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Mobile-assisted oral english learning: perceived impact and learner experience — a mixed-methods study

Mengfei Zhao^{1,2}, Nooreen Noordin^{1*}, Norhakimah Khaissa Ahmad¹ and Wenjie Wu^{1,3}

*Correspondence:
nooreen@upm.edu.my

¹ Department of Language and Humanities Education, Faculty of Educational Studies, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia

² School of Foreign Languages, Anhui University of Technology, Ma'anshan, Anhui, People's Republic of China

³ School of Foreign Languages, Handan University, Handan, Hebei, People's Republic of China

Abstract

Mobile-assisted language learning (MALL) has emerged as a promising method to address challenges in oral English learning. While most existing studies have focused on its quantitative effects, limited attention has been given to understanding the learner experience with using mobile technologies for oral English practice. To bridge this gap, this study employs a mixed-methods design with a multi-app treatment involving thirty Chinese undergraduates. Data were collected through a questionnaire and a focus group interview to explore the perceived impact of mobile-assisted oral English learning (MAOE) and students' learner experience (LX). Findings indicate that students reported perceived growth in complexity, accuracy, and fluency. The study also highlights the dynamic interplay between learners' experiences and their engagement with MAOE in different contexts. Furthermore, it underscores the potential of integrating mobile applications into formal and informal learning settings by offering practical implications for educators seeking to improve oral English education through mobile learning.

Keywords: Mobile-assisted language learning (MALL), Mobile-assisted oral English learning (MAOE), Perceived impact, Learner experience (LX)

Introduction

English is vital globally, with its speaking skills recognized as key elements of academic and career success for ESL and EFL learners (Kukulka-Hulme et al., 2023; Zhang, 2022). China emphasizes English education greatly at every level, with college English education being the final opportunity for many young individuals to systematically acquire English skills in a classroom environment (Liu et al., 2023). However, despite years of learning, many students remain “silent speakers” who can read and write but are paralyzed when speaking English due to limited vocabulary and fluency, weak grammar, poor pronunciation, low confidence, anxiety, shyness, fear, or embarrassment (Mai et al., 2024; Murad & Jalambo, 2019; Wu & Ekstam, 2021). With the widespread use of smartphones and other mobile devices, mobile-assisted language learning (MALL) has emerged as a promising strategy to promote oral English development and enrich learning experiences.

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MALL is valued for portability, accessibility, flexibility, and individuality, allowing learners to access extensive materials and engage in interactive communications anytime and anywhere (Sherine et al., 2020; Traxler & Kukulska-Hulme, 2016). It supplements the computer-assisted language learning (CALL) and serves as a bridge between formal and informal, personal and social learning environments (Luo & Watts, 2022). Additionally, MALL contributes to students' cognitive, practical, and affective growth while promoting pedagogical innovation, educational transformation, and community engagement (Kukulska-Hulme et al., 2023). Thus, it has a bright future in language education (Kukulska-Hulme, 2024).

An increasing number of studies demonstrate that MALL enhances English-speaking skills through repeated practice, real-time feedback, and communicative interactions. It benefits overall speaking performance and specific aspects such as pronunciation, lexical choices, fluency, and accuracy (Asratie et al., 2023; Benlaghrissi & Ouahidi, 2024; Hwang et al., 2024; Jia & Lu, 2025; Ma et al., 2025). However, there are three gaps. First, findings on oral complexity, accuracy, and fluency remain inconsistent across studies. Second, most research examines only one or two mobile tools, such as the social networking apps (e.g., WhatsApp, WeChat, and Facebook) or specific English-learning apps (e.g., Liulishuo, Keke English, and Duolingo) (Zhao et al., 2025), focusing narrowly on mobile communications (Hwang et al., 2024), giving and receiving feedback (Gokgoz-Kurt, 2023; Zeng et al., 2020), or repetitive practices like “dubbing” with instant corrections of pronunciation (Shadiev et al., 2023; Wang & Han, 2021; Wu & Ekstam, 2021). Few studies have explored how learners coordinate multiple apps to support different aspects of speaking. Third, the dominance of quantitative methodologies (Elaish et al., 2022; Zhao et al., 2025) suggests that there is a limited understanding of learners' qualitative experiences and how they actively adapt their smartphone use to support educational activities (Luo & Watts, 2022; Shadiev, 2020; Yildiz, 2020).

Therefore, to close these gaps, this study employs a mixed-methods design, combining questionnaire data and a focus group interview, to investigate the perceived impact of mobile-assisted oral English learning (MAOE) on Chinese university students' speaking development and their learning experience. Specifically, it investigates the integrated use of three apps, Liulishuo, Keke English, and Newsay, across formal classroom and informal after-class learning settings. This study aims to provide a more comprehensive understanding of how learners appropriate mobile applications to support oral English development.

Accordingly, the research is guided by the following questions:

RQ1: How do Chinese university students perceive MAOE's impact on their oral English in terms of complexity, accuracy, and fluency?

RQ2: What is the students' learner experience of MAOE?

Literature review

MALL in oral English

To address the issue of “silent English”, educators and researchers have increasingly turned to mobile-assisted language learning (MALL), which refers to the use of mobile

devices to support language learning by offering convenient access to learning resources, interactive activities, and communicative opportunities without the limitations of time and physical location (Kukulka-Hulme et al., 2017; Luo & Shi, 2022; Rajendran & Yunus, 2021).

One major aspect of MAOE focuses on social networking apps, such as WhatsApp and WeChat. They allow learners to practice speaking through instant messaging, voice recording, material sharing, and providing feedback. Studies across various contexts, including Saudi Arabia, Iran, Colombia, India, and China, report improvement in speaking skills when these apps are used for oral English teaching and learning (Albogami & Algethami, 2022; Aliakbari & Mardani, 2022; Chen & Chew, 2021; Durán-Bautista & Huertas-Malagón, 2021; Lei & Liu, 2020; Sherine et al., 2020; Zou et al., 2023).

Another important strand explores the effectiveness of educational mobile apps, which are better equipped to meet students' needs and align with specific pedagogical objectives (Chen et al., 2020). Applications such as Fun Dubbing, Duolingo, Liulishuo, Moodle, HE, and VoiceThread are found to be effective in enhancing learners' speaking performance through dubbing, shadowing, AI-powered feedback, pronunciation assessment, and course management (Ahmed et al., 2022; Benlaghrissi & Ouahidi, 2024; Hwang et al., 2024; Ma et al., 2025; Tang et al., 2020; Woldetsadik et al., 2022; Wu & Ekstam, 2021). However, relying on a single app may limit the potential benefits of mobile learning, which should support social contact and collaborative learning, and consider learners' personal needs (Kukulka-Hulme & Shield, 2008).

Research has also explored the effects of MALL on sub-aspects of oral English skills. Pronunciation and fluency generally show consistent improvement across studies (Chen & Chew, 2021; Hwang et al., 2024; Woldetsadik et al., 2022; Zou et al., 2023), whereas findings on vocabulary, grammatical accuracy, and syntactic complexity remain mixed. Wang and Han (2021), using Liulishuo, identify significant progress in complexity, grammar accuracy, and speech rate, while Zhou et al. (2025), using ChatGPT 4.0, report no significant improvement in accuracy or complexity. Ma et al. (2025) find significant development in pronunciation and fluency, but not in grammar and vocabulary.

Overall, most previous studies demonstrate significant effects of MAOE on pronunciation, fluency, and general oral English performance. In contrast, its effects on vocabulary, complexity, and accuracy are less conclusive.

Learner experience

Learner experience (LX) is a context-specific phenomenon shaped by interactions between learners and their educational ecosystems. It can be summarized as learners' perspectives, attitudes, and feelings as well as behaviors toward instructions, resources, technologies, social background, and institutional forms that ultimately reflect on learning outcomes, including knowledge acquisition, skill development, and motivation (Dos Santos et al., 2025; Liu et al., 2023a, 2023b; Schmidt & Huang, 2021). LX research explores how experiential and perceptual factors influence learning effectiveness and performance (Schmidt & Huang, 2021; Schmidt et al., 2020). Therefore, analyzing LX along with performance outcomes provides a more holistic view of the role of MAOE in overcoming the "silent English" problem, and explores why and how mobile technologies influence the oral English learning process.

Prior studies primarily focus on the quantitative effectiveness of mobile devices in various aspects of language learning, leaving ample room for a qualitative understanding of mobile learning (Luo & Watts, 2022; Yıldız, 2020; Zhao et al., 2025). In MAOE, most qualitative studies on LX are embedded within mixed-methods research that includes detailed quantitative analysis. These studies report improved speaking skills and positive attitudes among learners (Benlaghrissi & Ouahidi, 2024; Dong et al., 2023; Huang et al., 2025; Mykytiuk et al., 2022; Zou et al., 2023). The convenience, ease of use, accessibility, and flexibility of mobile applications are valued (Benlaghrissi & Ouahidi, 2024; Gokgoz-Kurt, 2023; Hwang et al., 2024; Jia & Lu, 2025; Zhou et al., 2025) because these affordances provide more opportunities for speaking, real-time feedback, greater learner autonomy, and more authentic language use (Hwang et al., 2024; Jia & Lu, 2025). Besides, learners report reduced anxiety, greater confidence, and enhanced learning motivation (Benlaghrissi & Ouahidi, 2024; Huang et al., 2025; Jia & Lu, 2025). In addition, “fun” and “interesting” are mentioned by learners to describe their experience (Benlaghrissi & Ouahidi, 2024; Hwang et al., 2024), and many express willingness to continue using mobile technologies for future learning (Zhou et al., 2025). Thus, existing research on LX has revealed that MAOE is well-received by learners.

Despite these promising findings, existing studies on LX in MAOE provide only brief descriptions, lacking the depth to fully capture its nuanced, context-dependent aspects. Core elements of LX, including learners’ perceptions, attitudes, behavioral engagement, and interactions between learners and mobile apps, are not fully explored (Dos Santos et al., 2025; Schmidt & Huang, 2021). To address this gap, the present study conceptualizes LX in three interrelated dimensions: affective–attitudinal (motivation, confidence, and anxiety), cognitive–behavioral (learners’ autonomy, strategies, and actual behavior), and sociocultural–contextual (influences from surrounding environments).

Moreover, most existing research tends to focus on a single mobile application. This design cannot fully reflect learners’ real-life learning practices. In reality, students often use multiple apps for various learning purposes. Therefore, little is known about how learners coordinate multiple educational apps, what strategies they use, and how this multi-app engagement affects their oral English development. These gaps highlight the need for a comprehensive investigation into the behavioral, emotional, and sociocultural dimensions of MAOE.

In summary, to address these research gaps, the present study employs a mixed-methods design. It examines the impact of three English learning apps (Liulishuo, Keke English, and Newsay) on Chinese university students’ oral English learning, as well as the learner experience with the usage of the three tools. By situating MAOE in a multi-app context, the study aims to provide a more comprehensive understanding of mobile learning in oral English development.

Theoretical framework

From the sociocultural perspective, language development is not an isolated process; it reflects the quality of social interaction and mediation with cultural artifacts, and learners’ involvement within their Zone of Proximal Development (ZPD) (van Compernelle & Williams, 2013; Vygotsky, 1978). In the ZPD, more knowledgeable others (MKOs), such as teachers, peers, and technology tools, provide scaffolded support for learners

to accomplish more than they can on their own, helping them internalize new skills and knowledge (Almziad, 2021; Stojanov, 2023). Accordingly, Luo and Watts (2022) propose that smartphone-assisted English language learning is a learner-centered cognitive process that begins with the learner agency. Various factors, including the broader context, cultural practices, and interactions with other individuals, influence this process.

Grounded in the sociocultural theory and adapted from Luo and Watts (2022), the current study conceptualizes that MAOE is a socially situated and culturally mediated activity, in which learner agency plays a central role. Through interaction with MKOs, learners engage in speaking practice across both formal and informal learning contexts. This dynamic process is shown in Fig. 1, which illustrates the mutual influences among learner agency, social and cultural activities, and MKOs (adapted from Luo & Watts, 2022).

In this framework, learner agency refers to a complex and dynamic system that “helps learners decide and manage what and how to learn” (Wang et al., 2025, p. 1). It encompasses learners’ attitudes, thoughts, motivation, and self-regulation, encouraging individuals to control and take constructive actions in their learning process (Luo & Watts, 2022; Mameli et al., 2025; Wang et al., 2025).

MKOs are teachers, classmates, and mobile applications that have more expertise or experience in oral English learning and can offer scaffolded support (Stojanov, 2023). Learners’ interactions with MKOs take place in both formal and informal learning environments, and are mediated by the surrounding social and cultural contexts. In this study, the three mobile apps serve as digital MKOs through various interactive activities. Liulishuo provides real-time pronunciation feedback, helping learners refine their oral output. Keke English offers authentic learning materials that support the internalization of linguistic structures through contextualized exposure. Newsay enables AI-driven conversational practice through a wide range of topics and situational contexts, providing interactional scaffolding for the oral English development in varied communicative settings.

Importantly, as is shown in this framework, learners’ oral English performance is not a direct outcome of any single factor. Instead, it is a cumulative result of mediated

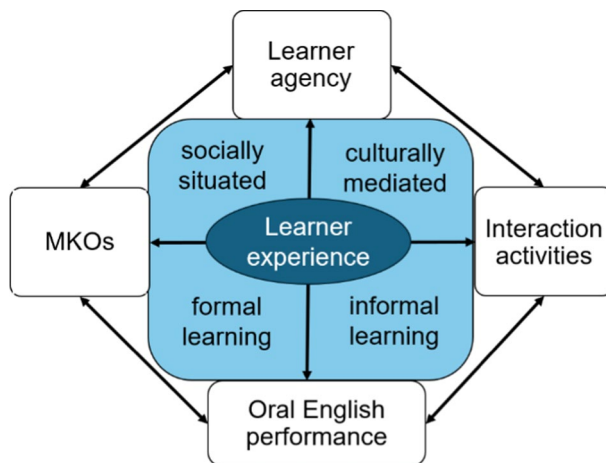


Fig. 1 The theoretical framework for MAOE

interactions among learner agency, MKOs’ scaffolds, and participation in specific social and cultural environments. In turn, learner experience is co-constructed through these interrelated components.

Methods

Research design

Based on the research objectives and questions, this study employs a mixed-methods approach to gain a comprehensive understanding of students’ perceived effects of MAOE and the learner experience of using it, both in formal and informal settings. Participants were asked to use three mobile apps: Liulishuo, Keke English, and Newsay, both in class and after class (as shown in Fig. 2).

The teacher played a guiding role, and the multi-app intervention was implemented with careful consideration of the specific functions of each application.

Keke English, offering authentic English listening and reading resources, was used before class. The teacher assigned reading and listening tasks on Keke English for students to preview the lesson.

Liulishuo, which offers short-duration dubbing activities and real-time pronunciation feedback, was used during class as a light in-class speaking activity. Students completed two or three topic-related dubbing exercises on Liulishuo, typically lasting around one to two minutes each, depending on their personal learning pace. Newsay, an AI-powered interactive oral English practice app, was employed in class for higher-level activities, allowing students to practice topic-related dialogues and discussions. This generally lasted five to ten minutes per session, although the actual duration varied according to

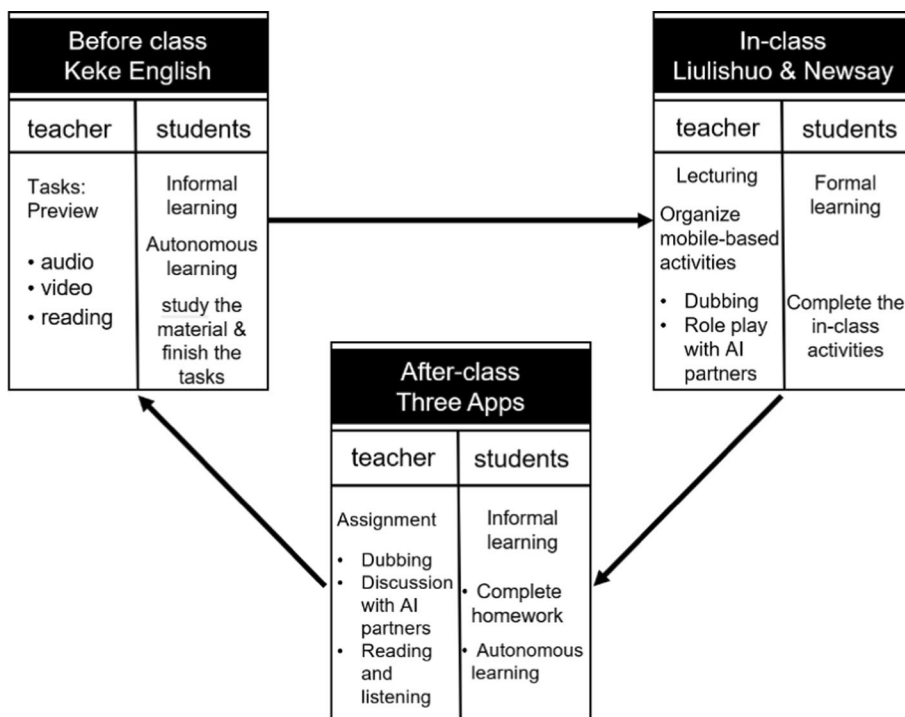


Fig. 2 MAOE teaching process

individual engagement and progress. During this stage, the teacher circulated throughout the classroom to provide guidance and facilitate student participation.

Following the class, students engaged in self-directed learning, which was highly flexible, with no fixed time constraints. Students could engage with the mobile apps at any time according to their individual schedules and learning preferences. Evidence of students' participation was collected through in-class discussions, questionnaire responses, and reflective comments during the interview. In addition, students submitted screenshots documenting their app-based learning records, such as the automated dubbing scores generated after completing Liulishuo exercises and screenshots of completed AI-based dialogues in Newsay.

Overall, the three apps were integrated into every weekly class session throughout the 16-week semester. Each lesson adhered to a consistent pedagogical cycle: pre-class multimodal input (Keke English), guided in-class speaking practice (Liulishuo and Newsay), and after-class app-based consolidation.

Quantitative data were collected from a questionnaire to examine the perceived usefulness of MAOE and their usage patterns. Complementarily, qualitative data were gathered from a focus group interview to explore learners' in-depth experiences, including attitudes, perceptions, feelings, learning behaviors, and the sociocultural factors that influence their engagement with MAOE.

Participants

Thirty undergraduate English majors aged 18–19 from a university in Anhui Province, China, were recruited for the study. Their average college entrance exam score was 114.4, which was the upper-middle level. All participants were enrolled in a 16-week Oral English Course-1, had mobile language learning experience, owned smartphones, and engaged in varied English learning contexts. From this group, eight students were selected through snowball sampling for the focus group interview.

Instruments

A five-point Likert scale questionnaire (1 = strongly agree, 5 = strongly disagree), adapted from Saidouni (2019), Zhang (2020), and Zou et al. (2023), was employed. The questionnaire contained thirty items and was conceptually divided into three parts based on item content. Given the small sample, we did not conduct factor analysis, and subscales are reported as content-based groupings.

The first part focused on students' perceived learning outcomes, covering listening comprehension, pronunciation, syntactic complexity, lexical diversity, grammatical accuracy, self-repairs, fluency, and overall English performance. The second part captured learners' attitudes toward MAOE, including motivation, engagement, and perceived usefulness. The third part concerned learning behavior, including app usage frequency, task completion, and self-directed learning.

Two experts reviewed the questionnaire for clarity and reliability. The reliability of the questionnaire was assessed using Cronbach's α , with values of 0.905, 0.822, and 0.759 for each of the three parts, respectively, and an overall Cronbach's α of 0.922, indicating excellent internal consistency. The questionnaire was delivered through Wenjuanxing, a professional online platform for questionnaire distribution, collection, and analysis.

Table 1 Perceived learning outcomes

| Item | N | Mean | SD |
|--|----|-------|-------|
| 1. Mobile apps improve my listening, understanding, and comprehension | 30 | 1.467 | 0.681 |
| 2. Mobile apps improve my speaking skills in general | 30 | 1.533 | 0.730 |
| 3. Mobile apps improve my pronunciation | 30 | 1.533 | 0.681 |
| 4. Mobile apps help me use more complex sentence patterns | 30 | 1.467 | 0.681 |
| 5. Mobile apps improve my vocabulary diversity | 30 | 1.600 | 0.724 |
| 6. Mobile apps improve the accuracy of grammar | 30 | 1.567 | 0.679 |
| 7. Mobile apps improve the accuracy of vocabulary | 30 | 1.500 | 0.572 |
| 8. Mobile apps reduce the frequency of self-repairs | 30 | 2.333 | 0.959 |
| 9. Mobile apps enhance my speaking rate in English | 30 | 1.533 | 0.571 |
| 10. Mobile apps reduce pauses (including verbal pauses and silent pauses) in my spoken English | 30 | 1.700 | 0.651 |
| 11. Mobile devices have a negative impact on my speaking performance | 30 | 2.13 | 0.900 |
| Overall | | 1.578 | 0.712 |

Table 2 Learner attitude of MAOE

| Item | N | Mean | SD |
|---|----|-------|-------|
| 12. Mobile apps help me save time | 30 | 1.433 | 0.568 |
| 13. Mobile apps help me save efforts | 30 | 1.367 | 0.556 |
| 14. Mobile apps help me learn oral English at anytime, anywhere | 30 | 1.200 | 0.407 |
| 15. Mobile apps provide me with more opportunities to speak English | 30 | 1.233 | 0.430 |
| 16. Mobile apps are an easy way to get feedback and notifications | 30 | 1.300 | 0.466 |
| 17. Mobile apps increase the flexibility of access to resources | 30 | 1.233 | 0.504 |
| 18. Mobile apps provide me with rich resources | 30 | 1.167 | 0.379 |
| 19. Mobile apps provide me with authentic learning material | 30 | 1.333 | 0.547 |
| 20. Mobile apps increase my interests in learning oral English | 30 | 1.567 | 0.728 |
| 21. Mobile apps help me speak English with more confidence | 30 | 1.500 | 0.630 |
| 22. Mobile apps help me feel less anxious about speaking English in front of other people | 30 | 1.633 | 0.809 |
| 23. Using mobile apps in class to learn oral English is not necessary | 30 | 2.030 | 1.159 |
| 24. Using mobile apps after class to learn oral English is not necessary | 30 | 1.730 | 0.907 |
| 25. Using mobile apps after class to learn oral English is beneficial and exciting | 30 | 1.400 | 0.563 |
| Overall | | 1.366 | 0.654 |

The second instrument was a focus group interview to gain a deeper understanding of the learner experience with MAOE. Conducted via Tencent Meeting in Mandarin, the interview followed eight open-ended questions and lasted 73 min until no new ideas emerged.

Data analysis

Given the small sample size, the quantitative data from the questionnaire were interpreted as exploratory and descriptive, with means, standard deviations, and percentages reported. Items 11, 23, and 24 were negatively phrased for validity purposes and reverse-coded to ensure scoring consistency. The mean scores reported for these items reflect the reverse-coded values, so lower scores indicate a more positive attitude toward using mobile apps for oral English learning, consistent with the coding direction of all other items. Overall values in Tables 1, 2, and 3 represent the mean of participants' averaged

Table 3 Learning behavior

| Item | N | Mean | SD |
|---|----|-------|-------|
| 26. I can seriously complete the oral tasks assigned by the teacher on the mobile apps | 30 | 1.300 | 0.535 |
| 27. I can practice oral English by learning other content on the mobile apps independently after completing the tasks assigned by the teacher | 30 | 1.867 | 0.937 |
| 28. I will continue using the mobile apps to practice oral English in my future study | 30 | 1.467 | 0.629 |
| Overall | | 1.545 | 0.721 |

item scores within each section. Qualitative data from the focus group interview were transcribed verbatim and analyzed thematically using the NVivo software and manual coding to ensure the depth and accuracy.

Ethics

This study was conducted in accordance with established ethical research practices. All participants were informed of the research purpose, the voluntary nature of their participation, and their right to withdraw at any stage without penalty. Informed consent was obtained at the beginning of the first lecture. Confidentiality and anonymity were strictly maintained. The research protocol was reviewed and approved by the relevant institutional ethics committee in February 2024.

Results, Findings, and Discussion

The questionnaire

Learning outcomes

Results

Addressing RQ1, the first part of the questionnaire focused on students' perceptions of how effectively these apps supported the development of oral English (as described in Table 1).

The overall mean score, 1.578 ($SD=0.712$), showed that students generally held positive attitudes toward the usefulness of MALL in developing oral English proficiency. Specifically, low mean scores were reported for listening comprehension, pronunciation, vocabulary accuracy, grammatical accuracy, speaking rate, and reduced pauses, with the means ranging from 1.467 to 1.7. Students also perceived improvements in syntactic and lexical complexity (items 4 and 5; Means = 1.467, 1.6). However, the highest mean score was observed for item 8, which focused on reducing self-repairs ($M=2.333$, $SD=0.959$). Nonetheless, the general trend indicated overall perceived improvements in complexity, accuracy, and fluency of oral English.

Discussion

According to the results, perceived improvements are observed in oral complexity (items 4 and 5), accuracy (items 6 to 8), and fluency (items 9 and 10), as well as in listening, pronunciation, and overall speaking skills (items 1 to 3). These perceived improvements in pronunciation, accuracy, and fluency are broadly consistent with prior studies, such as Woldetsadik et al. (2022), Zou et al. (2023), and Hwang et al. (2024). One possible reason for this consistency is that learners across different contexts share similar mobile learning activities, including voice recording, dubbing, and feedback on

pronunciation, fluency, and accuracy, which may help explain why participants reported improvements in these areas. Furthermore, given that participants in this and previous studies are university EFL learners with clear learning goals, it is reasonable that the findings are broadly aligned.

Notably, the reported enhancement in accuracy and in using more complex sentence structures and diverse vocabulary contrasts with the findings of Ma et al. (2025), Wang et al. (2024), and Zhou et al. (2025), with the first study reporting no significant improvement in grammar and vocabulary, while the latter two stated no notable progress in accuracy and complexity. The treatment design may have contributed to participants' perceptions of growth in this study. The three studies each used a single app: Fun Dubbing, Liulishuo, and ChatGPT, respectively. In contrast, the current study employed three complementary apps. This multi-app design is consistent with both the Input Hypothesis (Krashen, 1982) and the Output Hypothesis (Swain, 1985), which together suggest that learners may benefit when they receive comprehensible input and produce meaningful output.

Nonetheless, the comparatively higher score for self-repairs suggests that students may still face challenges in reducing self-corrections. It could indicate students' lower confidence in this sub-aspect of oral accuracy compared to other subskills. The tendency to correct their speech may reflect influences of the Chinese sociocultural background. Through years of high-stakes assessments, students are accustomed to prioritizing correctness to achieve higher scores. The strong emphasis on accuracy and avoidance of errors in Chinese EFL contexts may contribute to learners' greater focus on grammatical correctness (Yi et al., 2013). However, this result should not be viewed as a pure weakness, as it also reflects learners' awareness of content accuracy and their ability to monitor and regulate their language production (Levelt, 1983; Lilliati, 2013; Zhang & Song, 2019). Such self-monitoring behaviors highlight the importance of learner agency in developing oral English skills.

Learner attitude

Results

This section addressed RQ 2 and evaluated the affective–attitudinal dimension of LX. Items 23 and 24 were negatively worded and reverse-coded so that lower scores consistently reflect a more positive attitude. The mean scores reported for these two items also reflect the reverse-coded values.

As shown in Table 2, the overall mean score was around 1.366 (SD=0.654), indicating a generally positive attitude. Items 12–14 (M=1.433, 1.367, and 1.2) showed general agreement that mobile apps can save time and effort while allowing learners to practice oral English anytime, anywhere.

Items 15–19 (M=1.167–1.333) highlighted the value of interaction activities. Students gained more chances to speak English, received instant feedback, and accessed abundant authentic resources, fostering rich language input and meaningful output. For items 20–22 (M=1.5–1.633), participants reported experiencing positive emotional effects, such as increased interest in learning, greater confidence, and decreased speaking anxiety. Items 23–25 addressed students' attitudes toward the necessity of using mobile technologies in different learning settings. While students showed varied opinions toward

the usage of mobile apps in formal contexts ($M=2.030$, $SD=1.159$), there was a stronger consensus on the value and engagement with MAOE in informal contexts.

Discussion

The results in this section provide a partial answer to RQ 2 by focusing on the affective–attitudinal dimension of LX with MAOE, which reflects learners' attitudes and emotional responses toward the use of mobile applications. Students generally agreed that the three mobile apps help them regulate and personalize their oral English practice, making oral English learning more flexible and enjoyable. The self-reported increases in interest and confidence, along with the reduction in anxiety, may help explain why students reported greater autonomy and more active participation in oral communication. Similar results are found in Hwang et al. (2024), Nguyen (2024), Shen (2024), and Jia and Lu (2025). A possible explanation for these encouraging results may lie in Vygotsky's concept of MKOs and ZPD. By providing immediate, AI-powered feedback, abundant authentic resources, and increased opportunities for spoken interactions, mobile apps function effectively as MKOs that scaffold learners' development within their ZPD. This perspective may help explain why participants reported greater motivation and persistence.

The difference between formal and informal learning environments, regarding items 23–25, highlights a sociocultural tension. The slightly higher score on item 23 reveals that some students feel more comfortable and motivated to engage with MAOE in informal, self-guided settings. Similarly, Wu (2019) found that the proportion of students using MALL in informal contexts, such as dormitories and commuting, is much higher than in classrooms. This aligns with Calabrich (2016), who noted that students from East or Southeast Asia always held conservative attitudes toward the usage of MALL in class. These findings can be interpreted within the Chinese sociocultural context, where the classroom is traditionally viewed as a formal, authoritative learning space influenced by Confucian educational values (Chiang et al., 2020). In this light, the distinctive format and engaging features of mobile applications distinguish themselves from the formal, rigorous classroom instruction. This may help explain why some students may prefer to use MAOE after class rather than in class.

At the same time, the generally positive attitudes toward MAOE in both contexts indicate the potential of blending mobile technologies across settings. For teachers and administrators, the current study highlights the importance of balancing the fun-oriented features of mobile applications with the traditional expectations of classroom learning. Effective integration may require ensuring that MAOE complements the established norms of face-to-face instruction, thereby enhancing both acceptance and effectiveness.

Learning behavior

Results

The third section addressed RQ 2 by exploring the cognitive-behavioral dimension of LX (as shown in Table 3 and Figs. 3 and 4). The overall mean score, 1.545 ($SD=0.721$), indicated a generally high level of autonomy in MAOE. Item 26 ($M=1.300$, $SD=0.535$) revealed that students completed the assigned homework conscientiously and seriously on mobile apps. Item 27, however, demonstrated a slightly higher score ($M=1.867$,

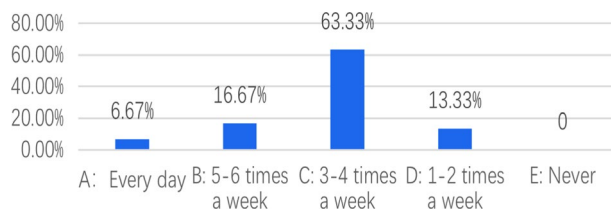


Fig. 3 Frequency of practice per week

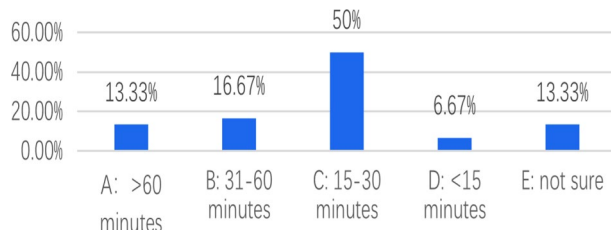


Fig. 4 Duration of each speaking practice

SD=0.937). This indicated that while students were often engaged in self-directed oral English practice beyond assigned tasks, the degree of this autonomy varied among individuals. Encouragingly, item 28 reported students’ overall intention to continue using MAOE, indicating strong potential for the long-term integration of MAOE.

The final two questions examined the frequency and duration of students’ oral English practice. As shown in Fig. 3, most students (63.33%) practiced oral English with mobile apps 3–4 times per week, 16.67% practiced 5–6 times, and 6.67% practiced daily. No students chose “never”, indicating a high motivation to use these mobile apps in speaking practice. Similarly, in Fig. 4, half of the participants engaged in 15–30 min of practice, making it the most common learning duration. 30% students practiced speaking for longer durations (more than 30 min), while only around 7% reported practicing for less than 15 min. Additionally, 13.33% were unsure of their practice time.

Discussion

According to the results, there is a high level of task completion and independent learning. Approximately 80% of students used mobile technology to practice oral English more than four times a week, with each session lasting over 15 min. These results suggest that students not only complete the required tasks but also engage in additional self-initiated oral English practice. A similar pattern was observed among Vietnamese students in Nguyen (2024) and Tran and Vuong (2024). They found learners frequently used mobile devices for English learning, with many spending over 40 min or over 60% of their study time on them. These findings resonate with the present study, which focuses more specifically on oral English learning.

These learning behavioral patterns may be interpreted as reflecting a certain degree of learner agency and learning autonomy, as they demonstrate a sense of self-discipline and self-regulation in actively managing their learning with reasonable frequency and duration. This underscores the potential of mobile apps to enhance autonomy and sustained self-directed oral English learning (Nguyen, 2024; Roy & Gandhimathi, 2025). However, the marginally higher score for item 27 suggests that although most students engage

in MAOE practice beyond teacher-assigned work, some still passively rely on teacher-assigned work. This points to room for further enhancing learner agency, as also supported by Xu and Li (2024).

The interview

Complementary to the questionnaire, the group interview addresses RQ 2 by providing a more in-depth understanding of students' LX with MAOE across all three dimensions. After transcription (in which the interviewer was assigned Number 1 and the eight student participants were numbered sequentially from 2 to 9), the qualitative data were analyzed using NVivo, with manual coding employed to ensure thorough understanding and accurate analysis.

The first author acted as a single coder, conducting the coding of all interview transcripts using NVivo while maintaining analytic memos. Codes were iteratively compared and clustered into preliminary categories, which were then refined into main themes through repeated review of both coded extracts and full transcripts to ensure that each theme was internally coherent and clearly distinguishable from others. To strengthen credibility and analytic rigor, the evolving codebook, theme boundaries, and labels were reviewed and discussed with the fourth author acting as a critical peer through peer debriefing. Revisions were made through consensus. Table 4 provides a transparent mapping between the final themes and illustrative excerpts.

Findings

Theme 1: Perceived impact of MAOE and goal-directed learner agency

The first theme highlights the perceived impact of the three mobile apps as MKOs and how students demonstrated goal-directed learner agency. Participants identified distinct functional strengths in each app, and regulated their learning process based on the apps' functions and their personal learning goals.

Liulishuo was appreciated for its structured, user-friendly activities and instant scoring with pronunciation-focused feedback, helping learners identify and correct mistakes and promoting pronunciation, fluency, and clarity. As Students 4 and 9 noted,

"It allows for shadowing, repetition, and retelling exercises. With its instant scoring feedback, I can keep practicing and make ongoing improvements."

"If you mispronounce something, the system gives you a score; this makes you want to keep practicing until you get it right."

These comments suggest that Liulishuo was believed to not only improve learners' pronunciation but also motivate them to practice repeatedly and independently.

Keke English distinguishes itself for its timely and authentic reading and listening resources, including news, film/TV clips, and songs. Students used these materials to expand vocabulary, deepen topical knowledge, and practice authentic expressions. Features such as sentence looping and playback speed control allowed learners to tailor their pace and focus, reflecting strategic resource management. As Student 3 commented,

"In class, we discussed the Canada Goose incident. Keke English promptly followed up with this event. I found it to be quite timely and a valuable source of listening material. It helped me practice both listening and speaking skills."

Table 4 Compact audit trail

| Theme | Brief definition | Inclusion criteria | Data example |
|---|--|---|---|
| Theme 1: Perceived Impact of MAOE and Goal-Directed Learner Agency | Learners' perceptions of how MAOE supports their learning goals, autonomy, and skill development | mentions of perceived improvement in oral English or goal-directed app usage | "I could only say a few words at first, but now I can speak in complete sentences." (Student 5) |
| Theme 2: Sociocultural Factors and Learner Preference | How social, cultural, and personal contexts influence learners' app choices | Mentions of social interaction, cultural relevance, or context-specific app use | "I still prefer practicing when I'm alone. Having too many people around makes me feel somewhat embarrassed." (Student 4) |
| Theme 3: Learner Attitudes Across Formal and Informal Learning Contexts | Learners' engagement, enjoyment, and attitude toward apps in class and outside class | Mentions of motivation, engagement, satisfaction, or learning in different contexts | "They can enhance our interest in learning and make the classroom lively and engaging." (Student 3) |

Newsay was valued for its AI-driven conversation practices, grammar corrections, and stylistic feedback. Students reported intentional involvement in repeated conversations to improve grammatical accuracy, syntactic complexity, and fluency. For example, student 5 shared,

"I love how Newsay lets me talk to different AI characters! They don't just correct my English; they adapt feedback for British, American, or professional Business English. I could only say a few words at first, but now I can speak in complete sentences."

This shows that students set clear goals to improve both linguistic accuracy and the ability to adapt in different communicative contexts. Additionally, students used these apps according to their interests, proficiency levels, and learning goals. As Student 9 explained,

"Teachers can't really pay attention to everyone in class, but when you learn on your own using a mobile device, it can be more accurate. Like, in Keke English, the level—whether it's CET-4 or CET-6—you can pick the one that suits you best."

Similarly, Student 8 described a staged learning process,

"I started with Liulishuo because its exercises are relatively simple. Then, when I need to find what to talk about, I turn to Keke English to learn the up-to-date materials. Last, I tried to talk with my AI partner in Newsay. Each of these three apps supported me at different stages."

This strategic use of different apps shows learners' ability to make flexible use of mobile apps according to their learning proficiency and goals. It reflects a high level of self-motivation, self-regulation, and goal-directed agency.

Theme 2: Sociocultural factors and learner preference

The second theme underscores the sociocultural factors that mediate MAOE and the resulting learner preferences.

Due to the flexibility, ubiquity, and informality of MALL, participants noted that they could make use of fragmented time during the day. As Student 7 explained,

"We can effectively utilize fragmented time, which not only fosters greater autonomy and accessibility in learning but also enables personalized learning experiences."

Additionally, since participants rarely have opportunities to interact directly with Western cultures or native English speakers at the university or in their hometown, their interest in learning was strongly driven by the variety and authenticity of resources provided by the three apps. For example, Student 4 praised Keke English for its wide selection of American TV shows, movies, and songs, noting that they helped practice authentic expressions, pronunciation, and intonation.

Participants also situated MALL within the evolution of technological progress in Chinese education. As Student 8 noted,

"Since primary school, we've experienced technological progress—from projectors to smart boards, and now to smartphones and different apps. I think all of these reflect the benefits brought by technological advancement."

Crucially, he contrasted mobile learning with traditional classroom pair work, which often lacked teacher feedback and could turn into off-task chatter. Mobile apps, on the contrary, can offer instant responses, facilitating real-time self-reflection.

Unlike other aspects of English learning, speaking inevitably requires producing sound, which may attract public attention. This often causes discomfort for some learners. For instance, Student 4 admitted,

"I can practice at any time on any topic. However, I still prefer practicing when I'm alone. Having too many people around makes me feel somewhat embarrassed."

This preference highlights a sociocultural factor within the Chinese learning environment, where concerns about "mianzi (face)" and peer judgment can increase speaking anxiety. Consequently, learners might need to find specific times and places to practice so that they feel more comfortable and less exposed.

Theme 3: Learner attitudes across formal and informal learning contexts

The third theme explores students' perceptions of learning oral English with mobile assistance in both formal and informal learning settings. Consistent with the questionnaire results, interview data showed that students valued the advantages of using mobile apps for speaking practice both in and out of the classroom, while also revealing significant disadvantages that complement and extend the quantitative results.

Regarding the use of mobile apps inside the classroom, many students praised the accessibility, innovation, communication, and personalization of MAOE. As Student 3 mentioned,

"Mobile devices are relatively novel and don't have the dull and boring features of traditional teaching methods. They can enhance our interest in learning and make the classroom lively and engaging."

Student 7 added, *"With many animated clips as well as other materials, mobile learning makes oral English learning more engaging and vivid, and facilitates speaking practice."*

Regarding drawbacks, interviewees mentioned distractions, technical dependence, and interruptions caused by peers speaking too loudly. Some students might lack self-discipline and play games on their phones during class. Additionally, dead batteries made participation impossible. Interestingly, Student 8 observed that distraction was not specific to mobile learning, because,

"Students in traditional classroom activities such as drills, pair work, or role-play could also be distracted, and group work can turn into group chat."

He then proposed using brief, time-restricted activities lasting one or two minutes to help students remain focused. This suggestion underscores the role of task design in maximizing MAOE's effectiveness in formal classroom teaching.

In informal learning settings, students appreciated the affordability, accessibility, flexibility, and individuality of mobile learning, which helps them practice at convenient times and places and to select content that interests them. However, they also encountered challenges such as low self-discipline, overreliance on app prompts, and a lack of communicative authenticity. As Student 7 explained,

“Mobile interactions lack visual and non-verbal cues like facial expressions and gestures, making them less similar to real-life interactions. The communicative adaptability in oral communication needs to be more authentic.”

This gap proves that while mobile tools may have a positive impact on the complexity, accuracy, and fluency of oral English, they may be less effective in developing pragmatic competence.

Overall, this theme reveals a paradox that MALL offers flexibility, individuality, and interactivity, yet these same qualities may contribute to self-discipline challenges and a less authentic communicative experience. Rather than replacing traditional methods, MALL should complement them through structured support, authentic interaction opportunities, and clear pedagogical guidance.

Discussion

Altogether, the interview data, which complement the questionnaire results, offer a detailed view of LX with MAOE and illustrate how the three mobile apps serve as both technological and sociocultural mediators in oral English learning.

Theme 1 illustrates the cognitive-behavioral dimension of LX. Questionnaire results indicated that students perceived the three apps as beneficial for improving oral English, particularly in terms of pronunciation, complexity, accuracy, and fluency. Extending these findings, interview data reveal the possible reasons for this perceived improvement. The pursuit of higher scores clearly demonstrates how MAOE encourages persistence and self-improvement. This finding aligns with Saito (2021), who stated that immediate corrective feedback plays a significant role in enhancing pronunciation accuracy and maintaining learner engagement. Moreover, within the context of Chinese education, where test scores carry considerable weight (Cai, 2020), feedback that includes scoring may stimulate students to practice and elevate their motivation to learn. However, this phenomenon is not exclusive to China; it is also prominent in East Asian countries such as Singapore, where emphasis on scores is a key aspect of educational culture (Jordania, 2023). Additionally, learners in this study engaged in self-directed learning behaviors, such as exploring app features, selecting appropriate proficiency levels, setting goals, choosing which apps to use, and monitoring their own progress. These behaviors reflect both self-regulation and metacognitive awareness, key indicators of autonomous learning (Alm, 2024; Nguyen, 2024; Roy & Gandhimathi, 2025).

The findings point to a mutually reinforcing relationship between learner agency, oral performance, and technological affordances. Students actively select apps in line with their goals, progress, and interests, while the varied functions of these apps enhance learners' oral English skills, learning autonomy, and sustained engagement in oral English practice. This conforms to Connectivism Learning Theory, which views learning as forming and navigating knowledge networks across digital platforms (Alam, 2023; Siemens, 2004). In this study, the three mobile apps serve as interconnected nodes, allowing real-time access to language resources and activities. Therefore, effective MAOE implementation should encourage the complementary use of multiple mobile platforms.

Addressing RQ 2, theme 2 explores the sociocultural dimension of LX and its influence on Chinese university students' engagement with MAOE. The flexibility, ubiquity, and informality of mobile learning enable learners to use fragmented time, access authentic

resources, and develop greater learner autonomy. This shows that students prefer efficient methods that yield visible progress. Furthermore, mobile learning is also seen as part of educational modernization in China, offering advantages such as immediate feedback and instant self-reflection that support self-monitoring and self-regulation (O'Malley & Chamot, 2012) and enhance competence and motivation (Legault, 2017).

Nonetheless, unlike receptive skills such as reading or listening, oral English requires sound production. Thus, some students felt embarrassed to practice English-speaking in public. This finding is consistent with Luo and Watts (2022), who noted that students were more willing to use MALL to develop receptive skills. This reluctance is closely tied to the Chinese sociocultural environment, where the concept of “saving face”, which involves maintaining social dignity and prestige, discourages making mistakes publicly (Chey, 2021). Additionally, in many Asian cultures, individuality is understood through social connections, highlighting that a person's identity is mainly linked to relationships with others (Li, 2024; Markus & Kitayama, 1991). This suggests that, despite the ubiquitous learning opportunities provided by mobile apps, learners' MAOE engagement, especially among introverted Asian students, remains shaped by cultural norms and the social contexts.

To maximize the portability and accessibility of MAOE while reducing social anxiety, instructors could adopt a gradual, low-pressure approach. For instance, students might begin practicing in private or semi-private spaces, such as their dorm room with one or two roommates, then progress to small, supportive groups before engaging in larger classroom settings. Additionally, instructors could encourage students to use brief moments before or during class for practice. Such measures may help learners gradually adapt to public speaking while making fuller use of mobile learning opportunities.

Theme 3 addresses RQ 2 by examining the affective–attitudinal dimension of LX, further emphasizing the interaction among context, culture, and LX. In the formal classroom setting, students generally regarded MAOE as a creative and interesting approach. However, it also causes distractions due to the sound of speech and the gamified features of mobile phones. In informal contexts, mobile apps significantly expand opportunities for oral English practice, allowing learners to make use of fragmented time and choose learning resources based on their interests and goals. However, AI-mediated communication was perceived as less authentic, given the absence of non-verbal cues that are important in actual communication.

Overall, students' general positive attitudes show that, on the one hand, it is necessary to implement mobile technologies in both formal and informal learning contexts, which aligns with previous research (Li, Fan, & Wang, 2022; Roy & Gandhimathi, 2025; Zhao et al., 2025). On the other hand, realizing the full potential of MAOE requires activities that not only facilitate learning objectives but also address challenges of distraction, authenticity, and sustained learner engagement.

To mitigate excessive classroom noise while maintaining engagement, instructors may prioritize low-volume oral tasks such as shadowing and dubbing with apps like Liulishuo, or short, goal-oriented role-plays with apps like Newsay. Additionally, to reduce the risk of distraction, in-class MAOE activities should be brief so learners can stay focused on the target task. As for more complex and time-consuming activities, such as topic-based communication, they can be completed after class. Regarding authenticity,

MAOE should be combined with in-person conversations. Integrating structured classroom tasks with culturally sensitive informal practice can bridge the gap between technological affordances and learners' social realities.

Conclusion

This study examined the use of three functionally complementary mobile applications, Liulishuo, Keke English, and Newsay, across formal and informal learning settings to investigate the perceived impact of MAOE and students' learner experience.

Findings indicate that students perceived that MAOE can enhance multiple dimensions of speaking competence, including listening, pronunciation, complexity, accuracy, and fluency. Moreover, students exhibited strong learner agency during the process. It shows that while autonomous learners used different apps strategically to meet their goals, the apps' specific features and activities may have contributed to participants' perceptions of enhanced agency. However, some students still relied on teacher-assigned tasks. Thus, how to enhance students' agency in using mobile apps for oral English learning after class remains necessary for further research.

Qualitative data further reveal that students tailored their app use to their learning stages, goals, proficiency levels, and interests. They valued the flexibility and individuality of MAOE, but were also concerned about speaking with other people around due to cultural reasons. Learners noticed the drawbacks of attention distractions, but providing structured support, authentic interaction, and clear guidance can help reduce these distractions and improve learning effectiveness.

Nevertheless, since these findings are derived from self-reported data, they may be influenced by memory errors, subjective bias, and inconsistencies between perceived and actual learning behaviors. In addition, the relatively small sample size may limit the representativeness of the results and reduce the generalizability of the conclusions to broader learner populations or educational levels. Therefore, future research could address these limitations by including larger and more diverse samples and triangulating self-reports with classroom observations, usage records from mobile applications, such as log data, duration, task completion, and performance scores, to obtain more objective and comprehensive insights.

All in all, this study suggests that the integration of MAOE into both formal and informal learning contexts should employ a multi-app design. In addition, instructors should take into account students' learner agency and their sociocultural background while carefully designing activities that foster learner autonomy and incorporate culturally sensitive strategies. Such an approach can help bridge the gap between technological affordances and authentic communicative practice.

Abbreviations

| | |
|------|---------------------------------------|
| CALL | Computer-assisted language learning |
| CAF | Complexity, Accuracy, and Fluency |
| LX | Learner experience |
| MAOE | Mobile-assisted oral English learning |
| MALL | Mobile-assisted language learning |
| MKOs | More knowledgeable others |
| ZPD | Zone of proximal development |

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Author contributions

M.Z. conceptualized the study, collected data, performed data analysis, wrote the original draft, and participated in review and editing. N.N. contributed to methodology, formal analysis, review and editing, and supervision. N.K.A. assisted with data analysis, review, and editing. W.W. was responsible for data analysis and software. All authors reviewed and approved the final manuscript.

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Data availability

The data generated and analyzed during the current study are available from the corresponding author on reasonable request.

Declarations**Ethics approval and consent to participate**

Ethical approval was obtained from the relevant institutional review board prior to data collection. All participants provided informed consent to participate in the study, and their privacy and confidentiality were strictly maintained throughout the research process.

Competing interest

The authors declare no competing interests.

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