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Effects of Using Mobile Assisted Language Learning Beyond Classroom on Chinese College Students' English Listening Comprehension and Speaking Skills

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Abstract:- Mobile assisted language learning (MALL) has become a ubiquitous learning for young generations, while the effects of using MALL beyond classroom are rarely explored. This study adopted a quantitative method to test if there was significant effect of employing MALL beyond classroom among Chinese college students at their extracurricular hours. Thirty college freshmen majoring in English participated and they were equally divided into an experimental group and a control group. Pre-test and post-test of English listening comprehension and speaking were conducted before and after the research intervention using a domestic mobile assisted language learning application for eight weeks. The findings indicated that all students improved after this period, while the students from the experimental group could surpass the control group in listening comprehension substantially. However, it also showed that the improvement in English speaking was not as significant as that of listening among all the participants. It is suggested that further qualitative explorations into the perceptions of the students concerning using MALL in their available hours after class are quite necessary, in order to strengthen its significance and improve students' communicative capabilities in listening comprehension and speaking skills.

Keywords: Mobile Assisted Language Learning (MALL), MALL beyond classroom, English listening comprehension, English speaking.

1. Introduction

In this digital age, teaching and learning has been transformed by technological advances [1]. The young generations of this era are more inclined to use the digital gadgets [2]. They tend to apply these mobile devices for watching movies, entertainments, news, and information, etc. [3]. These mobile technologies enable young learners to move around freely, break through the confinement of the walls of educational institutions, and meantime, provide financial viability of avoiding purchasing personal computer or paper textbooks because learning materials can be easily accessible via modern technologies [4].

According to Cisco's Annual Internet Report on Global Device and Connection Growth (2018-2023), it was anticipated that mobile subscriptions would increase at a rate of 2% each year. That suggested that by the year of 2023, more than 70% of individuals all over the world would be in possession of a mobile phone, and the wide-spread use of mobile devices would substantially impact on day-to-day life of young people and on the ways in which they acquire knowledge and obtain information, from a global perspective [5]. Based on the 50th Statistical Report on China's Internet Development [6], published by China Network Information Centre, the percentage of Chinese netizens using the Internet via mobile phones reached 99.6%. The netizens used the Internet for 29.5 hours per week. From December 2021 to June 2022, the applications for instant messaging, online video, video

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clip, online payment, online shopping, search engine, online news, online music, live streaming, online games, accounted for 97.7%, 94.6%, 91.5%, 86.0%, 80.0%, 78.2%, 75.0%, 69.2%, 68.1%, 52.6%, respectively. Apparently, mobile and information technology has provided possibilities to facilitate learning through messaging, videos, games, etc. It also leads up to a ubiquitous learning society.

The growing availability of mobile technologies and the Internet coverage is conducive to mobile assisted language learning (MALL). It brings language learning chances to older adults who are still interested in learning a foreign language [7]. It can develop elementary learners' writing skills [8], and enhance reading comprehension and skills of EFL learners in secondary level [9]. It can be beneficial to upgrade productive and receptive linguistic skills among college or university students [10].

Study also shows that actually COVID 19 accelerated the pace of integrating modern technologies into educational arena. Students now prefer to resort to MALL to enhance their language study [11]. The use of MALL applications has significantly grown [12]. Kacetl and Klímová [13] reviewed relevant journal articles and summarized the benefits of MALL in enhancing learners' cognitive capacity and motivation in both formal and informal learning environment, helping low-achievers with their learning goals. They also alerted that it is necessary to design with caution in order to cater to students' needs and promote their language skills in authentic learning settings. One of the most significant merits of MALL is that it allows learners of English as Foreign Language (EFL) to pursue their study beyond classroom, while the effects of such informal language learning is still less studied. Therefore, this study attempts to test if there is statistical significance of using MALL to improve English listening and speaking beyond classroom.

2. Literature review

2.1 MALL beyond Classroom

MALL not only provides access to authentic learning resources and facilitates foreign language learning anytime and anywhere, for anybody, but also provides with a scope for informal learning beyond the classroom. It extends language learning outside of classroom setting and plays a significant role in students' learning [14]. Waloyo et al. [15] discovered that students preferred utilizing an online dictionary for reading activities due to the fact that it was both efficient and flexible. Wang et al. [16] developed a personalized mobile-assisted system with a self-regulated learning mechanism to facilitate EFL students' learning of grammar. Their findings provide empirical evidence in support of the effectiveness of the system in improving students' grammar test scores, and indicate its value as a supplementary tool to conventional classroom teaching of English grammar.

EFL college students, especially lower-achieving students, should engage in MALL that could make their leaning more sustainable and independent, outside of the classroom [17]. Ahmed [18] examined the pedagogical role of WhatsApp in developing motivational levels of Yemeni EFL learners' reading and writing skills. The study provided the students with opportunities for practising a natural language, especially in written communication, outside the classroom. It is concluded that MALL application could enhance learners' reading and writing skills in English, and WhatsApp English medium groups enabled learners to practice English outside the classroom and motivate them to learn from each other. Jung [19] attempted to introduce a sample of engaging MALL activities toward the use of multiple mobile applications like Taylor's Integrated Moodle E-learning System, Naver Blog, and Quizlet, and presented that it was advantageous for students' learning outside of the classroom in terms of enhancing engagement and flexibility. However, the effect of MALL for sustainable, self-directed learning outside the classroom has been relatively under-researched.

2.2 Mobile Assisted English Listening

In recent years, academics have given mobile technology a great deal of consideration due to the fact that its application in English teaching and learning has risen globally over the course of the past two decades. A great number of experimental investigations about the utilization of mobile phones and the effectiveness of their usage in the process of teaching and learning have been carried out. In order to evaluate the differences in English listening comprehension, cognitive load, and learning behaviour between outdoor ubiquitous MALL and indoor computer assisted language learning, Chang et al. [20] conducted a study comparing these two types of language

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learning environments. The results of this study showed that the former was superior to the latter in terms of students' performance. Students who were exposed to an outdoor MALL environment had better English listening comprehension, lower cognitive load, and enhanced self-reported learning interests and interactions. Kim [21] studied the effects of MALL on English listening performance and anxiety among Korean college students and showed that MALL was effective in improving their scores and decreasing listening anxiety. Andujar and Hussein [22] conducted a study on the impact of the mobile instant messaging application WhatsApp. They discovered that it was not only efficient in enhancing listening comprehension, but it was also beneficial in boosting vocabulary, pronunciation, and speaking. Similar to the previous study, Dirjal et al. [23] conducted a case study to investigate the impact that the social media application Skype plays in fostering motivation and listening skills in Iraq.

However, according to Islam and Hassan's research [24], there have been still a limited number of studies undertaken on the topic of mobile-assisted listening comprehension. The interest in research related to the impact of MALL on developing students' listening skills remains relatively low and listening has been somehow neglected [25].

Unlike Islam and Hassan's qualitative research reviewing the relevant empirical studies concerning the effectiveness of MALL on English listening and summarizing constructive suggestions for teachers in future mobile assisted language teaching, Alzieni [26] conducted a study that demonstrated the positive impact of MALL on English listening skills. The research was conducted at Dubai Men's college, which is located in the United Arab Emirates. Twenty teachers and 66 students who had a specific impairment in listening skills took part in the study. By collecting both quantitative and qualitative data, it showed that there were significant disparities between experimental group and control group because of the extensive exposure to a variety of listening resources. Besides, in this study, game-like and informal learning environment was promoted, and motivation and engagement were also raised accordingly. The outcomes of this study indicate a step forward in our understanding of how MALL influences the learning experiences of language learners. Additionally, it suggests that because there has not been a great deal of experimental studies on MALL, there is a need for additional empirical research in order to make the conclusions more applicable.

2.3 Mobile Assisted English Speaking

As a result of the fact that the inability to communicate in English is one of the leading causes of unemployment [27], speaking abilities are believed to be exceptionally important for the future work chances of learners. Research conducted by Abugohar et al. [28] indicates that EFL students typically perceive their inability to speak effectively as a serious failure among language learners. As technology has had an impact on education, and a variety of methods have been utilized to assist EFL students in becoming more proficient speakers. MALL is considered the one that has been shown to have a notable significance [29], [30], [31]. According to Hashim et al. [32], students are able to learn more efficiently when they have access to portable and personal handheld devices such as laptops, personal digital assistants, tablets, smart phones, and mobile phones. Darmi and Albion [30] conducted a study in which they included 76 undergraduate students from Malaysia who were learning English. The results of the study revealed that the experimental group did better in terms of oral communication abilities than the control group, and the social interaction that took place created an environment that was conducive to cooperative learning. Abugohar et al. [28] studied 49 Arabian EFL learners from a higher education institute and concluded that in a less stressful teaching and learning setting, smartphone applications could help shy, anxious students develop better fluency, accuracy, and confidence. Almarshadi et al. [33] investigated the application of m-learning to improve speaking skills. In this study, 209 Saudi Arabia undergraduate EFL students believe that using m-learning will help them improve their speaking skills in the following areas: content delivery and creation (learning words and phrases with the help of authentic materials); context-based learning (improving pronunciation, grammar accuracy, and oral comprehension); and communication facilitation.

However, according to Parmaxi [34], there is still a lack of understanding the effects of digital tools and technologies on students' English speaking skills, particularly in various educational settings and regions.

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Therefore, it is also quite necessary to explore the situations beyond classroom in order to improve the English-speaking ability among EFL learners.

2.4   Mobile Assisted English Listening and Speaking

Because of the interdependence of listening and speaking, training in both listening and speaking English is required for the facilitation of using English as a foreign language learning [35]. However, most empirical studies on learner motivation have focused on one of these abilities rather than both at the same time [36].

A comparative study was undertaken by Mortazavi et al. [10] to examine the factors that influence the development of productive and receptive foreign language skills in Asian universities through MALL. University students could potentially benefit from utilizing LINE and WhatsApp, respectively, to enhance their receptivity (listening and reading) and productivity (writing and communicating). In addition, rather than relying solely on in-person training, they suggested that educators modify their present and future educational programs in accordance with the technology acceptance paradigm.

Yoestara and Putri [35] proposed that podcasting, which combines broadcasting and the iPod, could be utilized as an alternative method to enhance the listening and speaking abilities of EFL students. This is because, in Indonesia, English is used as a foreign language, students have restricted opportunities to interact with the English language beyond the classroom, with the exception of formal settings. Through the administration of pre- and post-tests to control and experimental groups, Dirjal et al. [23] demonstrated that the use of Skype could improve not only the listening but also the speaking abilities of Iraqi EFL learners.

Qiu and Xu [36] found that there are a few studies that contribute to listening and speaking respectively, and there are even less studies concerning the two skills. Moreover, it is essential to develop, implement, or design a mobile-mediated educational technique that is suitable for Chinese EFL learners [37]. Therefore, there is a great need to study the effects of using domestic MALL applications on Chinese EFL college students' English listening comprehension and speaking skills.

Accordingly, this study focuses on the following research questions:

(1) Does the use of MALL application beyond classroom have an impact on students' listening comprehension?

(2) Does the use of MALL application beyond classroom have an impact on students' speaking abilities?

(3) Is there a correlation between English listening comprehension and English-speaking proficiencies?

3.   Research Methodology

3.1 Research Participants

This is a pilot study adopting a quantitative research method. It was conducted in an independent college in China. The participants are freshmen, majoring in English, pursuing their Bachelor's Degree. Altogether, there were thirty students, equally divided into two groups based on students' willingness, namely, an experimental group (EG) and a control group (CG). There were six male students in the control group and one male student in the experimental group, the rest of the participants in the two groups were all female students.

3.2 Research Instruments

The research instruments for this study included pre-test and post-test. The pre-test was used to determine students' proficiency levels before the research intervention. The post-test was utilized to determine the improvement levels after the research intervention. For both pre-test and post-test, Linguaskill General was adopted and administered to all participants. Linguaskill General is developed and produced by Cambridge Assessment English, which is one of the most renowned exams and used by the top colleges and institutions [38]. It is based on the Common European Framework of Reference and normally used to gauge language learners' proficiency [39]. The tests range from PreA1, A1, A2, B1, B2, C1 to C2. As for the pre-test and post-test of listening, A2 and B1 level sample tests were taken, and there were 50 question items in total, which were assigned to with a score from 1 to 50 for subsequent data analysis. As for English speaking pre-test and post-test, there is

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an online speech robot that all participants can get access to. The score was given exactly after the speaking tests with CEFR scale from A1, A2, B1, B2, C1 to C2, which was also assigned to from 1 to 6 for further data analysis. All of the score data was subsequently analysed via SPSS 29.0.

3.3 Research Intervention

This study introduced Keke, a domestic mobile assisted language learning application to the experimental group. This application provides a wide range of listening materials and speaking activities that are tailored to each student's needs and level of proficiency [40]. It can be downloaded to the mobile phone of the students. In this study, all of the participants including both the experimental and the control groups haven't used this application before. For students in the experimental group, they had the following exercises provided by the application: (1) Intensive listening. It enables students to replay the listening materials sentence by sentence with both English and Chinese subtitles; (2) Word picking. Students can pick word from the nine grid to make the sentences complete while listening; (3) Dictation. There are two types of dictation. Students can choose to dictate online or they can write it down on paper and upload the picture for checking; (4) Shadowing. It enables the students to repeat after the listening materials with marks given for each shot; (5) Dubbing. It allows students to dub their own version of listening materials. They can also witness their progress or get a glimpse of others, since the mark is given for each dubbing and there is also a ranking for each dubbing work. (6) AI Chats. It provides opportunities for the students to engage in chatting with an artificial-intellegence oral coach. When chatting with AI oral coach, students can pick a context of the chatting, such as daily greetings, checking out for shopping or shopping online, job interviews, foreign trade, asking for the way, traveling, or hotel reservation. Students can also define a context out of their own interest.

This study is to explore into the students' extracurricular mobile assisted language learning by using this application with multiple functionalities, therefore, after the application was introduced to the students of the experimental group, they were advised to use this application for listening and speaking practices during their available hours outside classroom for two months. They were advised to use the application at least one hour each day outside the classroom, the formal setting. There were no extra assignments attached to it. Students

Table 1: Descriptive Results of Listening and Speaking Scores in the Pre-tests

Variables	Group	Number	Mean	SD
Listening (Pre-test Score)	CG	15	22.93	6.734
	EG	15	23.60	6.057
Speaking (Pre-test Score)	CG	15	2.53	0.516
	EG	15	2.73	0.594

Table 2: Results of Independent Samples T-test in the Pre-tests

		Levene's Test for Equality of Variances		t	df	Sig. (Two-tailed)
		F	Sig			
Listening (CG and EG)	Equal variances assumed	0.005	0.943	-0.285	28	0.778
	Equal variances not assumed			-0.285	27.691	0.778
Speaking (CG and EG)	Equal variances assumed	0.012	0.913	-0.984	28	0.333
	Equal variances not assumed			-0.984	27.473	0.333

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could pick whatever they liked to listen to and practice. From time to time, they needed to screenshot and report their time investment in practices by using the application via Wechat group. The screenshots marked their accumulated time consumption in listening and speaking practices, which also took a part in motivating them to be persistent in their day-to-day mobile assisted language learning.

4. Results and Discussions

The pre-test was conducted for students' proficiency levels of English listening comprehension and speaking skills before the research intervention. The following table 1 shows the results of the participants' English listening comprehension and speaking scores. By observing the descriptive data, the average scores for the control group (M=22.93 for listening pre-test, M=2.53 for speaking pre-test) are close to those of the experimental group in listening comprehension and speaking (M=23.60, M=2.73).

In order to see if there were any significant differences between EG and CG in the pre-tests, an Independent Samples T-test was conducted on the basis of normally distributed score data. The results are presented in the table 2. It shows that there is no significant difference in the pre-tests between the control group and the experimental group, with t(28)=-0.285, p=0.778 for listening, and t(28)=-0.984, p=0.333 for speaking.

As for both listening and speaking, based on the assuming and not assuming equal variances, the p-values are greater than commonly used significance level of 0.05. It suggests that there is no evidence to reject the null hypothesis of equal variances. Therefore, the assumption of homogeneity of variances for listening and speaking pre-tests between EG and CG is met. It indicates that there are no statistical differences between EG and CG in both listening comprehension and speaking scores before the research intervention. This result served as a crucial role in establishing a baseline for understanding any observed differences and ensuring the validity of subsequent analyses.

4.1 The Impact of MALL on Students' Listening Comprehension

After the research intervention, the post-tests were administered to the two groups. Paired Samples T-test of listening was conducted after the normality tests, in order to reveal whether students made any progress in listening comprehension. The results are shown in the following table 3.

According to the results, it is quite obvious that students of both groups made improvement in these eight weeks period of learning, with the significance level less than 0.01. In order to answer the first research question concerning the impact of MALL on the students' listening comprehension among the experimental group, the following Independent Samples T-test was conducted between the control group and experimental group in the post test.

Table 3: Results of Paired Samples T-test of Listening in the Pre-test and Post-test

| Variables | Group | Paired Differences | | t | df | Significance | |
		Mean	Std. Deviation			One sided p	Two-Sided p
Listening	CG	5.533	6.833	3.136	14	0.004	0.007
	EG	10.476	4.969	8.157	14	<0.001	<0.001

Table 4: Results of Independent Samples T-test of Listening in the Post-test

| | | Levene's Test for Equality of Variances | | t | df | Sig. (One-tailed) | Sig. (Two-tailed) |
		F	Sig				
Listening	Equal variances assumed	0.094	0.762	-2.216	28	0.017	0.035
	Equal variances not assumed			-2.216	27.736	0.018	0.035

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Apparently, according to table 4, there is a statistical difference between the experimental and the control group, as the significance level is less than 0.05, which shows the statistical magnitude of assuming inequality between the two groups. It also indicates that extending MALL beyond classroom had a discernible and positive impact on enhancing students' ability to comprehend spoken English.

This statistical significance observed in the improvement of English listening skills with MALL could be attributed to several factors. Firstly, the ubiquity and accessibility of mobile devices could enable learners to engage with a diverse range of authentic audio and video materials from Keke, creating a more immersive and dynamic learning environment. Secondly, the portability of mobile learning could allow students to practice listening skills beyond classroom, contributing to a more holistic language acquisition process with a personalized learning experience, addressing individual learning styles and pacing. It also suggested that, when appropriately utilized, mobile-assisted approaches might complement and extend the benefits of traditional classroom instruction and leaving the basic listening training to the students.

4.2 The Impact of MALL on Students' Speaking Skills

Except for focus on the impact of MALL on students' listening comprehension, this study also revealed the impact of using domestic MALL application on students' speaking skills.

The following table 5 shows the results of Paired Samples T-test for speaking in both control group and the experimental group to see if there is any statistical significance after the normality tests. By comparing the speaking pre-test and post-test in both experimental and control group, the significance p-value is greater than 0.05, even though the experimental group is much closer to the expected p-value, compared with the control group. However, generally speaking, it indicates that both groups had experienced no statistically significant progress in speaking scores. In order to further compare the two groups closely, the following Independent Samples T-test was also conducted, which also shows, in table 6, the same tendency, indicating no significant differences.

The outcome of the investigation shows the absence of statistically significant improvements in English speaking skills among both groups beyond the classroom setting, even though there is little difference between the two groups, where the experimental group may reach closer to the expected p-value (one-sided $p=0.082$). The findings suggest that, despite opportunities afforded by Keke for language practices, the impact on oral proficiency of students in the experimental group is not that significant. As a matter of fact, despite substantial efforts and diverse tactics, Asian EFL students have always found it difficult to speak English [41].

Several factors may contribute to the observed lack of statistical significance in English speaking skills improvement. Firstly, students might not pay equal attention to speaking practices after class. They might listen to the materials in their spare time, while they might tend to ignore speaking practices like shadowing or dubbing or even AI chats. Secondly, from the language production perspective, the production of language is more context dependent, while students might lack real interactive opportunities to hone their speaking capabilities. Thirdly, teacher support and encouragement might be needed for most students. Furthermore, individual differences among the students, such as personality, persistence, learning styles, might also influence the effectiveness of MALL for speaking skill development, since there were some few students indeed made some progress in speaking when mean scores of the students in general showed no statistical significance.

Table 5: Results of Paired Samples T-test of Speaking in the Pre-test and Post-test

Variables	Group	Paired Differences		t	df	Significance	
		Mean	Std. Deviation			One-sided p	Two-Sided p
Speaking	CG	0.067	0.258	1.000	14	0.167	0.334
	EG	0.133	0.352	1.468	14	0.082	0.164

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Table 6: Results of Independent Samples T-test of Speaking in the Post-test

		Levene's Test for Equality of Variances		t	df	Sig. (One-tailed)	Sig. (Two-tailed)
		F	Sig				
Speaking (Post-test between CG and EG)	Equal variances assumed	0.700	0.410	-1.148	28	0.261	0.261
	Equal variances not assumed			-1.148	24.713	0.262	0.262

Table 7: Correlations between Listening and Speaking Proficiency

		Speaking Pre-test (CG)	Speaking Post-test (CG)	Speaking Pre-test (EG)	Speaking Post-test (EG)
Listening Pre-test (CG)	Pearson Correlation	0.278			
	Sig. (2-tailed)	0.316			
Listening Post-test (CG)	Pearson Correlation		0.229		
	Sig. (2-tailed)		0.411		
Listening Pre-test (EG)	Pearson Correlation			0.346	
	Sig. (2-tailed)			0.207	
Listening Post-test (EG)	Pearson Correlation				0.353
	Sig. (2-tailed)				0.197

The above explanations also indicate that it is essential to delve deeper into qualitative aspects, such as students' perceptions, attitudes towards MALL, or qualitative assessments of their speaking performances, which may provide valuable insights into the causes. According to the findings of an earlier study carried out by Xu [40], it is also presented that students' listening proficiency improved after a period of practices while there was no significant improvement for speaking due to inadequate practices outside classroom.

4.3 The Relationship between English Listening Comprehension and Speaking Proficiency

In order to explore into the relationship between listening comprehension and speaking skills, this study also conducted a correlation analysis, as shown in the table 7.

By taking Pearson Correlation analyses of paired scores of 30 participants, it shows the strength of the relationship $r=0.278$, and the significance level $p=0.316$ for control group in the pre-test, and $r=0.346$, $p=0.207$ for the experimental group in the pre-test, while as for post-test, $r=0.229$, $p=0.411$ for the control group, and $r=0.353$, $p=0.197$ for the experimental group. These findings indicate that listening and speaking skills may correlate with each other, however, p-value for all is greater than 0.05, indicating that the result may be due to chances. By comparing the strength of the relationship between pre-test and post-test in listening and speaking proficiency, it is apparent that the relationship strength of listening and speaking for the control group is close to be negligible. While for the experimental group, it may indicate stronger connection for listening and speaking, while there is still lack of statistical significance.

According to this result, it may be inferred that even though students do have great improvement in listening comprehension and there is a moderate correlation between listening and speaking, it does not necessarily mean that students can evidently or drastically improve their speaking proficiency at the same time. This finding is also consistent with the above results concerning the impact of MALL on listening comprehension and speaking, and it is also in alignment with the research findings of Xu [40].

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In addition, since the p-value for four pairs of correlations is greater than 0.05, which indicates that the results may be out of chances. Therefore, a larger sample may be needed to further examine the correlations between listening and speaking skills.

5. Conclusion and Suggestion

In this globalized world, individuals with limited English listening and speaking skills may not be unable to effectively communicate [42]. On the other hand, merely depending on limited class hours is insufficient for college students to develop their English proficiency, so it is imperative to take advantage of their available hours outside the classroom setting, with the aid of domestic mobile applications to extend their study.

In the exploration of the effects of domestic mobile applications on Chinese college students' English proficiency, this study especially delved into the aspects of listening comprehension and speaking skills. It shows that the utilization of domestic applications within MALL framework has shown some promising aspects in the investigation. The findings also underscore the importance of immersive learning environment, emphasizing integration of mobile technology into students' daily learning for continuous language exposure and practice beyond classroom.

Based on this study, the positive impact of MALL on English listening comprehension is a standout result, aligning with prior researches [39], [22], [23] [26]. The statistical significance observed in improved listening skills highlights the potential of using mobile learning to enhance auditory language processing among college students. Furthermore, students still need to continue their extracurricular learning in order to be proficient language users, even though they have reached the level of being independent language users. Future research endeavours may explore the role of guided instruction in maximizing the benefits of MALL for English listening skills development. While the effects on speaking skills are not as expected as earlier studies [30], [33]. Even though both listening and speaking are around spoken language, it is necessary to acknowledge that challenges of oral proficiency development. Meantime, it is significant to explore further into the causes so as to improve students' speaking proficiency. The correlation analyses between listening and speaking skills provides valuable insights into the interplay of the two skills, while further study with larger sample is needed to confirm its significance.

The study also suggests key considerations for optimizing the implementation of MALL. Exploring students' perceptions, providing teacher support and addressing factors related to individual differences, such as learning styles, persistence in mobile-assisted language learning is integral for sustained effectiveness. Future studies may also explore alternative methodologies, different mobile applications, to identify potential avenues for enhancing the impact of MALL technology on language proficiency.

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