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Enhancing EFL learners' speaking skills, foreign language enjoyment, and language-specific grit utilising the affordances of a MALL app: a microgenetic perspective

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Enhancing EFL learners' speaking skills, foreign language enjoyment, and language-specific grit utilising the affordances of a MALL app: a microgenetic perspective

Abstract

Mobile-assisted language learning (MALL) is reported to be beneficial for improving English as a foreign language (EFL) learners' language learning skill. Although some studies have concentrated on utilising a MALL application's (app) affordances for improving EFL learners' overall speaking performance, there is as yet little empirical evidence of its effectiveness in terms of developing EFL learners' speaking skills and motivation-relevant factors. To tackle this knowledge gap, the current study adopted a sequential explanatory mixed-methods approach to explore the utilisation of a MALL app's affordances for developing EFL learners' speaking skills (including fluency and coherence, lexicon, grammatical range and accuracy, and pronunciation), foreign language enjoyment (FLE), and language-specific grit (LSG). With this aim in mind, we applied blocked randomisation applying computer-generated random numbers to equally distribute 66 EFL learners across two groups. Corroborating the adequacy of the sample size via power analysis, the two groups were randomly assigned to a MALL group (33 EFL learners) and a face-to-face group (33 EFL learners). The MALL learners had interactive speaking activities inside the class and utilised the MALL app for their out-of-class interactive speaking activities. On the other hand, the face-to-face learners had interactive speaking activities both inside the class and in a language learning laboratory in addition to the class time serving as supplementary interactive speaking activities. An IELTS speaking skill test, a foreign language enjoyment scale, and an LSG scale were used to collect the required quantitative data, and an individual semi-structured interview was conducted to gather the qualitative data. Running one-way ANCOVA to analyse the quantitative data, the findings indicated that both MALL- and face-to-face-supported instruction developed the EFL learners' overall speaking performance, speaking skills, FLE, and LSG; however, the MALL group outperformed their face-to-face counterparts on all measures. Furthermore, the qualitative analysis uncovered several themes and categories addressing the MALL learners' positive and negative attitudes towards and perceptions of the utilisation of the MALL app's affordances, which could explain the quantitative findings. The findings are useful for EFL learners and instructors interested in utilising MALL apps' affordances in their interactive speaking courses.

Keywords: Adult learning; Cooperative/collaborative learning; Distance education and online learning; Distributed learning environments; Mobile learning

1. Introduction

Research has corroborated that interactive speaking activities facilitate and enhance English language learners' speaking skills to a great extent (Ahn & Lee, 2016; Appel & Pujolà, 2021; Hwang et al., 2016; Sun et al., 2017). Following Vygotsky's (1978) social constructivist theory of learning, interactive speaking activities foster dynamic peer interactions among learners to enhance their linguistic skills. Via interactive speaking activities, more capable learners help less capable peers gradually internalise essential speaking abilities to achieve their autonomous functioning. However, as effective interactive speaking activities require a reasonable amount of time, especially in the English as a foreign language (EFL) context, learners often have insufficient opportunities to have interactive speaking activities with other learners during class time. In addition, due to peer pressure issues, learners are often unwilling to partake in interactive speaking activities (Peng, 2019).

Researchers argue that technology- and online-based devices and programmes address the time limitation and other interactive speaking issues that EFL learners may confront during class and in out-of-class time. For instance, unlike conventional classes in which interactive speaking activities are limited by spatial and temporal factors, mobile-assisted language learning (MALL) applications (apps) can help learners communicate with their peers anywhere and anytime (Jiang & Peng, 2023; Wong, 2012). MALL apps can give learners opportunities to engage in interactive speaking activities with their peers and the instructor both in and outside the class. Different affordances of MALL apps can contribute to learners' interactive speaking activities. For instance, various app affordances, such as the affordances of Duolingo, Liulishuo, HelloTalk, and Hello English (HE) could be utilised to facilitate English language learners' speaking skills.

For instance, the utilisation of the HE app's affordances (i.e. using various features of the HE app) helps develop English language learners' language learning skills (i.e. speaking, writing, listening, and reading) and subskills (i.e. grammar, lexicon, and pronunciation). The app offers diverse affordances, such as voice recognition, gamification, cultural activities, speaking partners, feedback, offline access, personalisation, quizzes, and progress tracking. Voice recognition enables authentic communicative speaking practice with instant feedback. Gamified activities ensure engaging interactive speaking practice both online and offline. Conversational and cultural lessons enrich learners' grasp of grammatical structures, expressions, phrases, idioms, and cultural nuances. HE facilitates authentic speaking practice and enables self- and peer assessment through recording and listening (Patni & Patni, 2017).

Several empirical studies have been published recently addressing the utilisation of the affordances of MALL apps in developing EFL learners' English language learning skills and

subskills (Kukulska-Hulme & Viberg, 2018; Zhang & Zou, 2022). However, to the best of our knowledge, insufficient studies have concentrated on the utilisation of MALL app's affordances in improving English language learners' speaking skills, especially in an interactive EFL learning environment (e.g. Fang et al., 2018, 2021; Hwang et al., 2014; Rajendran & Yunus, 2021). This might be due to the fact that in the current EFL context, MALL technologies are rarely used for educational purposes, and instructors still tend to adopt conventional methods of language teaching. On the other hand, most of the related studies have explored broader aspects of language learning, such as vocabulary and grammar knowledge, and neglected the specific use of MALL apps' affordances in developing EFL learners' speaking skills.

As learners' motivational factors directly affect their language learning skills, especially speaking skills (Saito et al., 2018), it is crucial to examine the role of motivation-related factors in helping learners improve their language learning (De Smet et al., 2018). Foreign language enjoyment (FLE), for example, refers to language learners' motivation and satisfaction with learning a foreign language which are believed to improve learners' engagement in interactive language learning activities (Dewaele & MacIntyre, 2014, 2016). FLE encompasses the emotional, motivational, and affective dimensions of language learners' language learning studies and activities. Exploring EFL learners' FLE may help us understand how to create more engaging interactive language learning activities for learners and enhance their long-term commitment to speaking-related activities (Bielak, 2022).

On the other hand, language-specific grit (LSG), which refers to learners' perseverance of effort (PE) and consistency of interest (CI), is essential for learners' successful learning performance (Duckworth & Gross, 2014). Exploring EFL learners' LSG in online language learning contexts can shed more light on learners' performance in accomplishing their online language learning tasks when they confront language learning issues (Zhao et al., 2023). For instance, it is essential to explore how learners maintain their effort and motivation in interactive speaking activities with their peers when they encounter speaking-related issues. EFL learners' FLE and LSG have not been sufficiently explored in the MALL environment (Fraschini & Tao, 2021), especially along with learners' engagement in interactive speaking activities in the MALL context. Although EFL learners' language learning motivation, a broad construct encompassing both FLE and LSG, has been adequately explored in MALL-related studies (Ahn & Lee, 2016; Kim & Kweon, 2022), further research needs to be carried out to specifically examine if EFL learners' FLE and LSG could be improved as a result of MALL-based interactive speaking activities.

To address the aforementioned research lacunas, we quantitatively examined the impact of a MALL app's affordances on EFL learners' speaking skills (i.e. fluency and coherence, lexicon, grammatical range and accuracy, and pronunciation), FLE, and LSG to find a better and more effective instructional procedure for enhancing EFL learners' speaking skills and their satisfaction with and enthusiasm for interactive speaking activities. By examining speaking skills, FLE, and LSG together, we captured a holistic view of how utilising the MALL app's affordances influenced the EFL learners' cognitive, affective, and motivational dimensions during the interactive speaking activities. This holistic perspective clarified both the direct impact of the MALL affordances on speaking skills and the broader impact on emotions, motivation, and commitment to speaking practice.

Examining the learners' speaking skills identified whether the MALL app's affordances effectively contributed to their ability to communicate fluently, coherently, and accurately in the target language. In addition, investigating the learners' FLE and LSG, helped us understand how the MALL app's affordances influenced their affective and motivational connections to the interactive speaking activities, and how the affordances contributed to their perseverance and commitment to mastering the speaking skills despite the setbacks for their interactive speaking activities. The rationale for considering both FLE and LSG together hinged upon the interrelation of FLE and LSG in forming language learners' language learning experiences. Previous research emphasised the integration of FLE and LSG in motivating learners' engagement in language learning activities (Pawlak et al., 2022; Swain, 2013), which is also in harmony with theoretical and empirical insights (Li, 2020). The purpose of this study was to indicate the impact of uplifting emotions (i.e. FLE) and enduring motivation (i.e. LSG), as integral parts of the language learning process (Dewaele & Li, 2020), on speaking skills improvement in the EFL educational setting. That is, we attempted to offer a holistic understanding of the role of emotions and motivation (i.e. FLE and LSG) in speaking skill improvement.

Our study aligned with contemporary psychological paradigms, like self-determination theory (Deci & Ryan, 2008) and positive psychology (Dewaele & MacIntyre, 2016), highlighting emotions and motivation as potent catalysts for human behaviour. Positive emotions, including enjoyment, were found to impact cognitive faculties, intrinsic motivation, and skill acquisition. Likewise, LSG, encompassing passion and perseverance, motivated learners over extended periods. By concurrently exploring FLE and LSG, we synthesised diverse theoretical viewpoints, comprehensively elucidating the psychological dynamics governing language acquisition and successful speaking outcomes. Although

previous studies have focused on understanding individual emotional aspects in isolation, the interaction of FLE and LSG has received limited attention. Our study shifted its focus to this critical intersection by conducting a comprehensive analysis that revealed how these emotional and motivational factors worked together.

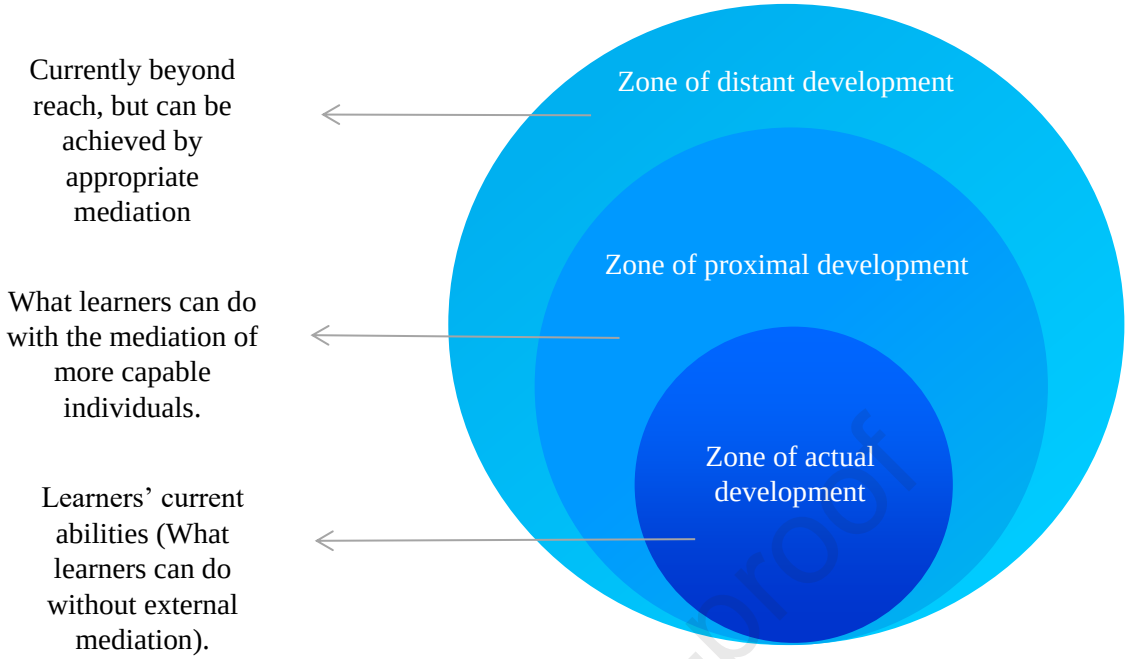
Employing qualitative research, we also explored the EFL learners' attitudes towards and perceptions of the MALL app's interactive speaking activities. This exploration provided deeper insights into the motivations and experiences driving EFL learners' engagement. By exploring the whys and hows, the qualitative analysis shed light on the intricacies and rationales behind our quantitative findings. By identifying key app affordances that motivated the learners, we not only clarified the drivers of improved speaking skills, but also offered pedagogical insights for optimising interactive speaking activities. The challenges encountered by learners using the app's affordances were also highlighted, which guided EFL instructors in improving interactive speaking experiences. The practical implications of our findings for interactive speaking courses are discussed in the subsequent section.

2. Literature review

2.1. Theoretical framework

Vygotsky's (1978) social constructivist theory of learning was adopted as the theoretical framework of the present study. Following Vygotsky's (1978) social constructivist theory of learning, learning occurs as a result of the interactions among learners. Learners, involved in interactive learning activities, mediate each other's learning skills and abilities and help each other internalise their learning skills and abilities. In this theory, peer and instructor mediation refers to a process in which a more capable individual helps other less capable individuals improve their social and mental abilities via "culturally constructed artefacts, concepts and activities" (Lantolf & Thorne, 2006, p. 79). This key construct is conceptualised as the learners' zone of proximal development (ZPD), which in Vygotsky's standpoint is referred to as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). In other words, the ZPD refers to "those functions that have not yet matured but are in the process of maturation" (Vygotsky, 1978, p. 86). Figure 1 presents Vygotsky's model of learning.

Figure 1. Vygotsky's (1978) social constructivist theory of learning.



Vygotsky's theoretical framework delineates three distinct cognitive realms: the zone of actual development (ZAD), the ZPD, and the zone of distant development (ZDD). In ZAD, learners tackle tasks commensurate with their current competence, independent of external guidance. ZPD encompasses the tasks beyond current mastery, which are yet attainable with guidance from instructors or capable peers, fostering significant linguistic and cognitive growth. ZDD refers to knowledge just out of immediate reach which requires mediation for acquisition. Proper mediation leads to internalisation, enabling autonomous task performance, thereby shifting them within the learners' capabilities. Vygotsky's schema emphasises the role of mediation in bridging ZAD and ZDD through the ZPD realm which can lead to independent and autonomous functioning.

In the current study, both MALL and face-to-face learners were required to engage in some interactive speaking activities to enable them to collaboratively accomplish some speaking tasks. However, the learners' speaking skills in the MALL class were mediated by other learners, the instructor, and the MALL app, whilst the face-to-face learners' speaking skills were only mediated by other learners and the instructor. To track both groups' peer mediation, Aljaafreh and Lantolf's (1994) model of microgenesis was followed. Microgenesis is conceptualised as "the gradual course of skill acquisition during a training session, experiment or interaction" (Wertsch, 1985, as cited in Donato, 1994, p. 42). Following this model, both MALL and face-to-face learners were obligated to employ greater

implicit peer-speaking mediation at first, then less implicit, then explicit and/or more explicit peer-speaking mediation. Only if the learners were unable to respond to the more or less implicit peer-speaking mediation, were less implicit and more explicit peer-speaking mediation offered by the other peers and the instructor. The EFL learners who relied on little or no peer-speaking mediation were closer to reaching their autonomous functioning. Since the study's primary goal was to determine the effects of MALL and face-to-face courses on EFL learners' speaking skills, all peer mediation centred on the speaking skills of the EFL learners. Vygotsky's (1978) social constructivist theory of learning provided a novel lens through which we explored the interactions between MALL, speaking skills, and affective factors. This theoretical foundation enhanced the richness of our findings by considering the broader socio-cultural context in which language learning takes place.

2.2. MALL

The potential advantages of MALL in language learning, including portability, social interaction, and immediacy, have been highlighted in several studies in recent years (Genc-Nayebi & Abran, 2017; Wang et al., 2017; Wang et al., 2018; Zhang et al., 2022). The development of mobile devices with social communication affordances gives instructors and students more flexibility in their communication by allowing them to use text, voice, and video chats. Social communication apps are one example of such technology, and they are frequently cited as a promising technique to aid with learning languages (Fang et al., 2021; Godwin-Jones, 2011; Xie et al., 2019). According to research, MALL provides plenty of opportunities to give students engaging, real-time, collaborative, and conversational experiences both inside and outside the class (Fang et al., 2018, 2021; Hao et al., 2019; McMullen et al., 2019; Su & Zou, 2022). In addition to its interactive nature, MALL gives students the opportunity to take the initiative and participate in activities tailored to their individual requirements anywhere and anytime (Bhandari et al., 2017; Shippee & Keengwe, 2014).

Several studies have explored the use of MALL apps' affordances, such as gamified language learning activities, timely feedback, personalised language learning activities, regular quizzes, and progress tracking, in and outside the classroom (Cavus & Ibrahim, 2017; Fang et al., 2018, 2021; Hassan Taj et al., 2016; Hwang et al., 2014; Rosell-Aguilar, 2018; Xu & Peng, 2017; Zhang & Perez-Paredes, 2021; Zhang & Zou, 2022). García Botero et al. (2021), for instance, investigated the scaffolding and self-regulation of EFL learners in a MALL setting. Via the Duolingo app, learners were encouraged to partake in outside-the-class language learning activities. The learners also received scaffolding for their MALL as

well as training in self-regulation. The findings indicated that self-regulation training and scaffolding are advantageous in an outside-of-class MALL scenario. A much greater engagement rate in Duolingo outside of class was further corroborated by the learners who received scaffolding and self-regulation training. Zhang and Perez-Paredes's (2021) study which examined how EFL learners utilised MALL apps' affordances outside the class, revealed that using MALL apps outside the class was primarily motivated by the enthusiasm to pass tests and increase their English vocabulary. Some learners were able to choose appropriate content via the apps and meet their present English learning needs, even though a small percentage of the learners were not routinely and actively participating in using MALL apps outside the class. The two motivating aspects for the learners' extracurricular activities, as stated by the participants, were having fun and engaging in interactive language learning activities.

Tragant et al. (2022) explored EFL learners' utilisation of WhatsApp for instant messaging supported by extra language-learning assignments outside the class. After a 5-week period, the learners' engagement and motivation for sending messages via WhatsApp outside of class gave them the chance to practise their language skills and interact with other peers and the instructor. Sending messages to the learners outside the class proved to be a successful way to get them to utilise the app's affordances outside the class and improve their language learning skills. More specifically, Sun et al. (2017) examined the use of MALL affordances for enhancing EFL learners' speaking performance (referring to all speaking skills as a whole). The EFL learners were assigned to either MALL or face-to-face classes; the MALL learners used MALL apps and social networking sites in addition to regular instruction, whilst the face-to-face learners received the regular class instruction without experiencing mobile learning. The MALL learners used the voice-recognition option of the app and applied the gamified speaking activities to practise and improve their speaking performance. The face-to-face learners covered the same learning materials but without using mobile learning. The findings indicated that both MALL-supported and face-to-face instruction improved the EFL learners' speaking performance, whilst the MALL-supported instruction outperformed its face-to-face counterpart in that regard. The MALL learners' higher improvements in speaking skills were attributed to the low-stress language learning environment facilitated by MALL apps.

Kartal (2022) investigated the utilisation of WhatsApp's affordances in contributing to EFL learners' speaking and pronunciation performance. The learners worked on their English via self-recording, checking their recordings, and comparing them with those of native

speakers. The learners also gave and received additional feedback from other learners after sharing their videos with them. Gathering the required data via a survey and interviews, the findings indicated that most of the learners reacted positively towards the incorporation of mobile learning into their speaking course. The learners were specifically engaged in the learning activities due to the technological affordances and the availability of their learning tools. The findings imply that using WhatsApp's potential as a mobile instant messaging tool in large classes can be beneficial for EFL learners' speaking performance. Although there are an abundant number of MALL apps that English language learners can use for their out-of-class language learning activities, we utilised the MALL app in the current study to help the EFL learners apply its different affordances for their out-of-class interactive speaking activities.

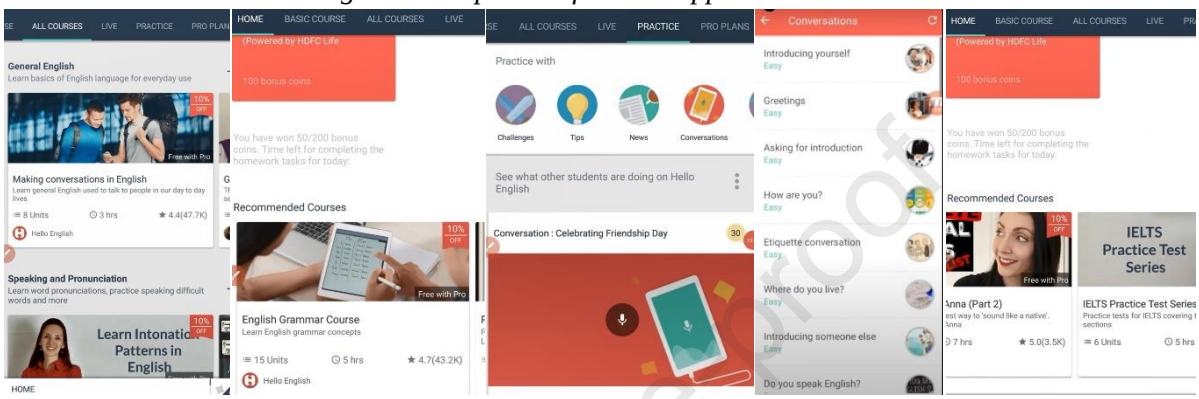
2.3. HE app

HE is a MALL app designed for English language learning purposes. Learners can use their native language or any other languages they know as a contributor to help master their English language skills as the app allows learners to learn English from 22 different languages. Based on the learners' learning purposes, the app presents a number of lessons which comprise conversational English with audio, vocabulary, and grammar explanations followed by interactive activities to help learners improve their language learning skills and game exercises to evaluate learners' mastery of the language learning skills (Patni & Patni, 2017).

Being applied both online and offline for language learning purposes, the app has approximately 500 interactive audio and video lessons and engaging practice games for reading, writing, and speaking activities. Learners can connect with other English language learner partners to have interactive speaking activities outside the class. Learners can also record their interactive speaking activities to check and view several times in order to concentrate and work on their speaking-related issues. The HE app can also provide learners with timely feedback and tips addressing their speaking skills, and give them relevant tests and quizzes to track their speaking progress over time. The in-built dictionary of the app has over 10,000 English words which can contribute to learners' language learning and speaking processes as well. Specifically, the voice recognition affordance of the HE app could be utilised by learners to improve their speaking skill in general and their pronunciation in particular. The app is also equipped with a helping affordance that helps learners get the answers to their language learning issues within 24 hours. Engaging assignments are also available for learners to encourage them to keep their language learning. That is, the app

provides learners with language learning and speaking activities that are more personalised, which can continue to engage learners in language learning and speaking practice. Whilst HE is just one instance of MALL, it is a widely used and popular app in the context of English language learning. The HE app has been downloaded around 50 million times from Google Play Store, indicating its widespread use and potential impact on language learning. Figure 2 displays some snapshots of the HE app environment.

Figure 2. Snapshots of the HE app environment.



Several studies have been conducted to examine the utilisation of the HE app's affordances for improving learners' language learning skills (Fadillah & Cahyaningrum, 2022; Ginting, 2019; Nurtriyanto, 2020; Seroja & Fithriani, 2021; Simanjuntak et al., 2022). Zakiyah (2020), for one, reviewed a number of studies examining the impact of HE affordances on improving EFL learners' vocabulary and grammar. The results of the review indicated that the utilisation of the HE affordances, such as its gamified language learning activities and supplementary materials and tests, could improve EFL learners' vocabulary and grammar knowledge to a great extent.

Ginting and Fithriani (2021) investigated the use of the HE affordances for developing Indonesian EFL learners' vocabulary learning by applying a quasi-experimental research design. The app provided regular vocabulary lessons each day to help the learners enhance their vocabulary knowledge. Additionally, the vocabulary lessons were supported with some gamified lessons and tests to engage the learners in vocabulary-based activities. A vocabulary-based multiple-choice test, used for data collection purposes, indicated that the HE affordances enhanced the EFL learners' mastery of vocabulary. Furthermore, Nurtriyanto (2020) explored Indonesian EFL learners' perceptions of the HE affordances. Collecting the required data via observation and interview, the findings indicated the EFL learners' positive attitudes towards and perceptions of the utilisation of HE affordances for their language learning.

Following Saito et al. (2018), learners' motivation and engagement influence their speaking skills; as a result, learners' motivation and engagement need to be examined in the MALL context to check their role in learners' interactive speaking activities. In this study, we also explored the role of EFL learners' FLE and LSG, regarded as learners' motivation and engagement (Dewaele & MacIntyre, 2014, 2016; Duckworth & Gross, 2014), in facilitating their MALL-based interactive speaking activities.

2.4. FLE

According to Dewaele and MacIntyre (2014), enjoyment is "a complex emotion, capturing interacting components of challenge and perceived ability that reflects the human drive for success in the face of a difficult task" (p. 216). Based on this definition, enjoyment is regarded not only as the pleasure the learners possess in doing a learning task but also as a personal investment to accomplish the learning task. Dewaele and MacIntyre (2016) argued that FLE has both social components, such as the learning context (i.e. the classroom atmosphere) and other peers and teachers with whom the learners communicate and private components, such as personal motivation and reactions to learning processes. Dewaele and MacIntyre (2014) suggest that learners with higher FLE, stemming from their notable language learning accomplishments, tend to exhibit greater activity and motivation in language classes. Additionally, such learners experience higher satisfaction and pride in their language achievements, nurturing their willingness to explore further interesting topics. According to Dewaele and MacIntyre (2014), learners' FLE can positively affect their mastery of the foreign language and their positive roles in interactive learning activities.

Several studies have addressed learners' FLE in online environments (Dewaele et al., 2022; Lee & Lee, 2021; Thumvichit, 2022; Wang et al., 2021; Yuan, 2023). Resnik and Schallmoser (2019), for example, explored the impact of e-tandem language learning on language learners' FLE. English language learners in the United States communicated with German language learners in the United Kingdom and the United States. Similar to the MALL-supported instruction, the learners in the e-tandem language learning class could have interactive speaking activities with other learners to improve their speaking performance. Gathering the required data via in-depth interviews, the findings revealed that learning a language through e-tandem contributed to the language learners' FLE. For instance, authentic conversations in the target language with native speakers online, receiving electronic feedback from their online partners, learning about the cultural elements of other speakers, and improving the language learning made the learners experience more FLE.

Lee and Lee (2021) also examined the relationship among informal digital learning of English, ideal L2 self and ought-to L2 self with both South Korean EFL middle school and university students' FLE. Ideal L2 self is referred to as "the L2-specific facet of one's ideal self" and ought-to L2 self is "the attributes that one believes one ought to possess to meet expectations and to avoid possible negative outcomes" (Dörnyei, 2009, p. 29). Like MALL-based instruction, the learners in Lee and Lee's study could have out-of-class language learning activities. Applying the survey research method, Lee and Lee indicated that informal digital learning of English and ideal L2 self strongly predicted both the middle school and university students' FLE. Lee and Lee argued that the students' online, out-of-class activities and their motivational mindset, including ideal L2 self and ought-to L2 self, substantially contribute to the students' motivation and engagement in learning their target language (i.e. FLE).

Moreover, Lee et al. (2022) checked if FLE could have a mediating role between the two factors of informal digital learning of English and the willingness to communicate with Hong Kong EFL learners both in and outside the classroom. Like the MALL-based apps, the learners in Lee et al.'s study could have out-of-class communication with other peers. The findings indicated that teacher appreciation, and personal and social enjoyment, as components of FLE, mediated the relationship between informal digital learning of English and willingness to communicate inside the classroom. However, only personal and social enjoyment mediated the relation between informal digital learning of English and willingness to communicate outside the classroom. Further analyses also indicated that personal enjoyment played a greater role in mediating the aforementioned relationship than teacher appreciation and social enjoyment.

2.5. LSG

Grit is a compound personality trait that is usually indispensable to individuals' successful performance in different academic domains (Credé et al., 2017). Following Duckworth et al. (2007), grit, especially LSG, could be conceptualised by both "perseverance and passion for long-term goals" (p. 1087). That is, both determination to accomplish something difficult (i.e. PE) and continuous devotion to a worthwhile goal (i.e. CI), as two key dimensions of grit, are the qualities that distinguish successful and unsuccessful learners (Duckworth & Gross, 2014). As language learning is characterised as a long-term goal, learners' language learning achievement requires perseverance and consistency to achieve the learning goals.

Some studies have addressed the role of grit in learners' learning performance (Gao et al., 2022; Lee, 2022; Sudina & Plonsky, 2021; Sudina et al., 2021; Teimouri et al., 2022). For

instance, Aparicio et al. (2017) examined the relationship between grit and satisfaction with e-learning success of undergraduate, masters and PhD students from different European countries via structural equation modelling. Similar to the affordance of the MALL apps, the learners, applying the e-learning language learning programme, could communicate with other learners anytime and anywhere. The findings indicated that the students' grit had a significant impact on their satisfaction with e-learning language learning activities. The findings implied that the students' attitudes towards and perceptions of e-learning programmes strongly affected their learning performance, task productivity, and the usefulness of the e-learning system. Therefore, the learning environment needs to be engaging and satisfactory for students in order to contribute to their aforementioned variables.

In much the same vein, Gao et al. (2022) explored the effects of grit on Chinese EFL learners' learning performance in an online learning context. Applying a grit scale, the learners were divided into high-grit learners and low-grit learners. The findings indicated that the gritty learners (i.e. the learners who received a high mark on the grit scale) were more actively engaged in various online activities and they tended to apply more sustained effort to deal with difficult learning tasks. As for the link between LSG, comprising PE, CI, and communication, Lee (2022) examined whether EFL learners' grit and their willingness to communicate are related. Both middle school and university students studying in a Korean EFL context participated in the study. The findings demonstrated that PE (as a subcomponent of LSG) predicted all the students' willingness to communicate, whilst CI (as another subcomponent of LSG) did not predict all the students' willingness to communicate. The findings imply that gritty learners are more willing to participate in communicative speaking activities.

3. The current study

As the foregoing literature review has shown, MALL apps have a positive impact on EFL learners' speaking performance (Kartal, 2022; Sun et al., 2017) and their attitudes towards and perceptions of online speaking activities (Nurtriyanto, 2020). Additionally, FLE and LSG have been reported to have a positive impact on EFL learners' language learning performance in online environments (Aparicio et al., 2017; Gao et al., 2022; Lee & Lee, 2021; Lee et al., 2022). However, no systematic attempts seem to have been carried out so far to explore the use of the HE affordances, a MALL-based app, for improving EFL learners' speaking skills, FLE, and LSG. To address these research lacunas, we initially quantitatively investigated the

use of the MALL affordances for developing EFL learners' speaking skills (i.e. fluency and coherence, lexicon, grammatical range and accuracy, and pronunciation).

These speaking subskills are based on the International English Language Testing System (IELTS) speaking checklist which helps evaluate IELTS candidates' proficiency in spoken English more accurately. Speaking fluency and coherence examine learners' ability to use utterances smoothly and without hesitation and their ability to maintain a coherent and continuous flow of speech. Lexicon checks learners' use of an acceptable range and variety of vocabulary, collocation, idioms, verbal phrases, and other vocabulary expressions accurately and appropriately. Grammatical range and accuracy investigate learners' utilisation of an acceptable range and variety of accurate and appropriate grammatical structures and punctuation. Finally, the pronunciation subskill examines learners' segmental and suprasegmental pronunciation features, such as word pronunciation, stress, intonation, and rhythm (University of Cambridge English for Speakers of Other Languages Examinations, 2011). Checking the aforementioned speaking subskills, we aimed to provide a detailed and comprehensive evaluation of the EFL learners' spoken English.

Whilst some previous studies have explored the effectiveness of the MALL app's affordances for English speaking performance, this study specifically focused on the speaking-related affordances of the MALL app, such as voice recognition, game-based speaking activities, conversational lessons, video recordings, personalised speaking activities, and speaking quizzes, to examine their effects on EFL learners' IELTS speaking skills. Moreover, our study aimed to contribute to the literature by examining the utilisation of the MALL affordances for other important factors, such as FLE and LSG. We believe that this is an important aspect to investigate as these factors can significantly impact EFL learners' motivation and engagement in language learning, which in turn can affect their language learning outcomes. This study offers a unique contribution by focusing specifically on the utilisation of MALL affordances and exploring their potential impact on both speaking and two notable positive psychology factors (i.e. FLE and LSG) in an interactive speaking setting, which can have practical implications for language instructors and learners alike. At the end, we further qualitatively explored the learners' attitudes towards and perceptions of the MALL interactive speaking activities to shed more light on the findings of the study. To address the purposes of the current study, the following research questions were postulated:

1. Compared to face-to-face-only instruction, how effective is the instruction supported by a MALL app's affordances in terms of developing EFL learners' speaking skills, FLE, and LSG?

2. What are EFL learners' attitudes towards and perceptions of the utilisation of a MALL app's affordances for interactive speaking activities?

The current study presents novel contributions to the field, particularly we followed a microgenetic examination by focusing on the gradual progression of EFL learners' speaking skills (including fluency and coherence, lexicon, grammatical range and accuracy, and pronunciation) from other-regulation to self-regulation within the MALL speaking environment. Unlike static assessments, this approach capitalised on the developmental patterns over time to explore the intricate dynamics of speaking skill development in response to MALL interventions. Following Aljaafreh and Lantolf's (1994) microgenetic model, we systematically assessed the learners' implicit/explicit speaking mediation which led to their developmental stages in speaking skills within the MALL setting. This structured framework provided insights into how the learners responded to speaking mediation which contributed to our understanding of speaking skill acquisition and progression.

Going beyond mere effectiveness evaluations, the current study also explored the learners' attitudes towards and perceptions of the MALL interactive speaking activities to get more insights into their preferences and motivations. This comprehensive exploration enriched our understanding of the learners' experiences within the MALL context and proposed invaluable insights into their speaking engagement and learning. This study also deepened our understanding of how positive emotions and perseverance affected EFL learner engagement in speaking courses. That is, by elucidating the impact of FLE and LSG, this study contributed to our understanding of EFL learner motivation and commitment to speaking tasks. On the other hand, by emphasising the interplay between FLE and LSG, we highlighted their collective impact on contributing to EFL learners' speaking skills.

As for the MALL app's affordances, the extensive provision of audio and video lessons, and adaptive affordances ensured a diversified learning experience by taking different learning styles and preferences into account. For example, various affordances, such as voice recognition, feedback mechanisms, gamified lessons, and quizzes, adapted to the learners' unique styles, which could develop their engagement in the interactive speaking activities. Additionally, facilitating collaborative speaking activities beyond the classroom setting, fostered an immersive learning environment and encouraged practical application of speaking skills. Whilst a specific app was used in this study, the term the app's affordances was deliberately utilised to capitalise on the broader applicability of the affordances inherent in various apps. The emphasis is not on the unique characteristics of the chosen app but rather on the generalisable utility of its affordances. The study deliberately avoided foregrounding

the specific app and, instead, directed attention to the overarching relevance and importance of these affordances in contributing to out-of-class interactive speaking activities. This ensured that the findings were conducive to broader English language contexts and apps beyond the confines of the specific technology adopted.

4. Methodology

4.1. Research design

Following Creswell et al. (2003), the sequential explanatory design of mixed methods was utilised in the current study to collect and analyse the required data both quantitatively and qualitatively. Based on this research design, a quantitative paradigm was initially implemented to collect and analyse the data followed by a qualitative paradigm for data collection and analysis. The purpose of the subsequent qualitative paradigm for data collection and analysis was to give further explanation of the quantitative findings so that we could shed more light on the findings of the study. For the quantitative paradigm, pre- and post-measurements were carried out (Friedman et al., 2010). The pretest assessments were administered prior to the intervention, specifically during the first session. Subsequently, the post-test measurements were carried out during the final session. As for the qualitative paradigm, we carried out individual semi-structured interviews with the group that was more successful in speaking skills, FLE, and language-specific learning tasks so that we could further explain the quantitative findings.

4.2. Context and participants

The sample included EFL learners who were taking an IELTS language learning course to improve their English language skills and prepare for the IELTS examination. In the current context, especially some developed private language institutes (like the present setting), the incorporation of technologies in the language learning setting occurs very scarcely and instructors would usually follow the rather conventional method of communicative language teaching by grouping language learners and assigning them different cooperative language learning tasks to accomplish. The learners usually encounter a limited amount of time to accomplish cooperative language learning tasks. Additionally, different rules of how to communicate with other peers are not explained for the learners to do the tasks appropriately. In this study, we incorporated a MALL app in one of the groups and encouraged the learners to utilise the various affordances of the app for doing their interactive speaking activities. Moreover, following Vygotsky's theory, the techniques of how to engage in interactive speaking activities were elaborated for the learners in both groups to present a new method for teaching speaking skills on the one hand, and to find a better instructional procedure to

develop EFL learners' speaking skills between MALL and conventional instruction on the other hand.

The participants were a number of 66 EFL learners who were enrolled in an intense IELTS language learning course in a language institute centre in Iran. The learners' English proficiency level was checked through the language centre's placement test. DIALANG, which is an online assessment platform, further confirmed that the learners' English proficiency level was B1 following the standards of the Common European Framework of Reference (CEFR). Once enrollment was completed, we conducted blocked randomisation using computer-generated random numbers. This ensured equal distribution of participants across the MALL and face-to-face groups. The process resulted in an equal number of learners in the MALL group and the face-to-face group. A total of 33 participants were assigned randomly to the MALL group (mean age = 24.13, *SD* = 3.21; 56.21% female), and the face-to-face group also consisted of 33 participants (mean age = 23.86, *SD* = 3.47; 52.76% female).

To assess the adequacy of our sample size, we conducted a power analysis based on Faul et al.'s (2007) guidelines. In their study, they recommended a minimum power of .80, a significance level of .05, and an effect size of .30 as a moderate effect. Using these parameters, we conducted a power analysis with G*Power software to determine the adequacy of our sample size. The power analysis indicated that with our sample size of 66 participants (33 in each group), we achieved a power of .83, which exceeds the recommended power level of .80. This suggests that our sample size is adequate to detect a moderate effect size with a significance level of .05.

One of the researchers, as an experienced instructor in using online platforms for English language teaching, was the course instructor in both groups (henceforth referred to as the researcher/instructor). However, attempts were made by the researcher/instructor to teach based on the pre-specified instructional procedures determined for each group (i.e. all the variables were controlled, only for the incorporation of the app in one of the groups). On the other hand, as the pre- and posttest results of the learners in both groups were rechecked by another debriefed researcher and compared with those of the researcher/instructor, the subjectivity of the findings was diminished to a great extent. The participating EFL learners stated that they had not used MALL apps for any interactive English language courses before. Before embarking upon the study, the learners were provided with a general overview of the research procedures, and their informed consent was obtained. Moreover, they were assured

that all the collected data were used only for research purposes and would remain completely confidential.

4.3. Materials and data collection instruments

4.3.1. Speaking for IELTS (Collins English for exams)

Speaking for IELTS (Collins English for exams) developed by Kovacs (2011) was employed for the two groups' speaking courses. This book is designed for intermediate and upper-intermediate English language learners who want to prepare themselves, specifically for the IELTS speaking examination so that they could display the required skills to communicate effectively in English. Whilst the learning materials used in our experiment were at the intermediate and upper-intermediate levels, they were still appropriate for B1-level learners as they provided opportunities for them to practise and develop their speaking skills, which was the main focus of the current study.

The book contained different conversation activities, exercises, and practices to engage the learners in interactive speaking activities that aligned with the learning objectives of the study. Additionally, the MALL app was utilised as a supplementary tool to provide the learners in the MALL group with further opportunities for interactive speaking practice and to enhance their learning experience outside the classroom. The app's content and affordances were aligned with the coursebook's topics and exercises, which aimed to reinforce the learners' understanding and app of English language skills. Although the coursebook was not very directly associated with the functionality of the MALL app, it provided a framework for the speaking tasks that were used in both the MALL and face-to-face groups. As such, the coursebook was chosen based on its suitability for the language level of the participants and its relevance to the IELTS speaking exam, which was the ultimate goal of the course.

During the experiment, the focus of the class was on the interactive speaking tasks and the learners' performance in these tasks. However, it is important to note that the class also covered other aspects of language learning, such as listening, reading, and writing skills (see Appendix A for a sample of the teaching material). These topics were covered in the same way for both groups to ensure that the overall language learning experience was comparable. The rest of the class was structured in a way that allowed for a balance between the interactive speaking tasks and other language learning activities. For instance, the class could have started with a listening activity followed by interactive speaking tasks. After the speaking tasks, the learners could have worked on some reading and writing activities related to the speaking topics covered in the class.

4.3.2. Speaking skill test

The EFL learners' speaking skills were assessed using pre- and post-tests by the researcher/instructor and one more trained, experienced, and debriefed rater in an exam session that took approximately 15 minutes. IELTS speaking test topics for the exam session were selected from the Cambridge IELTS speaking test book. The speaking test topics for the exam session were utilised verbatim, sourced directly from the Cambridge IELTS speaking test book. The speaking test included three sections: Section 1 gave the learners four or five minutes to talk about some general topics, such as their studies and interests; Section 2 gave the learners three or four minutes to discuss a particular topic presented on a card and some related questions; section 3 gave the learners four or five minutes to talk about abstract issues of the speaking topic in section 2. The same procedures along with identical topics were used to examine both MALL and face-to-face groups' speaking skills in pre- and posttests (see Appendix B for a sample of the pre- and posttests).

The IELTS speaking skill checklist was utilised to check the participating EFL learners' speaking skills. The evaluated speaking skills were fluency and coherence (i.e. the ability to link ideas together and produce speech at a normal rate without hesitations), lexical resources (i.e. the ability to use accurate, appropriate and various vocabulary items and idiomatic expressions), grammatical range and accuracy (i.e. the ability to utilise a wide range of accurate grammatical structures), and pronunciation (i.e. the ability to accurately apply British or American English pronunciation features). The IELTS Speaking Band Descriptor was employed to measure each learner's marks in the aforementioned areas. The learners were given a mark from 1 to 9 for fluency and coherence, lexical resources, grammatical range and accuracy, and pronunciation. The marks were then added up and divided by 4 to produce each learner's average mark for speaking skills. To diminish the subjectivity of the marking process, inter-rater reliability was applied, using Kendall's tau-b correlation coefficient, the results of which indicated a consistency value of .82.

4.3.3. Foreign language enjoyment scale

Foreign language enjoyment scale was used to check the learners' FLE before and after conducting the treatment (see Appendix C). The questionnaire was first developed by Dewaele and MacIntyre (2014) and included 21 items. The questionnaire was then adapted and validated by Jiang and Dewaele (2019), diminishing the number of items to 10 that addressed the social and private aspects of FLE. Hence, Jiang and Dewaele's (2019) adapted validated questionnaire was used in the current study which comprised 10 items and was checked via a 5-point Likert scale which ranged from 1 (*strongly disagree*) to 5 (*strongly*

agree). Jiang and Dewaele (2019) divided the scale into a two-level construct of social and private enjoyment and corroborated its psychometric properties. The internal consistency of the scale was calculated via Cronbach's Alpha, indicating a high-reliability coefficient of .89. This scale was given to the MALL and face-to-face groups both before and after conducting the instructional procedures. That is, the same scale was utilised as the pre- and posttest to check the MALL and face-to-face learners' FLE before and after the instruction.

Whilst the scale predominantly concentrated on activities within the classroom setting, it also encompassed the broader experiences of learners within the speaking class. That is, although the scale does not explicitly target out-of-class self-learning activities, it is crucial to capitalise on the validity and broader applicability of the scale in assessing enjoyment within the broader context of language learning, acknowledging that enjoyment in language learning is not limited solely to classroom activities (Dewaele & MacIntyre, 2014). Furthermore, following Dewaele and MacIntyre (2014), the scale's scope includes both social and private aspects of enjoyment which highlights the fact that enjoyment in language learning is multifaceted and extends beyond the boundaries of the classroom. Whilst the primary intent of our study was not just concentrated on out-of-class learning activities, the FLE scale comprehensively investigated the learners' enjoyment within the broader spectrum of language learning experiences and encompassed both in-class and out-of-class engagements.

4.3.4. Grit scale

The Grit scale, developed and validated by Duckworth et al. (2007), was applied in this study. The scale included 10 items which were evaluated on a 5-point Likert scale ranging from 1 (i.e. *not like me at all*), to 5 (i.e. *very much like me*) (see Appendix D). The scale assessed two underlying components of PE (five items) and CI (five reverse-scored items) in reaching ultimate goals. The internal consistency of the scale was calculated through Cronbach's Alpha, revealing a high-reliability coefficient of .88. This scale was applied as the pre- and posttests to examine the MALL and face-to-face learners' LSG before and after the instruction.

The scale also had some less relevant items, such as items relating to goal setting and project completion. The purpose was to offer a comprehensive evaluation of grit, encompassing both the PE and CI aspects as originally conceptualised by Duckworth et al. (2007). That is, the incorporation of such items was not to scrutinise particular, tangible achievements within the instructional context, but to examine the learners' subjective and general perceptions and inclinations regarding the establishment and perpetuation of long-term objectives and interests, as the fundamental constituents of grit.

4.3.5. Individual semi-structured interviews

Eight EFL learners in the MALL class were also interviewed to explore their attitudes towards and perceptions of the effects of MALL on their interactive speaking skills on the one hand and to explore why they performed better than the face-to-face learners in the quantitative part of the study on the other hand (see Appendix E for the interview questions). Given that the quantitative findings demonstrated the superior performance of MALL learners compared to their face-to-face counterparts in speaking skills, we conducted interviews with the aforementioned eight MALL learners. This aimed to provide detailed insights into the learners' successful engagement with MALL-supported interactive speaking activities. The participants were selected based on their availability and willingness to participate in the interview. The interviews were conducted individually and were semi-structured to allow for a more in-depth exploration of the participants' experiences.

Caution was exercised to select MALL learners who got either low, mid, or high marks in the speaking test, conducted after the treatment, to seek various attitudes and perceptions. The EFL learners' first language (i.e. Persian) was utilised to carry out the interviews so that the learners could easily express their deep feelings and emotions about the course and provide the researcher/instructor with the necessary information. Each interview taking approximately 30 minutes, was recorded, transcribed, and translated into English by the researcher/instructor for data analysis. The names of the participants were kept anonymous to preserve confidentiality. Using a member-checking technique (Creswell, 2007) to check the credibility of the transcripts, the researcher/instructor returned the English transcripts to the learners to either confirm or make changes, if needed.

4.4. Procedure

4.4.1. MALL class

To familiarise the EFL learners with the MALL app, a brief instruction was initially given by the researcher/instructor on how to apply its different affordances for interactive speaking activities. As this study was conducted in Iran, it was not possible for the learners to purchase the premium version of the app due to sanctions and restrictions on financial transactions. Therefore, all participants utilised the free version of the app, which did not have any premium affordances. For each session, a speaking task was given following the coursebook, and the learners were supposed to work on the task interactively. The learners were divided into groups of three or four to discuss the speaking topic and accomplish the required speaking task collectively, and the researcher/instructor acted as a facilitator to contribute to the learners' interactive speaking activities. This means that the researcher/instructor

introduced the speaking topics, involved the learners in brainstorming activities to familiarise the learners with the topics, monitored the learners' subsequent interactive speaking activities, offered support and advice when necessary, and mediated the learners' speaking skills based on Aljaafreh and Lantolf's (1994) microgenesis model. For the brainstorming activities, the researcher/instructor involved the learners in a class discussion to gather as many ideas as possible about the speaking topic. All the speaking ideas, generated by the learners, were written on the board to contribute to the learners' subsequent interactive speaking tasks.

The learners utilised the MALL app outside the class to have further interactive speaking activities with their peers. In addition to the offline option of the app for language learning purposes, the learners could use the app online and conveniently interact with their peers outside the class. The app had a built-in affordance that allowed the learners to engage in interactive speaking activities with their peers in real time via voice and text messaging. During the interactive speaking activities, the learners were able to see and hear each other through the app's video conferencing service, which provided a virtual space for them to practise their speaking skills. The learners could also use the app to record and play back their own speaking to self-assess and receive mediation from their peers. The learners in the MALL group were also instructed not to use any other language learning apps or materials during the study to ensure that the utilisation of the MALL app was the only intervention that could impact the learning outcomes. Furthermore, the researcher/instructor monitored the learners' use of the app's affordances via the app's log data and found that the learners who did not use the app regularly or who stopped using it during the study did not have a significant impact on the study results.

The MALL learners' out-of-class activities included the practice of speaking skills with other peers or the engagement in other language learning activities. The learners used the app daily, and on average, each session lasted approximately 60 minutes. During this time, the learners engaged in interactive speaking activities with their peers. The learners could practise on their own and collaborate with their peers outside of class time. In their out-of-class practice sessions, the learners set up group chats and virtual meetings to practise speaking skills together and also used the app's audio and video calling affordances to practise with their peers. The learners also used the app's interactive games and quizzes to reinforce their learning and practise their speaking skills.

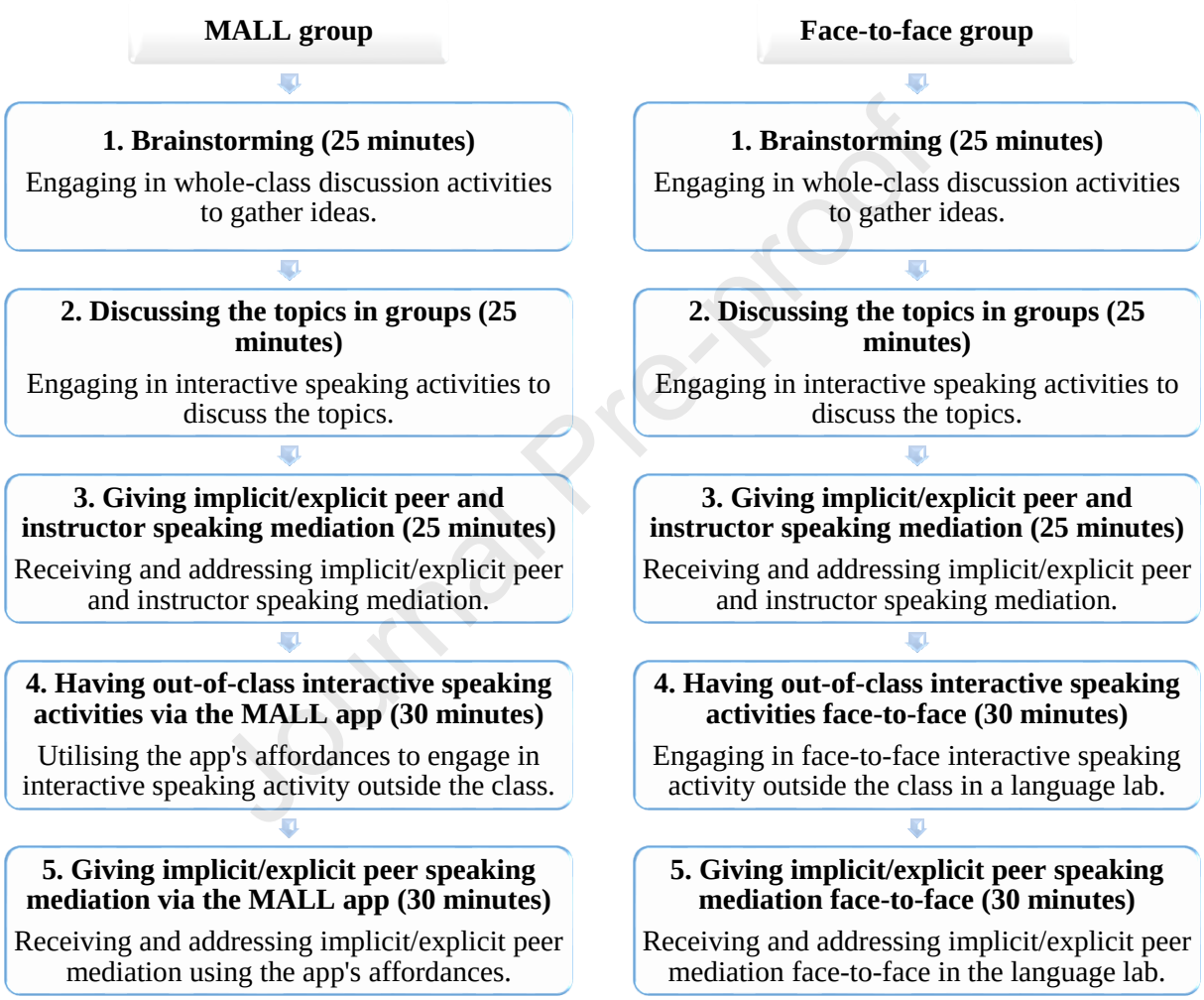
4.4.2. Face-to-face class

The same speaking tasks were also given to the face-to-face EFL learners which were designed to be aligned with the language learning objectives of the coursebook. Similar to the MALL class, the tasks in the face-to-face class included different types of speaking activities, such as role-plays, debates, discussions, and presentations, and were intended to promote interactive speaking skills among the learners. In each session, the researcher/instructor introduced the speaking task to the learners and provided them with the necessary instruction and guidelines. Like the MALL learners, the face-to-face learners were divided into groups of three or four to discuss the related speaking topic following the coursebook instruction. Although in contrast to the MALL group, no games were adopted in the face-to-face group during the implementation of the speaking tasks, the face-to-face learners were required to complete the same speaking task during the same session and in the same amount of time, following the same instruction and guidelines provided by the researcher/instructor. Similarly, the researcher/instructor acted as a facilitator in the face-to-face class, providing support and mediation to the learners to enhance their interactive speaking activities. The researcher/instructor monitored the learners' interactive speaking activities, offered suggestions for improvement, and encouraged the learners to engage actively in the interactive speaking tasks. By implementing the same speaking tasks in both groups, we aimed to create a level playing field for the learners, ensuring that they had equal opportunities to develop their interactive speaking skills, regardless of their learning environment.

The face-to-face learners were also required to engage in the same interactive speaking activities as the MALL learners outside the class. However, in contrast to the MALL learners, the face-to-face learners did not use the MALL app for their interactive speaking activities; rather, they had conventional face-to-face interactive speaking activities in a language laboratory outside the class. The learners were encouraged to engage in out-of-class interactive speaking activities with their peers by meeting up in person in a language laboratory. The laboratory was equipped with audio and video recording devices, which allowed the learners to record their conversations and listen to them later. Each group was assigned a specific time slot to use the laboratory and practise their speaking skills. During this time, the learners could choose a speaking topic from the coursebook and engage in interactive speaking activities with their peers. The learners could take turns speaking and listening, providing implicit and/or explicit peer mediation on each other's language use. The learners were encouraged to find language exchange partners outside the class and practise their speaking skills with them. They could arrange to meet in person or use video

conferencing tools to interact with their partners online. The researcher/instructor was also present during these sessions to provide guidance and support to the learners as needed. These out-of-class activities aimed to provide additional opportunities for the learners to practise their speaking skills in a natural setting and to encourage collaboration and implicit and/or explicit peer mediation. Figure 3 shows the processes involved in accomplishing a speaking task in both the MALL and face-to-face classes.

Figure 3. The processes of doing speaking tasks in both MALL and face-to-face classes.



4.4.3. Fairness of treatment in both groups

Both groups were required to devote at least 60 minutes to each session of the outside-class interactive speaking activities and at least 2-2.5 hours to practising conversation skills in total (i.e. practising conversation skills occurred both in and outside the class). To ensure that learners in both groups had an equal amount of time to engage in out-of-class speaking activities, the learners in the face-to-face class were provided with a set of supplementary materials and activities that were similar in scope and type to those available to the MALL group. Additionally, to ensure the fairness of the conditions, the researcher/instructor

periodically checked the progress and performance of the face-to-face group to ensure that they were making similar gains in their speaking skills as the MALL group. For example, to ensure that the MALL group did not have an unfair advantage over the face-to-face group, the researcher/instructor instructed the MALL group to limit their use of additional resources to those related to the coursebook, and to report their usage of such resources in their weekly diaries. The face-to-face group, similarly, was instructed to only use the resources provided by the researcher/instructor and to report their use of the app's affordances in their weekly diaries.

Furthermore, each learner in each group was required to write a short diary entry on how they had practised English speaking outside the class, and to mention the approximate time they spent applying MALL or face-to-face discussions during each week. The learners emailed their short diary entries to the researcher/instructor every Thursday evening at the latest. The diaries were checked by the researcher/instructor to ensure that the learners were engaged in similar activities outside class. The MALL learners' use of the app's affordances was monitored and analysed via the diaries, self-evaluation and reflection, and usage tracking and log data through which we tracked the number of times the learners engaged in interactive speaking activities, the duration of each session, and the specific affordances they utilised, such as voice and text messaging, video conferencing, and self-recording. the following bullet points present various factors and measures that were taken into consideration to ensure the fairness of the treatment received in both the MALL and face-to-face groups:

- *Coursebook utilisation:* The same coursebook was employed, ensuring uniformity in content coverage, task variety, and learning objectives.
- *Speaking task consistency:* The speaking tasks were comparable in terms of difficulty level, cognitive demands, and linguistic components.
- *Equitable task processes:* The same speaking tasks during the same sessions, following identical instructions and guidelines, were provided.
- *Equitable mediation:* Following the current abilities, identical peer and instructor speaking mediation was provided both in and outside class.
- *Supplementary materials:* Analogous supplementary language learning resources were provided either within the app or in printed form.
- *Additional resources:* The utilisation of additional resources was limited to those directly associated with the coursebook.

- *Diary writing evaluation:* The diaries about the duration and amount of out-of-class interactive speaking activities were checked.
- *Monitoring and assessment:* Regular monitoring and assessment of the utilisation of the app and in and out-of-class speaking interactions were checked.

4.4.4. Interactive speaking task design

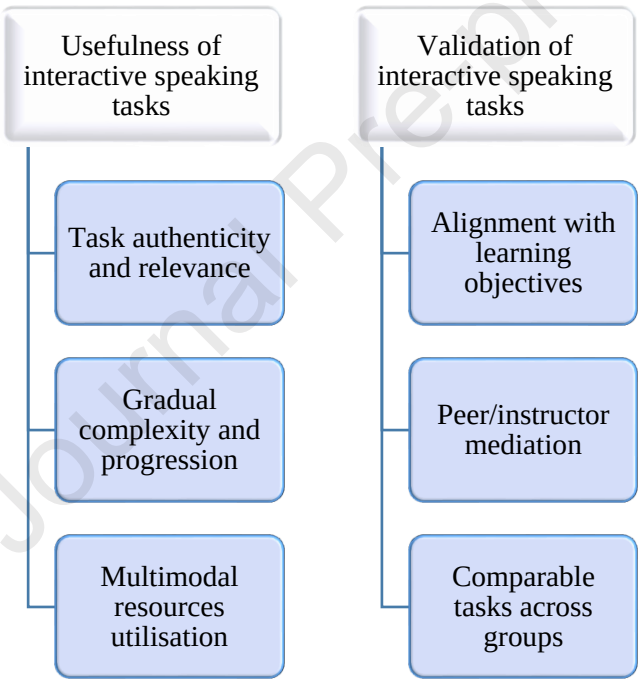
The researcher/instructor assigned the topics of conversation on a weekly basis. To ensure that the interactive speaking tasks were implemented in the same way for both groups, the same coursebook was used for both the MALL and face-to-face learners. Each speaking task was selected from the same unit of the coursebook for both groups, and the tasks were designed to be comparable in terms of difficulty level and the types of speaking skills they required. For example, one task involved describing a picture and answering questions about it. We made sure that both groups were given the same picture to describe and the same set of questions to answer. Another task involved role-playing a conversation between two people. We made sure that both groups were given the same scenario to role-play and the same dialogue to follow. Other sample speaking topics were as follows:

a) Asking and responding to questions related to names, hometowns, ages, and hobbies.
b) Talking about family, clothes, workplace, jobs, daily activities, and people's clothes.
c) Describing people or places.
d) Discussing social events.

A number of criteria were also taken into account to justify the usefulness of the interactive speaking tasks. For instance, the interactive speaking tasks were meticulously designed to reflect real-world communicative situations. To this end, each speaking task addressed specific language functions and structures relevant to everyday conversations. For example, the learners took part in some interactive speaking activities, such as role-plays, discussions, and presentations, that simulated everyday conversations. In addition, the interactive speaking tasks followed a mediation approach, gradually increasing in complexity to accommodate the learners' speaking skill development. Starting with basic interactions and progressing to more intricate dialogues, the provision of implicit and/or explicit mediation allowed the learners to build confidence and competence over time. Further, the interactive speaking tasks provided resources, such as text, audio, and visual stimuli, to create a rich language learning environment. By engaging multiple senses, the learners were better equipped to understand the context, enhance their lexicon, and improve their pronunciation.

Moreover, to ensure the validity of the interactive speaking tasks, several measures were taken into consideration. The speaking tasks targeted specific linguistic and pragmatic competencies of the coursebook, addressing fluency, lexicon, grammatical accuracy, and pronunciation features. Additionally, frequent assessments were conducted throughout the study which allowed the learners to receive immediate mediation on their speaking performance. Both peer and instructor mediation were provided to address the learners' speaking skills. On the other hand, the tasks were designed in a way to minimise task differences in terms of complexity, content, and language skills. Figure 4 presents different factors considered to justify the usefulness and validity of the interactive speaking tasks in the current study.

Figure 4. Different measures considered to ensure the usefulness and validity of the interactive speaking tasks in both groups.

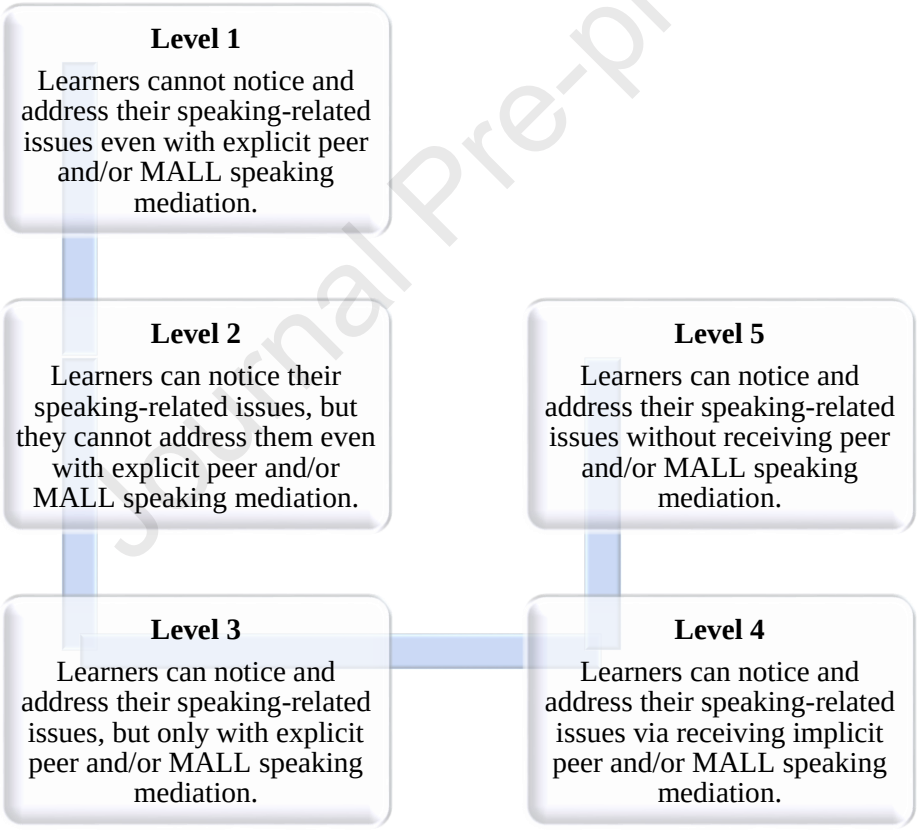


4.4.5. Peer/instructor mediation

Moreover, based on Aljaafreh and Lantolf's (1994) microgenesis, implicit and explicit mediation, the learners in both groups were provided with the same amount of implicit and/or explicit peer and instructor mediation and correction during the speaking tasks in and outside the class. The researcher/instructor aimed to follow a standardised protocol for giving mediation and correction to ensure that both groups received similar levels of support. As for the inside-the-class mediation, the MALL and face-to-face learners provided and received peer and instructor mediation on the class-based interactive speaking tasks. Both groups also provided and received out-of-class peer and instructor mediation on the out-of-class

interactive speaking tasks. Although following their speaking abilities and improvement, the content of the out-of-class mediation for both groups was identical, the MALL learners provided and received implicit and/or explicit peer mediation via the MALL app, whilst the face-to-face learners provided and received implicit and/or explicit peer mediation in person in the laboratory. Therefore, based on each learner's speaking abilities and improvement, we controlled the content of the mediation to precisely check the differences between the means of communication (i.e. the MALL or face-to-face instruction). Figure 5 demonstrates the criterion for both groups' peer and/or MALL speaking mediation based on Aljaafreh and Lantolf's (1994) model of microgenesis, showing how the learners moved from other-regulation (i.e. relying on peer and/or MALL speaking mediation) to autonomous functioning (i.e. not relying on peer and/or MALL speaking mediation).

Figure 5. The gradual provision of peer/MALL speaking mediation in both groups.



The social constructivist theory was adopted in both groups to involve the learners in in-class collaborative speaking activities role-plays, debates, and discussions, and out-of-class language exchange partners, and online peer interactions facilitated through the MALL app. Microgenesis, as a component of the social constructivist theory, encompassed the incremental implicit/explicit peer/instructor mediation both in face-to-face speaking tasks during the class time and via MALL or in lab speaking tasks outside the classroom. ZPD, as

another central point in the social constructivist theory, showcased the learners' attempt to move from other-regulation (collaborative speaking activities supported by other peers and MALL app in and outside the class) to self-regulation leading to ZDD where the learners could perform the speaking tasks autonomously, without receiving implicit/explicit speaking mediation. Table 1 presents a complete picture of how we integrated the social constructivist theory in all the in-class and out-of-class speaking activities.

Table 1

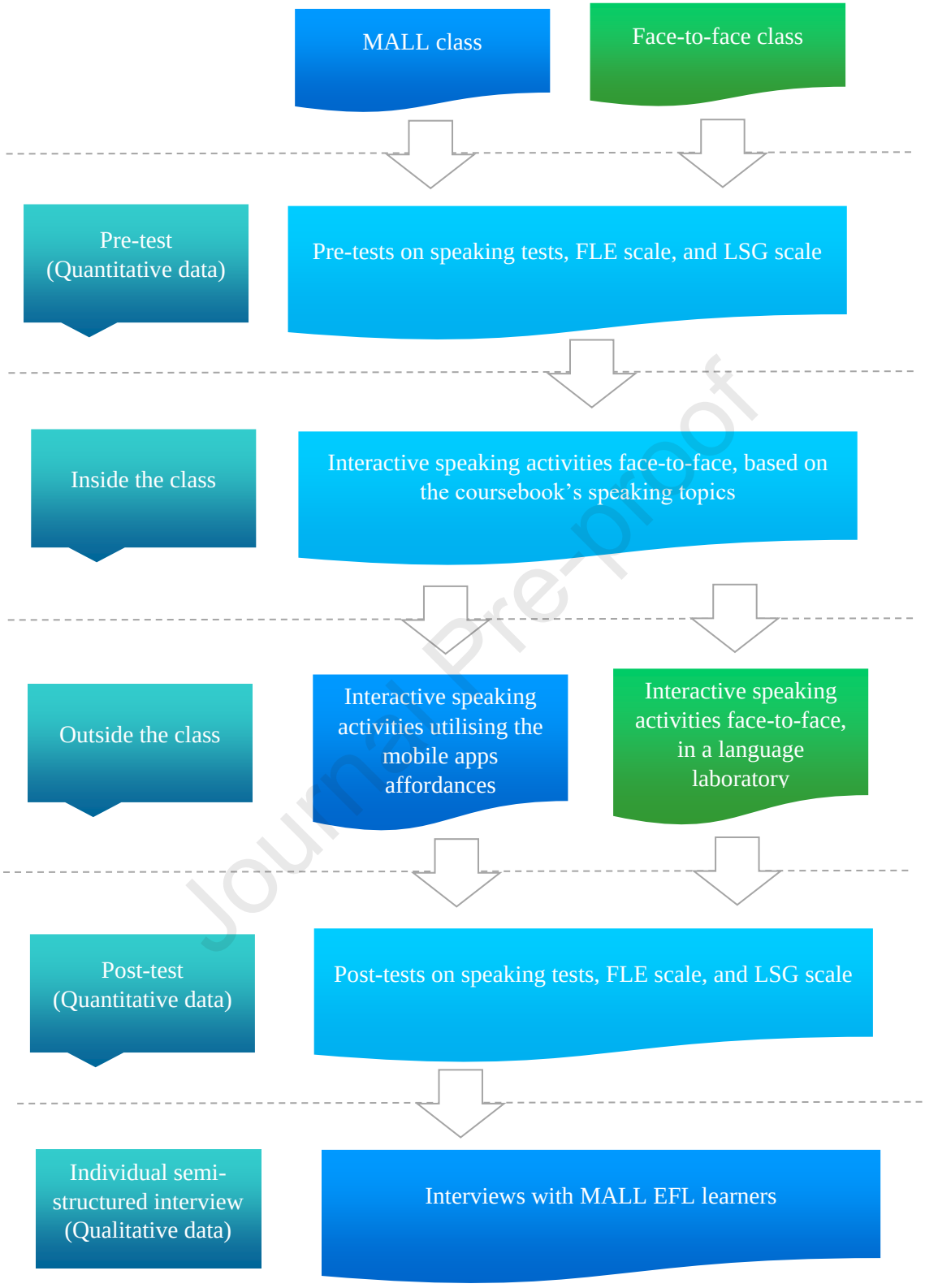
The incorporation of the theoretical framework in all the in-class and out-of-class speaking activities

Social constructivism as the leading theoretical framework in both groups				
Groups	MALL class		Face-to-face class	
Time	During class time	Outside the class	During class time	Outside the class
ZPD	Learners mediate each other's speaking capabilities via implicit/explicit peer speaking mediation during in-class other-regulated speaking activities.	Learners mediate each other's speaking capabilities via implicit/explicit peer speaking mediation in outside-the-class other-regulated speaking activities using the app.	Learners mediate each other's speaking capabilities via implicit/explicit peer speaking mediation during in-class other-regulated speaking activities.	Learners mediate each other's speaking capabilities via implicit/explicit peer speaking mediation in outside-the-class other-regulated speaking activities in the lab.
ZDD	Learners have reached their autonomous/self-regulated functioning in speaking			

4.4.6. Data collection procedures

The course for both groups took one term (14 weeks in total). There were two sessions each week, with each session lasting for 75 minutes. Each group had the same interactive speaking tasks in and outside the class, and the learners had the same group partners in all tasks. Each out-of-class interactive speaking activity also took approximately 60 minutes for each group. The speaking pre-test, FLE scale, and LSG scale were administered in the first session and the speaking posttest on speaking tests and the same FLE and LSG scales were administered in the last session of the course. The individual semi-structured interviews were also carried out in the last session for the MALL group. Figure 6 demonstrates the workflow of data collection in both groups.

Figure 6. Data collection procedures in both groups.



4.5. Measurement and analysis

4.5.1. Quantitative analysis

We initially used the Kolmogorov-Smirno tests to examine the normality of the EFL learners' pre- and posttest marks of speaking tests in both the MALL and face-to-face groups. The results of the Kolmogorov-Smirno tests indicated no outliers and the normality of the data. Hence, we used the parametric test of one-way between-groups analyses of covariance (ANCOVA) to examine the effect of the MALL and face-to-face instructional procedures on EFL learners' speaking skills, FLE, and LSG. One-way ANCOVA showed the differences between the two groups regarding the improvements observed in the EFL learners' overall speaking performance, speaking skills, FLE, and LSG. By using one-way ANCOVA, we could compare the MALL and face-to-face learners' posttests on all measures whilst controlling for any pre-existing differences between the two groups.

4.5.2. Qualitative analysis

Employing thematic analysis (Braun & Clarke, 2012), we scrutinised interview transcripts. Employing an iterative and bottom-up approach, we initially conducted open thematic coding, then grouped related themes using axial coding, and subsequently assigned labels to each category. Rigorous inter-rater reliability (Gass & Mackey, 2000) utilising Cohen's Kappa coefficient ensured precision across open coding, axial coding, and labelling stages. In addition to the primary researcher/instructor, an EFL expert in applied linguistics independently reviewed and cross-compared the coding and labelling. The Cohen's Kappa coefficient was .84, signifying substantial agreement between the two coders. Discrepancies were resolved through discussions.

5. Results

Adopting a sequential explanatory mixed-methods approach for the data analysis, we initially analysed the quantitative data to find a better instructional procedure for developing EFL learners' speaking skills, FLE, and LSG, followed by qualitative analysis to explain the quantitative findings.

5.1. The quantitative analysis

Initially, to calculate the EFL learners' mean scores of speaking skills, descriptive statistics were applied, the results of which are presented in Table 2.

Table 2

Descriptive statistics, checking the means of speaking skills in both groups

Variables	Group	N	Pre/posttest	Mean	Std. Error	95% Confidence Interval	
						Lower bound	Upper bound

Overall speaking performance	Mall	33	Pretet	4.41	.13	4.15	4.68
		33	Posttest	5.83	.10	5.62	6.04
	Face-to-face	33	Pretet	4.19	.13	3.92	4.45
		33	Posttest	5.30	.10	5.08	5.51
Fluency and coherence	Mall	33	Pretet	4.79	.10	4.57	5.01
		33	Posttest	5.29	.14	4.99	5.58
	Face-to-face	33	Pretet	4.58	.10	4.37	4.80
		33	Posttest	4.87	.14	4.57	5.16
Lexicon	Mall	33	Pretet	4.62	.11	4.38	4.85
		33	Posttest	5.79	.12	5.55	6.03
	Face-to-face	33	Pretet	4.54	.11	4.31	4.78
		33	Posttest	5.01	.12	4.77	5.25
Grammatical range and accuracy	Mall	33	Pretet	4.68	.11	4.46	4.91
		33	Posttest	5.96	.13	5.69	6.22
	Face-to-face	33	Pretet	4.66	.11	4.43	4.88
		33	Posttest	5.23	.13	4.96	5.49
Pronunciation	Mall	33	Pretet	4.63	.14	4.34	4.91
		33	Posttest	5.89	.17	5.54	6.24
	Face-to-face	33	Pretet	4.65	.14	4.36	4.93
		33	Posttest	4.83	.17	4.48	5.18

Table 2 indicates that there were some differences between the mean scores of the MALL and face-to-face groups in the pretest and posttest. For instance, the overall speaking performance (referring to all speaking skills as a whole) posttest mean score for the MALL learners was 5.83, whilst their speaking performance pretest mean score was 4.41. In addition, the postest mean score of the MALL learners for fluency and coherence was 5.29, whilst their pretest mean score was 4.79. Differences between the two groups' posttest marks were also observed. For instance, the MALL learners' posttest mean score for lexicon was 5.79, whilst it was 5.01 for the face-to-face learners. However, more statistical analyses were run to examine whether such differences were significant (i.e. the *p-value* is less than .05) and meaningful (i.e. the effect size or partial eta squared is more than .14).

Prior to analysis, we rigorously assessed the critical assumptions underlying our statistical tests. To ensure the robustness of the results, we evaluated the homogeneity of variance and normality of data distribution. Levene's test indicated comparable variance between the MALL and face-to-face groups ($p > .05$) and valid consistent data variability.

Similarly, the Kolmogorov-Smirnov test revealed data distributions adhering to normality ($p > .05$). This ensured that the application of parametric tests in our study was justified and reliable. Consequently, the application of one-way ANCOVA was justified to explore differences in overall speaking performance and skills between the MALL and face-to-face groups. Table 3 shows the ANCOVA outcomes.

Table 3

One-way ANCOVA, examining the differences between the two groups' posttest marks for overall speaking performance and speaking skills

Source	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta squared
Overall speaking performance	4.67	1	4.67	12.50	<.001	.16
Fluency and coherence	2.88	1	2.88	4.01	.04	.06
Lexicon	10.11	1	10.11	21.19	<.001	.25
Grammatical accuracy	8.80	1	8.80	15.16	<.001	.19
Pronunciation	18.50	1	18.50	18.17	<.001	.22

Table 3 indicates that after controlling for the overall speaking performance and speaking skills pretest marks as the covariates, there were significant differences between the MALL and face-to-face learners' posttest marks of overall speaking performance [$F(1, 64) = 12.50$, $p < .001$], fluency and coherence [$F(1, 64) = 4.01$, $p < .04$], lexicon [$F(1, 64) = 21.19$, $p < .001$], grammatical range and accuracy [$F(1, 64) = 15.16$, $p < .001$], and pronunciation [$F(1, 64) = 18.17$, $p < .001$], corroborating that the MALL learners outperformed their face-to-face counterparts in overall speaking performance and all speaking skills after the treatment. As for the effect size (i.e. partial eta squared), the value of .14 and higher was regarded as a large value, the value between .06-.14 was regarded as a medium value, and the value between .01-.06 was regarded as a low value. As the partial eta squared (η_p^2) for the above measures were .16, .06, .25, .19, and .22, respectively, the difference between the two groups' overall speaking performance and speaking skills (except for fluency and coherence) could be considered a big difference.

The effects of the MALL and face-to-face instruction on the EFL learners' FLE and LSG were also examined in the current study. To this end, descriptive statistics were initially run to indicate the pre- and post-test mean scores. The results of the descriptive statistics are displayed in Table 4.

Table 4

Descriptive statistics, checking the means of FLE and LSG in both groups

Variables	Group	*N*	Pre/post-test	Mean	Std. Error	95% Confidence Interval	
						Lower bound	Upper bound
FLE	Mall	33	Pretest	2.91	.07	2.75	3.06
		33	Posttest	3.62	.08	3.45	3.79
	Face-to-face	33	Pretest	2.98	.07	2.82	3.13
		33	Posttest	3.26	.08	3.09	3.43
LSG	Mall	33	Pretest	3.41	.10	3.20	3.61
		33	Posttest	3.99	.11	3.76	4.21
	Face-to-face	33	Pretest	3.29	.10	3.09	3.50
		33	Posttest	3.41	.11	3.19	3.63

As evident in Table 4, there were some differences between the mean scores of the MALL and face-to-face groups' FLE and LSG in the pretest and posttest. For example, the FLE posttest mean score for the MALL learners was 3.62, whilst their FLE pretest mean score was 2.91. Additionally, the FLE mean score for the MALL learners in the posttest was 3.62, whilst it was 3.26 for the face-to-face learners. One-way ANCOVA was also run to investigate whether the differences in Table 4 were significant. The results of one-way ANCOVA are presented in Table 5.

Table 5

One-way ANCOVA, examining the differences between the two groups' posttest marks for FLE and LSG

Source	Type III sum of squares	*df*	Mean square	*F*	Sig.	Partial eta squared
FLE	2.13	1	2.13	8.71	<.001	.12
LSG	5.48	1	5.48	13.48	.02	.17

As demonstrated in Table 5, after controlling for the covariates, there were significant differences between the two groups' posttest marks on FLE [$F(1, 64) = 8.71$, $p < .001$] and LSG [$F(1, 64) = 13.48$, $p < .02$], corroborating that the MALL instruction was more effective than its face-to-face counterpart in terms of improving the EFL learners' FLE and LSG. The partial eta squared (η_p^2) analyses for the FLE and LSG measures were .12 and .17,

respectively, corroborating a medium difference between the two groups' FLE and a big difference between the two groups' LSG.

5.2. The qualitative analysis

We also carried out an individual semi-structured interview with some MALL learners to explain why the MALL group outperformed its face-to-face counterpart in speaking skills in the quantitative part. The results generated several themes and categories about the MALL learners' positive and negative attitudes towards and perceptions of the utilisation of the MALL affordances in their interactive speaking course. Table 6 presents the generated themes and categories addressing the MALL learners' positive attitudes towards and perceptions of the utilisation of MALL affordances.

Table 6

Uncovered themes and categories about the learners' positive attitudes towards and perceptions of the utilisation of MALL affordances

Categories	Themes	Examples
Particular speaking activities	Interactive environment	L2: *It has a friend affordance option as well as forums that help English language learners get connected with one another through text chatting. This motivated me to try more to improve my vocabulary range and grammar.*
	Interactive lessons	L7: *Various interactive speaking lessons and games made my English speaking more interesting to me……for example, there were lessons related to explaining or describing something which I found effective.*
	Authentic activities	L3: *There were some role-play exercises which I found effective as they sounded like a more real conversation……. I felt like I was involved in a real dialogue with a foreigner.*
	Engaging speaking activities	L7: *I believe that the simple and funny exercises were motivators to learn how to speak spontaneously, continue simple conversations, and use more appropriate vocabulary in dialogues.*
	Direct contact with foreign speakers of English	L3: *I can say that MALL is more effective for English learners like us who do not have enough exposure to foreigners and cannot speak in English with real people outside the class.*

	Direct contact with online individuals	*L3: MALL was good because it gave me the opportunity to have direct conversations with online contacts who had very authentic pronunciation……. it made me have direct responses and gave immediate answers too…… it increased my motivation and self-confidence to improve my English conversation skills.*
	Accurate pronunciation	*L8: The challenge of increasing my pronunciation score really helped me improve my English pronunciation. I used the audio button to replay as many times as I could pronounce the word more accurately. I am now more confident in pronouncing the words and I will certainly continue to use this app.*
	Vocabulary development	*L4: I noticed that the exercises and games included more common words and phrases used by native speakers. So, I think MALL can improve one's accuracy in terms of using natural spoken English.*
Motivating language learning activities	Engaging activities	*L7: I cannot say that this app really improved my English and speaking but it increased my English learning motivation…. The interactive exercises, chatting affordances, various games, and reward coins all made me motivated in my English learning, especially because they increased my motivation for speaking.*
	Game-based activities	*L3: The game-based nature of the exercises and the interactive lessons were all engaging for me….all in all, I enjoyed the app and the course.*
	Fun activities	*L3: It made me remain interested by reporting my level, ranks, and bonus coins as if I were playing a competitive game….. these affordances made me enjoy English learning. I really felt good when I could earn extra coins. It made English learning fun for me!*
Distinctive language learning affordances	User-friendly affordances	*L5: HE is a free app that can be easily downloaded, installed, and used on any device…. Actually, it created a happy English learning experience for me.*
	Handy dictionary	*L4: I liked its dictionary very much as I could use its tab and find good word definitions as well as audio pronunciations.*

	Special voice recognition affordance	*L1: Its video and audio lessons were interactive …. It also offered entertaining practice games not only for speaking but also for other skills as well. I also liked its voice recognition affordance with which I could improve my pronunciation.*
Developmental language learning schedules	Organised language learning programmes	*L5: It had a daily schedule with a list of assignments which motivated me to go ahead and complete the lessons since I felt the app had a plan to follow……. It acted as a guidepost that encouraged me to have further practice and also increased my interest in the inside-class materials. I liked its notifications regarding my daily assignments.*
	Regular language learning tasks	*L7: Regardless of its real effectiveness, the app had a countdown timer which informed me when the received bonus coins would expire. It also listed the daily tasks for me and guided me to remain on top of the game…. This gave me a sense of achievement and motivation as well as an enjoyable learning experience.*
	Supplementary materials	*L2: If you like to have further practice, this app's affordances give you huge supplementary practice in the form of enjoyable games as well as conversations.*
	Support team	*L7: It has a good support team who answer your questions within 48 hours or even earlier. The helpline team speak in English via chatting and can help you with tips, questions, and problems.*

As evident in Table 6, four categories and 18 themes emerged concentrating on the MALL learners' positive attitudes towards and perceptions of the utilisation of MALL affordances for interactive speaking activities. For instance, the MALL learners capitalised on the role of the MALL app in providing a particular context for improving their speaking skills. The interactive nature of MALL gave the learners opportunities to get engaged in interactive speaking activities with other learners using different affordances, such as video chat options. The interactive lessons and the learning materials of the MALL app also involved the MALL learners in interactive speaking activities which could be the reason behind the learners' considerable enthusiasm for utilising the app for interactive speaking purposes.

The learners highlighted the authentic tasks (more native-like tasks) and engaging speaking activities leading to their active involvement in interactive speaking activities and their greater speaking skills in the MALL space. The learners' engagement in authentic speaking activities with other speakers of English and other online learners of the MALL app motivated them to engage in further interactive speaking activities. The use of the app's affordances improved the required speaking skills which contributed to their general speaking performance in the MALL environment. For instance, the learners stated that the app fulfilled a pivotal role in developing their pronunciation and vocabulary range and knowledge.

The MALL-motivating language learning activities served as the learners' particular focus of attention. For example, the interactive-based exercises, chatting activities, and language learning games motivated the MALL learners' greater speaking skills. The learners argued that the game-based activities, such as receiving coins for their successful accomplishments of the speaking tasks, encouraged them to have further language learning, especially speaking activities in the MALL environment. The gamified activities were also fun for the MALL learners, involving them in further interactive language learning activities which affected their speaking skills in the succeeding interactive speaking tasks in the MALL space and during class time.

The special affordances of the MALL app were also highlighted by the learners in the interview sessions. For instance, the learners capitalised on the convenience of installing and using the MALL app for interactive language learning purposes. Some affordances, such as the MALL-supported dictionary, the use of which contributed to the learners' speaking skills, especially pronunciation and vocabulary range and knowledge, were further highlighted by the learners. More specifically, the learners claimed that the voice-recognition affordance of the MALL app provided an engaging interactive language learning environment for the learners to interactively speak with other learners and improve their speaking skills accordingly.

The last group of themes, addressing the learners' positive attitudes towards and perceptions of the MALL app, revolved around the special and developmental schedules of the app for improving the learners' language learning. The learners asserted that they were provided with organised lessons and assignments each day, and they were required to accomplish the lessons consecutively, which contributed to the learners' subsequent interactive speaking activities both in and outside the class. The app also provided the learners with regular game-based language learning activities and notified them to do the following game-based language learning tasks. The learners had the opportunity to work on

the additional language learning materials, provided by the MALL app, to improve the learners' language learning in general and their speaking skills in particular. The learners claimed that the MALL-support team even facilitated their language learning processes by addressing any difficulties they may encounter during their activities. Doing this in English also provided the learners with genuine task-based language practice.

The above-mentioned characteristics of the MALL app highlighted by the MALL learners clarified the learners' constructive engagement in the MALL-based language learning activities which are believed to be considered the reason behind the MALL learners' better speaking skills in comparison with their face-to-face counterparts. Despite the overwhelmingly positive reactions of the MALL participants, some of the MALL learners expressed some negative attitudes towards and perceptions of the use of MALL affordances for interactive speaking activities. The negative attitudes towards and perceptions of the MALL affordances were not widespread (i.e. negative perceptions were exceptional) since these negative perceptions were raised only by three participating EFL learners (out of eight), and the same three EFL learners held some positive attitudes towards and perceptions of some of the app's affordances as well. The analysed interview transcripts in this regard uncovered a number of themes and categories which are displayed in Table 7.

Table 7

Uncovered themes and categories about the learners' negative attitudes towards and perceptions of the utilisation of MALL affordances

Categories	Themes	Examples
Ineffective language learning activities	Unhelpful language learning lessons	L6: *The speaking lessons were basic and not suitable for our level…… they were about topics related to greetings, favourite movies, shopping etc. I don't think such simple conversations can really help us get ready for more challenging speaking tasks required by IELTS.*
	Not a standalone language learning app	L8: *I don't think that anybody can learn English only with MALL! ….this app can just help the learners and can be recommended as a supplementary tool for learning a foreign language.*
Inconvenient language learning affordances	Less useful free version	L1: *Most useful affordances of HE are not free ….. for example, live video chatting or the CV writing course were not free and were only available in the premium modes.*

Pointless advertisements	*L5: The practice affordances were boring and not very useful. There were advertisements interrupting us…… the videos on the app lacked variety. The advertisements pop up very often and they make using this app become disturbing and inconvenient.*

As shown in Table 7, two categories and four themes emerged focusing on the EFL learners' negative attitudes towards and perceptions of the utilisation of MALL affordances. The first group of themes focused on the ineffectiveness of MALL-based language learning activities. Some of the MALL learners, for instance, thought that the speaking-based activities in the MALL app concentrated on simple speaking activities, such as greetings and shopping, which did not contribute to their speaking skills, especially the speaking skills required for the IELTS examination. Additionally, the learners contended that the MALL app needed to be accompanied by other resources and instruction in order to be fully effective for English language purposes, and that the app cannot be utilised as a standalone app for English language learning, especially for speaking skills.

The learners also raised the inconvenience of the app in providing them with the required affordances for their language learning. The learners, for example, did not have access to some affordances of the app since it required them to register for the premium mode of the app. As it cost the learners some money, they were reluctant to apply for the premium version. The abundant pop-up advertisements were also interrupting and disturbing for the learners since they precluded them from doing language learning- and speaking-based activities.

6. Discussion

Following Vygotsky's (1978) social constructivist theory of learning, we explored the use of MALL affordances in developing EFL learners' speaking skills (including fluency and coherence, lexicon, grammatical range and accuracy, and pronunciation), FLE, and LSG adopting a mixed-methods approach. Initially, the quantitative findings revealed that the utilisation of MALL affordances was effective in terms of enhancing the EFL learners' overall speaking performance (referring to all speaking skills as a whole) and that such mobile-supported instruction outperformed its face-to-face counterpart in developing the learners' speaking performance. The findings are in harmony with the findings of Kartal (2022) and Sun et al. (2017) who indicated that MALL EFL learners outperformed their face-to-face counterparts in speaking performance. The highly successful speaking performance of the EFL learners in the MALL class is related to the affordances of the MALL app, which

gave the learners opportunities to have sufficient and more effective interactive speaking activities with their peers outside the class anywhere and anytime. The qualitative part of the study also supported the quantitative findings by indicating the MALL learners' positive attitudes towards and perceptions of the effectiveness of the MALL app in providing a convenient environment for their interactive speaking activities.

Following Vygotsky's (1978) social constructivist theory of learning, EFL learners in both the MALL and face-to-face groups had interactive speaking activities with their peers both in and outside the class; however, as the MALL learners had access to more affordances and opportunities to communicate with their peers outside the class, they could outperform their face-to-face counterparts in speaking performance. That is, the MALL app and the MALL learners' peer mediation, considered the mediational artefacts in the MALL class, facilitated the interactive speaking activities for the MALL learners, and contributed to their speaking more significantly than the face-to-face only mediational artefact (i.e. the face-to-face learners' peer mediation both in and outside the class). The MALL learners were responsible for developing their own and peers' speaking performance via the MALL app, which enhanced their enthusiasm for the MALL-based interactive speaking activities.

Following the qualitative findings, the utilisation of MALL affordances substantially contributed to the EFL learners' other-regulation (their interactive speaking activities with other learners outside the class), and gradually, contributed to their self-regulation (autonomous functioning in individual speaking activities). It is argued that the utilisation of MALL affordances helped the learners achieve their autonomous functioning in individual speaking activities more swiftly than in the face-to-face class. This means that following Aljaafreh and Lantolf's (1994) microgenesis, the MALL app's affordances helped the EFL learners gradually rely less on explicit peer and instructor mediation by providing them with relevant speaking materials which could contribute to the swift achievement of their self-regulation in speaking.

According to Aljaafreh and Lantolf's (1994) model, the MALL learners' exposure to authentic speaking materials and their speaking practices and activities were regarded as initial implicit mediation which fostered the learners' speaking skills. Based on such implicit mediation, the learners could communicate with their peers utilising the affordances of the MALL app. The learners were also instructed to initially implicitly provide peer mediation to indirectly contribute to their interactive speaking activities. As some learners faced difficulties in interactive speaking activities, especially those with lower speaking proficiency, there was a need to shift from implicit to explicit peer mediation. This transition

was crucial for effectively completing their speaking tasks. At this stage, specifically, the MALL app's affordances provided explicit speaking mediation, such as corrective feedback and the required explanations, to help the learners understand the speaking-related points they missed during the implicit exposure and implicit peer mediation. Such explicit speaking mediation particularly contributed to the less capable learners' deeper understanding of the speaking skills so that they could apply such speaking knowledge and skills to their interactive speaking activities.

The utilisation of the app's affordances gave the learners opportunities to immediately receive implicit and explicit speaking mediation based on their speaking-related challenges and issues which could contribute to the gradual improvement of their speaking skills, and enhanced their independent functioning. That is, the MALL app's affordances provided an amalgam of different swift and appropriate speaking mediation to help the learners reach their ZPD and bridge the gap between ZAD and ZDD more efficiently and effectively (in comparison to the face-to-face group), which resulted in the MALL learners' more effective autonomous functioning in the speaking activities. In agreement with such findings, the MALL learners in the interview sessions claimed that the MALL app facilitated their interactive speaking activities by providing them with appropriate speaking-based affordances.

The findings also revealed that the utilisation of MALL affordances significantly improved the EFL learners' speaking skills and outperformed the face-to-face method of interactive speaking instruction in that regard. In agreement with the findings, the effectiveness of the MALL app in terms of improving speaking skills, such as vocabulary mastery (Ginting & Fithriani, 2021), has been corroborated. As the app regularly presented a number of lessons focusing on various speaking skills, such as vocabulary, grammar, and pronunciation, it could play a significant role in developing the MALL learners' speaking skills. The MALL learners' engagement in interactive speaking activities could gradually enhance their fluency and coherence in speaking, lexical resources, grammatical range and accuracy, and pronunciation. Enhancing the speaking skills was facilitated by different speaking-based affordances of the app, as highlighted by the MALL learners in the interview sessions. In harmony with the findings, for example, the MALL learners argued that the app provided an interactive environment along with interactively based and authentic lessons and tasks for their interactive speaking activities via the MALL app. The game-based activities and the voice-recognition affordances of the app contributed to the MALL learners' speaking skills likewise. The learners also capitalised on the role of the app in improving their

vocabulary knowledge and pronunciation accuracy which could further confirm the findings of the study.

Furthermore, the findings indicated that the MALL instruction was effective in terms of enhancing the MALL learners' FLE, and was more effective than the face-to-face instruction. The effectiveness of the MALL instructional procedures in terms of improving the learners' FLE could be due to the role of different affordances of the MALL app which increased the MALL learners' motivation and engagement in the interactive speaking activities. In line with such quantitative findings, in the qualitative part of the study, the MALL learners emphasised the positive role of the app in involving them in an engaging environment for interactive speaking activities. In the qualitative part of the study, the learners also highlighted the effectiveness of the app in terms of involving them in game-based and fun speaking activities which could be considered another reason behind the MALL learners' higher FLE improvements.

Consistent with Dewaele and MacIntyre's (2014) findings, the MALL learners were more active and engaged in interactive speaking activities using the MALL app, and they were more willing to have more language learning and interactive speaking activities which could substantially contribute to their FLE. The MALL learners' considerable improvements in speaking skills could also greatly contribute to their FLE, findings which are consistent with Dewaele and MacIntyre (2014). Based on the findings of Lee et al. (2022), and Resnik and Schallmoser (2019), the MALL app's online space was further effective in terms of enhancing the MALL learners' FLE. The learners' online communication with their peers gave them opportunities to have more creative and motivating interactive speaking activities with their peers, findings which were confirmed in the qualitative part of the study as well. The increased creative and motivating interactive speaking activities in the MALL class could be due to the technology-integrated affordances of the MALL class.

Additionally, the findings demonstrated that the MALL learners outperformed their face-to-face counterparts in LSG. Based on Duckworth and Gross's (2014) argument, the MALL app was rather effective in terms of developing the learners' PE and CI, regarded as two crucial subcomponents of LSG, in the language learning process. In the interview section, the MALL learners corroborated that the app enhanced their joint effort and enthusiasm in language learning and interactive speaking activities by providing them with relevant and engaging online and offline affordances. Aparicio et al. (2017), along this line, claimed that learners' perceptions of online language learning activities influence their language learning performance and task productivity, which can also develop their LSG. It could thus be argued

that gritty learners are more successful in accomplishing online language learning activities and tasks (Gao et al., 2022). The findings of the current study are also in agreement with those of Lee (2022) who indicated that EFL learners' PE and CI predicted their willingness to communicate. The affordances that specifically addressed the learners' LSG were the gamification and the progress tracking of the app which not only engaged the learners in the interactive speaking activities but also created a sense of speaking achievement and accomplishment leading to enhanced motivation and perseverance of the EFL learners. On the other hand, the personalisation affordance of the MALL app allowed the learners to work on the related content and exercises which encouraged them to maintain their interest and persist with their speaking skill practice.

Whilst the current study rigorously aimed at equating the time and resources allocated to both the MALL and face-to-face groups, the multifaceted nature of language learning makes it imperative to consider the interplay of various dimensions affecting speaking improvements, such as in-class speaking activities, peer/MALL speaking mediation, and the affordances of the MALL app. Considering this multifaceted approach, the dimensions contributing to speaking improvements likely encompassed a synergy of in-class speaking activities, speaking mediation, and the unique affordances of the MALL app. The delineation of the most striking contributor might not be linear but rather an amalgamation of these components synergistically fostering speaking skill development. Therefore, whilst acknowledging the complexity of isolating individual contributions, the presents study's strength lay in the holistic approach, wherein the combined interaction of the aforementioned dimensions facilitated substantial improvements in EFL learners' speaking skills. This could call for future studies to untangle these intricate relationships in order to understand which element (among in-class speaking activities, peer/MALL speaking mediation, and the affordances of the MALL app) leads to the most final improvement in the speaking gains. The qualitative findings also revealed the MALL learners' positive attitudes towards and perceptions of the MALL-supported interactive speaking activities. The app gave the learners further opportunities to communicate with their peers outside the class, apply the new linguistic items provided by the app, and improve their speaking skills, findings which were in harmony with those of García Botero et al. (2021), Tragant et al. (2022) and Zhang and Perez-Paredes (2021). The MALL learners were not restricted by spatial and temporal factors to communicate with their peers outside the class which could enhance the learners' motivation for more interactive speaking activities. Consistent with the findings of the current study, Nurtriyanto (2020) also found that the EFL learners had positive attitudes towards and

perceptions of the utilisation of the MALL app for their language learning activities. The qualitative findings of the study were in harmony with the quantitative findings since in the interview sessions, the MALL learners capitalised on the positive roles of the app in providing a convenient space for them to develop their speaking skills.

The qualitative findings also indicated some EFL learners' negative attitudes towards and perceptions of the app's affordances. For example, the learners stated that some of the speaking activities provided by the app were simple and did not help them improve their speaking skills. This shortcoming could be addressed by providing additional interactive speaking activities and relevant materials along with the activities of the app in order to make the interactive speaking activities challenging for the learners. The learners also highlighted the unavailability of the app's premium mode which was due to the money it cost and the restrictions the learning context had for providing the learners with the app's necessary affordances. Although similar shortcomings related to similar MALL apps have been reported by previous studies, the shortcomings of the MALL app could be addressed by policymakers if they provide the required necessities for the app in the learning environment.

7. Conclusion

The current study indicated that instruction supported by the use of MALL affordances was more effective in terms of enhancing EFL learners' speaking skills (including fluency and coherence, lexicon, grammatical range and accuracy, and pronunciation), and FLE and LSG than the face-to-face instruction due to the MALL instruction's more engaging learning affordances and environment. The MALL learners also held positive attitudes towards and perceptions of the MALL-supported interactive speaking activities which were further supportive of the findings. The app's effectiveness in terms of providing learners with abundant speaking-based affordances, such as interactive online and offline environments, authentic lessons, gamified language learning activities, and speech-recognition affordances for further interactive speaking activities with other learners, and involving them in further language learning and interactive speaking activities, which arguably were major contributing factors to the current study's findings, were the reasons behind the findings of the study.

7.1. Implications for interactive speaking courses

The findings have several productive implications for EFL interactive speaking courses. MALL apps with similar affordances could be applied to learner-centred, interactive speaking courses to more effectively improve EFL learners' speaking skills. EFL learners should use the app for their language learning purposes, and especially for their out-of-class interactive speaking activities with their peers. Following Vygotsky's theory, EFL learners can use the

app outside their interactive speaking class for additional and supportive language learning and interactive speaking activities to more efficiently achieve their self-regulation in speaking. EFL teachers need to utilise the app's affordances for their interactive speaking courses. They can give EFL learners a number of tasks each session and encourage them to use the app outside the class and report their language learning and interactive speaking outcomes after accomplishing each task. To use the app more effectively, EFL teachers may train EFL learners on how to apply the app for language learning and interactive speaking purposes.

7.2. Limitations and suggestions for future research

The present study, however, has some limitations which need to be explored in future studies. Since a small sample size was recruited in this study, future studies may recruit a larger sample size of EFL learners in both MALL and face-to-face classes to generalise the findings with confidence. Since qualitative data collection and analysis were conducted only with the MALL learners in the current study, the findings might not give a deeper insight into the differences between the effectiveness of the MALL and face-to-face classes. Such a limitation might encourage EFL researchers to explore and compare the MALL and face-to-face learners' attitudes towards and perceptions of the effectiveness of each course in terms of improving their speaking skills, FLE, and LSG. As the qualitative part was not a cause/effect relationship to thoroughly elucidate the MALL learners' better performance in speaking skills, EFL researchers may also collect additional qualitative data in both groups, such as observations and writing journals about EFL learners' interactive speaking activities, to further explain why the MALL learners outperformed their conventional counterparts in speaking skills. As for the quantitative analysis, future studies can consider moderation analysis, which examines the possible association between variables of the study and a third variable. Exploring moderation effects can shed more light on the impact of certain factors on the instructional procedures (MALL-supported and face-to-face instruction) and EFL learners' speaking skills, FLE, and LSG.

Following the IELTS speaking band descriptors, we checked the learners' speaking subcomponents, including fluency and coherence, lexicon, grammatical range and accuracy, and pronunciation; however, it needs to be noted that targeting and improving learners' grammatical range and accuracy in oral tests is a complex task and it deserves special attention in future studies. Although the structure of the speaking tasks in this study aimed at prompting diverse conversations and discussions among the EFL learners which encouraged them to naturally utilise a wide range of grammar whilst expressing ideas clearly and

fluently, future studies might consider including specific exercises or activities explicitly focused on improving EFL learners' grammatical range and accuracy within the speaking curriculum. That is, although this study adopted the IELTS speaking band descriptors as a robust evaluation framework, there is room for refining the assessment design to give more explicit attention to developing EFL learners' grammatical range and accuracy by taking a more structured approach to address and foster grammatical range and accuracy within speaking assessments.

The current study's qualitative part also generated some themes addressing the EFL learners' negative attitudes towards and perceptions of the EFL learners towards the app's affordances, findings which encourage further research. As the simplicity of the language learning activities of the app was refuted by the EFL learners, other researchers are provoked to utilise another app with more challenging activities in their interactive speaking courses to more effectively enhance the speaking skills of all learners. Researchers can also incorporate more resources along with the app's language learning activities to make the interactive speaking activities more challenging and effective and make a more holistic language learning experience. As the premium mode of the app was not available for the learners of the current study, we could not extensively and deeply explore the effectiveness of the app's affordances. Therefore, other researchers are encouraged to apply the app's premium mode in their interactive speaking course to check its impact on learners' speaking skills.

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Appendices

Appendix A:

Sample teaching material

5 Communication

Aims: Talking about languages, keeping in touch, globalisation
Making comparisons | Expressing attitude | Pronunciation: Consonants
Exam technique: Giving yourself time to think

Vocabulary: Languages

1 30 CD1

Listen to someone talking about the languages they speak. Listen again and write the words and phrases that correspond to definitions 1–6. You will hear the answers in order.

1 the language that you learn from your parents when you are a baby _____
2 able to speak more than two languages very well _____
3 able to speak the language easily and correctly _____
4 speak a language well enough to communicate about basic things _____
5 not as good at something as you used to be because you have not done it for a long time _____
6 learn something without effort over a period of time _____

Listen again and find five collocations with the word *language* that correspond to definitions 7–11.

7 a language that is spoken internationally _____
8 a language that is spoken by only a small proportion of people in a country _____
9 a language that is not spoken as a native language in your country _____
10 a language that is used by many people _____
11 a language that you speak well but that is not your native language _____

Appendix B:

IELTS speaking pretest topics

PART 1

The examiner asks the candidate about him/herself, his/her home, work or studies and other familiar topics.

EXAMPLE

Songs and singing

- Did you enjoy singing when you were younger? [Why?/Why not?]
- How often do you sing now? [Why?]
- Do you have a favourite song you like listening to? [Why?/Why not?]
- How important is singing in your culture? [Why?]

PART 2

Describe a film/movie actor from your country who is very popular.

You should say:
who this actor is
what kinds of films/movies he/she acts in
what you know about this actor's life
and explain why this actor is so popular.

You will have to talk about the topic for one to two minutes. You have one minute to think about what you are going to say. You can make some notes to help you if you wish.

PART 3

Discussion topics:

Watching films/movies

Example questions:
What are the most popular types of films in your country?
What is the difference between watching a film in the cinema and watching a film at home?
Do you think cinemas will close in the future?

Theatre

Example questions:
How important is the theatre in your country's history?
How strong a tradition is it today in your country to go to the theatre?
Do you think the theatre should be run as a business or as a public service?

IELTS speaking posttest topics

PART 1

The examiner asks the candidate about him/herself, his/her home, work or studies and other familiar topics.

EXAMPLE

Clothes

- Where do you buy most of your clothes? [Why?]
- How often do you buy new clothes for yourself? [Why?]
- How do you decide which clothes to buy? [Why?]
- Have the kinds of clothes you like changed in recent years? [Why?/Why not?]

PART 2

Describe an interesting discussion you had about how you spend your money.

You should say:
who you had the discussion with
why you discussed this topic
what the result of the discussion was
and explain why this discussion was interesting for you.

You will have to talk about the topic for one to two minutes. You have one minute to think about what you are going to say. You can make some notes to help you if you wish.

PART 3

Discussion topics:

Money and young people

Example questions:
Why do some parents give their children money to spend each week?
Do you agree that schools should teach children how to manage money?
Do you think it is a good idea for students to earn money while studying?

Money and society

Example questions:
Do you think it is true that in today's society money cannot buy happiness?
What disadvantages are there in a society where the gap between rich and poor is very large?
Do you think richer countries have a responsibility to help poorer countries?

Appendix C: Foreign language enjoyment scale

1 = Strongly disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly agree

Items	1	2	3	4	5
1. I do not get bored.	( )	( )	( )	( )	( )
2. I enjoy this term's English speaking course.	( )	( )	( )	( )	( )
3. I performed well in this term's English speaking course.	( )	( )	( )	( )	( )
4. I feel proud of my accomplishments in this term's English speaking course.	( )	( )	( )	( )	( )
5. It is a positive environment.	( )	( )	( )	( )	( )

6. It is cool to know English as a foreign language.	( )	( )	( )	( )	( )
7. English speaking course is fun.	( )	( )	( )	( )	( )
8. My peers in the English speaking activities are nice.	( )	( )	( )	( )	( )
9. There is a good atmosphere.	( )	( )	( )	( )	( )
10. We laugh a lot during the speaking activities.	( )	( )	( )	( )	( )

Appendix D: Grit scale

1. Not like me at all; 2. Not much like me; 3. Somewhat like me; 4. Mostly like me; 5. Very much like me

Items: Perseverance of effort	**1**	**2**	**3**	**4**	**5**
1. I have overcome setbacks to conquer an important challenge.	( )	( )	( )	( )	( )
2. Setbacks don't discourage me.	( )	( )	( )	( )	( )
3. I finish whatever I begin.	( )	( )	( )	( )	( )
4. I have achieved a goal that took years of work.	( )	( )	( )	( )	( )
5. I am diligent.	( )	( )	( )	( )	( )

Items: Consistency of interests	**1**	**2**	**3**	**4**	**5**
1. My interests change from year to year.	( )	( )	( )	( )	( )
2. I have been obsessed with a certain idea, project, or activity for a short time but later lost interest.	( )	( )	( )	( )	( )
3. I often set a goal but later choose to pursue a different one.	( )	( )	( )	( )	( )
4. I have difficulty maintaining my focus on activities or projects that take more than a few months to complete.	( )	( )	( )	( )	( )
5. I become interested in new pursuits every few months.	( )	( )	( )	( )	( )

Appendix E: Interview questions

1. Can you tell me about your experience using the MALL app for the interactive speaking activities?
2. How did you feel about using the app in group settings?
3. In what ways did you feel the MALL app improved or hindered your ability to communicate with your group members?
4. In your opinion, how does the utilisation of the MALL app compare to other methods of language learning that you have used?
5. How do you think the MALL app could be used to support the development of interactive speaking skills for English learners in general?

- Mobile app affordances help develop EFL learners' speaking skills
- Mobile app affordances enhance EFL learners' foreign language enjoyment
- Mobile app affordances improve EFL learners' language-specific grit
- Learners hold positive perceptions towards the affordances of mobile apps