perform communication tasks that mirror authentic service interactions. Existing ASR research seldom addresses how ASR supports professional communicative competence, nor does it extensively investigate its combined impact on achievement, anxiety, and learning satisfaction in vocationally oriented courses.

To address these gaps, the present study examines the effects of Google's ASR-based practice on:

1. English speaking achievement,
2. English speaking anxiety, and
3. Learning satisfaction

among technological university students in an ESP hospitality course. By exploring both cognitive and affective outcomes, this study contributes empirical evidence on the applicability of ASR as a pedagogical tool for preparing learners for real-world professional communication.

METHOD

Research Framework

This study aims to investigate the impact of Google Automatic Speech Recognition (ASR) on reducing speaking anxiety, enhancing oral performance, and improving learning satisfaction in an English for Specific Purposes (ESP) hospitality course. To address these objectives, a mixed-methods approach was adopted. The quantitative component employed an experimental design, with 50 technological university students

randomly assigned to an experimental group and a control group. Both groups received identical classroom instruction, but differed in their post-class practice methods. The qualitative component involved semi-structured interviews with a subset of participants from the experimental group, allowing for deeper exploration of learners' perceptions and experiences with ASR practice.

Research Subjects

The participants of this study were 50 technological university students in southern Taiwan. To ensure the validity of the experimental design, the students were randomly assigned into two groups: an experimental group (n = 25) and a control group (n = 25). Before the intervention, both groups completed a pre-test to evaluate their initial proficiency in culinary English, as well as a speaking anxiety questionnaire. The pre-test ensured that the two groups were homogeneous in their prior knowledge and anxiety levels.

The instructional intervention lasted for 18 weeks, during which both groups were taught by the same instructor to control for teacher-related variables. Weekly lessons covered three major hospitality English topics: (1) making restaurant reservations, (2) seating guests, and (3) taking customer orders. The course design integrated vocabulary instruction, sentence patterns, and situational dialogues relevant to these contexts. The two groups differed only in their after-class oral practice methods. The experimental group practiced using Google's Automatic Speech Recognition (ASR) system through the Google Translate platform, where learners read dialogues aloud and received immediate feedback based on recognition accuracy. They engaged in self-correction and repeated practice when the system failed to recognize certain words or sentences. In contrast, the control group followed traditional practice methods, consisting of teacher-guided dialogues in class followed by independent self-practice after class.

At the end of the 18-week intervention, both groups completed a post-test of oral performance, the speaking anxiety questionnaire, and a learning satisfaction survey. In addition, five students from the experimental group (three female and two male) were invited to participate in semi-structured interviews to provide qualitative insights into their experiences with ASR-supported practice.

This study was reviewed and approved by the university and was conducted in accordance with the ethical requirements established by the Ministry of Education's Teaching Practice Research Program (PED1123412). Written informed consent was obtained from all participants, as they were provided with a clear explanation of the study's purpose, procedures, and their rights. Participants were informed that they could withdraw from the study at any time without consequence. All collected data were anonymized and treated confidentially, and were used solely for academic research purposes.

Qualitative Interview Participants

To complement the quantitative data, five students from the experimental group were invited to participate in semi-structured interviews. These participants were selected using purposive sampling to represent a range of gender and learning perspectives,

consisting of three female students (F1, F2, F3) and two male students (M1, M2). The interviews were conducted in Mandarin to ensure clarity, lasted approximately 20–30 minutes each, and focused on learners' experiences with ASR, their perceptions of speaking anxiety, and their satisfaction with ASR-supported practice.

Research Questionnaires and Interviews

The research instruments included both questionnaires and semi-structured interviews.

English Speaking Anxiety Questionnaire

The research questionnaires include English Speaking Anxiety Questionnaire and Learning Satisfaction Questionnaire. This study uses the English Speaking Anxiety Scale to measure learners' levels of speaking anxiety before and after using the Google Automatic Speech Recognition learning method and the traditional self-practice learning method. The study modifies the English Classroom Anxiety Scale compiled by Tseng (2005) and Horwitz et al. (1986) to align with the research objectives and teaching content. After the expert validity review by five relevant experts and scholars, the revised English Speaking Anxiety Scale includes three dimensions: (1) Fear of English communication; (2) Test anxiety in English; (3) Worry about negative evaluation. The scale contains 33 items, with items 8, 11, 22, and 32 being reverse-coded. A Likert-type 7-point scale is used to assess the respondents' performance in actual English learning situations.

Learning Satisfaction Questionnaire

The Learning Satisfaction Questionnaire in this study aims to evaluate learners' attitudes toward teaching methods and learning effectiveness after using the Google Automatic Speech Recognition learning method and the traditional self-practice learning method. The study modifies the Learning Satisfaction Questionnaire compiled by Wu (2015) and Sun et al. (2008) to align with the research objectives and teaching content. After the expert validity review by five relevant experts and scholars, this questionnaire contains nine items, using a Likert-type 7-point scale to measure learners' learning satisfaction.

Semi-Structured Interviews

To triangulate the quantitative findings, five students from the experimental group participated in individual interviews. Interview questions focused on learners' perceptions of ASR-supported practice, including:

1. How did practicing with Google ASR influence your pronunciation and speaking skills?
2. Did ASR practice affect your speaking anxiety inside or outside the classroom? In what ways?
3. How satisfied were you with using ASR as a supplementary tool compared to traditional practice?
4. Can you share any examples where ASR practice helped you in real-life communication (e.g., part-time work, talking to foreign customers)?

5. What suggestions would you make for improving ASR-based learning activities?

FINDINGS

Quantitative Results (Questionnaires and Tests)

Before the experiment, a pre-test was conducted to evaluate both groups' hospitality English proficiency, focusing on dialogue tasks such as making reservations, seating guests, and taking orders. No significant differences were found between the experimental and control groups at the pre-test stage, confirming group equivalence. After the 18-week intervention, a post-test revealed that the experimental group (M = 87.44, SD = 11.47) scored higher than the control group (M = 81.25, SD = 10.31). An independent-samples t-test indicated a statistically significant difference, $t(48) = 2.083$, $p<.05$. The effect size was moderate, Cohen's d = 0.568, Hedges' g = 0.559, suggesting that learners who practiced with Google ASR achieved meaningfully greater gains in oral English proficiency than those who engaged in traditional practice, as shown in Table 1.

Table 1
Post-Test Assessed Hospitality English Proficiency of Students under Control and Experimental Group

Group	N	Mean	SD	t	Cohen's d	Hedges' g
Experimental Group	25	87.44	11.47	2.083*	0.568	0.559
Control Group	25	81.25	10.31			

* *p<.05*

Before the experiment, a pre-test was conducted to measure the English speaking anxiety of both groups. No significant differences were found between the experimental and control groups, confirming initial equivalence. After the 18-week course, a post-test revealed that the experimental group (M = 3.33, SD = 0.66) reported lower levels of speaking anxiety than the control group (M = 3.84, SD = 0.95). An independent-samples t-test indicated a significant difference, $t(48) = 2.223$, $p<.05$. The effect size was moderate, Cohen's d = –0.624, Hedges' g = –0.614, showing that learners who practiced with Google ASR experienced meaningfully reduced speaking anxiety compared to those who engaged in traditional practice, as shown in Table 2.

Table 2
Post-Test Assessed English Speaking Anxiety of Students under Control and Experimental Group

Group	N	Mean	SD	t	Cohen's d	Hedges' g
Experimental Group	25	3.33	0.66	2.223*	-0.624	-0.614
Control Group	25	3.84	0.95			

* *p<.05*

Table 3 presents the results of learning satisfaction. The experimental group reported a higher mean satisfaction score (M = 4.51, SD = 0.86) compared to the control group (M = 3.84, SD = 0.87). An independent-samples t-test confirmed a statistically significant difference, $t(48) = 2.812$, $p<.01$. The standardized mean difference indicated a

moderate-to-large effect, Cohen's d = 0.775, Hedges' g = 0.762. These results demonstrate that learners who practiced with Google ASR expressed substantially greater satisfaction with their English speaking practice than those who engaged in traditional practice.

Table 3
Results of Learning Satisfaction of Students under Control and Experimental Group

Group	N	Mean	SD	t	Cohen's d	Hedges' g
Experimental Group	25	4.51	0.86	2.812*	0.775	0.762
Control Group	25	3.84	0.87			

* $p<.05$

Qualitative Results (Interviews)

To triangulate the survey and test findings, semi-structured interviews were conducted with five students from the experimental group, including three females (F1, F2, F3) and two males (M1, M2). Thematic analysis identified three recurring themes: pronunciation awareness, reduction of speaking anxiety, and learning satisfaction and confidence. Representative excerpts are presented below.

Pronunciation Awareness

Recognition of Mispronunciation: One recurring theme was that ASR made learners more aware of their mispronunciations. Students noticed errors they had previously overlooked and felt motivated to make corrections.

> *F1: "When Google did not understand me, I knew I had to adjust my pronunciation, and I could try again immediately. When ASR recognized my words incorrectly, I was not afraid, because I knew I could let the system pronounce them for me. By listening and imitating ASR several times, I could finally make it recognize what I said correctly."*

> *M1: "It made me listen carefully to my own voice. I realized I had been mispronouncing certain words for years, like ma'am, I'd, restaurant, and total."*

Improved Intelligibility and Fluency: Several students indicated that ASR feedback encouraged them to speak more clearly and fluently, not just focus on individual sounds. Some adjusted their speech rate and articulation to improve recognition.

> *F2: "At first I spoke too fast and the system could not catch me. Later I learned to slow down and pronounce more clearly, which also helped me in class presentations."*

> *M2: "Sometimes Google recognized the word but not the whole sentence. That reminded me to speak more smoothly, not just focus on single words."*

Development of Self-Monitoring Skills: ASR practice also fostered self-monitoring strategies, as learners identified recurring pronunciation challenges and began to pay attention to stress, intonation, and problematic sounds.

F3: "I started to check which words were always marked wrong. It trained me to pay attention to difficult sounds like 'th' or 'r'."

F1: "I became more conscious of stress and intonation. If I put the wrong stress, Google sometimes did not recognize the sentence."

Reduction of Speaking Anxiety

Freedom from Fear of Making Mistakes: Students repeatedly emphasized that practicing with ASR reduced the fear of being judged for errors, since they were interacting with a system rather than peers or teachers.

F2: "I don't feel embarrassed when I make mistakes with the computer. It encourages me to speak more."

M1: "When I use ASR, I can repeat as many times as I want. Nobody is watching me, so I don't feel the pressure I usually feel in front of classmates."

Reduced Classroom Anxiety: Learners described that ASR practice carried over into the classroom, helping them feel calmer and more willing to participate.

F3: "In class, I sometimes avoid speaking because I'm afraid of being laughed at, but with Google I feel safe to practice many times, so I feel less nervous in lessons now."

F1: "Before, I was very nervous about pronunciation tests. Practicing with ASR made me calmer because I already knew what to expect when I spoke in class."

Greater Willingness to Communicate: Several students reported that the reduced anxiety fostered by ASR practice made them more willing to engage in real communication, both in academic and personal contexts.

M2: "ASR gave me confidence. I used to be afraid of speaking up in group discussions, but after practicing alone with the system, I felt more prepared and less anxious to try in class."

F2: "Because I feel safer practicing with Google first, I am not as afraid to try speaking with real people afterwards."

Learning Satisfaction and Confidence

The third theme highlights that ASR practice enhanced learners' motivation, confidence, and overall satisfaction with English speaking practice. Students described ASR-based learning as enjoyable, flexible, and personally rewarding, emphasizing the sense of control and achievement they experienced during practice.

M2: "I can practice freely at my own pace, and when the system finally recognizes my words, I feel proud."

F1: "It feels like a game; when my sentence is fully recognized, I get a sense of achievement and want to keep going."

> *F3: "It's convenient. I can practice anytime on my phone without waiting for a teacher or classmates. That makes me feel more in control of my learning."*
>
> *M1: "It's not boring. Sometimes I treat it like a challenge and make Google understand me perfectly. That keeps me motivated."*

These reflections indicate that learners perceived ASR-supported speaking practice as both enjoyable and empowering. The immediate feedback and game-like interaction contributed to a sense of accomplishment, while the flexibility of independent practice enhanced satisfaction and autonomy.

Application to Workplace Communication

A notable subtheme emerged from F1's interview, showing that confidence gained through ASR practice extended beyond the classroom to real workplace contexts. She shared that her improved pronunciation and fluency were recognized by her colleagues, and that this external feedback further boosted her self-confidence.

> *F1: "My colleagues at my part-time job told me that my English sounds better and clearer now. That made me more confident when serving foreign customers."*
>
> *F1: "When I serve foreign customers at my part-time job, I now feel more willing and confident to communicate with them because I have practiced with Google beforehand."*

This transfer of learning demonstrates that ASR-based speaking practice not only improved learners' linguistic competence but also empowered them to communicate more effectively in real-world ESP contexts, such as hospitality service interactions.

Overall, the interviews provide strong support for the quantitative results. Learners valued the immediate feedback from ASR, which improved their pronunciation awareness; they also appreciated the psychological safety it offered, which reduced speaking anxiety; and they expressed high satisfaction and confidence, even reporting positive transfer to real-world interactions with foreign customers. These qualitative insights reinforce the effectiveness of ASR as both a cognitive and affective support tool in EFL speaking practice.

DISCUSSION

Enhanced Learning Achievement through ASR

The present study confirmed that Google ASR significantly improved students' oral English proficiency, with a moderate effect size (Cohen's $d = 0.57$). This finding echoes Celce-Murcia et al. (2010), who emphasize the role of accurate pronunciation in successful communication, and extends their work by showing how technology can facilitate pronunciation awareness. The qualitative evidence strengthens this interpretation: students repeatedly reported that ASR alerted them to mispronunciations and encouraged self-correction (e.g., F1: "When Google did not understand me, I knew I had to adjust my pronunciation…"). This suggests that ASR not only reinforced linguistic accuracy but also promoted self-regulated learning strategies, aligning with Oxford's (1999) perspective on effective language learning strategies.

The findings of this study not only align with previous research demonstrating the benefits of ASR for improving pronunciation and oral performance (Celce-Murcia et al., 2010), but also extend the existing literature by providing empirical evidence of ASR use within an ESP context, specifically hospitality English communication tasks—an area in which prior studies have been scarce. The results show that ASR supports learners not only in correcting segmental and suprasegmental features but also in enhancing the fluency and coherence required for situated professional interactions, expanding beyond earlier ASR research that has primarily focused on general English learning or pronunciation training. Moreover, the anxiety-reducing effects identified in this study echo the framework of language anxiety proposed by Horwitz et al. (1986) and the cognitive models of anxiety's influence on language processing described by MacIntyre and Gardner (1994), while offering new evidence that such affective benefits can also occur in domain-specific oral tasks. These findings address a gap in current ESP pedagogy by illustrating how ASR can function as both a linguistic scaffold and an affective support tool, thereby contributing uniquely to the development of professional communication readiness in ESP learners and supporting learner motivation and satisfaction as emphasized in technology-enhanced learning research (Sun et al., 2008).

Reduction of Speaking Anxiety

Another significant finding was the reduction of speaking anxiety among the experimental group (Hedges' $g = -0.61$). This outcome corroborates Horwitz et al. (1986) and Young (1992), who highlight fear of negative evaluation as a major source of foreign language anxiety. Consistent with Krashen's (1981) Affective Filter Hypothesis, the lower anxiety levels suggest that ASR provided a psychologically safe space where learners could practice without fear of peer judgment. Qualitative data revealed that students valued this low-stakes environment (F2: "I don't feel embarrassed when I make mistakes with the computer."). Importantly, learners indicated that this reduced anxiety carried over into classroom settings, increasing their willingness to participate and lowering apprehension during oral tests.

Increased Learning Satisfaction and Confidence

Learners in the ASR group reported significantly higher levels of learning satisfaction (Cohen's $d = 0.78$), a large effect size, demonstrating that the technology enhanced motivational aspects of language learning. This supports Sun et al. (2008), who found that learner satisfaction is linked to autonomy and feedback in technology-mediated environments. Similarly, Çınar and Arı (2019) demonstrated that technology-based learning tools such as Quizlet can significantly enhance learners' motivation and positive attitudes toward English learning, emphasizing that interactive and autonomous digital environments foster greater engagement. Students in the present study likewise appreciated the autonomy and gamified sense of achievement that ASR provided (F1: "It feels like a game. When my sentence is fully recognized, I get a sense of achievement."). Moreover, ASR practice transferred beyond the classroom: F1 explained that she felt more confident communicating with foreign customers at her part-time job, illustrating the practical value of ASR-supported practice for real-world communication.

LIMITATIONS AND FUTURE RESEARCH

Despite its promising outcomes, this study has several limitations. The scope was restricted to hospitality English in one technological university, and thus generalization to other contexts should be made with caution. The sample size was modest (N = 50), and only five students participated in qualitative interviews, limiting representativeness. Moreover, ASR is limited to recognizing pronunciation and fluency; it cannot replace authentic interaction necessary for developing pragmatic competence and conversational strategies.

Future research should address these limitations by including larger and more diverse samples, conducting longitudinal studies to investigate long-term effects, and exploring blended approaches that combine ASR with peer or teacher feedback. In addition, examining ASR's impact across different proficiency levels and disciplinary contexts would provide further insight into its pedagogical potential.

CONCLUSION

This study examined the effects of Google ASR on English speaking achievement, speaking anxiety, and learning satisfaction among technological university students enrolled in an ESP hospitality course. The results revealed that ASR-supported practice enhanced learners' oral performance, reduced speaking anxiety, and increased learning satisfaction, with moderate to large effect sizes.

By triangulating quantitative and qualitative findings, the study demonstrated that ASR facilitated pronunciation awareness, reduced affective barriers, and fostered a motivating and autonomous learning environment. Students valued the immediate feedback, the opportunity for repeated self-correction, and the sense of autonomy in managing their own learning progress. Some even reported transferring these gains to real-world hospitality settings, where improved pronunciation and confidence supported effective communication with foreign customers.

Pedagogically, integrating ASR into ESP instruction provides an effective supplement to classroom teaching, particularly for out-of-class oral practice. Teachers are encouraged to design ASR-based speaking tasks that create a low-stakes, feedback-rich environment to build both linguistic accuracy and communicative confidence.

Despite these promising results, this study was limited by its small sample size, single-discipline focus, and short intervention duration. Future studies should explore long-term effects of ASR use, test its applicability across different proficiency levels and professional domains, and investigate blended learning models combining ASR with interactive classroom communication. Such work will further clarify how ASR can be leveraged to support both cognitive and affective dimensions of ESP learning.

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DATA AVAILABILITY

The data supporting the findings of this study include participants' oral performance scores, questionnaire responses, and interview transcripts. Due to privacy and ethical restrictions, these data are not publicly available. Data may be made available upon reasonable request to the corresponding author, subject to ethical approval and anonymization procedures.

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CONFLICT OF INTEREST

The author declares no conflicts of interest associated with this research.

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