Effect of Mobile Assisted Learning on English Language Vocabulary and Grammar: The Saudi Arabian Context as a Case Study

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Abstract
Mobile-assisted language learning offers a different learning environment, facilitating learning in second/foreign languages and vocabulary learning. The current study attempted to explore the utilization effect of mobile-assisted language learning, facilitating English language learners to perform better in English vocabulary and grammar learning. In other words, this research aims to support the body of research related to the effect and usefulness of mobile learning or mobile-assisted language learning by examining the English language context of Saudi Arabian college students. Employing a pre-test/post-test design on 29 diploma students, the researcher compared students' learning performance utilizing mobile learning at King Abdulaziz University, Jeddah-Saudi Arabia. Results indicated that the post-test grades scored by the students were better in vocabulary than the pre-test scores. These findings indicated that the strategic utilization of mobile integrated language learning has the strength to positively impact academic performance, especially in terms of achievement in English vocabulary and grammar. This supports the theory that electronic tools such as mobiles can create a non-formal but interactive way of learning foreign language grammar and vocabulary. Careful implications for foreign language learning were offered.

Keywords: grammar, Mobile-Assisted Language Learning, motivation, technology-integration, vocabulary

Introduction

Mobile-assisted language learning (MALL) is a part of digital learning. It is different from routine learning because mobile learning can be done anytime, anywhere, provided there is an internet connection. There is no need to carry a laptop or a tab for learning purposes. It is also good to access learning material through a mobile without much effort. A learner can even lie, relax, and watch a video of his interest related to assignments or projects. Vocabulary and grammar are the backbone of second/foreign language learning. Sometimes, one hears a word that he can't understand. In that case, he can google it and check possible meanings and appropriate sounds. Similarly, one can find multiple uses of a part(s) of speech (as a verb or a noun) or derivational patterns, which can be suitable from various perspectives.

The study's significance lies in carefully evaluating traditional learning, online learning, and the benefits of mobile learning in English language classrooms and even beyond classroom instruction, however, guided by the instructor, to yield maximum outcomes. Undoubtedly, Mobile technology has become an inseparable part of daily life for millions worldwide such as business, industry, education and entertainment. Effective and useful utilization of smartphones and tablets has revolutionized various aspects of society, including education. Mobile learning (ML) can be used to access educational content and learning materials anywhere, anytime. Students can easily communicate with their peers and instructors. Researchers are still taking interest in exploring the potential benefits of MALL, therefore empirical research on its effectiveness is still ongoing.

It has been noted that in the recent past, MALL has become quite popular in the Saudi Arabian academic setting, especially at colleges and universities. This widespread adoption of mobile devices presents new education opportunities, particularly in mobile learning (m-learning). However, while the potential benefits of m-learning are widely acknowledged, empirical research on its effectiveness or challenges in Saudi Arabia is being conducted to assess its relevance compared to the period affected by the COVID-19 pandemic. In other words, there is a growing recognition of the need to explore alternative means or modes to teaching and learning.

The effectiveness of m-learning on student’s academic performance HAS BEEN STUDIED by several researchers in various contexts including English grammar and vocabulary learning. Al-Adwan et al.’s (2018) survey is an interesting work on the Jordanian students' readiness to utilize mobile learning. Al-Rahmi et al. (2015) found m-learning quite effective in improving students' English language skills in Saudi Arabian universities.

Peng et al. (2023) confirmed technology based learning facilitates second/foreign language learners of English (ESL/EFL learners). Criollo (2018) also enumerated multiple benefits and advantages of Mobile Learning (ML). However, he also mentions some issues while utilizing it. Users can avail of many advantages of messaging services, emails, in addition learning applications, such as edu-gaming. Researchers believe interactional language production MALL provides a knowledge-source for language learning or acquisition. (Khezrlou, 2020a, 2020b, 2020c). There is a need to mention that most of the studies available in literature reviews dealt with lexics, lexicon, testing issues, listening-speaking, morphology, etc (Alwi, Adams, & Newton, 2012). Studies conducted by Khezrlou, Ellis, Sadeghi (2017) and Khezrlou (2019c) also are nearly same type. On the other hand, present research was concerned with enhancing learning outcomes in grammar and vocabulary by creating interactive mobile learning setting.
SWOT Analysis

Strengths, Weaknesses, Opportunities, Threats (SWOT) is a decision-making process that aims to arrive at the most appropriate decision. As the name suggests, it has four elements. This study focuses on MALL's SWOT to explore and conclude its worth and feasibility.

Strengths

The following are the strengths of MALL:

One of the strengths of MALL is the availability of existing technologies, including wireless mobile networks, Internet, multimedia technology, etc. In addition, mobiles can facilitate social networking. MALL offers flexibility to learn anywhere, anytime. Most importantly, MALL improves adaptable teaching methods, particularly for different learning styles. Even neo-learners can easily learn m-learning which offers a wealth of information and educational resources. It is very interactive, dependable, flexible, and efficient. MALL has access to digital text, graphics, photos, videos, audio files, and other learning tools. With individualized m-learning, students can select the subject, study time, and place for self-directed learning.

Weaknesses

The following are some crucial weaknesses, such as the size and screen size of the device/tool, battery life, and other problems related to comfort level and software configurations. Furthermore, operating platforms, device types, and supporting technology variations can further complicate the usage of apps and platforms. Device and data security issues due to a lack of common standards for mobile devices can also be issues. Last, ‘Technology’ does not guarantee better or more effective learning! An intentional pedagogy to support technology integration and vice versa is ultimately required from all stakeholders.

Opportunities

Mobile devices can be proven to be a better tool for many reasons. These become useful extensions of media distribution. Mobile devices/Apps offer a different and more thrilling user experience than a device with bigger screen sizes. MALL opportunities can be utilized and integrated by modern technology users who can simultaneously experience some action-related issues. MALL can facilitate a learner in storing in a number of locations by providing ready access to materials/e-content, books/e-books, lecturer notes, tutorials, assignments, etc.

Threats

Each App and tool can pose threats in addition to specific security issues. Handling multiple platforms can be challenging and time-consuming. If the user knows the type and characteristics of the device, it will be easier to predict difficult situations. Issues related to 'Big data,' like sorting, storing, and locating information, may appear to be problematic, which requires overall management. Apart from these technical issues, mobile learning digresses some students as they access the Internet and the opportunity to utilize their tools; they start chatting and socializing. In the case of a big class, it becomes a real challenge for a teacher to manage the non-academic use of mobiles within the class.

Balanyà Rebollo and De Oliveira (2024) identified Mobile education’s Strengths and Weaknesses, and mentioned the security weaknesses and dangers of mobile learning for students. Another study by Nikhil et al. (2016) highlighted some threats to mobile learning. A conference
paper was presented by Santiago and Sergio (2018) on the theme of a SWOT analysis and explored many crucial points to take care of while utilizing MALL.

It is a misconception as many people think that mobile devices are tools only for communication and entertainment and would become a distraction in the classroom. If a teacher is well-trained, he can control his students by utilizing different techniques.

While mobile technology has become increasingly prevalent in Saudi Arabian society, empirical and experimental studies on the usefulness of m-learning in Saudi Arabian institutions (especially colleges) is somewhat limited. There are issues with student engagement and academic performance in Saudi Arabia’s traditional education system, and there is a growing realization that alternative teaching and learning methods that make use of technology to enhance student engagement and improve learning outcomes are necessary. Regarding the effect of m-learning on engagement, interaction, and learning outcomes among the diploma/college students in K.S.A., there is a notable deficiency in the literature. The dearth of empirical research on the efficacy of m-learning and its effects on student engagement and academic achievement in vocabulary and grammar in particular is the issue that this study attempts to solve.

This study's primary goal is to investigate how mobile learning, or mobile-assisted learning, can be used to teach English grammar and vocabulary. As a result, the primary goals of the study were to evaluate how m-learning affected students' academic performance in the grammar and vocabulary domains. The study also sought to determine how mobile learning differed from traditional learning. The following were the principal research questions:

1. What is the effect of MALL on students' academic performance?
2. To what extent do traditional classroom instruction and mobile learning differ?

**Literature Review**

**Importance of Teaching Vocabulary and Mobile Learning**

Possibly the most significant component of a language is its vocabulary. It is the only foundation for teaching and learning any language. The most crucial part of language and communication in the classroom is vocabulary (Celik & Toptas, 2010). Even if the learners are aware of the grammar, communication may not take place appropriately unless they know the correct word (Rashid et al., 2022).

Vocabulary is one of five components of teaching/learning of reading. Sedita (2005) researched Effective Vocabulary Instruction and offered valuable tips. Similarly, Hu (2013) has already contended that mobile learning is useful for effective vocabulary teaching in the Chinese context. Since acquiring vocabulary is a crucial component of learning a language, mobile MALL applications have become increasingly popular. (Klimová, 2019). Research has demonstrated that selecting or creating a mobile application based on the demands of the learner leads to more favorable and effective learning results (Klimová, 2019; Mahdi, 2017; Polakova & Klimova, 2022; Rezaei et al., 2013). Furthermore, Tabatabaei and Goojani (2012) conducted a thorough investigation on the advantages and educational significance of text messaging in order to improve the successful acquisition of new and particular vocabulary. Motallebzadeh et al. (2011) investigated the impact of SMS on the process of learning collocations in a different study; however, the study's sample consisted of lower intermediate Persian-speaking EFL learners from Iran. Okumuş (2023) conducted a review especially related to the effect of mobile assisted learning on Vocabulary, and found it useful. Zain (2021) came to the same conclusion on the pedagogical usefulness of MALL for higher education. In their trend analysis of MALL, Penelope & Panagiotis

Al-Johali (2019) worked on using mobile applications for teaching English vocabulary and said that for effective use of vocabulary m-applications, “students should be well trained and classrooms should be more mobile-oriented” (p.51).

**Importance of Grammar and Mobile learning**

Grammar is said to be 'about language. There are different viewpoints regarding the importance of grammar and the teaching of grammar. Hence, knowledge of functional grammar is essential. Utilizing applications, platforms, and technologies, English instruction has been provided in general, with a focus on grammar and vocabulary. Teachers at the Applied College, Jeddah, use online content prepared by many books/publishers, such as the Life series by National Geographic. 'Blackboard Learn' is available on mobiles where students can take lectures, access content, and appear on tests and exams in addition to assignments.

Without a question, the paradigms of both formal and informal learning contexts have shifted due to mobile devices. (Stockwell, 2021). Numerous language learning applications have already been created and are being used in and outside of classrooms for EFL/ESL instruction. Among these are Duolingo, Rosetta Stone, and A.B.A. English. & al., Loewen 2020). The potential of a personalized mobile-assistance system to support English grammar learning was investigated by Wang et al. in 2021.

Upon reviewing relevant literature and studies, it was discovered that a large body of research backs up the claim that M-Learning can help ESL/EFL students acquire grammar. Khodabandeh et al. (2017), Gharehblagh and Nasri (2020) and Johansson and Cukalevska (2021) state that when students participate in the learning process, their correctness and competency in grammar improve even more. The researchers strongly emphasized the role of MALL in offering a conducive and personalized learning environment that suits most learners of ESL/EFL. Peer cooperation is improved via mobile apps like Telegram and WhatsApp. According to Rosita et al. (2019), MALL makes grammar learning easier. Li and Hegelheimer (2013) studied how the "clinic's smartphone Grammar learning app" affected practice as well as the attitudes of the students on utilizing the app in particular to study grammar. Klimova (2019) supported the positive impact of using smartphones. MALL was found to increase students' learning pleasure (Khan et al., 2019).

In addition, Ta’amneh, 2017; Jasrial, 2019; Khan et al., 2021 concluded that teaching through WhatsApp could attain interaction among the students, between the teacher(s) and students, and the students and the concerned content/material. Thus, collaborative and cooperative learning for grammar through WhatsApp can considerably increase both learners’ proficiency and competency. (Alshammari et al.,2017; Ali & Bin-Hady, 2019). Alshammari et al. (2017).WhatsApp has facilitated students (especially adults) by giving access to utilize content anytime, anywhere using the app for learning grammar in particular.

This research is a modest attempt, by exploring and studying the effects of m-learning on student involvement which leads to achievement in Saudi Arabian students. Thus, this study seeks to fill in the research gap. To be more precise, the researcher wishes to offer empirical evidence supported by related literature which will guide educational practice and policy in Saudi Arabia by contrasting the efficacy of m-learning with traditional classroom instruction. The results of this
study will have a powerful impact on m-learning technology developers, policy makers and pedagogues.

Through the application of rigorous research methodologies and addressing the current need, the study seeks to offer significant insights into the potential benefits of MALL or mobile learning for enhancing academic achievement and student engagement. In the end, it is hope that the study's findings would provide some recommendations for improving education both inside and outside of Saudi Arabia.

**Methods**

According to Gopalan et al. (2020), researchers use quasi-experimental research designs (QERS) to replicate experimental methods by subjecting certain participants to treatment (experiment) while not randomly selecting other subjects. When conducting randomized but controlled trials is not morally or technically possible, QERS are typically employed (Haris et al., 2006).

This study used quasi-experimental method (a pre-test/post-test design) to examine how mobile learning affected academic achievement and student engagement among the students of Diploma program. Because the participants were not chosen at random, QERS was deemed suitable.

**Participants**

The study utilized a convenient sample of 29 students (boys) aged 19-21 studying in the first semester of 2024. They were enrolled in a diploma course at the Applied College which is part of King Abdulaziz University, Jeddah-KSA. Since the author/researcher happens to be their course instructor, no difficulties were faced during the data collection process. The college administration was aware of the research and the information was kept confidential as per the protocol of language education research.

**Research Instruments**

There was no need to construct a test for data collection purposes because the book publisher/author(s) provided many tests as part of the book. Therefore, a readymade test from the life series (elementary) by the National Geographic publishers was utilized to give pre and post-tests. It is a regular practice to give book-based tests after 2 units. Therefore some tests were combined and administered to the student-sample.

**Research Procedures**

The study was based on a treatment/intervention of MALL employed over four weeks, covering the curriculum content taught in the regular classes. The procedure followed this step: Pre-test: Every participant finished a pre-test to determine their typical level of academic achievement before to the intervention.

**Intervention**

Students were asked to use a MALL through the Blackboard platform in which they accessed the e-content of the life series published by National Geographic. Post-test: After the intervention, each participant filled out a post-test to gauge how well they had performed academically.
Data Analysis

Due to the small sample size, ANOVA or ANCOVA was not performed. Instead, individual scores were studied and closely analyzed by calculating the grades and percentages. It is possible to conclude that there is some variation in the students’ grades between the pre- and post-test based on the data from the tests (students’ grades and scores). As seen in the table (Appendix-A), there are instances where the grades are discovered to be lower than the pre-test results.

Results

In general, the post-test results show that the students performed better academically in vocabulary grades, but not in grammar (see Table 1 in Appendix A). MALL or mobile-assisted vocabulary acquisition can be attributed for such a result in the vocabulary area.

Table 2. Comparison of performance of two students

<table>
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<tr>
<th>S.N.</th>
<th>Vocabulary MM.25</th>
<th>Grammar MM.25</th>
<th>Total MM.50</th>
<th>Vocabulary MM.25</th>
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<td>Student 2</td>
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Looking at student number one, he completed the pre-test with a total score of 24 out of 50. His grammar score was 11 out of 25 and his vocabulary score was 13. However, the same student did not receive a grammar grade rise despite earning 17 out of 25 in vocabulary on the post-test. We can conclude that MALL improved vocabulary acquisition but had no effect on grammar learning.

Figure 1. The score/grade of Pre and post-test of Student -
Furthermore, there doesn't seem to be much of a difference between the pre- and post-test grades/scores for pupils in grades 3-6 when comparing their grammatical skills. The tiny variation in grammar grades cannot be linked to MALL because the factors were not controlled.

Figure 2. Comparison of pre & post-test grammar grades/scores of some students

Many students could not perform any better, either in vocabulary or grammar. It cannot be said that MALL is not beneficial, but some students don't learn by any means. It may also be a factor that they need to improve at using smartphones, or their phones need to be more sophisticated and up-to-date. However, generally speaking, students’ performance in vocabulary is better than performance in grammar.

Discussion

The current study studied and explored the impact of mobile-assisted English vocabulary and grammar learning. Following research questions (RQ) focused on how mobile learning affected students' academic performance and how traditional teaching and mobile learning differed in terms of learning outcomes.

RQ1: What is the effect of MALL on students' academic performance?

Data analysis confirms that MALL or mobile learning affects vocabulary learning, as the learners' academic performance improves. However, the effect of MALL on grammar is not seen as the academic performance does not improve grade-wise, but the students show great dedication to using mobiles for learning English grammar, too.

The results of the current study are supported by the findings of numerous other studies. The papers in question are Koleini et al. (2024), Penelope & Panagiotis (2021), Okumuş (2023), Zain (2021), and Pang and Aziz (2021). The results of the study conducted by Ali et al. (2024), which mostly supported the effectiveness of MALL on teaching English in Pakistan, are similarly consistent with the findings of the present study. In particular, they critiqued the antiquated routine technique of teaching grammar and examined the differences between traditional and mobile learning. Hence the researchers supported the utilization of MALL to expand the horizons of pedagogy and English language learning.
RQ2: To what extent do traditional classroom instruction and mobile learning differ?
The mobile learning experience was found to be much different from traditional learning. Students were found to be more engaged, motivated, and active during the mobile learning process. Hence, it must be noted that teachers are supposed to control the learners and guide them toward active and effective mobile use.

According to earlier research (e.g., Lei et al., 2022; Kord et al., 2023; Koleini et al., 2024), these results are consistent. These results, however, could seem to differ from those of the research published in the Stockwell series (2007, 2008, 2010), when it was said that the majority of students were hesitant to use their mobile phones for language study. Apart from the scores, it was found that the majority of the students found MALL quite interesting, which emphasized personalized and self-learning. By integrating MALL, the instructor/researcher instilled self-confidence, active participation, and positive reinforcement motivation among student learners, which is likely to facilitate learning. The results of this study are consistent with those of a study conducted in 2008 by Willougby and Wood, who found that integrating technology into instruction both inside and outside of the classroom has been shown to be an effective teaching strategy. The reason why technology integration, in general, and MALL, in particular, has become popular among modern learners in KSA is due to increased interest in engaging processes and interaction, as felt by Lytras et al. (2008).

Ali et al. (2024) analyzed the teaching practices in the EFL/ESL context of Pakistan (which is not much different from other second language teaching countries), critiqued the traditional method of teaching, and recommended that teachers should integrate the latest technology to foster learning in the digital age. Students are quite modern in using sophisticated tools for socializing, therefore social networking means should be utilized in academic environments also.

Conclusion
This study looked into how MALL affected learning outcomes in Saudi Arabia, specifically focusing on the Applied colleges. A pre-test/post-test design was employed by the researcher to investigate the advantages of MALL for vocabulary and grammar learning. It was interestingly found that the grades of some students were increased in vocabulary but not in grammar, which can be attributed to the effect of MALL utilization. Though the outcome in the grammar was not much increased grade-wise, it can be mentioned that the learners were positively reinforced during the entire process of MALL integration. In other words, the intervention reported a more positive mobile learning experience, used the platform more frequently, perceived it as more useful, and expressed higher satisfaction. The intervention group exhibited a higher number of logins, total platform time, videos watched, quizzes completed, and discussion forum posts. These results imply that mobile learning can be an advantageous resource for Saudi Arabian instructors and educators, promoting increased engagement and potentially improving learning outcomes. However, future research is warranted. Optimizing the platform for further learning gains and investigating the scalability and sustainability of implementing mobile learning technologies within the Saudi Arabian higher education context are crucial next steps. Understanding the long-term feasibility and potential challenges associated with such interventions will be essential for maximizing the impact of mobile learning in Saudi Arabian universities.
This study is an advancement in the domain of MALL research by concentrating on the unique teaching-learning circumstances of Saudi Arabia. Given the distinctive nature of this educational environment, it appears that mobile learning can improve learning outcomes as well as student engagement. To optimize mobile learning's potential as a tool for raising the caliber of instruction and learning in Saudi Arabia's higher education institutions, more research—as previously mentioned—will be necessary. As we know, there are many interesting ways of using MALL that are coming into practice. There can be many platforms/apps that learners can utilize, such as online programs/tools/apps such as Facebook, Telegram, Whatsapp, Twitter, emailing, etc., that can be utilized by dedicated instructors as additional activities. Other apps like group chats, YouTube, videos, and Google Hangouts can be good alternative tools.

**Limitations**
A piece of research investigates into a problems, answers some questions and leaves many questions for further research in near future. The present study also has some limitations. First limitation was that the learning phase was short and limited. In addition, the study could not reveal if all the students in the sample has smart phones. It was not clear if students were motivated to learn in general or via mobile learning in particular. A quantitative study of a huge sample is required to generalize the outcomes for better implications and subsequent recommendations.

**About the Author**
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**Authenticity**
This manuscript is an original work

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### Appendices

#### Appendix A

(Academic performance of the students)

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<th>Students</th>
<th>Pre-test</th>
<th>Post-test</th>
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*Table 1. Pre test and post-test scores*
Effect of Mobile Assisted Learning on English Language Vocabulary

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### Appendix B

#### Intervention Scheme: Mobile Learning for 4 Weeks

1. **Week 1: Orientation to Mobile Learning Platform and Use**
   - **Objective:**
     - Familiarize students with the mobile learning platform.
     - Introduce students to the features and functionalities of the platform.
     - Facilitate them to use mobiles for learning
   - **Activities:**
     - Introduction to the mobile learning platform.
2. Week 2-3-4: Content Delivery and Engagement

Objective:
- Follow up MALL, deliver curriculum content through the mobile learning platform.
- Promote student engagement through interactive learning activities.

Activities:
- Delivery of instructional content through multimedia presentations, videos, and interactive modules.
- Collaborative learning activities, such as group discussions, peer review, and collaborative projects.
- Gamification elements to increase student engagement and motivation.
- Provide opportunities for students to apply and practice the concepts learned.
- Reinforce learning through interactive exercises and real-world applications.

Support and Assistance:
- Technical support will be provided to students to address any issues or difficulties with accessing the mobile learning platform.
- Teachers will be available to provide guidance and support to students throughout the intervention period.

Pre-test Design:
Objective: The pre-test will assess the initial level of academic performance and student engagement before the intervention.

Components of the Pre-test:

Academic Performance Assessment:
- The pre-test will consist of questions covering the curriculum content that will be taught during the intervention period.
- The test will include multiple-choice, short answer, and essay questions to assess students' understanding of the material.
- The test will be designed to measure students' knowledge, comprehension, application, and analysis of the curriculum content.

Scoring:
- The academic performance assessment will be scored based on the number of correct responses.
- The student engagement survey will be scored using a Likert scale, with higher scores indicating higher levels of engagement.

Ethical Considerations:
- Informed consent will be obtained from all participants and their parents or legal guardians.
- Participants will be assured of confidentiality and anonymity, and their data will be used for research purposes only.
- The pre-test will adhere to ethical guidelines for research involving human participants.