

THE EFFECTIVENESS OF MOBILE LANGUAGE LEARNING APPLICATIONS (MLLA) FOR VOCABULARY ACQUISITION

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Abstract

This study reviews the effectiveness of Mobile Language Learning Applications (MLLA) in vocabulary learning and acquisition, particularly for English as a Second Language (ESL) and English as a Foreign Language (EFL) learners. By analyzing research from 2020 to 2024, the review identifies key factors influencing the success of MLLA, including interactive interfaces, usability, design, content quality, and accessibility. Moreover, game-based learning elements, multimedia environments, immediate corrective feedback, spaced repetition, and dual coding systems are highlighted in enhancing vocabulary retention and recall. The findings show that the significant benefits of MLLA, offering personalized, engaging, and flexible learning experiences that support effective vocabulary acquisition. Future studies can benefit from the design towards innovation in digital vocabulary instruction.

Keywords: *Mobile language learning application, Vocabulary acquisition*

I INTRODUCTION

The development of mobile technology has changed the way we access information and carry out learning activities. With the increasing penetration of smartphones and tablets, language learning applications become more accessible to various groups and provide new opportunities for language learners to be able to improve their skills anywhere and at any time (Fansury et al., 2020). Moreover, mobile apps can also be a solution to overcome time and place limitations which become obstacles in conventional learning. The mobile app offers various new features that are flexible, efficient and interactive. Some examples of these features include vocabulary exercises, language games, and evaluation tests designed to increase user engagement and facilitate more effective and efficient learning (Stefanovic and Klochkova, 2021). Not only that, the adaptive technology used in the mobile app also allows personalization of learning based on the needs and abilities of each student. For example, a mobile app can adjust the difficulty level of vocabulary exercises based on the user's previous performance, providing appropriate challenges to encourage continuous development (Arini et al., 2022). Therefore, research on the effectiveness of using mobile apps in the language learning process for vocabulary acquisition is important and needed.

One important aspect in language learning is vocabulary mastery, which is the basis for understanding and improving students' language skills. Moreover, vocabulary mastery is not only important for understanding texts and conversations but also for the ability to produce correct and meaningful language (Yudha and Mandasari, 2021). Therefore, effective strategies for vocabulary learning and acquisition have become a major focus in research and practice in language learning. Various learning methods have been used to facilitate the process of vocabulary learning and acquisition, ranging from direct teaching in class to the use of modern technology (Hao et al., 2021). Over time, in the context of advances in technology and language learning, mobile language learning applications have become an increasingly popular tool to use. Research shows that mobile language learning applications can provide various benefits in vocabulary learning (Dağdeler et al., 2020; Namaziandost et al., 2021). The results of previous research also indicate that the use of mobile language learning applications can increase student involvement and motivation (Sun and Gao., 2020; Refat et al., 2020). Based on this explanation, it can be concluded that mobile language learning applications have great potential in supporting vocabulary learning and acquisition. However, the level of effectiveness of mobile language learning applications in helping vocabulary learning and acquisition still needs to be evaluated and explored more deeply and systematically to understand what factors influence its success.

Several previous studies have shown that the use of mobile apps in the language learning process can provide significant benefits, especially in vocabulary learning and acquisition. For example, some studies show that these apps can increase learning engagement and provide the more frequent and repetitive practice needed to strengthen retention of new vocabulary (Klimova and Polakova., 2020). Other research also reveals that the effectiveness of mobile language learning applications can be

influenced by various factors, including application design, teaching strategies used, and individual learner characteristics (Zhang and Zou., 2022).

Although there is a lot of previous research that discusses and supports the benefits of mobile language learning applications, there are still several gaps in our understanding of how effective these applications are in vocabulary acquisition and what factors influence their effectiveness. Therefore, the main question that this study try to answer is: how effective is vocabulary learning through mobile language learning applications in second language acquisition? Moreover, this study also aims to identify what factors influence the effectiveness of vocabulary acquisition in second language learning through mobile language learning applications. By conducting a systematic literature review, this research aims to provide a comprehensive overview of existing findings and identify areas that require further research. This research makes an important contribution to the field of language learning with mobile technology by identifying best practices and key factors that influence the success of vocabulary learning.

II MATERIALS AND METHODS

2.1 VOCABULARY LEARNING AND ACQUISITION

Language learning in the context of second language acquisition is often associated with several main theories, such as the Input Hypothesis theory by Krashen (Bailey and Fahad, 2021), which emphasizes the importance of comprehensible input in language learning. In addition, the Output Hypothesis theory by Swain (Liu, 2022) emphasizes the importance of language production to strengthen vocabulary learning. Moreover, according to the Dual Coding theory by Paivio (Luo, 2022). mastery of understanding is more effective when information is presented both verbally and visually. In order to simplify and support the language learning process, various methods have been used for the implementation process. Starting from traditional methods such as rote memorization and flashcards to contextual methods such as learning vocabulary through broad understanding and use of vocabulary in real contexts. In addition, modern technology, such as the use of mobile language learning applications and computer-based software, is also used to offer an interactive and adaptive approach to vocabulary learning.

Vocabulary mastery is influenced by various factors, including frequency of exposure, learning context, motivation, and individual learning strategies. Research by Abdulmalik Ali, (2020), shows that strategies such as discovering the meaning of vocabulary through context and the use of mnemonics can improve vocabulary learning. Affective factors, such as interest and attitudes towards the target language, also play an important role in successful vocabulary learning (Getie, 2020). In addition, recent research conducted by Enayati and Gilakjani (2020) shows that the use of technology and social media can significantly increase vocabulary mastery. They explained that the use of gamification-based mobile language learning applications can increase vocabulary retention for language learners. Moreover, research conducted by Zhai and Wibowo (2023) emphasized the importance of repeated and continuous vocabulary learning to help students improve language fluency.

2.2 MOBILE LANGUAGE LEARNING APPLICATION

Vocabulary Mobile language learning applications continue to experience rapid development since they were first introduced until now. At first, this application only offers basic features such as a dictionary and some vocabulary exercises. However, as technology advances, these applications now include various advanced features such as voice recognition, interactive exercises, and gamification-based learning. Some popular examples include *Duolingo*, *Babbel*, and *Memrise*, all of which offer different approaches to language learning. They are different in terms of the depth of learning experience, the focus of the study, and appearances of the application.

Various studies have been conducted to evaluate the effectiveness of using mobile language learning applications. A study by Hernadijaya (2020) showed that using the Duolingo application had a significant impact in improving students' language skills after several weeks of use. Another study conducted by Ishaq et al (2021). found that gamification-based applications can increase motivation and vocabulary retention among English language learners. In addition, research conducted by Booton et al. (2023) highlights that the integration of mobile applications with traditional learning methods can produce better results than using either method alone.

Although much research has been conducted, there are still several areas that need to be explored. There is still little research that discusses the long-term impact of using mobile language learning

applications. In addition, there is also a need to further explore how these applications can be effectively integrated with traditional teaching methods and how they can be adapted to the needs of students with different backgrounds and abilities. Future studies should investigate adaptive learning algorithms and personalized feedback mechanisms in MLLA.

2.3 SEARCH STRATEGY

The data in this research was collected from two databases, including Google Scholar and ProQuest. The reason for selecting those two databases was that those were the most commonly cited databases for educational research. Furthermore, to obtain data that were appropriate to the topic and questions of this research, the researcher used three key terms in the search; "vocabulary", "effectiveness", and "Mobile Language Learning applications". The database searches were limited from 2020 to 2024. The period was chosen due to the use of up-to-date mobile language learning applications recently.

2.4 SELECTION PROCESS, INCLUSION AND EXCLUSION CRITERIA

The results of the search and selection of studies were reported using the PRISMA Flow Diagram, which describes the stages of identification, screening, eligibility, as well as included and excluded studies. This structured methodological approach ensures that our research was based on valid and relevant data, so that the resulting findings were reliable and made a significant contribution to the development of theory and practice in the field of language learning.

The study selection process was carried out in several stages. First, we screened the titles and abstracts to assess the relevance of each study based on the research question and inclusion and exclusion criteria. Eligible studies were then evaluated in more depth through full-text assessment. At this stage, we ensured that the selected articles were relevant to the research questions and established criteria, and documented the reasons why some studies were excluded. The following inclusion and exclusion criteria were developed and used in this study to filter further the studies produced.

These inclusion criteria were: research must be conducted to teach English as a second language (ESL) or English as a foreign language (EFL) context, research must be conducted in the teaching and learning of vocabulary, research must be conducted on mobile-assisted language learning, the research must be published in a peer-reviewed journal, The research should be indexed in Scopus, and the research must be written in English. On the other hand, the exclusion criteria were: it involved the teaching of other languages, it involved the teaching and learning of other language skills such as listening, speaking, reading and writing, how the research which included in book chapters, and conference proceedings were excluded, and that the research which used all other languages except English were excluded.

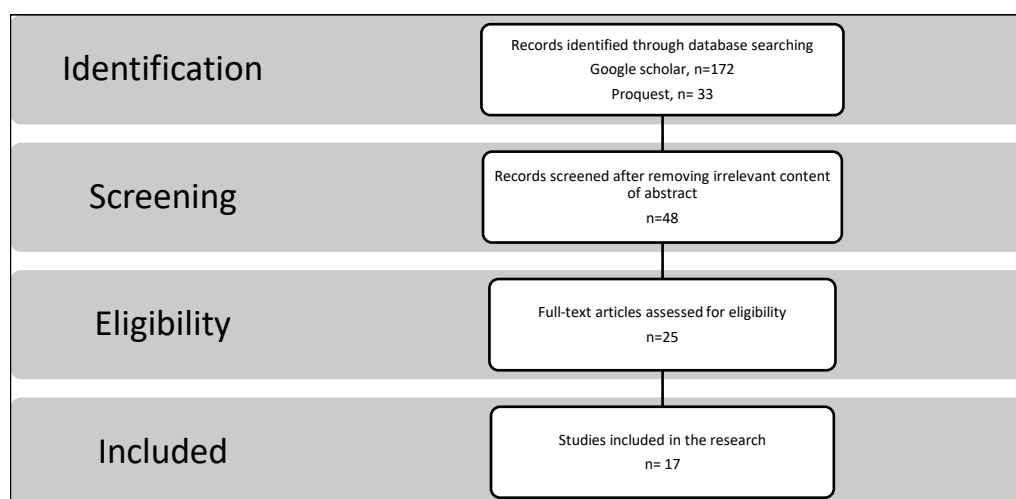


Figure 1. Stages for study selection

Excerpt on grammar and language polishing

"**The data in this research was collected**" → should be "**The data for this re-search were collected**" (data = plural noun).

"**those were the most commonly cited databases**" → more academic phrasing: "**these are among the most widely cited databases in educational research.**"

"recently" at the end of the paragraph is a little vague. Better phrased: **"reflecting the latest trends in mobile language learning."**

"The research which included in book chapters, and conference proceedings were excluded." → should be **"Research included in book chapters and conference proceedings was excluded."**

"The research which use all other languages except English were excluded." → should be **"Research using languages other than English was excluded."**

III RESULTS AND DISCUSSION

Excerpt on grammar and language corrections

"sub discussiion"

→ Typo. It should be **"sub-discussion"** (also better to hyphenate it).

"Effectiveness of using mobile language learning applications in vocabulary learning and acquisition"

→ It's a little long and repetitive. You could slightly tighten it:

"Effectiveness of Mobile Language Learning Applications for Vocabulary Acquisition."

Same for the second sub-heading:

"Factors Influencing the Effectiveness of Mobile Language Learning Applications for Vocabulary Acquisition."

Minor note: "Result and discussion" → academic standard is usually **"Results and Discussion"** (plural "Results")

3.1 EFFECTIVENESS OF USING MOBILE LANGUAGE LEARNING APPLICATIONS IN VOCABULARY LEARNING AND ACQUISITION

Mobile language learning applications (MALL) are highly effective in improving vocabulary acquisition and retention for learners, particularly EFL students, due to their interactive, multimedia, and flexible learning environments. The paper emphasizes the various features and advantages of mobile language learning applications that contribute to their effectiveness in vocabulary learning and acquisition:

3.1.1 INTERACTIVE INTERFACES AND VARIED ASSESSMENTS

MALL applications enhance engagement and improve vocabulary learning outcomes by providing interactive interfaces and varied types of assessments. Interactive interfaces in MALL applications enhance engagement by involving learners in the learning process through touch-based controls, drag-and-drop activities, and gamified elements like quizzes and puzzles. These features make learning more enjoyable and interactive, leading to longer study sessions and better retention of vocabulary. Immediate feedback from these interfaces helps learners correct mistakes quickly and reinforces correct usage, which is crucial for effective vocabulary acquisition.

Varied assessments in MALL applications cater to different learning styles by offering multiple-choice quizzes, matching exercises, fill-in-the-blank tasks, and pronunciation checks. This diversity ensures a comprehensive evaluation of vocabulary knowledge, addressing both recognition and contextual usage. Continuous feedback from varied assessments allows for personalized learning experiences, adapting to the learner's needs and optimizing vocabulary learning outcomes.

3.1.2 USABILITY AND DESIGN

The usability and design of MALL applications are critical for their effectiveness in vocabulary learning. Usability refers to how user-friendly and intuitive the application is, ensuring that learners can easily navigate through the content without frustration. A well-designed interface with clear instructions, engaging visuals, and smooth functionality enhances the learning experience, making it more enjoyable and efficient. Good design also includes adaptive features that cater to individual learning paces and styles, further improving usability.

Content, accessibility, and infrastructure are equally important. High-quality content that is relevant, diverse, and appropriately challenging keeps learners engaged and motivated. Accessibility ensures that the application is available on various devices and platforms, allowing learners to study

anytime and anywhere. Robust infrastructure guarantees that the application runs smoothly without technical issues, providing a seamless learning experience. Together, these elements ensure that MALL applications are effective tools for vocabulary acquisition, offering an optimal blend of ease of use, engaging design, rich content, and reliable performance.

3.1.3 GAME-BASED DESIGN

Incorporating elements like phonics, animations, and games increases student engagement and learning efficiency. Game-based learning in MALL applications incorporates elements like phonics, animations, and interactive games to enhance student engagement and learning efficiency. By making the learning process fun and interactive, games capture students' interest and motivate them to spend more time on vocabulary practice. This increased engagement leads to more frequent and prolonged learning sessions, which are crucial for vocabulary retention. In addition, phonics and animations help in reinforcing the correct pronunciation and meaning of words, making them easier to remember. Games often include challenges and rewards, which encourage students to achieve higher scores and improve their performance. This gamified approach not only makes learning enjoyable but also promotes active participation, deepens understanding, and improves overall vocabulary acquisition.

3.1.4 FLEXIBILITY AND CONVENIENCE

The flexibility and convenience of mobile devices allow learners to practice and improve their vocabulary skills at their own pace and on their own schedule. It means that learners can fit language study into their daily routines, whether they have a few minutes between tasks or longer periods dedicated to focused learning. The ability to access learning materials anytime and anywhere makes vocabulary acquisition more accessible and consistent. This flexibility is beneficial for accommodating different learning styles and paces. Learners can review and practice vocabulary as often as needed, ensuring better retention and mastery. Mobile devices thus provide a personalized learning experience, enhancing overall language learning by making it more adaptable to individual needs and lifestyles.

3.1.5 MULTIMEDIA ENVIRONMENT

Combining pictures and text in a multimedia environment enhances vocabulary comprehension, motivation, and knowledge transfer to real-world contexts. Visual aids such as images and animations paired with textual information help learners create mental associations, making it easier to remember and understand new words. This dual coding approach leverages both visual and verbal memory, leading to improved recall and retention. In addition, the multimedia environment makes learning more engaging and motivating. Interactive and visually appealing content captures learners' attention and sustains their interest, encouraging them to spend more time on vocabulary practice. This immersive experience not only aids in immediate comprehension but also helps learners apply their knowledge in real-world situations, bridging the gap between theoretical learning and practical usage.

3.1.6 IMMEDIATE CORRECTIVE FEEDBACK

Mobile apps provide timely feedback, helping students adjust their learning techniques and retain correct meanings, which aids long-term memory retention. Immediate corrective feedback provided by mobile apps plays a crucial role in vocabulary learning. By receiving prompt feedback on their responses, students can quickly identify and correct mistakes, leading to a deeper understanding of the material. This feedback mechanism helps students adjust their learning techniques, reinforcing correct meanings, and rectifying errors, ultimately contributing to long-term memory retention.

The timely nature of this feedback is particularly beneficial as it allows learners to address misconceptions and reinforce correct usage immediately. This immediate reinforcement strengthens memory traces associated with vocabulary items, making them more likely to be retained in the long term. In addition, the feedback loop created by mobile apps fosters a more interactive learning experience, enhancing student engagement and motivation. Overall, immediate corrective feedback is a powerful tool for facilitating effective vocabulary acquisition and retention in mobile language learning applications.

3.1.7 SPACED REPETITION

Spacing out vocabulary reviews improves the transfer of words from short-term to long-term memory, enhancing retention. Spaced repetition in mobile language learning applications enhances vocabulary retention by strategically spacing out review sessions. This method leverages the spacing effect, a cognitive phenomenon where information is more easily remembered when it is reviewed at increasing intervals over time. By revisiting vocabulary at spaced intervals, learners reinforce their

memory traces, facilitating the transfer of words from short-term to long-term memory. This technique prevents the cramming effect and reduces forgetting, ensuring that vocabulary is retained more effectively. Spaced repetition allows learners to consolidate their knowledge gradually, making it a powerful tool for long-term vocabulary acquisition. In the end, learners experience better retention and recall of vocabulary, making their language learning process more efficient and enduring.

3.1.8 DUAL CODING SYSTEM

Using both verbal and visual modes improves word recall and makes vocabulary more memorable. This approach leverages the brain's ability to process and store information in two distinct ways: through text (verbal) and images (visual). By combining these modes, learners create stronger and more diverse memory associations, which enhances word recall and retention. Using both verbal and visual representations makes vocabulary more memorable because it engages multiple cognitive pathways. When learners can associate a word with both its written form and a corresponding image, they are more likely to remember it. This dual coding method not only aids in immediate comprehension but also reinforces long-term retention, making vocabulary learning more effective and enduring.

3.2 FACTORS THAT INFLUENCE THE EFFECTIVENESS OF USING MOBILE LANGUAGE LEARNING APPLICATIONS IN VOCABULARY LEARNING AND ACQUISITION

The effectiveness of mobile language learning applications in enhancing vocabulary acquisition is influenced by various factors. Key elements such as the multimedia environment, immediate corrective feedback, and spaced repetition play crucial roles in optimizing learning outcomes. In addition, the dual coding system and higher involvement load in exercises further contribute to improved vocabulary retention and recall. Understanding these factors can help in designing more effective and engaging mobile language learning tools.

3.2.1 MULTIMEDIA ENVIRONMENT

The multimedia environment in mobile apps, which combines pictures and text, significantly enhances vocabulary learning by leveraging the brain's dual coding capabilities. When learners encounter new words alongside relevant images, they can create stronger mental associations between the visual and verbal representations. This dual coding process makes it easier to understand and remember vocabulary, as it engages multiple cognitive pathways, thereby improving recall. The visual context provided by images helps clarify meanings and provides concrete examples of abstract concepts, facilitating deeper comprehension. Furthermore, this multimedia approach boosts learner motivation and engagement. Visual content is more appealing and can maintain interest more effectively than text alone. By making the learning experience more enjoyable, learners are more likely to spend additional time on vocabulary practice. In addition, the ability to transfer knowledge to real-world contexts is enhanced, as learners can better visualize and apply new words in practical situations. Therefore, the combination of pictures and text in mobile apps creates an effective learning environment that enhances vocabulary acquisition and retention.

3.2.2 IMMEDIATE CORRECTIVE FEEDBACK

Immediate corrective feedback provided by mobile apps plays a crucial role in enhancing vocabulary learning. When learners receive timely feedback on their responses, they can quickly identify and correct mistakes, which helps them retain the correct meanings of words. This prompt feedback mechanism allows students to adjust their learning techniques in real-time, making their study sessions more effective and efficient. By addressing errors immediately, learners can reinforce accurate knowledge, aiding in the consolidation of information in long-term memory. This timely feedback also contributes to overall vocabulary comprehension and acquisition. It helps learners monitor their progress, understand their strengths and weaknesses, and stay motivated by seeing their improvements. Continuous feedback loops ensure that learners remain engaged and aware of their learning trajectory. By correcting errors as they occur, mobile apps facilitate a more interactive and responsive learning environment, ultimately leading to more effective and lasting vocabulary acquisition.

3.2.3 SPACED REPETITION

Spaced repetition is a technique used in mobile apps to enhance vocabulary retention by scheduling reviews of vocabulary words at increasing intervals over time. This method leverages the spacing effect, which posits that information is more effectively encoded into long-term memory when

reviews are spaced out rather than clustered together in short periods. By revisiting vocabulary words at strategic intervals, learners reinforce their memory traces, making it easier to transfer words from short-term to long-term memory. The impact of spaced repetition on vocabulary learning is significant. It prevents the common issue of forgetting information shortly after initial learning, as the spaced intervals ensure that the material is revisited and reinforced just as it begins to fade from memory. This results in stronger, more durable memory retention compared to traditional cramming or repeated learning sessions conducted in quick succession. Consequently, learners experience greater long-term memory gains, making vocabulary acquisition more effective and enduring over time.

3.2.4 DUAL CODING SYSTEM

The use of both verbal and visual modes in mobile apps leverages the brain's ability to process information through multiple channels, significantly enhancing vocabulary learning. When learners encounter words alongside images or animations, they engage both their visual and verbal memory systems. This bimodal approach creates stronger associations and richer memory traces, making it easier for students to recall words. By simultaneously presenting information in two different formats, mobile apps help reinforce understanding and retention of vocabulary. The impact of this dual coding system is profound. The combined use of verbal and visual cues not only aids immediate comprehension but also ensures that the learned vocabulary is more memorable and retrievable in the long term. This enhanced processing leads to better retention of vocabulary items, as learners can draw on multiple memory pathways. Consequently, students are more likely to remember and accurately use new words, significantly improving their vocabulary acquisition and long-term memory of these terms.

3.2.5 HIGHER INVOLVEMENT LOAD

Exercises in mobile apps that require a higher level of cognitive involvement engage learners more deeply in the word learning process. These activities might include tasks such as constructing sentences, interactive problem-solving, or applying words in various contexts. Such high-involvement exercises demand more mental effort, prompting learners to process the vocabulary more thoroughly and thoughtfully. This depth of processing enhances understanding and makes the learning experience more engaging and meaningful. The impact of higher involvement load on vocabulary retention is significant. When learners invest more cognitive effort into processing words, they create stronger and more durable memory traces. The initial processing determines the likelihood of new information being transferred to long-term memory. As a result, vocabulary learned through high-involvement exercises is more easily memorized and recalled, leading to more effective and lasting vocabulary acquisition.

IV CONCLUSION

The systematic literature review conducted in this study provides a comprehensive overview of the effectiveness of mobile language learning applications (MALL) in vocabulary acquisition. Through an examination of existing research, key factors influencing the effectiveness of these applications have been identified, shedding light on best practices and areas for further exploration. The findings suggest that MALL applications offer significant benefits for vocabulary learning and acquisition, particularly for English as a second language (ESL) and English as a foreign language (EFL) students. Interactive interfaces and varied assessments engage learners and enhance vocabulary learning outcomes by providing tailored learning experiences. Furthermore, the usability, design, content, accessibility, and infrastructure of MALL applications play crucial roles in their effectiveness, ensuring a seamless and engaging learning environment. Moreover, incorporating game-based learning elements, such as phonics, animations, and interactive exercises, increases student engagement and efficiency in vocabulary acquisition. The flexibility and convenience offered by mobile devices enable learners to practice vocabulary skills at their own pace and convenience, making language learning more accessible and adaptable to individual needs. The integration of multimedia environments, immediate corrective feedback, spaced repetition, dual coding systems, and exercises with higher involvement loads further enhances vocabulary retention and recall. By leveraging these factors, MALL applications provide dynamic and effective learning experiences that promote long-term vocabulary acquisition.

In conclusion, this systematic literature review contributes to our understanding of the effectiveness of MALL applications in vocabulary learning and acquisition. The identified factors highlight the importance of design, engagement, and personalized learning experiences in optimizing vocabulary learning outcomes. Moreover, continued research in this area will further refine our knowledge and inform the development of more effective language learning strategies and applications.

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