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AN EMPIRICAL STUDY ON THE EFFECTIVENESS OF MALL METHOD IN ENHANCING EFL STUDENTS' LISTENING COMPREHENSION

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Abstract:

The advent of Mobile-Assisted Language Learning (MALL) has revolutionized English as a Foreign Language (EFL) education by providing learners with unprecedented access to language learning resources anytime and anywhere. Listening is often considered one of the most challenging skills to master in language acquisition. While previous research has shown the effectiveness of the MALL method in areas such as writing and reading, few empirical studies have focused on its application in EFL listening classes. This empirical study adopted a mixed-method approach, collecting quantitative data from pre- and post-tests and qualitative data from learners' journals, to investigate the effectiveness of the MALL method in enhancing EFL learners' listening comprehension and learners' attitude toward MALL in their listening practice. Data were collected and analyzed using SPSS. The results indicated that the MALL method is effective in improving EFL listening comprehension and allows learners for the adjustment of content and pace, facilitating personalized and effective learning experiences. This study aims to provide insights for incorporating MALL in EFL listening studies and improving listening efficiency.

Keywords:

Effectiveness, English as a Foreign Language (EFL), Listening Comprehension, Mobile-Assisted Language Learning (MALL)

Introduction

The rapid advancement of mobile and digital technologies has significantly altered people's lives and communication patterns. In this digital era, the ongoing information and technological

revolution is transforming education (Burbules et al., 2020; Granić & Marangunić, 2019; Li & Singh, 2024). The sudden outbreak of the COVID-19 pandemic further accelerated the use of information technology in education for emergency purposes (Kaqinari et al., 2021). Consequently, innovative online education methods and AI-based tools have emerged to adapt to the new situation (Karakose et al., 2023).

The integration of modern technological devices in education has led to the development of technology-dependent teaching and learning approaches, particularly in the field of English as a Foreign Language (EFL). One such approach is Mobile-Assisted Language Learning (MALL), which transforms conventional classroom learning into formal or informal learning outside classroom settings via mobile phones, unrestricted by time and place (Miangah & Nezarat, 2012; Azli et al., 2018). Teachers can remotely send teaching materials online, and learners can study at their own pace and schedule (Arvanitis, 2019; Qiao, 2021). The abundance of language learning materials available on the Internet and through various applications (Apps) facilitates the language-learning process, supporting outdoor, gamified, and genuine learning models within authentic and contextual learning environments to enhance learning outcomes (Yuniarti, 2014; Martin & Ertzberger, 2016).

In EFL learning, listening is regarded as one of the four essential competencies, along with reading, writing, and speaking. Listening is the most crucial of these skills, as it serves as a primary input channel for the output skills of speaking and writing and is frequently used in daily life, playing a vital role in understanding and communication (Darti & Asmawati, 2017; Ghafar et al., 2023). Despite its importance, listening comprehension is often considered the most challenging skill for EFL learners, who must process content information and linguistic knowledge while understanding, analyzing, remembering, referencing, and sometimes translating (Siegel, 2013; Kim, 2013; Bozorgian & Shamsi, 2023). The listening process is also complex, involving physical, psychological, and sociocultural activities, including phonetic recognition, word segmentation, syntactic parsing, and discourse inference within micro and macro sociocultural contexts (Goh & Vandergrift, 2021; Zhang et al., 2023; Siegel, 2015). Thus, integrating modern technology to improve EFL listening comprehension and learning efficiency is crucial in the digital era.

This empirical study adopted a mixed-method approach, collecting and analyzing both quantitative and qualitative data from an experiment. Quantitative data was collected from students' CET-4 listening pre- and post-test, and the qualitative data was collected from students' listening journals. This study aims to investigate the effectiveness of the MALL method in enhancing EFL learners' listening comprehension and learners' attitude toward MALL in their listening practice. Given this context, the study addresses the following research questions: (1) What is the effectiveness of the MALL method in improving students' English listening ability? (2) What are students' attitudes toward the MALL method in their EFL listening practice?

Literature Review

Mobile-Assisted Language Learning
Mobile-assisted language learning refers to conducting language learning by using mobile technology (Wu, 2018). It is considered an approach to language learning supported and enhanced by handheld mobile tools (Hasan & Islam, 2020). Kukulska-Hulme (2015) defines

MALL as the use of portable devices, including laptops, tablets, and smartphones to supplement sporadic and individual language learning method. In recent years, with the development of technology, MALL has held wider scope conception like using Virtual Reality (VR) combined with internet resources to conduct language learning. MALL is considered as a descendant of Computer-Assisted Language Learning (CALL) and a subclass of mobile learning (M-Learning) (Viberg & Grönlund., 2012).

MALL has garnered significant attention in recent years due to its unique characteristics and the benefits it offers to language learners. There are five properties of handheld devices that produced unique educational affordances, they are: portability, social interactivity, connectivity, context sensitivity, individuality (Hoven & Palalas, 2011; Elfiona et al., 2019; Octavia et al., 2019; Kim & Kimm, 2017; Klopfer et al., 2002). With these features, MALL benefits learners a lot and has been increasingly incorporated into EFL learning and teaching. First, MALL eliminates the time and space limitations of language learning, so that teachers and learners can send and access learning resources remotely from anywhere at any time (Hoven & Palalas, 2011; Arvanitis, 2019; Qiao, 2021), offering learners with increased practice and more formal or informal learning opportunities. Moreover, mobile devices integrated with internet resources and various applications (apps) provide various types of texts and authentic language materials (Arvanitis, 2019), creating interactivity, collaboration, real-context contact and situational language learning across educational settings (Jing, 2018), as well as underpinning language learners to enhance their language skills (Nuraeni et al., 2020). In addition, it empowers language learners to learn individually or together (Sharples, 2013), and enables them to manage learning following personal preferences and authentic needs, adjusting their learning-pace and selecting proper learning contents, which can increase students' learning motivation and interest, reducing learning anxiety (Liu et al., 2021; Li & Singh, 2024; Kim, 2018).

Application of MALL in Listening Comprehension
For years, MALL has been documented and proved to be effective to facilitate EFL learners' four main language skills as listening, reading, writing and speaking (Chen et al., 2020; Sung et al., 2015; Sung et al., 2016). While listening needs more facilitation from MALL as listening is an essential linguistic skill to recognize and process spoken sounds (Nunan, 2003), while it is a significant and easily neglected communication skill (Renandya & Hu, 2018). In addition, the process of listening is complex and challenging for EFL learners because they must process both content information and linguistic knowledge by combining physical and psychological activities and social-cultural knowledge to infer and understand utterance's meaning and intention (Zhang et al., 2023). Compared with traditional listening class in which learners confronted with such difficulties as insufficient classroom instructions and a lack of sustained listening practice to guide them to be successful listeners (Hwang et al., 2016; Goh & Vandergrift, 2021), MALL could facilitate and scaffold students' listening comprehension from the following aspects. First, various applications and internet websites offered abundant listening text, audio and video materials. This provided more chance for students to be exposed to authentic and meaningful situated-listening context with increased practice and multi-modal materials to become proficient listeners (Kim, 2013; Liu et al., 2021; Siegel, 2014). In addition, the individualized and interactive features of MALL could encourage learners to overcome the limitation of traditional classroom instructions, conduct individual-paced or collaborative learning (Li, 2021) which satisfy listeners' learning objectives, access wider range of valuable resources, participate in activities, and communicate with classmates and lecturers thus

promote learning efficiency (Mulyadi et al., 2022).

Previous studies have demonstrated that MALL is effective and practical for improving learners' listening comprehension skills (Alabsi, 2020; Liu et al., 2018; Saeedakhtar et al., 2021; Tai & Chen, 2021). However, some researchers (Hwang et al., 2016; Rashtchi & Mazraehno, 2019; Seo & Choi, 2014) have reported limited effects of MALL on EFL listening skill development. To address these discrepancies and investigate the effectiveness of the MALL method in EFL listening classes, as well as learners' attitudes toward MALL in their listening practice, this study conducted an empirical experiment to assess the impact of MALL on EFL listening ability.

Methodology

Research Design
This study employed an explanatory sequential design mixed methods approach, integrating both quantitative and qualitative data to answer the research questions. Quantitative data were collected from pre- and post-test results, while qualitative data were derived from students' listening journals. Both tests were selected from China's national College English Test, Band 4 (CET-4), with the pre-test conducted at the beginning of the experiment and the post-test at the end of the six-week experiment. The test results were compared to assess the effects of the MALL method on EFL listening ability.

Participants were divided into a control group and an experimental group. Students in the experimental group were required to maintain listening journals throughout the experiment. These journals were then analyzed to investigate the students' attitudes toward the MALL method in their listening practice process.

Research Setting
This research was conducted at Xi'an University in Shaanxi Province, China, a comprehensive institution comprising 15 colleges and offering 50 majors in arts and sciences. The study took place at the School of Foreign Studies, focusing on students majoring in English Translation and Interpretation.

Participants
The participants comprised of 49 undergraduate students majoring in English and English Translation and Interpretation. All participants are native Mandarin speakers with approximately six years of EFL education in high school. They are 19-20 years old and sophomores in their first semester of the second year. English listening is a compulsory course, with two hours of in-class learning each week.

The samples were randomly selected from two intact classes, with the principal researcher (Xiong) as the instructor. The students were divided into a control group (n = 27) and an experimental group (n = 22). Consent to conduct the study was obtained from the School of Foreign Studies at the author's university.

Research Instruments
To obtain quantitative data for the pre- and post-tests, this study utilized China's national College English Test, Band 4 (CET-4) that is administered by the National College English
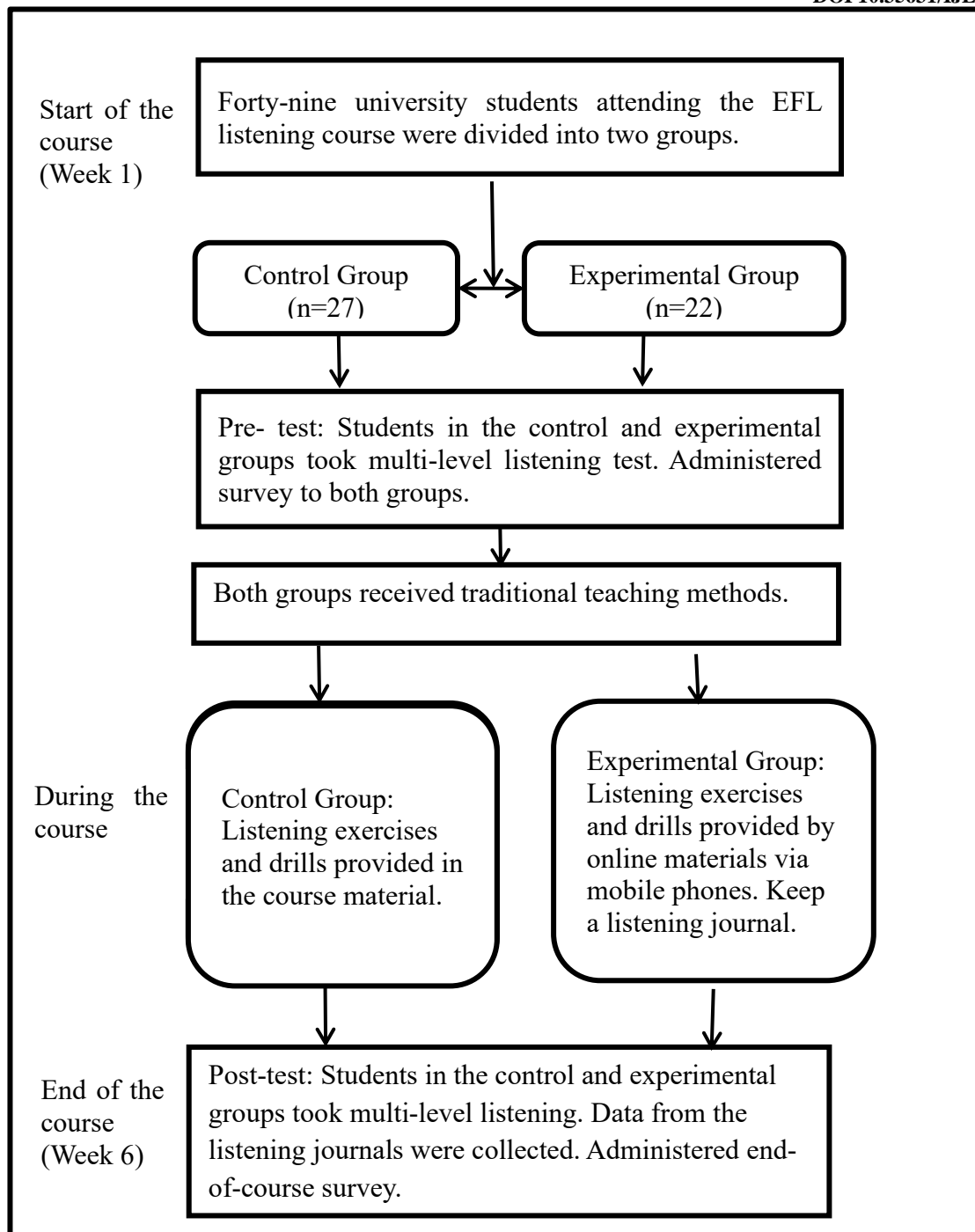
Testing Committee on behalf of the Chinese Ministry of Education. The CET-4 is conducted twice annually, in June and December, for undergraduate students. The pre-test in this study used Test Paper 1 from 2022, and the post-test used Test Paper 1 from 2021. Meanwhile, the qualitative data were obtained using the students' listening journals, which they wrote in after listening to a listening material.

Procedures

The study was conducted in three stages, each with distinct tasks and requirements. Initially, two intact classes consisting of 49 students were randomly selected and divided into a control group with 27 students and an experimental group with 22 students (i.e., non-equivalent groups design). At the start of the experiment, the pre- test was administered to both control and experimental groups to assess their listening abilities using the CET-4 2022 Test Paper. Over the subsequent six weeks, the experimental group adopted the MALL method, whereby the students listened to English news or self-selected content via their mobile phones after class and maintained a weekly listening journal to record their materials. In contrast, the control group engaged in listening practice using in-class materials or their own methods without mobile phone facilitation. After six weeks of differing practices, both groups took a post-test, and the results were collected for analysis.

To obtain the qualitative data, learners in the experimental group were required to maintain a listening journal for each listening practice session. They selected news or any online content based on their proficiency and preferences, ensuring daily listening practice. During each session, they took notes on the main content, new vocabulary, and any other significant or useful information. Additionally, at the end of each week, they wrote reflections on their perceptions of the MALL method in their listening practice. At the beginning of the following week's listening class, the teacher reviewed each student's listening journal individually. Subsequently, 3-4 students were selected to share their previous week's listening content by reading or retelling it aloud to the class. After a six-week experimental period, the students' listening journals were collected for analysis. The procedures are depicted in Figure 1.

Start of the course (Week 1)	Forty-nine university students attending the EFL listening course were divided into two groups.

Control Group (n=27)	Experimental Group (n=22)

Pre- test: Students in the control and experimental groups took multi-level listening test. Administered survey to both groups.

Both groups received traditional teaching methods.

During the course	Control Group: Listening exercises and drills provided in the course material.

Experimental Group: Listening exercises and drills provided by online materials via mobile phones. Keep a listening journal.

End of the course (Week 6)	Post-test: Students in the control and experimental groups took multi-level listening. Data from the listening journals were collected. Administered end-of-course survey.

Figure 1: Research Procedure

Data Analysis

The quantitative data (students' CET-4 pre- and post-tests) were analyzed using IBM SPSS Statistics 21, specifically descriptive and inferential statistics. The Independent Sample T-test and Paired-Samples T-test were conducted to compare the listening scores of the experimental and control groups. The analysis focused on mean scores, frequency and standard deviations to determine any significant differences, thus assessing the effectiveness of the MALL method

in improving learners' listening abilities

The qualitative data from students' listening journal were analyzed by thematic analysis procedure. Following Braun and Clarke's (2006) procedure for thematic analysis, after familiarizing with the data, the author first generated initial codes from the data. A code refers to 'the most basic segment, or element, of the raw data or information that can be assessed in a meaningful way regarding the phenomenon' (Boyatzis, 1998, p. 63). In this case, codes were extracts from students' listening journals, which were relevant to their listening content and perception of MALL method application to their listening practice. Next, the different codes were sorted into potential themes, which subsequently underwent further refinement, with some being merged and some separated. This process is a way of grouping codes obtained from the previous step into more meaningful and analytic units (Miles et al., 2014). Finally, the final themes were defined and presented for the analysis. The research instruments and data analysis methods are listed in Table 1 below.

Table 1: Summary of Research Instruments and Data Analysis Methods

Research questions	Research Instruments	Data Analysis method
1. What is the effectiveness of MALL method in improving students' EFL listening ability?	Pre- and post-tests (CET-4 2022 and 2021 test papers)	Descriptive analysis
2. What are students' attitude toward MALL method in their EFL listening practice?	Students' listening journal	Thematic analysis

Findings

Findings From the CET-4 Pre- and Post-Listening Tests
To answer the first research question (What is the effectiveness of MALL method in improving the students' English listening ability outside class?), the researcher carried out the pre- and post-listening test. The result in the following Table 2 shows the independent sample T-test results of both pre- and post-tests for the experiment and control class in the listening test.

Table 2: Independent Sample T-Test Results for the Listening Test in the Experiment and Control Classes

	Sample	N	Mean	P	Sig. 2
Listening pre-test	Experimental Class	22	172.66		
	Control Class	27	151.89	.340	.103
Listening post-test	Experimental Class	22	200.85		
	Control Class	27	173.95	.030	.018

Table 2 presents the pre- and post-test results for both the experimental and control classes. In the experimental class, the mean pre-test score was 172.66 points, while the mean post-test score increased to 200.85 points, an improvement of 28.19 points. In the control class, the mean pre-test score was 151.89 points, and the mean post-test score increased to 173.95 points, an improvement of 22.06 points. These results indicate that after six weeks of learning and practice, both classes showed improvement in test scores. However, the experimental class, which utilized the MALL method, showed an additional improvement of 6.13 points (28.19-22.06 = 6.13) compared to the control class, which did not use the MALL method.

Additionally, a Paired-Samples T-test was conducted for the pre- and post-test results in both the experimental and control classes. The results are presented in Tables 3 and 4.

Table 3: Paired-Samples T-Test Results for Pre- and Post-Tests in the Experiment Class

Experimental Class	Mean	N	Std. Deviation	Std. Error Mean
Post- test	200.85	22	44.225	6.515
Pre- test	172.66	22	30.560	9.429

In

Experimental Class	Paired Differences					T	Sig.
	Mean	Std. Deviation	Std. Error Mean	95 Confidence Interval of the Difference			
				Lower	Upper		
Post-test-Pre-test	28.186	51.654	11.011	51.086	5.288	2.560	.003

Table 3, the results of the Paired-Samples T-test for the experimental class show a mean score improvement of 28.186 points after six weeks of using the MALL method in the listening class. The data also indicate statistically significant differences between the pre- and post-test results ($t=2.560$, $p=0.003$, <0.05).

Table 4: Paired-Samples T-Test Results for Pre- and Post-Tests in the Control Class

Control Class	Mean	N	Std. Deviation	Std. Error Mean
Post-test	173.95	27	46.758	8.836
Pre-test	151.89	27	43.654	8.250

Control Class	Paired Differences					T	Sig.
	Mean	**Std. Deviation**	**Std. Error Mean**	**95 Confidence Interval of the Difference**			
				Lower	**Upper**		
Post-test-Pre- test	22.061	36.117	6.826	36.066	8.056	3.232	.018

As shown in Table 4, the Paired-Samples T-test results for the control class show a mean score improvement of 22.061 points after six weeks of traditional teaching methods, without the MALL method. The data reveal statistically significant differences between the pre- and post-test results (t=3.232, p=0.018, p<0.05). However, compared to the experimental class, the improvement in the control class is 6.13 points lower (i.e., 28.19-22.06 = 6.13).

These findings address the first research question, "What is the effectiveness of the MALL method in improving students' English listening ability?" The results indicate that the MALL method is effective in enhancing students' listening skills by providing additional practice outside the regular classroom setting. Although both classes showed improvements in the post-test scores compared to the pre- test scores, the experimental class demonstrated a 6.13-point greater improvement than the control class.

Findings From the Students' Listening Journal

To address the second research question "What are students' attitude toward MALL method in their EFL listening practice?", the researchers selected 9 listening journals out of a total of 22 from the experimental group and conducted a thematic analysis to identify the arising themes. The reason only nine students' listening journals were collected was that—although the teacher required all the students to write their listening journals every week—some students did not fulfil this requirement. Some students could persistently write in their journals throughout the entire six-week experiment; however, some students did not take the task seriously and just treated the listening journal task as a burden by writing only a few words to complete their journals. As a result, the journals did not contain sufficient information about their perception on the MALL method, nor did they include any valuable content that could be used to conduct the analysis. Consequently, only nine journals met the standards of consistent, detailed, and thoughtful entries, which recorded students' perceptions and attitudes toward the MALL method in their listening practice. These journals were subsequently coded to identify emerging themes. Ultimately, four prominent themes were identified:

1) **Factors impeding students' listening comprehension:** These factors included unfamiliar vocabulary, the speaker's rate of speech, and a lack of background knowledge. These issues were consistently reported in the majority of the nine selected journals.

2) **Tailoring listening content and methods to individual listening proficiency:** During the listening practice, some students adjusted their listening materials according to the degree of difficulty. They began listening to familiar topics such as "Hello, China" and gradually progressed to world news or other unfamiliar subjects. This adjustment proved to be highly

beneficial to improve students' listening comprehension.

3) **Sufficient practice duration and repeated exposure to the same topics:** Students ensured they allocated a specific amount of practice time each day, facilitated with adequate language input. Listening to a repetition of the same topics helped students quickly become familiar with recurring vocabulary and content.

4) **Listening to English programs and global news:** This practice expanded the students' knowledge of world events.

Discussion

Based on the pre- and post-test results from both the control group and the experimental group following the MALL intervention, it was observed that the mean score in the experimental group was 6.13 points higher ($p<0.05$) than that of the control group, as illustrated in Table 2. This indicates a significant improvement in the listening comprehension abilities of students in the experimental group after six weeks of implementing the MALL method outside the classroom. The findings also provided the answer to the first research question that the MALL method was effective to improve EFL students' listening ability. In this study, the application of the MALL method in the experimental group was operated in the following ways. First, the students were instructed to listen to English news or programs daily from their mobile devices and document the main content, new vocabulary, or significant sentences in a journal anytime and anywhere after class to finish their homework. Additionally, the students were granted the autonomy to select contents that aligned with their interests and proficiency levels from various apps or websites, in either audio or video formats. Regardless of the specific content or approach, the selected materials were required to be conducive to enhancing listening skills. Consequently, the learners were exposed to a diverse range of resources, facilitating increased listening practice. Furthermore, each learner could engage in self-paced and self-regulated learning to address their individual needs, aligning with the principles of constructivist theory.

The operation process and the results obtained from this study supported the study by Nuraeni et al. (2020) who believed mobile devices provided various features and applications which could facilitate language learners to enhance their language skills. The present results also supported the findings of Elfiona (2019) and Kim & Kimm (2017) whose studies indicated that special features in mobile devices such as accessibility and mobility increased students' learning motivation and interest. In addition, the effectiveness of the MALL method in improving learners' listening ability has been discussed by scholars such as Nuraeni et al. (2020) and Xu (2020). According to them, the effectiveness of the MALL method is due to the special features in mobile devices such as video and audio features and diverse applications. These features allow language learners to have speedy access to the learning contents and activities spontaneously, informally, and individually. Moreover, mobile phones are also easy to carry and use, providing more opportunities for students to get more practice, to have well-timed feedback and conduct self-evaluation. Thus, this enhances learners' language skills, increasing their motivation and interest in learning, to affect learners' learning effectiveness (Xu, 2020; Kukulska-Hulme & Viberg, 2018).

In addition, based on the results of the students' listening journals, it is evident that factors such as new vocabularies, speaker's fast-speaking pace and lack of background knowledge of a topic are the common problems that EFL listener encounter in their EFL learning. The results from

the listening journals are in line with several researchers who believed that the factors hindering learners' listening comprehension and the causes of their listening deficiency included cultural references, speaker's speaking speed, unfamiliar content, unknown vocabulary and accents, cultural and need for attention and sufficient capacity of working memory to recall listening input for the sake of output (Siegel, 2013; Cross, 2018; Tanewong, 2019).

Moreover, from this study, the individuality and flexibility of mobile learning suggest that the MALL method is well-suited for EFL listening practice. Learners can select listening materials that progress from easy to difficult, ensuring sufficient practice duration and repetition, and benefit from authentic and situated learning contexts provided by daily news. These results align with the theories of constructivism, behaviorism, and authentic learning.

Constructivism posits that learners integrate new knowledge into their existing schemas, adjusting them as needed (Piaget, 1970; Vygotsky & Cole, 1978). This aligns with Vygotsky's Zone of Proximal Development, emphasizing that learners build cognitive knowledge by connecting familiar concepts to new information. In the context of EFL learning, behaviorism suggests that language acquisition occurs through imitation, repetition, and reinforcement of correct usage, viewing language learning as a mechanical process of habit formation (Richards & Rodgers, 2014). In this study, the students constructed their own learning styles and processes by choosing their preferred and suitable learning contents and materials, which fitted the theory of Zone of Proximal Development, i.e. they constructed their learning from easy to difficult level based on their own ability. The students constructed their cognitive knowledge by taking their own learning experience to develop their learning skills.

In addition, Behaviorism posits that language acquisition is fundamentally a behaviorist process. Behaviorists believe that learning is all about the successive increase of skills and shaping learners' responses through demonstration and reinforcement of closer approximations to the intended response (Palincsar, 1998). In Second Language Acquisition, Behaviorism is translated into practice by having learners go through a series of drills and oral practices that will lead to habit formation, because behaviorist learning activities promote learning as a change in learners' observable actions (Lightbown & Spada, 2013). The MALL method in this research required the students to listen to a certain number of listening materials each day, take notes and read aloud their journal entry at the beginning of each class. These actions were repeated to reinforce their listening skill. Students' learning skills namely listening, speaking and reading are developed by their successive daily practice, demonstration and reinforcement.

Additionally, the theory of authentic learning emphasizes placing learners in real-world contexts where they engage in activities they are likely to encounter, reflecting the interactive and dynamic nature of language learning (Brown et al., 1989; Lave & Wenger, 1991). In this study, the students were asked to listen to the latest news and other online materials from the authorized Apps and websites. The content of the news, interviews, sports or TV series were derived from real and authentic situations and contexts. These contents-together with affordances and flexibility of mobile devices-ensured that the students had opportunities to access authentic social discourses and have ample available resources to conduct their learning.

Conclusion

This study aimed to investigate the effectiveness of the MALL method on EFL learners listening ability and students' attitude toward the MALL method applied in their EFL listening practice. The findings from this empirical study showed that the MALL method was effective

to improve EFL learners' listening score. The result also proved that most learners faced challenges in listening comprehension due to limited vocabulary, insufficient background knowledge of a topic, and speaker's speaking speed, which impeded their listening abilities. Identifying appropriate methods and strategies to address these issues were crucial for enhancing the students' listening skills. MALL offers learners a diverse array of learning tools and abundant resources, enabling them to select suitable learning materials and methods based on their individual proficiency levels. This approach allows for the adjustment of content and pace, facilitating personalized and effective learning experiences. Additionally, the authentic, contextualized materials and up-to-date news content provided by MALL broaden learners' horizons, enhance their knowledge base, and improve their listening comprehension outcomes.

This study has several implications. First, EFL learners can fully utilize MALL method to enhance their listening skills. Second, teachers can leverage the features of MALL to guide EFL learners with cognitive strategies, thereby improving the efficiency of listening instruction.

This study also has several limitations. First, it was conducted with a small sample size of only 22 respondents over a short duration of six weeks, limiting the generalizability of the findings. Future research should involve a larger sample size and a longer study period for more reliable conclusions. Second, this study did not examine the role of teachers in guiding the MALL method. Future research could address the importance of teachers' guidance and explanations in the EFL listening process.

Acknowledgement

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