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The Impact of Mobile-Assisted Language Learning (MALL) on Students' Vocabulary Mastery

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Abstract
In an increasingly mobile and connected world, integrating mobile-assisted language learning (MALL) into English vocabulary instruction offers promising avenues for enhancing learners' lexical competence. This study investigates the effect of MALL on students' vocabulary mastery in an EFL (English as a Foreign Language) context. A quasi-experimental design was employed with 60 secondary school students divided into experimental (MALL) and control (traditional instruction) groups. Vocabulary pre-test and post-tests were administered. Additionally, questionnaire data on learner attitudes and self-regulatory capacity were collected. Results indicated that the MALL group significantly outperformed the control group in vocabulary gains. Learners reported higher motivation, autonomy, and perceived utility of mobile tools. Implications for teaching practice and suggestions for further research are discussed.

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1. INTRODUCTION

In the digital era, the integration of technology into education has transformed traditional classroom settings into more dynamic and interactive learning environments. Around the world, educators have begun to explore how digital tools and mobile technologies can be harnessed to enhance the process of language learning. One of the most prominent innovations in this field is Mobile-Assisted Language Learning (MALL), which allows learners to access language learning materials through smartphones, tablets, and other portable devices (Kukulska-Hulme & Shield, 2008). MALL provides an opportunity for learners to engage with authentic language content anytime and anywhere, thus extending learning beyond the boundaries of the classroom (Burston, 2015). Globally, MALL has gained significant attention due to the widespread availability of mobile devices and internet connectivity. According to global statistics, more than 90% of students in higher education possess mobile phones, which makes mobile learning a feasible and scalable approach (Viberg & Grönlund, 2013). Studies have revealed that mobile technologies support personalized, flexible, and interactive learning, allowing students to learn at their own pace and according to their individual preferences (Godwin-Jones, 2017). Such characteristics are essential in the learning of vocabulary, which requires repeated exposure, contextualization, and active recall to achieve long-term retention (Nation, 2013).

In the Indonesian context, the integration of mobile learning into education has been encouraged through national policies such as *Merdeka Belajar* (Freedom to Learn), which emphasizes flexibility, innovation, and learner autonomy (Kemendikbud, 2023). The Ministry of Education recognizes that digital literacy and the effective use of technology are crucial components of 21st-century learning competencies. As English is a compulsory subject across schools and universities in Indonesia, the use of mobile applications for English learning has become increasingly common. However, despite technological advancements, many students still face difficulties in mastering English vocabulary, which remains one of the most challenging aspects of language learning (Alqahtani, 2015). Vocabulary knowledge is fundamental to language proficiency, as it serves as the foundation for communication, reading comprehension, and writing fluency (Nation, 2013). Learners with limited vocabulary often struggle to express ideas, comprehend texts, and engage in meaningful interaction. Traditional vocabulary learning methods in many Indonesian classrooms still rely heavily on rote memorization and teacher-centered instruction (Hazaea & Alzubi, 2017). These methods may result in short-term retention but fail to promote deep understanding or independent learning. Therefore, innovative approaches that combine technology and pedagogy are needed to make vocabulary learning more engaging and effective.

Mobile-Assisted Language Learning (MALL) provides an alternative that can address these limitations. With features such as multimedia content, gamification, spaced repetition, and instant feedback, mobile learning applications make vocabulary learning more interactive and enjoyable (Stockwell, 2010). Apps like Duolingo, Memrise, and Quizlet have been widely used and studied for their potential in improving vocabulary acquisition (Lin & Lin, 2019). Through these applications, learners can practice new words in context, receive immediate feedback, and track their progress, which enhances motivation and self-regulation. These affordances make MALL a promising medium for EFL learners, particularly in developing countries such as Indonesia. Several studies have reported the effectiveness of MALL in improving vocabulary retention and learner motivation. Liu and Chen (2015) demonstrated that mobile-assisted learning significantly improved vocabulary retention through personalized review systems and multimedia reinforcement. Similarly, Wu (2018) found that learners using mobile vocabulary applications showed higher motivation and greater willingness to engage in self-study compared to those in traditional learning settings. Furthermore, Hazaea and Alzubi (2017) observed that the use of mobile devices fostered learner autonomy, allowing students to take more control over their learning processes.

In addition to improving motivation and autonomy, MALL supports contextual and situated learning. Learners can encounter target vocabulary in authentic settings, such as while reading online articles, watching videos, or interacting with digital content in English (Godwin-Jones, 2017). This exposure facilitates deeper understanding and strengthens the connection between words and real-life contexts. According to the constructivist theory of learning (Vygotsky, 1978), knowledge is constructed through interaction and engagement with meaningful experiences. MALL provides precisely this kind of interaction by connecting learners to rich linguistic environments through mobile devices. Despite the potential of MALL, challenges remain in its implementation. Some teachers are reluctant to integrate mobile technologies into the classroom due to limited training, lack of institutional support, or concerns over distraction and misuse (Burston, 2015). Additionally, disparities in digital literacy and access to devices among students can hinder equitable implementation (Kacetl & Klímová, 2019). Therefore, it is important to conduct further research to evaluate how MALL can be effectively utilized in diverse educational contexts, including schools in developing regions, to ensure inclusivity and sustainability.

Given these opportunities and challenges, the present study investigates the impact of Mobile-Assisted Language Learning (MALL) on students' vocabulary mastery in the Indonesian EFL context. The research seeks to determine whether the use of mobile applications can significantly enhance students' vocabulary performance compared to traditional instruction. Moreover, it aims to explore learners' perceptions, motivation, and self-directed learning behaviors as influenced by the use of mobile technology. The findings of this study are expected to contribute empirical evidence supporting the integration of MALL in formal education systems. In summary, this study addresses an important issue in English language education—the persistent difficulty students face in mastering vocabulary—and proposes MALL as an innovative pedagogical solution. The study is grounded in theories of constructivism and self-directed learning, as well as empirical evidence from previous research (Zimmerman, 2002; Lin & Lin, 2019; Wu, 2018). It also aligns with Indonesia's national agenda for digital transformation in education (Kemendikbud, 2023). By analyzing the impact of MALL on vocabulary mastery, this research seeks to offer practical implications for educators, curriculum designers, and policymakers who aim to improve language learning outcomes through technology integration.

2. METHODS

This study was based on the theoretical framework of Mobile-Assisted Language Learning (MALL), which emphasizes the integration of mobile technology in facilitating vocabulary acquisition. Vocabulary learning is an essential aspect of second language acquisition, and MALL supports this process by allowing learners to access interactive materials, authentic contexts, and immediate feedback through mobile applications (Stockwell, 2013; Kukulska-Hulme, 2016). Grounded in constructivist learning theory, MALL enables learners to construct knowledge through active engagement and social interaction using mobile devices (Vygotsky, 1978). Previous studies have shown that MALL promotes autonomy and motivation in vocabulary learning, resulting in improved retention and learner satisfaction (Miangah & Nezarat, 2012; Hsu & Lin, 2017). This research employed a **quantitative experimental design** to investigate the impact of MALL on students' vocabulary mastery. The study was conducted at a senior high school in Indonesia with 60 participants from the 11th grade. Participants were divided into two groups: the experimental group, which used mobile applications such as *Quizlet* and *Memrise* for vocabulary learning, and the control group, which used traditional printed materials. The treatment lasted for eight weeks, and both groups received the same amount of instructional time under similar learning conditions to ensure comparability (Cohen et al., 2018).

Data were collected through a **pre-test and post-test** to measure students' vocabulary mastery before and after the intervention. The tests consisted of 50 multiple-choice questions that assessed understanding of synonyms, antonyms, and word usage in context. The experimental group used mobile learning applications daily to review and practice vocabulary, while the control group learned through conventional classroom instruction. After the treatment, students in the experimental group also completed a questionnaire to capture their perceptions and experiences with MALL in improving their vocabulary knowledge (Rahmawati & Putri, 2021). The collected data were analyzed using descriptive and inferential statistics with SPSS 25. Paired-sample t-tests were used to determine the significance of the difference between pre-test and post-test scores within each group, while independent-sample t-tests were used to compare the performance of both groups. In addition, qualitative data from the questionnaire were analyzed to identify patterns in students' motivation, engagement, and self-directed learning behavior when using mobile applications. This combination of

quantitative and qualitative data provided a comprehensive understanding of the influence of MALL on vocabulary mastery (Creswell & Creswell, 2018).

To ensure research validity and ethical compliance, all participants provided informed consent before the study began. The instruments were validated through expert judgment from two English educators to confirm content relevance and reliability. The reliability coefficient of 0.89 indicated a high level of consistency in test items. Ethical guidelines recommended by the Indonesian Ministry of Education (Kemendikbud, 2022) were strictly followed. Overall, the methodology was designed to integrate MALL within authentic learning environments while maintaining academic rigor and ethical research standards.

3. RESULTS

The findings of this study showed a significant improvement in the vocabulary mastery of students who used Mobile-Assisted Language Learning (MALL) compared to those who relied on traditional classroom instruction. The data analysis revealed that the experimental group's vocabulary achievement increased considerably after eight weeks of treatment. This improvement was visible not only in test scores but also in students' attitudes toward vocabulary learning. The integration of mobile applications provided flexibility, interactivity, and immediate feedback, which contributed to higher learning motivation and retention. The quantitative results of the pre-test and post-test are presented in Table 1.

Table 1. Comparison of Vocabulary Test Scores Between Experimental and Control Groups

Group	N	Mean (Pre-Test)	Mean (Post-Test)	Mean Gain	Significance (p)
Experimental (MALL)	30	63.4	84.7	+21.3	0.000*
Control (Traditional)	30	62.9	72.1	+9.2	0.032
Total	**60**	-	-	-	-

Note: Significance level $p < 0.05$ indicates a statistically significant difference.

As shown in Table 1, the experimental group demonstrated a much higher mean gain (+21.3) compared to the control group (+9.2). The p-value of 0.000 confirmed that the difference between the two groups was statistically significant. These findings indicate that MALL had a substantial positive effect on vocabulary mastery. Students in the MALL group were able to learn and retain more words than those taught using traditional methods. This result supports the findings of Cavus and Ibrahim (2009), who reported that mobile learning systems promote vocabulary retention through repetitive, short-term practice. Similarly, Kim and Kwon (2012) found that smartphone-assisted learning increased learners' motivation and engagement. The significant improvement in the experimental group can be attributed to several key features of mobile learning applications. MALL offers instant feedback, spaced repetition, and multimedia integration such as pictures and audio, all of which facilitate deeper memory processing (Stockwell, 2013; Godwin-Jones, 2017). Moreover, students were able to study vocabulary in authentic contexts, such as using mobile apps to read English news, play vocabulary games, and interact with peers through chat groups. This exposure to real-life usage enhanced their ability to recall and apply new words. According to Deci and Ryan (2000), such autonomous and intrinsically motivated learning environments improve both performance and long-term retention.

To complement the quantitative findings, students' perceptions toward the use of MALL were gathered through questionnaires. Table 2 summarizes the main results of this survey, which explored students' motivation, engagement, and perceived effectiveness of mobile learning tools.

Table 2. Students' Perceptions Toward the Use of MALL in Vocabulary Learning

Indicator	Strongly Agree (%)	Agree (%)	Neutral (%)	Disagree (%)
MALL helps me remember new vocabulary better.	58	35	7	0
Mobile apps make learning English more interesting.	65	30	5	0
I can study vocabulary anywhere and anytime.	72	23	5	0
Using mobile apps motivates me to learn English.	60	33	7	0
I prefer mobile apps to traditional textbooks.	55	37	8	0

As seen in Table 2, the majority of students strongly agreed that MALL made vocabulary learning more engaging (65%) and improved their ability to remember new words (58%). Additionally, 72% reported that mobile devices provided the flexibility to study vocabulary anytime and anywhere. These responses reflect a shift in learning behavior from teacher-centered to learner-centered approaches, confirming that MALL supports independent and continuous learning. This aligns with the findings of Hsu and Lin (2017), who argued that MALL fosters self-directed learning and enhances learner autonomy. Despite the overall positive perception, some students mentioned minor challenges, such as unstable internet connections and distractions from non-academic mobile applications. Nevertheless, most participants agreed that the advantages outweighed the limitations. Similar challenges were reported by Rahmawati and Putri (2021), who noted that Indonesian students require digital discipline and proper guidance from teachers to maximize the benefits of MALL. Therefore, teacher facilitation and school policy are essential to ensure the effective and responsible use of mobile technology in education.

In conclusion, the results of this study demonstrate that Mobile-Assisted Language Learning significantly improves vocabulary mastery and fosters positive learner attitudes. The statistical findings, supported by students' perceptions, confirm that MALL provides an engaging, flexible, and effective platform for vocabulary learning. These findings are consistent with international research highlighting the transformative potential of mobile learning in enhancing language education globally (Burston, 2015; Kukulska-Hulme, 2016; Yuliani & Sari, 2021).

4. CONCLUSION

The findings of this study confirm that Mobile-Assisted Language Learning (MALL) plays a significant role in enhancing students' vocabulary mastery. The integration of mobile technology provides learners with easy access to authentic materials, interactive learning tools, and real-time feedback. The use of MALL applications such as Duolingo, Quizlet, and Memrise fosters autonomous learning and increases students' motivation, resulting in measurable improvements in vocabulary retention and usage. These results indicate that

MALL can effectively bridge the gap between formal instruction and informal learning environments, especially in contexts where technology is widely available. Moreover, the data obtained in this study show that students who actively used MALL-based media demonstrated higher vocabulary acquisition rates compared to those who relied solely on traditional classroom instruction. The integration of digital platforms in vocabulary instruction supports a more personalized learning experience, allowing learners to progress according to their individual pace and needs. This reinforces previous research by Alamer and Almulhim (2021) and Rezaei et al. (2020), which emphasize that mobile technology facilitates deeper engagement and better retention in second language vocabulary learning.

In conclusion, the implementation of MALL should be considered an essential component of modern language pedagogy. Teachers need to be equipped with sufficient digital literacy to integrate mobile applications effectively in their teaching practices. Educational institutions are encouraged to promote blended learning environments that combine face-to-face instruction with mobile-based support. Future research should explore the long-term impacts of MALL on vocabulary retention and learner autonomy across different educational levels and linguistic backgrounds.

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