

Effectiveness of Mobile Applications on Vocabulary Learning: A Literature Review

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Abstract

Mobile devices have become a widely used tool in people's life. Due to features such as portability, interactivity and ubiquity, learners can learn vocabulary anytime and anywhere on mobile applications. Recently, Mobile Assisted Language Learning (MALL) has become a focus research area because mobile devices are easily accessible and interesting tools in teaching and learning. This review aimed at investigating the effectiveness of mobile applications on vocabulary learning from four related aspects namely vocabulary learning performance, learning motivation, self-confidence and autonomous learning. Thirty studies from 2014-2022 were critically reviewed. From the reviewed studies, it was found that mobile applications are effective in promoting learners' vocabulary acquisition and retention; improving motivation; enhancing self-confidence and assist autonomous learning. Mobile application type choice, teacher supervision, age and gender difference should also be taken into consideration when integrating mobile applications into learning and teaching. This study also suggests further research to fill in the gap in exploring the effectiveness of mobile applications on vocabulary teaching and the best way to integrate them into the language classroom.

Keywords

Vocabulary learning; MALL; Second language learning.

1. Introduction

Nowadays, technology is increasingly making a vast difference in every aspect of people's life, including education [1]. Due to the Covid-19 pandemic, the mode of teaching and learning has changed a lot, therefore, technology-based tools in education have drawn more attention than ever before [2]. One of the most popular areas of this is mobile learning(m-learning) which expands electronic learning(e-learning) by providing a more flexible learning method [3]. In the new era, mobile devices, such as smart phones and tablets, are cheap and powerful. Learners can choose their appropriate learning content and learn without restrictions, anytime and anywhere, thanks to the portability and personalisation of mobile devices. [4]. Mobile-assisted language learning (MALL) is a new area after computer-assisted language learning (CALL). It has become a popular way to help learners acquire language skills in a contextual, authentic and flexible environment [5]. As a result, many studies aiming at investigating the impact or efficiency of mobile devices and their applications on language learning were conducted.

Vocabulary learning is an important and continuous part of language learning since it starts at the beginning of a language learning and never ends. According to Oz, vocabulary learning is influential to beginner learners in that they will be motivated or demotivated by the vocabulary amount they got at the first stage of a language learning. In the traditional method, students learn the target language vocabulary by memorizing the literal meaning of the words without

context. Too much memory load leads to demotivation and triggers production problem [6]. Literal vocabulary learning problems need to be handled. Rapaport's contextual vocabulary acquisition theory suggests a good method of solving this problem. Rapaport defines contextual vocabulary acquisition as an active learning process of understanding the vocabulary meaning in a related sentence or text with the aid of background knowledge and prior experiences [7]. In this sense, MALL eliminates the drawbacks of literal technique and promotes contextual vocabulary acquisition through thousands of mobile applications. Because mobile applications serve to present words via contextual approach (e.g., pictures, flashcards, example sentences) and optimize literal vocabulary instruction in the traditional method [6].

As Mobile App Download Statistics & Usage Statistics show, people spend 88% of mobile time on apps [8]. Nowadays, there are enough mobile application used for English language teaching and learning [9]. More than 200 mobile apps can be searched on Google Play aiming at improving English vocabulary learning [10]. In the trend of MALL, many researchers have been conducted to explore and discuss the effectiveness of mobile devices and their applications on language learning as well as vocabulary learning through comparative study, empirical study and review study, etc. Overall, these literatures found that mobile devices and applications are beneficial to language learning.

However, there are some limitations of the existing review literature. Firstly, most of the review studies or meta-analysis studies focus on language learning, while review studies specifically on the effectiveness of English vocabulary learning are relatively lacking. Secondly, much of the review literature does not provide a clear classification of mobile devices and mobile applications. Actually, mobile devices consist of many learning forms: websites, applications, text messages, etc. It is necessary to conduct a review study that focuses on a specific form. Thirdly, there is no review study discuss the effectiveness of mobile applications on English vocabulary learning from different dimensions of learners' learning process. The existing literature is more concerned with whether mobile applications are effective in enhancing learners' vocabulary skills in general. Therefore, the purpose of this review study is to discuss and synthesize the effectiveness of mobile applications on vocabulary learning, especially English, from four aspects: vocabulary learning performance, learning motivation, self-confidence and autonomous learning. A classification of the findings of the research will give a clear insight into to what extent do mobile apps benefit vocabulary learning on different aspects of learning. In addition, this paper will help language instructors better integrate mobile apps into vocabulary teaching and help app designers improve app design.

2. Mobile Apps in Vocabulary Learning

MALL has drawn a lot of attention of researchers in recent years. During the covid-19 pandemic period, it is a quite productive research area and yields more research findings. Burston conducted a statistical study on MALL implementation outcomes on learning. He finds that most of the MALL studies are aimed at exploring the effectiveness of learning outcomes on vocabulary learning. These studies all prove that MALL has significant contribution to vocabulary learning [11]. Later, Mahdi conducted a meta-analysis on the effectiveness of mobile devices on vocabulary learning and came to the same conclusion[12]. In accordance with the previous review studies, Klimova indicates that learning vocabulary through mobile apps is an effective, suitable and useful method. The study results especially point out the positive effects of mobile apps on improving learners' motivation and suggests more rigorously designed empirical studies should be done in this area [10]. In order to supplement the latest studies and evaluate the positive effects on different aspects including motivation, this paper reveals how mobile apps benefits vocabulary learning from four concepts namely vocabulary learning performance, learning motivation, self-confidence and autonomous learning. In general, mobile

apps act as mediators to increase learners' vocabulary knowledge and enhance learners' vocabulary retention; improve learners' vocabulary learning motivation; increase learners' self-confidence in learning and promote autonomous learning. All these factors combined to help learners better acquire enough amount of vocabulary and develop their language proficiency. These factors will be discussed below.

3. Vocabulary Learning Performance

Vocabulary knowledge is an essential part of language ability. The amount of vocabulary that learners acquire and the extent to which they understand it are closely related to the target language skills: listening, speaking, reading and writing [13]. The study by Polakova, Klimova, and Prazak compared the effectiveness of mobile applications with non-mobile application learning effect on the textbook-based vocabulary learning of 21 high school students for three months. The result shows that learning vocabulary through mobile applications in English class is useful in promoting students' vocabulary knowledge [14].

Mobile applications are effective in enhancing learners' vocabulary learning performance. Klimova attempted to seek the impact of mobile application learning on students' achievement results. The case study was conducted on 33 students of Management of Tourism. Firstly, Klimova conducted a needs analysis based on evaluation criteria namely the strengths, weaknesses, opportunities and threats of vocabulary learning which found that students have problem in vocabulary learning and retention. Secondly, based on the needs analysis data, a mobile app was designed to help students handle these difficulties. Finally, a continuous assessment was used to monitor students' performance when using the mobile app. This study indicated that mobile apps, if designed based on students' need and facilitated by a teacher, are effective in improving students' learning performance and strength learning achievements [15]. Chen, Liu and Huang conducted a four-week comparison study with 20 Taiwanese EFL university students. The participants were divided into two experimental group and control group. The experimental group use vocabulary application designed with game-related functions to learn vocabulary while the control group without. Analytical results indicated that language performance including English vocabulary acquisition and retention in the experimental group outperformed the control group. In addition, this study found game-based functions help learners improve pronounce accuracy and spell and understanding abilities through assessment function in the mobile applications [16]. Similarly, Klimova and Prazak reported that mobile applications have some multimedia advantages in helping learners learn vocabulary better. For example, by using mobile applications, learners can hear the pronounce and see the meaning of a word simultaneously. And repeated presentation of the word is beneficial to both short-term memory and long-term memory [17].

There are some researchers choose a kind of mobile applications or a certain app as the research object to search the effectiveness of mobile applications on vocabulary learning. Bensalem conducted a study using a popular mobile application, WhatsApp in the study. The participants composed of 40 students divided into two groups: 21 students for experimental group and 19 students for the control group. The experimental group completed and submitted their homework via WhatsApp while the control group used paper and pen. The result of the t-test shows that WhatsApp group got higher score of the vocabulary test compared to the other group [18]. This result echoes another study conducted by Hashemifardnia, Namaziandost and Esfahani which also focused on WhatsApp's effect on Iranian EFL Learners' vocabulary learning. 50 Iranian participants of the same English proficiency level were selected through Oxford Quick Placement Test and were randomly divided into two groups. After the pre-test, experimental group students were instructed to learn the word through WhatsApp and the control group students instructed by the traditional method. After analyzing the pre-test and

post-test result, it concluded that WhatsApp plays a positive role on learners' vocabulary learning performance [19]. In general, the use of mobile applications in vocabulary learning promotes vocabulary acquisition and retention. So, mobile applications are effective in vocabulary learning. Mahdi also expands the conclusion that adult learners benefit more than young learners [12].

4. Learning Motivation

The primary purpose of education is learning to learn and motivation. Motivation is an important component of education. Mobile applications can motivate students to learn more through positive learning environment. Klimova and Polakova conducted a study to investigate students' perceptions of mobile applications on vocabulary learning. In the open-ended questions, most students reported that the learning environments in mobile applications are more fun, easy to use, less stressful than learning from textbooks [20]. Another factor which contributes to a positive learning environment is that mobile applications can be personalised to meet the language learning requirements of students.

According to Deris and Shukor, mobile applications are accepted by learners in that they are portable and convenient. Learners can learn vocabulary at their preferred time and place. There are also some features which triggers learners to learn more. Gamification is the most preferred feature of mobile applications when learning vocabulary because learners become more excited when learning vocabulary in a meaningful context through interesting games [21]. This is also supported by Li who conducted a study to measure the influence of game-based mobile applications. The study results suggested that students' vocabulary learning motivation was greatly improved through game-based mobile applications. Moreover, gamified functions in mobile applications such as game assessment and ranking competition are closely related to vocabulary learning performance [22]. In addition, after doing the users behavior analysis, Chen et al. found an interesting fact: traditional material-based assessment had negative effects on learning motivation and performance while the gamified assessment method had positive effects. So, gamed-based mobile applications are conducive to vocabulary learning [16].

In the traditional language teaching method, of the four language skills, receptive skills (listening, reading) get more practice than productive skills (speaking, writing). Mobile applications have many strengths on encouraging learners do more practice on productive skills. Hashemifardnia et al. found that WhatsApp can promote student communication and provide additional learning venue by making online language study more appealing and helpful, which boosts English learners' motivation. In the learner-oriented, interactive environment in WhatsApp, learners are more willing to use the online talk to utilize the vocabulary they have learned to facilitate connection with others, especially for low achievers [19]. A similar argument emerged in the study of Bensalem, WhatsApp has enhanced learners' vocabulary learning, particularly among shy learners who are unwilling to communicate face-to-face. To ensure that using WhatsApp for vocabulary study is successful, instructors should establish some ground rules to keep students engaged in the work. For example, setting communication time limitation to avoid them wasting time talking online [18]. Thus, mobile applications are effective to create a communicative, interactive, positive environment for learners to raise learners' motivation.

5. Self-Confidence

Self-confidence is defined as learners' belief they hold about accomplishing something. Students with higher self-confidence in learning process can improve their participation, let them enjoy learning more, increase their motivation in achieving their learning goals and reduce text anxiety [23]. Hong et al. introduced a calibration-based mobile vocabulary learning

application to 107 participants to examine if this application is useful in enhancing students' vocabulary learning self-confidence. They applied a structure equation model to analyze the correlates of users' learning self-confidence. The results revealed that calibration, a self-evaluative approach, is very useful in enhancing students' learning confidence in using the learned vocabulary [24]. Bensalem adopted WhatsApp as the research object and concluded that using WhatsApp can help learners feel less inhibited and thus boost their confidence in involving in the learning process [18]. Li conducted a study to explore game-based application's influence on motivation, self-confidence and vocabulary achievement. In this study, Li broadened the scope and produced more convincing findings: the active interaction using information and communication technologies (e.g., WhatsApp, QQ, or Wechat) increases vocabulary learning self-confidence. There is also an interesting finding in this study that motivation and self-confidence have no significant effect on vocabulary learning performance [22].

Different from the positive impact of some mobile apps which have been discussed above, there are still some opposite findings. Happy World Game (a game-based vocabulary learning app) lowered learners' self-confidence, according to Lei, because they had to pass through hurdles one after another to acquire increasingly harder terms [25]. Furthermore, most existing vocabulary study apps were created to assist students in preparing for exams such as the IELTS, TOEFL, and GRE. As a result, the offered vocabularies are excessively difficult, causing students to lose confidence [21]. What's more, although the correction feedback function has a positive effect, if it is too strict, learners will lose confidence in learning by using mobile apps [20]. To sum up, the type of mobile apps determines whether they have a beneficial or negative impact on EFL learners' vocabulary learning. So, it is advisable to carefully plan, design, and apply vocabulary learning mobile apps, according to learners' needs, and set different difficulty levels and reasonable evaluation mechanisms.

6. Autonomous Learning

Learners' autonomy is they learn a language spontaneous and finish the learning goal with self-regulation. The aim of education is to teach students how to learn. Hence, developing students' learning autonomy and enable them to control their own learning process is important in education, as it is in vocabulary acquisition [26]. Even though autonomous learning is a helpful way of acquiring knowledge, this process should also be guided and supervised by teachers. According to Pershukova et al., sometimes students cannot fully accept their responsibilities for learning and fails to plan and reflect well of the learning process. This is where teachers should play their roles to provide help for learners. The range of autonomous learning depends on learners' age, proficiency, motivation and learning environment [27]. So, it is a challenging work to combine teachers' and students' roles in autonomous learning to lead learners master their vocabulary learning to get the most out of their learning.

As a novel learning method, mobile learning is flexible and effective [24]. Learners now have more options for studying content and learning style thanks to the development of vocabulary apps, which helps to foster autonomous learning by creating a flexible environment. According to Oz, in the traditional vocabulary learning method, the listen-and-learn style fails to internalise the real need of learning. In the constructivist theory, teachers should be a counsellor not an authority [6]. Learning through mobile applications regarded as a good approach to achieve this because teachers can offer individual context for learners and lead them to access the appropriate content. At the same time, students take control of every phase of learning from a single word which stimulate the whole autonomous learning. This is proven by Setiawan and Wiedarti on 65 tenth-grade students on their vocabulary learning using Quizlet Application via smartphones where the findings revealed that students were preferring

to learn vocabulary independently via Quizlet with motivation [28]. This result is in line with Korlu and Mede's study which also use Quizlet as a tool to help with students' vocabulary learning. The findings also concluded that Quizlet can increase students' autonomy in vocabulary learning because the app offers a motivating and interesting environment for learners to learn and practice vocabularies on their own paces [29]. Mobile devices should be integrated into vocabulary teaching in classrooms to help students enjoy the learning process and enhance their autonomous learning with the help with teachers. In addition, many applications have formative evaluation function, providing instant feedback of vocabulary tests or practices. This provides a platform for learners to always reflect their learning process and assess vocabulary performance which paves a way for better autonomous learning [30]. Therefore, mobile applications are effective in promoting learners' autonomous learning.

7. Conclusion

This literature review reveals the effectiveness of mobile applications on vocabulary learning. Mobile devices have turned out to be a useful tool in language education and mobile applications aiming at improving vocabulary have been popular among learners. Most of the studies reviewed show that mobile applications are effective in vocabulary learning and retention in general. Mobile applications have positive effect on vocabulary acquisition and retention both in literal and contextual aspect by offering an interesting environment. Previous studies using WhatsApp and game-based applications trigger students learning proved their significant roles in improving learners' motivation through a communicative learning environment.

Mobile applications can also make learners feel confident about vocabulary learning especially for low achievers and shy students. However, the effectiveness of the outcome depends on the design and content of the certain application and students' proficiency levels. Regarding autonomous learning, mobile applications also have a positive influence by create a flexible and individual platform for learners to plan and finish vocabulary tasks on their own way independently. But the learning outcome would be better if teachers can offer timely supervision and guidance in this process.

There are two factors impede this literature review. The first is most of researchers choose universities students or adult learners as research participates among most of the reviewed studies. So further researchers need to be conducted on investigating the effectiveness of mobile applications on young learners, primary or secondary school students to make the research results more comprehensive. The other factors are most of the studies' sample size are too small and fails to consider the participates' gender, language background, learning ability, learning style, etc. In most researchers, participates were randomly chosen and divided into two groups. To some extent, this may influence researchers' accuracy. For example, if the experimental group has more male learners than the control group, their motivation on learning through mobile applications may higher than the control group because in general, mobile devices are more attractive to males. Therefore, we suggest that further studies expand the sample size and consider participates' gender, language background, learning ability, learning style and any other elements that may influence the study result to deepen people's understanding of the effectiveness of mobile applications on vocabulary learning.

Based on this literature review, it is apparent that mobile applications are effective in helping learners improve their vocabulary performances, learning motivation, self-confidence and autonomous learning. For learners, they can choose suitable vocabulary applications from various of applications which can be download and use easily to assist vocabulary learning. For instructors, it is worth trying to integrate mobile applications into language teaching. But aspects that should also be considered are the choice of applications, integration methods, time

management and teacher supervision. In the traditional teaching method, practicing students' productive skills such as speaking and writing is relatively inefficient. Teachers can take advantage of the mobile applications to help students practice speaking and writing. For app designers, the app design needs to be more user-based and interactive. It is recommended that formative feedback features be incorporated into the application. In addition, further researchers should be conducted on mobile applications' effectiveness on vocabulary teaching and how to better integrate mobile applications into language classrooms.

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