Effects of Memrise on Vietnamese EFL Students' Vocabulary: A Case Study at a College in a Rural Area

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Abstract: Understanding the role of English language acquisition in developing the socioeconomic status of Vietnam forms the backdrop for this study, which seeks to shed light on the potential benefits of technology-assisted vocabulary learning. Based on this context, this study employed a mixed method of quantitative and qualitative design attempting to investigate the vocabulary development of college students (n=23) who were treated by the use of Memrise (Experimental group) in combination with a traditional teaching method compared to their counterparts (n=24) who were taught by a traditional teaching method (TTM) (Control group) without the use of this application. Students' thoughts about the benefits and challenges of Memrise for their vocabulary learning after the treatment were also investigated. The study yielded noteworthy results on multiple fronts. Quantitatively, data collected from the vocabulary post-tests showed that the experimental group significantly outperformed the control group in their vocabulary scores. Qualitatively, interview data indicated that Memrise positively impacted students' motivation and interest for vocabulary learning, suggesting its effectiveness in addressing the particular problems of engagement and retention in vocabulary acquisition. However, there were logistical challenges, particularly in rural settings. Factors like unstable internet connections and inadequate mobile devices adversely affected the quality of learning experiences with Memrise. By focusing on these elements, this study highlights key pedagogical implications and underscores the value of technological interventions in language learning, offering insights into addressing infrastructure barriers and tailoring e-learning methods to diverse learning environments and needs.

Keywords: Memrise, Rural area, Traditional teaching methods, Vocabulary teaching and learning, Vietnam

1. Introduction

The significant importance of vocabulary in language acquisition has been discussed in literature (Alqahtani, 2015; Asyiah, 2017). Together with methods of teaching and learning vocabulary developed by scholars and experts, applying technology to vocabulary teaching and learning also plays a crucial role (Klímová and Berger, 2018). The Memrise application, along with apps, has appeared as a powerful tool to help learners improve their vocabulary learning (Affandi and Syafi'i, 2018; Fathi, Alipour and Saeedian, 2018; Łuczak, 2017). Fadhilawati (2016), for instance, found out that Memrise had positive effects in developing learners' vocabulary, and they, therefore, responded positively toward the use of it. Izah (2019) concluded that Memrise could enlarge students' vocabulary and, at the same time, engage them in a relaxing learning environment. From these perspectives, it can be hypothesized that integrating Memrise into language teaching, particularly vocabulary teaching, can be considered a valuable approach that may be especially suitable for Vietnamese students, and by extension, potentially beneficial for other English learners globally.

In 2008, the Vietnamese government made a significant policy intervention in language education with the introduction of a reform called "Teaching and Learning Foreign Languages in the National Formal Educational System". This reform aimed to make a shift from traditional form-based teaching methods towards more modern, interactive techniques that would better prepare Vietnamese students for global engagement (Nguyen, 2018). Also, the introduction of this policy coincided with the rise of digital technology in educational settings, allowing for the incorporation of computer-assisted language learning tools (Nguyen and Vo, 2021). Therefore, investigating the suitability of e-learning practices, such as those offered by Memrise, for Vietnamese students can provide insights into addressing the digital divide and enhancing English language proficiency.

Memrise has been widely used as a powerful tool in helping learners learn English vocabulary worldwide (Melati and Herlina, 2019). However, only a few studies on the use of Memrise have been conducted in the context of Vietnam, where English language teaching has been said to be different from other contexts due to its policies and also the influence of traditional form-based teaching methods (Nguyen and Jaspaert, 2021). This underscores the need for a tailored examination of Memrise's applicability to the Vietnamese educational milieu and its relevance for Vietnamese students specifically.

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From these perspectives, it is crucial to examine whether using Memrise affects EFL learners' vocabulary development, especially in rural areas of Vietnam where applying technology to English teaching and learning still encounters several difficulties. Moreover, students' perceptions of the use of Memrise in their vocabulary learning should be addressed. By doing so, this study aims to not only address a gap in the research but also offer practical insights for various stakeholders involved in the realm of English language education in Vietnam and beyond.

1. To what extent does Memrise enhance students' vocabulary development more than TTM?
2. How do students perceive the specific advantages and disadvantages related to vocabulary learning when using the Memrise application for their English language education?

2. Literature Review

2.1 Memrise

Memrise is known as a technological tool for language learning, which has been selected for this study due to its unique approach to vocabulary acquisition. It uses memes which are known as Memes-markers. Memes can be mnemonics, etymologies, amusing videos, photos, pictures, example sentences, or anything connecting students with their learning. These memes stimulate learners' senses, imagination, and emotions to strengthen their memory and keep the learning process interesting (Zhang, 2019). Engagement and retention are also critical factors in language learning, and Memrise addresses these directly, which underscores the rationale for its selection in this context.

Hamer (2021) stated that Memrise can be easily accessed via computers and other electronic devices. The accessibility of Memrise is a crucial factor for its selection, as it aligns with the increasing penetration of digital technology in Vietnam. Thanks to various functions provided by Memrise, it supports English learning effectively, particularly vocabulary. This application allows users to take advantage of available design courses, or it is also possible for users to create their courses with multimedia added to particular items for different purposes (Kent and Sherman, 2013). The ability to customize and create courses is particularly advantageous for Vietnamese educators and learners, as it allows for the incorporation of local cultural and linguistic nuances into the learning process. Such customization is a compelling reason for choosing Memrise as a tool for this study, and it highlights the areas worth exploring in terms of personalization and effectiveness in the Vietnamese educational context.

2.2 Features of Memrise

2.2.1 Space-Repetition

Space-Repetition assists learners in identifying their strengths and weaknesses (Arnold and McDermott, 2013). The Memrise application uses Space-Repetition to facilitate memorization and recall. Furthermore, Karanfil and Özet (2021) stated that Space-Repetition is the primary teaching feature that triggers test-potential effect. Additionally, a specific algorithm is applied for testing vocabulary and helps learners discover the knowledge gap and work on inadequate knowledge (Zhang, 2019).

2.2.2 Competition

Memrise uses the feature of Competition as a gamification tool that motivates students to gain the highest position in the leaderboard (Karanfil and Özet, 2021). The board range of Memrise provides several points that learners get in every time. Learners can find their and others' results in the board range. Learners who frequently practice with items and give correct responses will get more points on the board. If they want to move on to the next level, they have to correctly provide a new word.

2.2.3 Community

Łuczak (2017) argued that Memrise allows learners to create their courses, and members of the Memrise community can also contribute their effort to the course content. It is noted that learners can interact and learn with other members and share their ideas while using Memrise (Affandi and Syafi'i, 2018). Also, learners can freely decide on the topics or courses for their learning purposes (Melati and Herlina, 2019).

2.2.4 Exercise system

The exercise system effectively enables learners to practice and strengthen their memory capacity (Tyas and Nurdiawati, 2019). This system provides several activities, such as vocabulary learning, translation, multiple-choice and word arrangement, that help engage learners in the learning process. Moreover, the sound pattern

application in the exercise system helps learners improve their pronunciation, contributing to their language acquisition. Moreover, word translation and typing challenges are other exercises provided by Memrise that help learners practice the language (Izah, 2019).

2.2.5 Reminder

The reminder function effectively helps remind students about the time to learn or review their courses (Fadhilawati, 2016). It sends an automatic email message to remind learners about the studied material to increase opportunities for further practice (Luczak, 2017).

2.2.6 Gamification elements

Memrise has been featured as an application incorporating several gamification elements into the learning process. At first, Memrise makes learning new words like a game that encourages learners to plant a flower seed. Then, every correct answer gained by learners will assist the seed to growing into fully blooming (Izah, 2019). Another task type is to require learners to match visual context cues with either spoken or written format. If the learner answers correctly, the flower seed grows, and vice versa. The items will be grown and watered to make a certain number of points each time. Feedback is given immediately through visual or musical code. Learners, therefore, can see their results and know what to prepare for the next learning stage.

2.3 Vocabulary

In literature, there are several definitions of vocabulary proposed by scholars. Hatch and Brown (1995) defined vocabulary as a list or a set of words for a specific language the speakers use to deliver their messages to their listeners. Vocabulary is categorized into two types of active and passive (Ansarin and Khabbazi, 2021). Active vocabulary refers to the words that learners can understand and use orally, while passive vocabulary refers to the words which students know through passive recognition and students, therefore, cannot use actively (Schmitt, 2008). Other scholars divide vocabulary into two types: receptive and productive (e.g., Hatch and Brown, 1995). About receptive vocabulary, Alqahtani (2015) claimed that receptive vocabulary refers to the words that learners recognize and understand as these words are used in context, but they cannot produce these words. Learners recognize receptive vocabulary in reading texts but cannot use it in speaking and writing. Dealing with productive vocabulary, it is used constructively in speaking and writing (Alqahtani, 2015) since learners can understand and pronounce or write it correctly.

2.4 The Relationship Between Memrise and Vocabulary Teaching and Learning

Vocabulary teaching requires learners to be introduced to a new word to comprehend it (Nuralisah and Kareviati, 2020). Teachers can apply certain aspects of a word that assist learners in having more opportunities to learn a word. Memrise satisfies the requirement of vocabulary teaching procedure as its features facilitate teachers' teaching. By using it, teachers can provide a new word with its pronunciation, spelling, and part of speech. Moreover, teaching vocabulary needs to apply interesting and fun activities to develop learners' interest and help them memorize words easier and longer (Asyiah, 2017). Various tasks combining flashcards and games in Memrise can train learners' memorization capacity. Hence, it makes learning vocabulary enjoyable for students.

Yugafiati and Priscila (2019) stated that learners should focus on several aspects of vocabulary, including pronunciation and orthography, grammar and meaning to master vocabulary. Specifically, Memrise helps provide input consisting of pronunciation, spelling, part of speech, and word meaning, so learners can recognize how to accurately pronounce words and understand its spelling and part of speech. Moreover, Memrise includes unique features that assist learners in practicing a word by listening to it and/or using it in a particular context through tasks, such as fill-in-the-blanks or sentence completion. Therefore, it can be said that the app is potential for vocabulary teaching and learning.

2.5 Related Studies

Fadhilawati (2016) conducted action research in which the author used Memrise in teaching vocabulary to thirty-nine learners at a university. Three levels of vocabulary related to agriculture were prepared for teaching, and the learners were required to learn the vocabulary in the classroom and review it at home via Memrise. The results revealed that using Memrise as a vocabulary learning tool improved learners' vocabulary achievement from a mean score of 60.45 (Pretest) to 86.27 (Posttest). Moreover, learning vocabulary through Memrise was an enjoyable activity, and the learners were motivated to learn vocabulary (Abarghoui and Taki, 2018). Other factors, including satisfactory responses, task achievements, and social relationships, made the participants willing to learn and review vocabulary through the application.

Similarly, Fathi, Alipour and Saeedian (2018) investigated the effects of Memrise on vocabulary learning and self-regulatory capacity in vocabulary acquisition. Fifty-nine learners were randomly assigned to an experimental group (n=33) and a control group (n=26) for the intervention. The results showed that Memrise helped learners in the experimental group outperform their counterparts in the development of vocabulary and self-regulating capacity (Esmaeili and Shahrokhi, 2020).

Tyas and Nurdiawati (2019) conducted an experimental study to determine whether Memrise is practical for tenth-grade learners' vocabulary learning. The learners were divided into two groups, consisting of an experimental group and a control group. The results showed that it was not adequate for the learners to use Memrise to learn vocabulary, mainly due to personal and technical problems (e.g., lack of electronic devices, low internet connection). Therefore, it is argued that only when the learners are well-supported with mobile devices and sufficient internet connection, Memrise can be successfully applied as a practical learning tool.

In brief, Memrise is a valuable tool that generally enriches the vocabulary learning experience by making it more interactive, efficient, and enjoyable. Nonetheless, for optimum results, it should be integrated thoughtfully into a comprehensive language learning strategy that takes into account the learner's individual circumstances, technological accessibility, and learning objectives. While Memrise appears to foster learning by using gamification and various memory techniques, there is a gap in the research in Vietnam focusing on direct comparisons of Memrise's effectiveness in vocabulary learning against traditional methods. This also extends to the qualitative aspects, as most of the literature does not deeply explore students' perceptions about the benefits and challenges of using Memrise. This lack of specific focus on comparative effectiveness and detailed user perceptions leads us to the primary aims of this current research.

3. Methods

3.1 Research Design

This experimental study employed a pretest and posttest design to investigate the students' development in their lexicon knowledge when learning with and without Memrise. The study was structured with two settings for vocabulary learning: one group would be learning vocabulary with the assistance of the Memrise app, and the other group would not use the app. This design allowed for a direct comparison of vocabulary acquisition rates and retention between the two groups, thereby addressing both lexicon knowledge and vocabulary usage. To add depth to this study, qualitative data were collected through semi-structured interviews. These interviews would provide insightful perspectives from students who were assigned to the Memrise-using experimental group, shedding light on their subjective experiences in terms of benefits and challenges.

3.2 Participants

Participants were students studying at a Medical college in the Southwest of Vietnam, specifically majoring in Nursing. Their average age was around 19 years old, and their level of English was generally intermediate according to the CEFR. Approximately 80% of the students had previously been exposed to English language learning prior to college but had limited experience with computer-assisted language learning methods.

To recruit the participants, firstly, the researcher contacted the school to gather contact information with students there. After receiving permission, the researcher sent invitations to 148 first-year students, equivalent to six classes. The number of students in each group in order was 26 (Group 1), 24 (Group 2), 24 (Group 3), 23 (Group 4), 25 (Group 5), and 25 (Group 6). Given that these students were relatively new to the college environment, they were less likely to have been influenced by the teaching methods of their teachers. Then, the students had an orientation day to discuss the topic, its importance, students' contribution to this research, and their rights if they agreed to voluntarily participate in research.

Next, the 148 students took a 150-word screening test taken from the content of the upcoming lessons to redefine their lexicon knowledge. This step aimed to select groups of similar English competence before officially becoming participants of the study and prepare a list of vocabulary that would be taught and tested in this study. All student groups had the same test time of 180 minutes, and each question was worth 1 point. The results showed that the average scores of groups from Group 1 to Group 6 were 60, 30, 52, 29, 73, and 80, respectively. There was a significant difference in the lexicon knowledge of the groups, except for Group 2 and Group 4, when compared with each other. Therefore, these two groups (Group 2: Traditional teaching method; Group 4: Memrise) were eligible to participate in the intervention.

Two volunteer lecturers were also invited as collaborators of the study. These two lecturers had relatively similar backgrounds. Specifically, they were all lecturers with years of experience teaching English at higher education

level and had all applied Memrise into their teaching in practice. Therefore, they knew how to use this app to teach vocabulary to their students. Before the intervention was implemented, the research team and these two teachers, together, had several sessions to discuss lesson plans that they would use to teach the students. The research team designed all the lesson plans used in this current study to reduce the fact that the differences in the teachers' teaching styles would affect the research results. Therefore, they were required to stick to lesson plans. Then, two teachers taught demos under the observation of the research team to evaluate and adjust their teaching to best serve the purpose of this study.

As for the selection of interviewees, this study employed a control quota sampling technique. This technique allowed the researchers to select the participants based on predetermined characteristics so that the total sample would have the same distribution of characteristics. Specifically, 9 out of the 23 students in Group 4 were intentionally selected. Among them, 2 students scored the highest, 2 scored the lowest, 2 scored average, and 3 whose scores varied on the posttest. The rationale for involving only 9 students in the interview process was influenced by a combination of methodological rigor and practical constraints. The control quota sampling technique, applied here, ensured a representation across a spectrum of performance levels within Group 4. By selecting two students with the highest scores, two with the lowest scores, two with average scores, and three students with varying scores on the posttest, the researchers aimed to capture a broad and diverse array of experiences and insights into the use of Memrise for vocabulary acquisition.

3.3 Data Collection Instruments

3.3.1 Vocabulary test

The screening test served as a critical instrument for data collection and was designed to equitably compare the efficacy of the two treatment conditions - learning with Memrise and learning without Memrise. The researchers followed a rigorous selection process which was grounded in three key criteria: 1) the words had to belong to themes presented in the students' current textbook, ensuring educational relevance; 2) they had to be rated as A2 level according to the CEFR, making them suitable for the proficiency level of the participants; and 3) the words had to be unfamiliar to the students, creating a fresh learning experience and allowing us to better measure vocabulary acquisition. To be specific, 72 words that were answered incorrectly by students in both groups were identified. These words were written on individual pieces of paper, folded, and placed in a cardboard box. Team members then took turns drawing these pieces of paper until a total of 50 words were selected.

To enhance the reliability, initially, a pilot test was conducted on a subset of 30 students who did not participate in the main study. It is noted that the demographic and educational backgrounds of the participants involed in the pilot test were closely matched to those of the main study sample. Based on the feedback received from the pilot study, 90% of the students found the questions to be clear, while 85% believed the level of difficulty to be appropriate. This feedback was instrumental in fine-tuning the questions for the main study. Three experts also reviewed the questions for appropriateness and relevance to the study's objectives. Finally, to quantitatively confirm the internal consistency of the vocabulary tests, a Cronbach's alpha was calculated post-administration of the tests. The Cronbach's alpha value was found to be 0.87, indicating a high level of internal consistency and thereby confirming the reliability of the test items.

The posttest was designed to assess students' memorisation of these 50 words through four types of questions including: 1) word completion exercises (10 words); 2) word completion exercises (10 words); 3) multiple-choice questions (15 words); and 4) word selection tasks (15 words). This diverse range of question types was chosen to assess both receptive and productive vocabulary skills, as well as the ability to understand vocabulary in context.

To address the management of written records, it is essential to highlight that all materials, including the written records such as pretest and posttest sheets, were treated with the utmost confidentiality and in accordance with ethical research standards. All written records were anonymized to remove any personal identifiers, ensuring the privacy of the participants was maintained. These records were then stored securely, accessible only to the primary researchers involved in the study. For data analysis purposes, the written responses from the tests were digitally transcribed, with each participant being assigned a unique code to further ensure anonymity. The digital records of the transcriptions were encrypted and stored on a password-protected computer. These transcriptions were used for the quantitative analysis. All physical records were to be kept for a period defined by the study's protocol, after which they would be shredded and disposed of in a secure manner. Digital records,

similarly, would be retained for a period as stipulated by the ethical guidelines before being permanently deleted.

3.3.2 Semi-structured interviews

To offer more details on the qualitative component of the study, semi-structured interviews were scheduled shortly after the treatment course was completed, ensuring that the experience of using Memrise was still fresh in participants' minds. The interviews were designed to provide in-depth, qualitative data that would complement the quantitative results. According to Kvale and Brinkmann's (2009) methodology, the aim of these interviews was not just to collect surface-level data, but to dig deeper into participants' personal experiences and viewpoints regarding the use of Memrise for vocabulary learning. In this manner, the interviews could reveal the nuanced perspectives of learners, in their own words, about the various advantages and disadvantages of using the app. The questions for these interviews were carefully crafted based on a framework proposed by Wright and Alison (2004), which aimed to investigate two key areas of interest: 1) the perceived benefits of using Memrise for vocabulary learning; and 2) the perceived challenges, which could span issues such as technical difficulties, limitations of the app's vocabulary database, or any demotivating factors.

It is worth noting that language can be a significant factor in the quality of data collected during interviews. In this respect, all interview participants were given the option to use their mother tongue, Vietnamese, for the interviews. This choice aimed to create a more comfortable and open environment (Creswell, 2012), thereby encouraging participants to fully express their opinions, share their experiences, and contribute nuanced insights into the utility and limitations of Memrise in vocabulary learning.

All interviews were audio-recorded with the explicit consent of the participants and transcribed verbatim. These transcriptions allowed for a detailed analysis of the data, ensuring that the participants' insights and nuances were accurately captured. To maintain confidentiality, all transcripts were anonymized, with any identifying information being removed or altered. As per ethical research practices, both audio recordings and their corresponding transcriptions will be retained only until the end of the research project, after which they will be permanently deleted.

3.3.3 Data analysis

For the quantitative data pool, descriptive statistics were first run to summarize the central tendency, dispersion, and shape of the dataset's distribution. This helped identify whether any noticeable differences existed in the posttest results between the two groups, those who used Memrise and those who did not. Furthermore, an Independent Samples T-test was performed to ascertain whether the observed differences in posttest vocabulary scores were statistically significant. For this study, the alpha level for determining statistical significance was set at $p<.05$. Regarding the qualitative portion, a thematic analysis method was applied to examine the interview transcripts. This analytical approach involves identifying, analyzing, and interpreting patterns within qualitative data. By employing thematic analysis, the researchers were able to systematically address the research issues and questions. In this respect, it adds a rich and contextual layer to the quantitative results.

3.3.4 Procedures

The procedures of this study are detailed in Table 1.

Table 1: Research procedures

Duration	**Stages**	**Sub-stages**	**Experiment Group**	**Control Group**
2 weeks	Pre-intervention	Pretest	See Section 3.2	
15 weeks	While-intervention	Step 1	**Introducing the lesson aims.** The teachers set the scene to teach the lesson, including its aims and objectives. To create an environment for discussion (in pairs or in groups), the students were asked leading questions and, at the same time, received suggested clues for the answers. There were many activities that the teachers used in this step to stimulate the students' contribution of ideas.	
		Step 2.1	**Teaching vocabulary**. The instructional activity was organized into two phases. In the first phase, the teachers taught vocabulary by traditional teaching method; that was, they explicitly introduced the vocabulary to students by directly translating its meaning in L1 or showing pictures representing the meaning of the words. The students were also	

Duration	Stages	Sub-stages	Experiment Group	Control Group
			instructed on pronouncing the words correctly by tentatively listening to the teachers spelling out and repeating what they heard.	
		Step 2.2	In the second stage, the students were instructed to work with **Memrise** to review the words they had learned. To start learning with Memrise, the teacher introduced the words for learning with their provided Vietnamese meanings, sound, and parts of speech.	In the second stage, the students were instructed to work with **handouts** to review the words they had learned. To start learning with the handouts, the teacher introduced the words for learning with their provided Vietnamese meanings, sound, and parts of speech.
		Step 3	**Checking students' understanding of vocabulary**. This step aimed to give students opportunities to review the words they had learned through consolidating exercises. The students were encouraged to complete the exercises in the allotted time required by the teachers. Once the students finished the activities, they could know the degree of vocabulary they had the mastery of during the lesson.	
		Step 4	**Using the words**. This step aimed to encourage the students to apply the words they had just learned to a so-called real-life situation word use. In this step, the teachers often asked the students to practice the words in particular communicative topics, customarily taken as speaking or writing activities. Students could work individually or in pairs or groups for their performance.	
2 weeks	Post-intervention	Posttest	At the end of the treatment, a posttest was run to check the students' vocabulary development in the two groups. On the test date, the students were arranged to sit separately from each other and constantly observed and managed by two examiners to ensure that any cheating activities could be prevented. Each of the performances was then scored by two independent judges for its reliability.	
		Interviews	After the treatment, nine students were invited for the interview, which was conducted via Zoom. Each lasted for approximately 60 minutes. All interviews were audio-recorded, then double-checked by an independent judge for data analysis afterward.	**x**
"X" means to do nothing.				

4. Results and Discussions

4.1 Differences in Students' Vocabulary Development Between the Memrise Setting and the Traditional Teaching Method Setting

Table 2 describes the results of the Independent Samples T-test used to check whether there was any significant difference in the posttest results between the two groups of students after being treated by two different settings.

Table 2: Posttest results

GROUP	N	Mean	Max	Min	SD	p
Group 4	23	32.5	46	15	8.8	.02
Group 2	24	25.2	49	9	12.2	

Descriptive results show that the experimental group outperformed the control group in developing their vocabulary (M_{Group4}=32.5, M_{Group2}=25.2, respectively). The results of the Independent Samples T-test indicated a significant difference in vocabulary performance between the two groups ($p<.05$) in favor of Group 4. It is therefore concluded that integrating Memrise with a traditional teaching method was influential in developing students' vocabulary compared to that of the traditional teaching method only.

The current results not only substantiate the existing literature but also shed light on the possible mechanisms that contribute to these improvements. Firstly, the enjoyment factor cannot be underestimated. Fadhilawati (2016) indicated that the engaging nature of digital learning platforms like Memrise can positively affect learner outcomes. Unlike traditional methods, Memrise employs gamified elements that make the learning process

more entertaining and less monotonous resulting in increased engagement and motivation. Secondly, Memrise offers a multifaceted approach to vocabulary learning. It incorporates multiple modes of practice, including but not limited to vocabulary recognition, spelling, and listening exercises, and reviewing mechanisms (Fadhilawati, 2016). This comprehensive feature set might have contributed to the observed difference, as it provides a richer learning experience compared to traditional methods that often focus on one or two aspects of vocabulary learning. Furthermore, Memrise incorporates spaced repetition algorithms that encourage frequent reviewing, enabling better retention. This is consistent with the findings of Zhang (2019), who pointed out that regular review and repetition are crucial for effective vocabulary memorization. The results align well with previous studies by Fathi, Alipour and Saeedian (2018) and Esmaeili and Shahrokhi (2020), thereby adding to a growing body of evidence supporting the efficacy of Memrise in enhancing vocabulary learning. These cumulative findings suggest that Memrise is not just an alternative but could be considered a robust supplement for traditional vocabulary learning methods.

4.2 Students' Perceptions of the Benefits and Challenges Using Memrise in Vocabulary Learning

Regarding the benefits of using Memrise in vocabulary learning, the findings showed that most students (n=7 out of 9) indicated that Memrise was convenient and effective for enhancing their vocabulary range. For instance, one student reported: "I could remember the words because I learned the words many times via Memrise" (Student 1) or "I could remember the words faster and longer because when learning with Memrise, I could listen, write, and see the words many times via Memrise." (Student 2).

Not only did the students find Memrise convenient for learning new vocabulary, but they also highlighted its role in reinforcing memory retention of new words through multiple exposures. The "many times" mentioned by the majority of students could be traced back to the app's accessibility - being available at any time and place, which in turn promotes frequent use and repetition. This is particularly important because vocabulary retention is often linked to frequent and varied exposures to new words (Nation and Webb, 2011). Previous studies, such as those by Affandi and Syafi'i (2018) and Aminatun and Oktaviani (2019), have highlighted the importance of "ample input" in vocabulary learning. Memrise caters to this by providing diverse modes of input, i.e., visual, auditory, and kinesthetic that contribute to a fuller understanding of a word's nuances, including its spelling, pronunciation, and contextual usage. For example, Student 2 specifically pointed out how the multimedia features of Memrise, which allowed him to "listen, write, and see the words many times" led to faster and more enduring memory retention. This mirrors findings by Deris and Shukor (2019) that audio aids are instrumental in helping students recognize and pronounce words correctly. Additionally, the students implicitly acknowledged the app's effectiveness in improving multiple aspects of vocabulary knowledge, not just recall. This encompasses understanding the word meaning, correct spelling, and proper pronunciation, which collectively contribute to a richer vocabulary skill set.

The results additionally showed that most of the students (n=7 out of 9) strongly perceived the positive effect of Memrise in promoting their learning interest. Student 1, for instance, expressed: "Well, honestly, I like learning vocabulary with Memrise" because his/her motivation and interests increased due to "the repetition function", which allows him/her to "practice the words with Memrise until I could remember the words exactly". Sharing the same view, Student 3 reflected: "I like learning vocabulary with the Memrise application because my pronunciation was improved without looking the words up in the dictionary by practicing with the listening part." Moreover, this student found the translation function given by Memrise enjoyable because "I could rewrite the words many times if I gave the wrong answer so that I would remember the words better." In addition, the data indicated the significant impact of the leaderboard on students' motivation to learn vocabulary through Memrise, as one student reported: "I want to climb to the highest position of the leaderboard." (Student 9).

It could be seen that Memrise impacted not just vocabulary retention but also the intrinsic motivation and engagement levels of the students. Starting with the notion of "repetition" as pointed out by Student 1, it is worth noting that the effectiveness of repetition is not merely anecdotal but is grounded in cognitive psychology principles concerning the "spacing effect" which postulates that information is better retained when studied in multiple sessions over time (Rogers, 2017). The repetition function in Memrise is not just a feature but a strategically designed mechanism based on cognitive learning theories, contributing to more effective vocabulary retention. Similarly, the improvement in pronunciation, as mentioned by Student 3, leverages auditory learning strategies, which supplement visual or reading-based methods. This multi-modal approach is supported by Mayer's Cognitive Theory of Multimedia Learning, suggesting that learners can understand and retain material much better when they engage with it through multiple sensory channels. The "leaderboard"

aspect reported by Student 9 echoes findings in gamification literature that competition can serve as a strong extrinsic motivator (Hamari and Koivisto, 2014). The "gamification" of Memrise, which many students found appealing, ties into a broader educational philosophy that learning can - and should - be fun to foster engagement. The game-like features of Memrise go beyond mere entertainment. They tap into pedagogical paradigms that underscore the role of engagement and motivation in effective learning. The gaming elements offer immediate feedback, rewards, and challenges, all of which are proven motivational boosts in educational settings (Kapp, 2012).

Regarding students' challenges when using Memrise to learn vocabulary, the students (n=6 out of 9) reported that they had problems when registering and installing the app because of their lack of knowledge and skills in using applications in language learning. Student 1, for instance, shared that she "had to do many times when I first signed up for the application" mainly due to her poor knowledge of the app. In a similar vein, Student 4 found it difficult to use Memeise since "this was the first time I had downloaded any English learning apps to study".

It is possible to recognize the role that the "digital divide" and pedagogical traditions play in students' ability to navigate educational technologies like Memrise. Student 1's and Student 4's difficulties with registration and initial use can be seen not merely as individual challenges but as manifestations of a broader issue of digital literacy. This links to educational literature suggesting that the effective use of technology in learning is not just about having the necessary hardware but also the skills to use it effectively (van Deursen and van Dijk, 2015). The students' difficulties in the initial setup could potentially act as an obstacle to their long-term engagement with the app, thus impacting their vocabulary acquisition adversely. This highlights the need for scaffolding support during the initial stages of technology adoption in educational settings, something that is often overlooked. It is also important to explore the sociocultural factors affecting technological adoption. The lack of experience with edtech among the student participants is not merely an individual problem but is influenced by the pedagogical culture they come from. The teacher-centered, traditional educational systems prevalent in Vietnam may not prepare students well for the self-directed learning that platforms like Memrise require. This suggests that even if edtech solutions are pedagogically sound, their effectiveness may be limited if students are not prepared to navigate them. Moreover, the students' initial struggles with Memrise highlight a potential barrier to entry that goes beyond simple usability. The students are, essentially, facing a double cognitive load, that is learning how to use the technology and learning English vocabulary simultaneously (Sweller, 2018). Taken together, these observations suggest that while Memrise has potential benefits for vocabulary acquisition, its effectiveness can be impacted by a variety of external factors including digital literacy skills, cultural approaches to pedagogy, and the cognitive demands of using the app. These are crucial aspects to consider for teachers or stakeholders who are planning to integrate technology like Memrise into their curricula. The experiences and challenges faced by the students in this study are not isolated incidents but are reflective of larger trends and challenges in the edtech landscape, particularly in settings that have traditionally been less technologically oriented.

Another difficulty is that the slow Internet connection and students' low configuration devices affected the Memrise learning process. More than half of the students (n=5 out of 9) shared that the Internet speech function in Memrise worked badly due to poor internet connection. As for clarification, Students 1 and 3 admitted that their devices could not function well because of the "low speed of the internet" (Student 3). Regarding the devices for Memrise learning, Student 4 shared: "Sometimes the network was too bad, but my phone configuration also needed to be stronger I guess […] so that the download could have been faster".

Based on the outcomes of the above interviews, it is vital to acknowledge the intricate interplay between socio-economic status, access to technology, and effective e-learning. The issue goes beyond mere technical difficulties; it is a matter of educational equity. The challenges posed by slow internet connections and low-configuration devices can act as significant barriers to effective e-learning. This aligns with the research on the digital divide which suggests that a lack of access to high-quality digital technology can exacerbate educational inequalities (Chen, Wei and Liu, 2011). For the students in this study, the technical issues they faced could be a manifestation of broader social inequalities, limiting their ability to fully benefit from educational technologies like Memrise. Moreover, the students' challenges highlight the idea of technological efficacy which refers not just to the availability of technology but its effectiveness in aiding educational outcomes. If students are to get the most out of applications like Memrise, it is not enough to have a device and an internet connection; these need to be robust enough to support the application's multimedia elements, such as Internet speech functions. As for the poor internet connectivity, attributing it merely to poor technical services oversimplifies the issue.

Infrastructure challenges, especially in rural areas, often reflect wider systemic issues, from government policy to local funding constraints (Bélanger and Carter, 2009).

5. Conclusions

This study aimed to investigate the efficacy of the Memrise app in a unique educational setting, a college in Southwest Vietnam. Additionally, the students' perceptions of the benefits and challenges when using Memrise to learn vocabulary were addressed. Based on the results from the posttest, using Memrise helped students in the experimental group outperform those in the control group. Additionally, interview data revealed that Memrise could significantly assist students with vocabulary acquisition. The application, according to the students, was an effective and enjoyable tool for learning vocabulary. However, the learning conditions in the current study were not in favor for using technology, which could significantly affect the learners' experience when learning vocabulary with Memrise. Specifically, participants experienced initial challenges in familiarizing themselves with the Memrise platform and faced technological hindrances such as unstable internet connections and suboptimal mobile devices.

Based on the results, it is implied that language learners are encouraged to learn more about the features given by the Memrise to ensure that they can use this app successfully. Due to the significant development in the learners' vocabulary range and their positive perceptions in this current study, it is implicated that teachers should use Memrise as a supplementary practice for their students. Dealing with difficult issues found, it is suggested that necessary supports given by educational leaders in terms of learning conditions such as wireless connections are essential for students in rural areas to experience and learn most effectively by applying technology, typically using Memrise for vocabulary learning. These supports address some of the unique challenges, such as limited educational resources and access to quality instruction, that students in rural Vietnam face.

Despite rigorous methodology and effort invested in the study, it is important to acknowledge that certain limitations remain such as limited time for the treatment, small sample size of participants and incapability of measuring the potential of this app in students' vocabulary learning. In addition, the study investigated the students' vocabulary performance shortly afterward the treatment. Therefore, the study only evaluated the students' memory in constant time, not for vocabulary retention.

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