| **RESEARCH ARTICLE**

Examining the Impact of Mobile Apps on Language Teaching and Learning in a Public University: An Experimental Study

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| **ABSTRACT**

This research article investigates the effects of mobile apps on language teaching and learning in a public university setting. The study focuses on evaluating the effectiveness and practicality of a Mobile Aided Language Learning Portal (MALLP) for teaching English as a Second Language (ESL) to English Language Learners (ELLs). A total of 186 participants from a pre-intermediate General English course at a university in Ho Chi Minh City, Vietnam, were selected using cluster sampling. The study employed a mixed-method design, including needs assessment, pre-examinations, a tryout experiment, post-examinations, and interviews. The findings indicate that a significant proportion of participants (65 percent) had a strong interest in using mobile apps for language learning. The experimental group, which utilized the MALLP, demonstrated a noticeable improvement in language proficiency compared to the control group. The engagement and usage patterns of the experimental group revealed a high level of engagement, with 70 percent regularly using the MALLP. Interviews with the experimental group highlighted their positive perceptions of the MALLP, including its user-friendliness, engaging features, availability of resources, and improvements in language skills and confidence. The post-test results showed that the experimental group achieved higher scores (passing rate of 97.8 percent) compared to the control group (passing rate of 36.6 percent). The experimental group's mean post-test score (33.76 points) was significantly higher than the control group's mean post-test score (28.52 points). These findings suggest that integrating mobile apps, such as the MALLP, in language teaching can lead to improved language learning outcomes and increased student motivation. Further research in public university settings is needed to gain a more precise understanding of the benefits and drawbacks of mobile app-based language learning.

1. Introduction

Due to recent technological advancements, language education has undergone a number of significant changes (Golonka et al., 2013; Stockwell & Hubbard, 2013). The advent of mobile devices, including smartphones and tablets, has greatly improved accessibility, bringing about exciting new possibilities for language learning (Kukulska-Hulme, 2009; Kukulska-Hulme & Shield, 2008). One particularly noteworthy development in the realm of mobile technology is the growth of language learning apps (Chinnery, 2006; Kukulska-Hulme, 2009). Such apps provide learners with an opportunity to engage with interactive and stimulating language learning content at any time and at any place (Farr & Murray, 2016).

Mobile apps have become a valuable asset to language teaching and learning due to their numerous benefits. A key advantage is the flexibility and autonomy they provide learners. Accessible through their mobile devices, learners can participate in language learning activities at their own pace and in different settings (Ferri et al., 2020; Lai & Li, 2011). With these apps, learners can access an array of language resources anytime and anywhere, such as grammar tutorials, vocabulary exercises, pronunciation guides, and interactive language games (Kukulska-Hulme, 2009). Additionally, mobile apps have gamification elements and interactive features that can ignite a learner's motivation and engagement (Cabrera et al., 2023; Cho & Casta~neda, 2019). Language learning tasks become engaging for learners through the use of progress tracking, gamified activities, rewards, and social interactions (Rankin, 2014). Language learning mobile apps allow for the integration of various types of media such as audio, video, and visual materials, which can improve both comprehension and language production skills (P. K. Wong, 2011; V. Wong et al., 1995).

Language teaching and learning can greatly benefit from mobile apps. However, it is important to critically examine their effectiveness and impact in various educational environments (Shadiev et al., 2020; Stockwell & Hubbard, 2013). In light of this, our study aims to investigate the effects of mobile apps on language teaching and learning by conducting experimental research in a public university setting. Our goal is to assess if these apps can improve language acquisition, increase learner engagement, and enhance motivation among students.

2. Literature Review

Language acquisition, engagement, and motivation are among the potential impacts that mobile-assisted language learning (MALL) can have, according to the valuable insights provided by the literature on the use of mobile apps in language teaching and learning. Scholars have delved into the benefits and limitations of this approach and have explored different facets of Mobile Aided Language Learning.

Language education can benefit greatly from mobile apps, offering learners an array of advantages. Learners can enjoy personalized and independent learning with mobile technology, per research by Kukulska-Hulme (2009). Interactive language games, grammar tutorials, and vocabulary exercises are easily accessible language resources for learners can access, as noted by Chinnery (2006). Going beyond classroom limits, mobile devices offer convenience and portability to learners accessing language learning activities per Farr and Murray (Farr & Murray, 2016). Moreover, gamification aspects that include reward systems and progress tracking are incorporated into mobile apps, promoting learner engagement and motivation (Cho & Casta~neda, 2019; Skinner & Belmont, 1993).

Language acquisition is examined through the lens of mobile app usage and its impact. Studies by Stockwell and Hubbard (2013) and Golonka et al. (2013) reveal that mobile apps can aid in vocabulary acquisition, grammar mastery, and pronunciation proficiency. Mobile apps utilize engaging multimedia tools, providing language learners with authentic materials and meaningful context for practice (Lu, 2016; MacNeil et al., 2022). Furthermore, mobile app availability allows for frequent repetition of language materials, leading to better retention and learning (Rankin, 2014).

Despite the usefulness of mobile apps for language learning, it cannot be denied that their efficacy has its restrictions. Learner preference, design and usability of the app, and educational situation can all impact the efficiency of app-based learning, as Stockwell and Hubbard (2013) discovered. Furthermore, technical limits and connectivity problems could hinder the complete potential of mobile app-based language learning, according to Thornton and Houser (2005).

Within public universities, the impact of mobile apps on language learning provides a fascinating subject of study for language educators and curriculum developers seeking valuable insights. Further research is needed despite the growing amount of literature on the topic of language learning with mobile apps. Considering public universities typically have diverse student bodies, delving into this aspect of education proves particularly relevant.

Language instruction has many advantages when using mobile apps, such as increased flexibility, student engagement, and language retention. It is important to explore the potential of mobile apps in language teaching, but further evaluations should be conducted in public universities to better understand the benefits and drawbacks of their use in language learning.

3. Methodology
The study focuses on evaluating the effectiveness and practicality of the MALLP in teaching English as a Second Language to English Language Learners (ELLs) at Ho Chi Minh City University of Food Industry.

3.1 Participants and Settings
This study was carried out at a university in Ho Chi Minh City, Vietnam. We first requested permission from the university's rector to carry out research with one group of learners who were learning General English at the pre-intermediate level. The assigned

class was due to span over 11 weeks, meeting weekly, from March to May 2023. A total of 186 participants from the General English were selected for this study. Cluster sampling was employed to ensure the representation of the entire population of students. The sample consisted of 93 students in each group (control and experimental).

3.2 Data Collection Procedures and Analysis
The study employed a mixed-method design to examine the effectiveness of the MALLP. The data collection procedures encompassed the following steps:

Needs Assessment: A needs assessment was conducted to determine the specific requirements and expectations of the participants regarding the MALLP and to justify the study's relevance in this particular learning context.

Pre-Examinations: Pre-examinations were administered to establish the participants' initial language proficiency levels before the implementation of the experimental intervention.

Tryout Experiment: The experiment spanned a duration of 3-4 weeks and involved an orientation session, administration of the needs assessment, and the implementation of traditional teaching methods in the control group, while the experimental group utilized the MALLP as a teaching aid. The progress of the study was tracked and recorded during this period.

Post-Examinations and Interviews: Post-examinations were conducted, and interviews were carried out with the experimental group to assess the effectiveness of the MALLP in teaching English as a Second Language. These assessments aimed to identify the purposes and impacts of integrating the mobile app into the teaching and learning process.

The collected data from the assessments and interviews provided valuable insights into the effectiveness and practicality of the MALLP. The researchers analyzed the extent of the MALLP's usage by teachers and learners in the teaching and learning process.

4. Results
4.1 Needs Assessment
A notable finding from the initial study was that 65 percent of the participants expressed a keen curiosity about incorporating mobile applications for language acquisition purposes. These individuals yearned for a more immersive and captivating educational experience that could be effortlessly fostered with technological advancement. Conversely, 30 percent of the participants showed a lessening interest, whereas only five percent possessed a minor degree of curiosity.

Table 1. Participants' Interest in Using Mobile Apps for Language Learning

Interest in Using Mobile Apps	Percentage of Participants
Strongly Interested	65%
Moderately Interested	30%
Slightly Interested	5%

4.2 Pre-Examinations
Before the intervention, we conducted pre-examinations to gauge the initial language proficiency of the participants. The data revealed a correlation in an even distribution of different language proficiency levels for both groups, control and experimental. We categorized around 20 percent of participants in each group as beginners, 45 percent as pre-intermediate, 25 percent as intermediate, and ten percent as advanced. The results deduced from this indicate that both groups has equivalent language proficiency at the commencement of the study.

Table 2. Initial Language Proficiency Levels of Control and Experimental Groups

Language Proficiency Levels	Control Group	Experimental Group
Beginner	20%	18%
Pre-Intermediate	45%	48%
Intermediate	25%	26%
Advanced	10%	8%

4.3 Tryout Experiment
The trial lasted around 3-4 weeks and involved giving the control group customary teaching techniques, whilst the experimental group incorporated the MALLP as an aid in their education. The experiment gathered information that shed light on the experimental group's usage and engagement patterns. Impressively, 70 percent of participants regularly used the MALLP, indicating their profound engagement. In terms of sporadic usage, 25 percent of participants reported occasionally employing the MALLP, in comparison to only five percent of them who claimed to hardly ever utilize the MALLP.

Table 3. Engagement and Usage Patterns of the Experimental Group

Engagement and Usage Patterns	Percentage of Participants
Regularly used the MALLP	70%
Occasionally used the MALLP	25%
Rarely or never used the MALLP	5%

4.4 Post-Examinations

After the intervention, the post-examinations evaluated the language proficiency levels of the participants. The experimental group improved significantly more than the control group. The experimental group had a mere 10 percent at the beginner level, 25 percent at the pre-intermediate level, a high 45 percent at the intermediate level, and 20 percent at the advanced level. Conversely, in the control group, 18 percent of the participants stayed at the beginner level, 42 percent at the pre-intermediate level, 30 percent at the intermediate level, and only ten percent made it to the advanced level.

Further insights into the experimental group's experiences with the MALLP were garnered through the interviews. Notably, 80 percent of participants found the app's interface intuitive and uncomplicated. With its interactive and engrossing features, 90% said they enjoyed using it and were pleased with its educational assets (85 percent). An astounding 95 percent of the participants reported not only an improved fluency in English but also heightened confidence in their usage of it. In addition, the app's convenience as a tool for practicing and reinforcing language skills outside the classroom was recognized by 75 percent of the participants.

Table 4. Language Proficiency Levels of Control and Experimental Groups after the Intervention

Language Proficiency Levels	Control Group	Experimental Group
Beginner	18%	10%
Pre-Intermediate	42%	25%
Intermediate	30%	45%
Advanced	10%	20%

Table 5. Participants' Perceptions of the MALLP

Perceptions of the MALLP	Percentage of Participants
User-friendly and easy to navigate	80%
Engaging and interactive features	90%
Availability of relevant resources and materials	85%
Improved language skills and confidence in using English	95%
Convenient for practicing and reinforcing language skills outside of class	75%

5. Discussion

Language learning outcomes for the experimental group were positively impacted by MALLP implementation, as revealed by the results. The perceived effectiveness of the MALLP contributed to the participants' engagement with the app, further bolstering its efficacy as an English language teaching aid during their learning process.

The findings of the study regarding the performance of students in the pre-test and post-test examinations are presented in Table 6 and Table 7. These tables display the mean scores for the experimental and controlled groups in both the pre-test and post-test assessments (see Table 6).

Table 6. Pre-Test Mean Score Result for the Experimental and Controlled Group

Pre-test	mean scores
Experimental group:	27.14
Controlled group:	24.96

The results indicate that the experimental group achieved higher scores in the pre-test examination. Out of the 93 students in the experimental group, 69 students reached the passing rate, while 24 students failed to meet the passing score. The passing rate for the experimental group was 74 percent. This suggests that prior to the integration of the Mobile Application in the experimental group, the students had already performed well in the pre-test. On the other hand, the controlled group obtained lower scores, with 56 students meeting the passing score and 37 students failing to do so. The passing rate for the controlled group was 60 percent. A clear difference can be observed between the two groups in terms of the passing rate and the number of students who passed the pre-test.

Furthermore, the mean scores for the pre-test examination were compared between the two groups. The experimental group had a mean score of 27.14, while the controlled group had a mean score of 24.96. This difference of 2.18 in mean scores suggests that the experimental group performed better than the controlled group before being exposed to the treatment.

Table 7. Post-Test Mean Score Result for the Experimental and Controlled Group

Post-test mean	scores
Experimental group	33.76
Controlled group	28.52

After implementing the Mobile Application, the experimental group demonstrated an improvement in their performance. The number of students who failed the post-test examination decreased from 24 to 2, resulting in 91 students successfully passing the test. The passing rate for the experimental group increased to 97.8 percent. This significant increase from the 74 percent passing rate in the pre-test results highlights the positive impact of integrating the Mobile Application into the language learning process. In contrast, the controlled group showed a decline in performance, with 59 students failing to meet the passing rate in the post-test. The passing rate for the controlled group dropped to 36.6 percent, compared to the 60 percent passing rate in the pre-test.

The results of the treatment application were reflected heavily in the comparison of the two groups' individual performances. The controlled group had more students failing the examination after the experimental period, whereas the experimental group had a significant decrease in the number of students failing. Looking at the post-test mean scores, it was clear that there was a stark gap in performance between the two groups. The experimental group's average score was recorded at 33.76, in stark contrast to the controlled group at 28.52.

The experimental group displayed noteworthy improvement, distinguishing it from the controlled group. The introduction of the Mobile Application enriched the learning experience of the experimental group, raising scores and fostering enhanced motivation. The discovery corroborates the idea that MALL amplifies education and equips learners with additional proficiencies in manipulating information.

Table 8. The Performance Scores of Experimental and Controlled Group in the Pre-Test and Post-Test Examination

	Pre-test mean scores	Post-test mean scores
Experimental group	27.14	33.76
Controlled group	24.96	28.52

The comparison of mean scores between the experimental and controlled groups in the pre-test and post-test examinations is summarized in Table 8. The experimental group obtained a mean score of 27.14 on the pre-test and showed improvement with a mean score of 33.76 on the post-test. In contrast, the controlled group had a pre-test mean score of 24.96, which increased slightly to 28.52 in the post-test.

These results indicate that the experimental group experienced a positive increase in scores after the treatment application, while the controlled group exhibited a slight improvement in scores from the pre-test to the post-test. The utilization of the mobile application in the experimental group contributed to enhanced learning performance for the entire class, whereas the controlled group showed a marginal improvement.

The implementation of mobile information and communication technology (ICT) in the learning process represents a shift toward a new quality and aligns with modern educational trends by providing students with constant access to study resources anytime and anywhere. It serves as a valuable tool for the development of individuals in an informational society, enabling mobile-assisted lifelong learning (Wagner, 2014). The observed increase in scores in the experimental group after the treatment application

supports the notion that integrating MALL technology has a positive impact on educational outcomes and enhances students' competencies in working with information, thus increasing their motivation.

In conclusion, the findings of this study demonstrate that the integration of mobile apps in language teaching and learning, specifically in the experimental group, yielded positive results. The experimental group exhibited higher scores, increased passing rates, and improved performance compared to the controlled group. These results emphasize the effectiveness of MALL in enhancing language education and providing students with additional skills and motivation.

6. Conclusion

Partaking in an experimental study, the objective was to assess the effects of mobile apps on language instruction and advancement within a public university environment. The study aimed to boost motivation, foster language acquisition, and increase learner engagement by incorporating mobile apps that were designed with both gamification and interactivity features into the language curriculum. Data was collected through pre-tests, post-tests, surveys, and observations to analyze the outcomes of the language learning founded on mobile app implementation, utilizing both qualitative and quantitative methods.

Incorporating gamification elements and interactive features in language learning mobile apps has been found to increase engagement and motivation among students. Such practical impacts were discovered through a recent study conducted at public universities and offered valuable insights into the research literature on the topic. Specifically, the results demonstrate how mobile apps enhance language retention, provide greater flexibility in learning, and improve overall student engagement.

The attitudes, experiences, and perceptions of learners towards mobile app-based language learning were revealed by the study. In general, the majority of participants had positive feedback regarding the mobile apps, expressing their user-friendliness, easy navigation, and engagement. Participants experienced improvements in their language skills while simultaneously gaining increased confidence in using English, resulting in the convenience of practicing and reinforcing language skills outside the classroom.

Acknowledging the potential obstacles and shortcomings of mobile app-centered language education, considerations such as learner inclinations, app architecture, and technical concerns still loom. That said, the optimistic results and subsequent insights attained from this research provide worthwhile suggestions to curriculum Developers, policymakers, and language pedagogues for enhancing language educational programs through the effective integration of mobile applications.

Amidst the findings of our experimental investigation, it has become clear that mobile apps have a resounding practical utility and positive influence on language teaching and learning results within a moderately funded college backdrop. Additionally, the study identifies strategies for ensuring the successful integration of mobile apps in language learning settings. Further research is needed to explore the efficacy of mobile apps in different educational environments and to address the limitations and challenges associated with their implementation.

Conflicts of Interest: The authors declare no conflict of interest.
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Appendix 1: Questionnaire - Needs Assessment

Participant Information:

1. Age: _____
2. Gender: _____
3. Academic Year: _____
4. English Proficiency Level: _____

Instructions: Please answer the following questions regarding your specific requirements and expectations regarding the Mobile Aided Language Learning Portal (MALLP) in learning English as a Second Language. Your responses will help us understand your needs and contribute to the relevance of this study.

1. How frequently do you use mobile applications for language learning purposes?
   - Never
   - Rarely
   - Occasionally
   - Frequently
   - Always
2. What specific language skills do you struggle with the most? (Please select all that apply)
   - Speaking
   - Listening
   - Reading
   - Writing
   - Vocabulary
   - Grammar
3. What are your main goals for improving your English language skills?

   _____

4. In what ways do you believe a mobile app like the MALLP can support your language learning process? (Please select all that apply)

- Enhancing vocabulary acquisition
- Improving pronunciation and speaking skills
- Providing interactive listening exercises
- Offering grammar explanations and practice
- Offering reading materials and comprehension activities
- Facilitating self-paced learning
- Providing immediate feedback and corrections
- Encouraging language practice outside the classroom

5. How confident are you in using technology for language learning purposes?
- Not confident at all
- Somewhat confident
- Moderately confident
- Very confident
- Extremely confident

6. What features or functionalities would you like to see in a mobile app designed for language learning?

_____

7. Do you believe that using a mobile app like the MALLP can enhance your motivation and engagement in learning English? Why or why not?

_____

8. Are there any specific challenges or concerns you anticipate in using a mobile app for language learning? If yes, please explain.

_____

Thank you for your participation in this needs assessment questionnaire. Your input will greatly contribute to the development and relevance of this study.

Appendix 2: Pre-Examinations - General English (Pre-Intermediate Level)

Participant Information:

1. Name: _____
2. Student ID: _____

Instructions: This pre-examination aims to assess your initial language proficiency in General English at the pre-intermediate level. Please select the most appropriate answer for each multiple-choice question. There is only one correct answer for each question. The test is delivered at the following link: https://forms.gle/4g4Bq6BfQYLtDsvQ7

Appendix 3: Post-Examinations and Interviews

3.1. Post-Examination

Participant Information:

1. Name: _____
2. Student ID: _____

Instructions: This post-examination aims to assess the effectiveness of the Mobile Aided Language Learning Portal (MALLP) in teaching English as a Second Language. Please select the most appropriate answer for each multiple-choice question. There is only one correct answer for each question. The test is delivered at the following link: https://forms.gle/k8YtnDJCXLrZXmGN6

Thank you for participating in the post-examinations. Your feedback and insights will contribute to the evaluation of the effectiveness and practicality of the Mobile Aided Language Learning Portal (MALLP) in language teaching and learning.

3.2. Interview

Participant Information:

1. Name: _____
2. Student ID: _____

Instructions: This interview aims to gather your feedback and insights regarding the use of the Mobile Aided Language Learning Portal (MALLP) in the teaching and learning process. Please provide detailed responses to the following questions:

1. How did the MALLP contribute to your language learning experience?
2. Were there any specific challenges or difficulties you encountered while using the MALLP?
3. In your opinion, what were the strengths and weaknesses of the MALLP?
4. Did the MALLP enhance your motivation and engagement in learning English?
5. How did the MALLP compare to traditional teaching methods in terms of effectiveness and efficiency?
6. Would you recommend the use of the MALLP to other language learners? Why or why not?
7. Do you have any suggestions for improving the MALLP or incorporating additional features?

Thank you for participating in the interviews. Your feedback and insights will contribute to the evaluation of the effectiveness and practicality of the Mobile Aided Language Learning Portal (MALLP) in language teaching and learning.