

NGHIÊN CỨU ỨNG DỤNG ANKI NHẪM GIA TĂNG VỐN TỪ VỰNG CHO SINH VIÊN NĂM THỨ NHẤT TẠI MỘT TRƯỜNG ĐẠI HỌC Ở VIỆT NAM

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Nghiên cứu này khảo sát tính hiệu quả của ứng dụng Anki trong việc học từ vựng tiếng Anh và quan điểm của người học về ứng dụng này dựa trên 3 tiêu chí: sự hữu ích, sự tiện lợi và sự hài lòng. Đối tượng tham gia vào quá trình nghiên cứu là 2 nhóm sinh viên đến từ 2 lớp, có trình độ tiếng Anh được đánh giá là sơ cấp. Cả 2 nhóm đều trải qua bài pre-test, sau đó được tham gia vào 3 tuần học từ vựng trong chương trình KET Vocabulary List của Cambridge TESOL (tương đương khung năng lực bậc A2). Trong đó, nhóm đối chứng (tổng số=18) học phương pháp truyền thống với flashcards; nhóm thực nghiệm (tổng số=18) học từ vựng thông qua ứng dụng Anki. Cả 2 nhóm sau đó được làm bài kiểm tra nhằm so sánh kết quả của 2 phương pháp nêu trên. Kết quả chỉ ra rằng, cả 2 phương pháp đều giúp người học đạt kết quả tốt trong việc học từ vựng; tuy nhiên, nhóm thực nghiệm có kết quả tốt hơn nhóm đối chứng. Như vậy, có thể kết luận rằng, Anki là ứng dụng hiệu quả trong việc nâng cao vốn từ vựng cho người học.

Từ khóa: Anki, flashcard, công cụ học từ vựng.

This study investigates the impacts of Anki, a web-based flashcard program, on learners' vocabulary learning and their perceptions towards the program based on three criteria: usefulness, convenience and satisfaction. Participants from two intact classes at elementary level were included in the study. Both groups underwent a pre-test and then participated in a 3-week course to learn the KET Vocabulary List developed by Cambridge TESOL (CEFR level A2). The control group (n = 18) utilized traditional paper flashcards while the experimental group (n = 18) used Anki flashcards. They then took a post-test so that comparisons between these two methods could be drawn. The results showed that both methods would facilitate learners' vocabulary learning; however, the experimental group had better performance than the control one. Therefore, it can be concluded that Anki is an effective tool for language learners to improve their vocabulary.

Keywords: Anki, flashcard, vocabulary learning tool.

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AN INVESTIGATION INTO WEB-BASED ANKI APPLICATION TO ENHANCE VOCABULARY ACQUISITION OF FIRST YEAR STUDENTS AT A UNIVERSITY IN VIETNAM

1. Introduction

There is plenty of learning software that has received a great deal of attention in L2 research such as Quizlet or Memorise. Among those programs, Anki is a flashcards-creating-and-learning software whose popularity has recently been on the rise because of its great potential. It allows users to study flashcards using spaced repetition. Anki was stated to help learners foster their vocabulary growth and successfully recall the learned information (Altiner, 2011; Zare & Barjasteh, 2017; Hanson and Brown, 2019). Nevertheless, Bower and Rutson-Griffiths (2014) found that there was no significant improvement when L2 learners used Anki. Due to this contradictory discoveries, the researchers noticed the worthiness of studying about Anki with the aim of making a contribution to the body of already existing research. For this reason, the topic of this thesis is to investigate how Vietnamese students' vocabulary learning is affected when they use Anki.

The study targets at addressing the following issues:

- Investigate the impact of Anki on non-English major first-year students at a university in Vietnam.
- Study students' perception on Anki based on the three following categories: usefulness, usability and enjoyment.

In order to achieve the purposes stated above, the study revolves around these two research questions:

1. How does the use of Anki impact the vocabulary learning of first-year students at a university in Vietnam?
2. What are the first-year students' perceptions about learning vocabulary with Anki?

2. Literature review

Previous research examined whether Anki could bring benefits on learners' vocabulary learning together with their perceptions and attitudes towards it. Godwin-Jones (2010) saw the great potential of this program when it comes to helping learners achieve their goal of mastering L2 vocabulary. Bailey and Davey (2011) investigated how students felt about using Anki inside and outside of the classroom. The participants included two groups. Group 1 had 21 students who majored in Economics, while group 2 had 25 students whose major was International Relations. One different trait between these two groups was the latter would be studying abroad next semester. They had to study on decks made by the teacher in class and encouraged to study at home throughout the semester with their progress regularly recorded on the following lesson. At the end of the semester, they completed a questionnaire for the perception assessment purpose.

The researchers obtained the findings indicating the frequency of Anki usage of International Relations group was higher than the Economics group. There were even several students who did not use it at home. Regarding questionnaire results, both groups show a preference for Anki and desire to keep continuing it in the future, although the Economics group was not in favor of Anki as much as the other group. The researchers explained this was the imminent study abroad experience that affects this group's motivation while using Anki.

Additionally, findings of the study carried out by Altiner (2011) showed that Anki helped learners become proficient in at least 50% in Academic Word List. 13 intermediate-level students from an intact group were required to use Anki for three weeks. All learners increased their scores compared with the pre-test scores, in particular, the result showed that two learners had a far greater improvement in vocabulary acquisition. Furthermore, the researchers dug deeper into the students' perceptions towards Anki based on three categories: usefulness, usability, and enjoyment. Following the post-test, learners were required to fill out a survey form, some of whom took part in the interview afterwards. To begin with, they agreed on its usefulness, particularly the inclusion of example sentences. Moreover, the fact that they had chance to encounter the vocabulary items many times helped to remember them better. Regarding the usability, they indicated that it was easy to use Anki in general. No serious technical

problems were recorded during the treatment. However, some definitions and example sentences in the deck were rather ambiguous and confusing to recall the target words. Lastly, much as the students enjoyed learning with Anki, they suggested that the deck should have employed more multimedia components such as visuals and pronunciation.

Zare and Barjasteh (2017) conducted a study to explore the possible effect of using flashcards on Anki on learners' vocabulary development through the analysis of pre-test and post-test scores. Forty-one students who were at advance level were assigned to study 446 TOEFL words in total on Anki. The treatment lasted for three weeks during which the students learned 20 words on a daily basis. The result from the pre-test and post-test proved students outperformed in the latter one. Despite the positive results of the study, one limitation is the lack of comparison, more specifically, control group. It is impossible to say with absolute certainty that their vocabulary range improved because of the program when they had nothing to compare this outcome to.

The study of Hanson & Brown (2019) investigated the effectiveness of Anki on 62 students at a university in the northeastern United States who enrolled in a beginning Spanish course. During the third week of the semester, the students completed a survey concerning the quick learning beliefs, their Spanish self-efficacy, Spanish learning motivation, and

study strategies, followed by a Spanish proficiency test. After that, they were introduced to Anki and were told to use it as a class requirement. The premade deck they used contained all the vocabulary, expressions and verb conjugations that were taught in that course. The minimum timescale of learning was 5 minutes a day for at least 5 days a week. The post-test and post-experiment survey took place in the last week of the semester (week 15). The results showed that with the regular Anki usage, the students acquired greater Spanish proficiency. According to the students' responses in the surveys, low enjoyment was reported; however, the students' motivation and studying effort at the end of the semester was higher than those at the beginning of the semester.

To sum up, Anki has been considered an effective L2 learning tool for language learners (Altiner, 2011; Zare & Barjasteh, 2017; Hanson & Brown, 2019). Nevertheless, a methodological weakness of these studies was the lack of a control group. Moreover, given the research done by Bower and Rutson-Griffiths (2014) which showed no enormous improvement in learners' vocabulary base after using Anki, it can be concluded that the effectiveness of Anki should not be stated with absolute certainty. Thus, it seems worthwhile to investigate whether Anki leaves major benefits for L2 learners who are struggling to memorize vocabulary. Additionally, according to Sahin and Shelley (2008), because learners make a tremendous contribution to the development of the language learning tool,

having a thorough understanding of how learners perceive a tool is an important factor in evaluating its effectiveness. Hence, the question regarding learners' perceptions about Anki was also addressed in this study.

3. The present study

3.1. Participants

Participants in this study included 36 students non-English major students at a university in Vietnam. They were drawn from two intact classes taught by the researchers which met two hours and thirty minutes per week during a 15-week course of 2019. Both classes had eighteen students. The first class (group 1) were selected as the experimental group that would use Anki for their vocabulary learning, while the second class (group 2) were selected as the control group using the traditional paper-and-pen vocabulary acquisition technique. With regard to vocabulary learning strategies of group 1, they normally used the traditional method, which is writing down new words into a notebook and then learning them by heart. They have never used Anki or any other vocabulary learning applications before.

3.2. Data collection instruments

Both quantitative and qualitative instruments were used to collect data to address the research questions. To deal with the first question regarding the impact of Anki on the vocabulary learning of students, a pre- and post- test were used as the instruments in this study. Between the two tests was the Anki treatment

intended for the experimental group. Anki flashcards consist of two learning types (recognition cards and recalling cards), and the deck used for this study adopts the latter one so that the target vocabulary can be memorized more effectively and instead of just recognizing words, the learners can use them more actively. Regarding the interface, the front side of the flashcard includes the Vietnamese definition of the word and the image. After students look at the definition of a new word with the image attached, students have to type the word in the answer box and then click on “Show Answer” button to check whether their answer is correct or not.

Vocabulary items in the pre-test were chosen randomly from the material and taught in the first semester, but at the same time, were the words introduced in KET Vocabulary List. The pre-test was a 25-item vocabulary test with two tasks. The first exercise asked students to match the word with the corresponding picture. The second exercise is about writing the meaning of the given words. After both groups took a pre-test, there was an intervention. Group 1 were introduced to Anki and requested to download Anki and a ready-made deck on their digital devices to learn the vocabulary from the KET Vocabulary List, whereas group 2 continued to learn new words on paper. They did not know about Anki nor interacted with any digital vocabulary learning programs. After the completion of the learning, a post-test with the same format as the pre-test for checking their

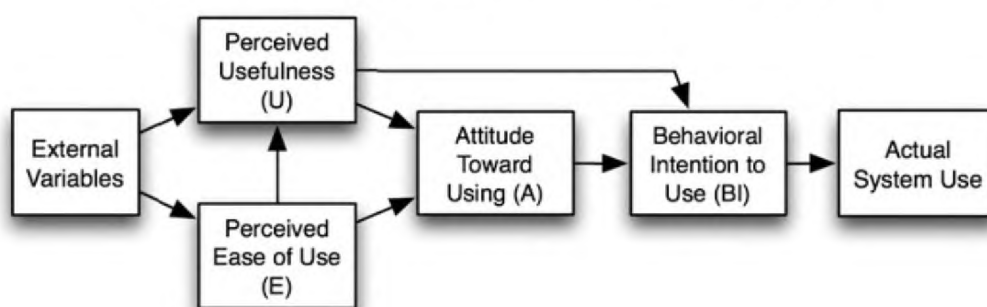
vocabulary knowledge was done by two groups. Because all the test items belong to A2 level, the difficulty level between the two tests is equal. As stated earlier, the study only focuses on investigating the learners’ ability to remember the meaning of the vocabulary, the tasks in the tests aim to check students’ acquisition of the meaning of the target words. One of the factors to evaluate the effects of Anki is the use of visual aids in learning. On that account, the first task asked learners to identify the word based on the illustration, which were the same images used in the learned deck. In addition, although the tests were taken in class, there was not a scheduled timetable for this activity; as a result, the researchers had to design the tests with 25 items that were done in ten minutes at the beginning of the lesson for the tests in order not to influence the lessons in the curriculum.

As regards the second question related to their perceptions about this program, a Likert-scale survey and interview after the intervention were used for the study. The survey includes 12 items based on three criteria namely usefulness, usability and enjoyment. The items regarding usefulness and usability were adapted from the technology acceptance model (TAM), a research framework developed by Davis et al (1989). According to Davis et al (1989), when users are presented with a new technology, two key factors influence their decision about how and when they will use it. The first one, perceived usefulness (PU), explains the degree to which an individual believes

that a particular system is useful and meets their certain needs. Perceived ease-of-use (PEOU) is defined as the degree to which a person finds that system easy to use and feel confident using it. Both factors, together with other external variables sometimes also considered, exert

an influence on users' attitude towards the use of the technology in their daily life such as what they think and to what extent they like it. Those general impression forms behavioral intention (BI), which eventually lead them to actually use it.

Figure 1 *Technology acceptance model (Davis et al., 1989)*



In addition to TAM, the researchers also adopted questions from a survey in Ranalli's work (2009) and then make adaptations to design her own questionnaire that is appropriate for the topic of this thesis. The original survey

was designed to evaluate how effective a web-based vocabulary training is under three subcategories namely usefulness, usability and enjoyment. It can be seen that this survey is also based strictly on Davis' model.

Table 1 *Students' perceptions Model (Davis et al., 1989)*

Usefulness	<ul style="list-style-type: none"> - Images were useful for me to remember new words. - I learned many new words by looking at the definitions of words. - My vocabulary has improved since I started using Anki. - I think Anki can help me improve my vocabulary in the future.
Usability	<ul style="list-style-type: none"> - It was easy to use Anki. - I used "again", "hard", "good", and "easy" options of Anki to arrange my vocabulary study. - I have not experienced any technical difficulty with Anki.
Enjoyment	<ul style="list-style-type: none"> - Using Anki for vocabulary learning is enjoyable. - It is motivating to use Anki to learn new words. - I liked the fill-in-the-blanks exercise for vocabulary learning. - I would use Anki again in the future. - This kind of tools should be included in language courses.

After filling out their personal information, students were asked to read the statements and rate how closely their responses match to the statements. The five options range from strongly disagree to strongly agree.

Afterwards, six students from the experimental group were chosen randomly to take part in a one-on-one interview where they elaborated on their answers in the survey so that an in-depth understanding about how they thought of Anki could be acquired.

3.3. Analysis of the data

There are two research questions that need addressing in this study. To answer the first question regarding the impact of Anki on students' vocabulary learning, quantitative data was first collected from the pre-test and post-test taken by two groups. The result of both tests were then entered into SPSS program and the researchers conducted a paired samples t-test and independent samples t-test to analyze the differences in means that may be present between both test results of experimental group and control group.

The researchers answered the second question regarding their perceptions about Anki based on the responses from the

survey and interview. Their answers in the questionnaire was analyzed using mean scores and standard deviation of each survey item descriptive statistics in SPSS program.

The data from the interview were analyzed by means of a coding scheme. As the second question deals with students' perception towards Anki based on usefulness, availability and enjoyment, three equivalent coding categories were formed. While the researcher read through the transcript and notes, important words and phrases related to these three categories were highlighted with different colors. Afterwards, all the data with the same color were put into the same group under the subheadings of usefulness, availability and enjoyment. The researcher used them as support for survey results.

4. Findings

4.1. Research question 1

In this research, the researchers raised the first question "*How does the use of Anki impact the vocabulary learning of first-year students at a university in Vietnam?*" with the aim of examining if an improvement in acquiring vocabulary was yielded after the intervention process.

Table 2 Paired samples statistics of pre- and post-test of participants

		Mean	N	Std. Deviation	Std. Error Mean
Experimental group	Pretest	18.111	18	2.0832	.4910
	Posttest	21.556	18	2.0926	.4932

Control group	Pretest	17.944	18	1.3921	.4381
	Posttest	19.278	18	1.4874	.3506

First, as can be seen from the table 1, the result of the paired-samples t-test has shown that there is a statistical difference between the means in the pre-test and post-test score of the experimental group, which are 18.11 and 21.55 respectively. The average score of the experimental

group increased by approximately three points between the pre-test and the post-test, proving a rise. In order to see whether the differences are significant, the paired samples t-test was performed and the results are presented in table 2 below.

Table 3 Pre- and post-test comparison of the experimental group

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest - Posttest	-3.444	1.653	.390	-4.266	-2.622	-8.841	17	.000

The significance of the differences is noticeable with the value of $p < 0.001$. To conclude, it can be implied that learners

gained greater amount of vocabulary by virtue of the use of Anki during their learning process.

Table 4 Pre- and post-test comparison of the control group

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pretest - Posttest	-1.3333	.9075	.2139	-1.7846	-.8821	-6.234	17	.000

As regards the control group, it is noteworthy that there is also a difference in the post-test performance compared to the pre-test. To be more specific, the post-test score (M= 17.944) is statistically

higher than that of the pre-test (M= 19.278). Students in the control group achieved better scores on the vocabulary acquisition post-test.

Table 5 Independent sample tests

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Posttest	Equal variances assumed	2.794	.104	3.764	34	.001	2.278	.605	1.048	3.508
	Equal variances not assumed			3.764	30.685	.001	2.278	.605	1.043	3.512

In addition, an independent samples t-test was conducted to compare the post-test score of the group who used Anki and the group who did not receive the

treatment. There was a significant difference in the scores of the experimental group (M= 21.556, SD= 2.0926) and those of the control group

($M = 19.278$, $SD = 1.4874$); $t_{(34)} = 3.3764$, $p = 0.001$. This finding suggests that using Anki does have a positive effect on learners' vocabulary learning.

4.2. Research question 2

The second question raised in this research is "What are the first-year students' perceptions about learning vocabulary with Anki?". Their

perceptions are revealed based on three categories, which are usefulness, usability and enjoyment.

4.2.1. Usefulness

When giving thoughts about the usefulness of Anki, students rated how helpful the images and definitions of target words were, and then rated its usefulness in general.

Figure 2 Perceptions about usefulness

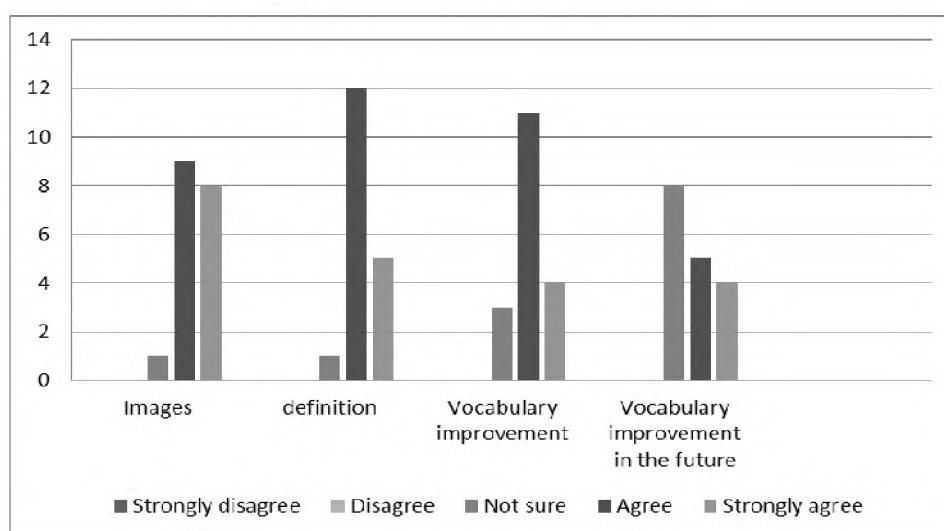


Figure 2 illustrates their perceptions about this category. The students found both images and definitions effective; however, eight students showed their marked preference towards the visual aid attached to the words, which was slightly more than theirs towards the definition with five students.

I like the use of images. They were remarkable size wise and eye-catching. I think they made me remember the words faster. Sometimes I just guessed the words by looking at the image rather than the definition. (P1)

Although both tests used in the research did not require listening skills, and the audio pronunciation files serve as an additional feature, the students who took part in the interview expressed their preference for it.

Compared to the paper-and-pen vocabulary learning technique, Anki provided the audio pronunciation files, which I enjoy the most during the learning process. I always listened carefully and tried to imitate it. (P6)

Furthermore, there is a strong agreement on the notion that their A2

level vocabulary was expanded thanks to Anki as eleven students ticked on the “agree” column and four students on the “strongly agree” column. In the interview, the researchers saw the students’ positive attitudes reflected through the comments.

This Anki deck helped me to boost my A2 level vocabulary. If I struggled to recall a word, I chose the option “Again” to have a chance to encounter it many more times. As a result, I now remember the meaning of almost all the words in the deck and how they are pronounced. (P10)

Nevertheless, there was a modest reduction in the number of students who agreed with the statement about Anki that can help students to improve their

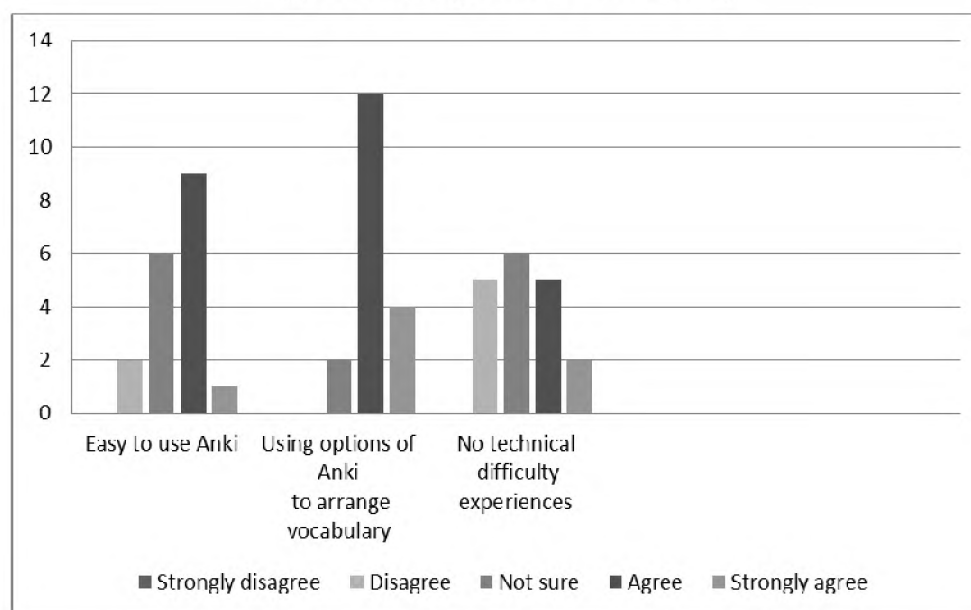
vocabulary. The below comment sheds light on their choices.

Anki is useful in my opinion. However, the words in this deck are objects or action verbs commonly used in our daily life, so I assume they do not take much time to remember the words and their spelling. Assuming I use it for higher level vocabulary such as abstract words or ones with difficult spelling, I wonder if Anki can be this effective. (P1)

To sum up, Anki is proved to be useful in learning vocabulary. Their vocabulary range at A2 level improved after using Anki and illustrations made a marked contribution to that achievement.

4.2.2. Usability

Figure 3 *Perceptions about usability*



According to Figure 3 above, there are various ideas about Anki being easy to use. To begin with, the majority of students did

not have difficulty using the four options in Anki to arrange their vocabulary study. This may result from the fact that they had

been told about the function of each option and how to use them to optimize the learning before starting using Anki at home. Moreover, above each option is the interval for the target word would re-appear in the future, so the students were likely not to face any difficulties in using the options properly to set the time they need to review the words. Similar responses from the students were collected in the interview.

One notable thing in this section is a weak agreement among the notions that it was easy to use Anki, and they had not had technical difficulty with Anki. Some students followed what they had been taught in the introductory lesson about Anki and therefore, the studying went smoothly. On the contrary, there was a student who encountered an unexpected problem and was not able to solve it on their own. The interview offered a clearer view on this issue.

Luckily, I did not face any troubles while using Anki. I thought it would be difficult due to the English instruction but it was not. After the first day with the teacher's demonstration, I used it confidently. (P10)

I had a bad experience while using it. It was fine on the first day; however, my computer suddenly displayed the wrong time on the following day. As a consequence, I could not run Anki as it kept showing the error message, but I did not know the cause at that time. Besides, because it is in English, I had

no idea how to fix it and got even more worried. I had to send an e-mail to the teacher and asked for her help. (P12)

To sum up, almost all students had no problems in using the four options of Anki to arrange their vocabulary study. However, there is less agreement on the usability of Anki compared to its usefulness because of various reasons. The students used an electronic flashcard program for the first time, as a result, they were unacquainted with the set-up procedure as well as experienced unexpected technical problems without knowing the solution.

4.2.3. *Enjoyment*

The last factor that the researchers inquired into students' opinions and experiences is to what extent students enjoy using Anki. More than half of the students expressed an interest in this program and the fill-in-the-blanks exercise. The interviewees explained that they liked that type of exercise because it was helpful as regards remembering the spelling.

For me, when I use Anki, it is not only learning with an Anki deck but also a quiz when I check my memory of the word spelling. I think it is fun. (P13)

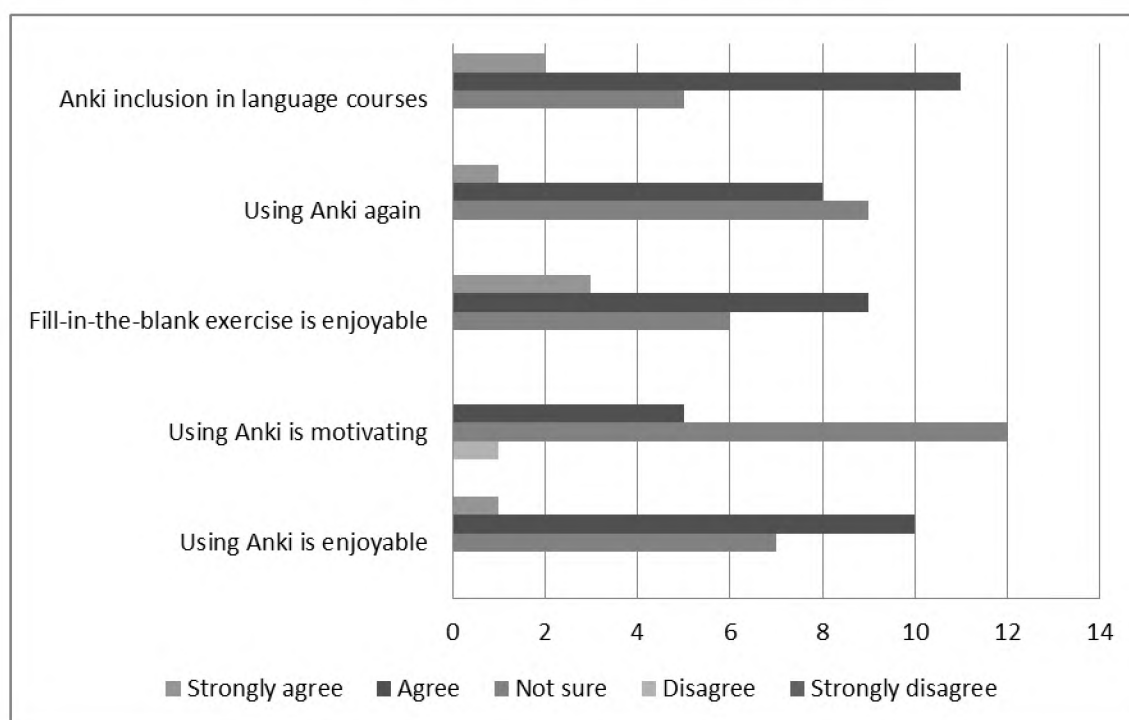
Meanwhile, it is noteworthy that not many students gained motivation while using Anki, which is clearly shown with only five out of eighteen agreeing upon the motivation generation. During the interview, the students clarified their different choices.

When I used it at first, I felt excited and motivated. However, learning every day reduced the level of excitement. (P10)

Although Anki did drive my determination in the first few days, the more I interacted with it, the less motivated I had. I guess it was due to

the same learning process, which is seeing the meaning and the picture, typing the word and check whether your answer is correct. To be honest, I had expected more such as diverse exercises to assist learners to learn and review the target words. (P13)

Figure 4 *Perceptions about enjoyment*



There is also a slightly strong agreement that Anki should be integrated into language courses. When asked the reason why, the students gave an explanation that everyone has their own preferred learning techniques; therefore, the fact that they do not love the program does not mean others would not enjoy and be able to benefit from it. Furthermore, the students should regard it as an additional opportunity for practice instead of the only dominant tool to absorb vocabulary. They may write words down

into their notebook, and review them on digital devices afterwards. Meanwhile, students in the interview also explained about their uncertainty regarding integrating Anki in language courses. They indicated that notwithstanding the compatibility of smartphones and Anki, they had access to Anki on the desktop computer instead of the mobile version because it charges IOS users a considerable amount of money. This leads to their assumption that those who do not own a laptop or computer and have only

IOS mobile devices might feel reluctant to use Anki. Lastly, they stated that the probability of students enjoying Anki may increase provided that they are given a ready-made deck.

I think it is great to have this program as part of our daily learning. Besides, when friends around me use Anki, I would probably feel more delighted to use it. (P6)

At first, I really wanted to learn on the smartphone as I invest more time using it than using my laptop; However, Anki is not free on iPhone, so I must resort to the other alternative. Because I do not usually carry the laptop with me, it made learning less convenient and enjoyable. I think other students who are in my case will probably feel the same. (P12)

In the future, when integrating Anki in language courses is allowed, I think it would be best if students can use the deck made by teachers. I believe most students have never used a program like this; therefore, supposed they had to make their own deck, the deck might not have high quality and well-prepared. Besides, a number of problems might occur, which would deter their learning process as well as their motivation. (P10)

The students indicated that learners could have optimized their learning with Anki if examples had been added. One mentioned,

I'm satisfied with all the features included in this program, but it would

be better if there were examples on the back side so that we could see how the words, especially the verbs are used in context. (P1)

From the qualitative data, it is noticeable that students found learning with Anki enjoyable and interesting. They expressed their desire to keep using it in the future and they are of the opinion that other students will probably also enjoy and benefit from it provided that the decks are prepared by others. However, much as they enjoyed this tool, one student disagreed and twelve had doubts that Anki did not generate enough motivation for them to be excited to learn new words due to the lack of various tasks to practice vocabulary. Additionally, they made a suggestion that adding examples is likely to improve their vocabulary knowledge since that helps them to know in which context those words should be put.

4.3. Discussions

There are two research questions in the study. The first one is "How does the use of Anki impact the vocabulary learning of first-year students at a university in Vietnam?". The results of the post-tests show that almost all of the students who used Anki gained higher scores and therefore, Anki is proved to be an effective learning tool. This is in accordance with the previous research conducted by Altiner (2011) and Zare and Barjasteh (2017), which show similar positive results. Broadly, Anki does assist learners in learning vocabulary a great deal like other web-based flashcard

programs (Başoğlu and Akdemir, 2012; Dodigovic, 2013; Alzeer, 2015).

The second question addressed in the study is “What are the first-year students’ perceptions about learning vocabulary with Anki?”. Their perceptions were divided into three subheadings: usefulness, usability, and enjoyment. First of all, regarding the usefulness of Anki, students came to mutual agreement that they benefited from learning on this spaced repetition program. The progress they made after using Anki may not be the same, but almost all the students’ range of A2 level vocabulary expanded. The findings support the claim about the improvement of learners is attributable to the algorithm Anki uses that enable users to learn difficult words more often (Pyc & Rawson, 2007). This spaced repetition algorithm leads to efficient memorization and students’ performance on the tests (Baddeley, 1990; Dempster, 1987). Visual aids were particularly recognized when it comes to assisting learners to memorize the meaning of the words. They also enjoyed learning vocabulary by using digital flashcards as audio pronunciation is associated. Moreover, students in the interview expressed their thoughts about examples that might lead to increasing usefulness for this program.

The next subheading that the researchers investigated is usability. While Ali et al (2012) indicated the comfort while using computers as they have become an indispensable tool in their life, Anki is quite difficult to use for some

learners in this research. It was the first time they tried a digital flashcards program that does not even support their native language, and they suffered from their shortage of vocabulary and grammar, it consequently took them quite a long time to get used to the program. One even reported that they experienced an unexpected technical problem and did not know how to tackle it.

Additionally, learning with Anki was enjoyable for students in general, which is consistent with previous findings by Altiner (2011). It should be noted that their motivation was not high during the time they learned with Anki. Allum (2004) stated that the addition of audio and visual aids might affect the learners’ motivation, and Hanson & Brown (2019) noted the same result with the usage of Anki. However, in this study, Anki, albeit enjoyable, did not help to increase their motivation to a great extent. They studied the deck as one of their responsibilities. According to the students participating in the interview, part of the reason may lie in the lack of various tasks that reinforce the target vocabulary and their unfamiliarity with the program. Besides, the fact that they found Anki difficult to use and experienced a technical problem hindered the joy of using Anki as well as lessened their motivation. For these above reasons, it can be seen why there is hesitation about the continuation of using Anki in the future. If Anki is incorporated in language courses in the institution, they expressed a preference for ready-made decks made by teachers.

They also stated that on the back of the flashcard should be provided with an example, so that they can learn in what situations that word is used.

5. Conclusion

5.1. Summary of the study

This research aimed to identify the effects of Anki on learners' vocabulary learning and their perceptions about this program. It was conducted in the light of both qualitative and quantitative methods, using a variety of research instruments, which were two group pre and-post-tests, a questionnaire and an interview. Subjects of the study were from two intact groups of first-year students at a university in Hanoi, Vietnam. Several following conclusions can be drawn based on the research results. First, concerning the effect of Anki on vocabulary learning, it can assist language learners to foster their vocabulary range. Additionally, in general, positive perceptions about this flashcard program were gauged in terms of its usefulness and enjoyment; however, some learners are of the opinion that using it is neither easy for beginners nor highly motivational. There is a likelihood that they will continue learning with Anki in the future provided that they are given ready-made decks instead of creating ones by themselves.

5.2. Limitations of the study

There are a few limitations to this study that should be considered. First, the study focused on a small sample size that was the researchers' own students from one

class, which results in the employment of descriptive statistics instead of inferential statistics. As a consequence, it is hard to make a generalization about the efficacy and perceptions of Anki to a larger population. Secondly, the students in this research learned Anki at home and the class met once a week. This led to the difficulty in closely monitoring their daily learning despite the history learning chart checking. Thirdly, the duration of the intervention (three weeks) in this research was rather short. Although the learners finished studying the deck in the given time, the time for reviewing the vocabulary should have been increased so that they could retain what they had learned better. Lastly, the study was limited in regards to measuring receptive knowledge of vocabulary. To be more specific, it primarily investigated the students' ability to retain the meaning and spelling of the vocabulary. Schmitt (2010) indicated that the vocabulary mastery of language learners would be measured more accurately if the knowledge covered many other aspects of word knowledge, such as word structure, lexical relations of the word with others, or correct usage in appropriate contexts.

5.3. Pedagogical implications

The researchers want to list out some pedagogical implications that may make great contributions to teaching and learning languages. To begin with, because there was a difference between learning with traditional flashcards and Anki, and it is reported to be useful and

enjoyable, the usage of this web-based flashcards program is recommended as it is likely to enhance learners' vocabulary learning. It is advisable to utilize it as either a mandatory practice source in the class or an optional source out of the classroom beside other learning methods. However, it should be noted that features of the program such as the audio and visuals need to be fully added so that successful learning could be feasible.

5.4. Recommendations for further study

In relevance to the results and the limitations of the study which were presented above, suggestions for further research include the following points. First of all, future researchers would be highly recommended using a bigger sample size. Because the sample size in this study is small, it is nearly impossible to conclude that all learners can benefit from learning with Anki.

Second, students shared in the interview that examples on the back of the card, in their opinion, would facilitate the learning. For that reason, any future researchers who wish to explore the potential of Anki should consider adding examples in the deck and test their ability to use target words correctly. Accordingly, learners' performance would be assessed in a broadened categories.

Future researchers interested in this topic are advised to add the delayed post-test. After learners take the post-test, there should be an interval and then the learners

are asked to do the delayed post-test. The use of this test can determine whether Anki does have a positive impact on learners' vocabulary learning in the long run or the learners struggle with the retention of information after a long period of time.

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