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The Effect of Digital Apps on Vietnamese EFL Learners' Receptive Vocabulary Acquisition: A Case Study of Quizlet and Paper Flashcards

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STATEMENT OF AUTHENTICATION

The work presented in this thesis is, to the best of my knowledge and belief, original except as acknowledged in the text. I hereby declare that I have not submitted this material, either in full or in part, for a degree at this or any other institution.

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ABSTRACT

The thesis aims to investigate the efficacy of a digital vocabulary learning application called Quizlet compared with that of a more traditional method, such as paper flashcards, among English as a Foreign Language (EFL) learners in Vietnam where the teaching and learning of English has been an object of concern for the government. Reports so far have recorded slow progress and official policies attempt to encourage improvement in the area including the use of digital media in teaching and learning. So it is legitimate to ask whether reliance on digital media in EFL education may be justified. This is the practical motivation of this project, which compares a digital tool and a more traditional tool used for the same purpose: the learning of the L2 lexicon.

The theoretical framework of the study is the Cognitive-Affective Theory of Learning with Media (CATLM) (Moreno & Mayer, 2007), and the evaluation framework used follows Miyamoto (2001) according to whom multimodal second language learning activities should be evaluated from three different perspectives:

the linguistic development in the learner, (2) the linguistic environment provided by the learning tool and (3) the learner's perception on the learning tool. Consequently, this study examines two vocabulary learning tools, Quizlet and paper flashcards in terms of (a) actual learning outcomes; (b) input, output, interaction and feedback and (c) learners' attitude.

This study follows a design including pre-test, training (two one-hour reading and vocabulary learning sessions per week for four weeks) and immediate post-test as well as delayed post-test. Participants in the study were an intact class of 39 high school students in Vietnam. They were divided into two groups. Approximately twenty new words selected from a reading passage were introduced to the students each week. As for the vocabulary learning tools, group A used Quizlet while group B paper flashcards for the first two weeks. Then, group A switched to paper flashcards, and group B Quizlet in the following two weeks. This method was used to counterbalance the order effect of using two different tools.

Data analysis included screen captures (Quizlet) and video recordings (paper flashcards) of six randomly selected participants' learning activities during training

sessions; improvements from vocabulary pre-tests to post-tests and; participants' responses to a questionnaire. Results suggest that both of the tools have a positive influence on vocabulary learning. However, Quizlet appears to be more effective than paper flashcards in fostering vocabulary development. Additionally, Quizlet has various advantages over paper flashcards in terms of the linguistic environment provided for learning and meets students' preference. However, paper flashcards do have some specific merits such as encouraging students to practise pronouncing words, which was not observed on Quizlet.

The research proposes that there is some justification to the belief that digital apps may elicit better results overall than some of the more traditional method for L2 vocabulary learning in English as a second language because they provide a greater variety of linguistic environments and because they can help meet the need for exposure to native English in the Vietnamese school system.

CHAPTER 1: INTRODUCTION

The aim of the current research is to investigate the efficacy of an information communication technology (ICT) tool for learning English vocabulary such as Quizlet as against a traditional vocabulary-teaching tool such as paper flashcards. For the government of Vietnam, English language teaching and learning has been of great concern since, according to studies such as Nhan (2013), 98% high school students in Vietnam cannot carry on basic English conversation. Additionally, the shortage of competent English language teachers in Vietnam affects English learning by Vietnamese students. Supporting Nhan's (2013) survey, Nguyen (2015) discovered that just 0.1% of high school teachers of English in Vietnam have advanced English levels. In order to solve the lack of appropriate English input and to complement English language teaching, technological tools could be used to enhance English teaching and learning (Pop, 2010; Dang, 2011).

Undoubtedly, English language learners need to develop a rich vocabulary in the language in order to attain high proficiency (Schmitt, 2000). Vocabulary knowledge, which includes the knowledge of receptive vocabulary and productive vocabulary, is often used as an indicator of general knowledge of a language. For instance, according to Nation (2006) a person can understand 90% of the words in spoken texts if they have a receptive vocabulary size of the 2000 most frequent word families. An earlier study by Laufer (1992) also suggests that receptive knowledge of the most frequent 3000 word families enables people to comprehend authentic reading texts in the language they are learning. Now, receptive vocabulary refers to the words that language learners can understand when they listen to, or read, them (Webb, 2008), so, given the importance of receptive vocabulary as a means to ensure comprehension of natural texts in the second language, it would seem reasonable that methods for improving receptive vocabulary should be closely studied.

Traditionally, paper flashcards have been widely used as vocabulary learning tools in language classrooms. These are considered as one of the most effective vocabulary learning tools (Elgort, 2010). This is because the tool allows retrieval and spaced repetition, both of which have positive effects on vocabulary retention (Nation, 2013, pp. 450-457).

On the other hand, rapid advances in ICT, i.e., "digital applications, [and] all electronic devices and network in all of their forms" (Healey et al., 2009, p.3), have been producing over the past decade or so, more sophisticated tools for language learning, which facilitates self-directed learning. Thus, according to Godwin-Jones (2011), ICT can increase learner autonomy. Furthermore, ICT enhances learner motivation, as multimedia technology with video clips and

animations "attracts their [i.e., the students'] attention and elevates their interest in learning" (Kuo, 2009, p.25). Additionally, Kawaguchi and Watkins' study (2015) suggests "learning via mobile games matches young students' lifestyles and technological preferences". Today, a wide range of learning devices known as apps is available on the Internet. Among them Quizlet is a widely favoured app with 40 million users every month (Dizon, 2016). This app provides an alternative to paper flashcards as it enables users themselves to create digital flashcards. For these reasons, Quizlet, an ICT tool, has been chosen to be investigated in the current project for a detailed comparison with paper flashcards, a traditional tool, as a method for vocabulary learning.

The present study, then, investigates the effectiveness of Quizlet among EFL learners in Vietnam and in comparison to the effectiveness of paper flashcards for English vocabulary development. One theoretical framework for this kind of the research is the cognitive-affective theory of learning with media (CATLM; Moreno & Mayer, 2007). According to this theory, "humans have separate channels for processing different information modalities", and the channels operate on limited working memory capacity. Affective factors can also influence learning (Moreno

Mayer, 2007). For instance, if a student is interested in culture and art, he or she can be cognitively engaged in the lessons about the topic. In terms of the evaluation of digital learning tools for second language learning, Miyamoto (2001) proposes that these should be evaluated from three viewpoints: 1) the linguistic development achieved by learners, 2) the linguistic environment provided for them and; 3) learners' perception of the learning tool. In line with her suggestion, this research assesses both Quizlet and paper flashcards in terms of (1) the actual learning outcomes; (2) the input, output, interactivity and feedback provided by each tool; and (3) the learners' perception and attitude towards the tools. Given these premises, the research questions (RQ) are as follows:

RQ1: Do EFL learners achieve significant vocabulary gains with either Quizlet or paper flashcards?

RQ2: Is there any significant difference in the vocabulary gains between the learners using these two tools?

RQ 3: Is there any difference between the multimodal linguistic environments created by Quizlet and paper flashcards?

RQ4: What are Vietnamese high school students' perceptions towards these two tools? To broach these questions, the current study is designed as a quasi-experiment (Larsen-Freeman & Long, 1991), with pre-test, intervention (two one-hour learning sessions per week for four weeks) and post-test. Approximately 20 new words – selected from a reading passage in grade 11 English textbook used in Vietnam – were taught each week over four weeks to an intact class of 39 high school students in Vietnam. They were divided into two groups. Group A used Quizlet

while group B paper flashcards for the first two weeks. Then, in the following two weeks, the two groups swapped the learning tool. This method was used to counterbalance the order effect of using two different tools as well as avoid disadvantaging any students. Regarding implications, this research helps learners and teachers to be aware of how digital applications affect English vocabulary acquisition, so they can use them appropriately. Moreover, the study provides empirical data about Moreno & Mayer (2007) CATLM applied to the field of second language acquisition, and further it reveals the influence of linguistic environment on vocabulary learning. Lastly, the Vietnamese Government has issued a policy to improve English proficiency among Vietnamese students and promote the use of information technology in education (Government of Vietnam, 2017a; Government of Vietnam, 2017b). The current research may shed some light on whether and in what ways ICT tools may be advantageous and encourage educators to help fulfil the aims of the government directive.

The remainder of the present work is organised as follows. The next chapter will discuss the current use of digital applications in English learning and components of linguistic environments in language learning as well as offer a detailed description of Quizlet and paper flashcards as learning tools followed by a review of previous studies on these tools. Chapter 3 describes the theoretical frameworks of this study, and discusses the RQs guiding this study in relation to the underlying hypotheses. Next, chapter 4 discusses the method used to uncover possible answers to the RQs comprising research design, participants' information, data collection and analysis methods. Chapter 5 will present the results and discussions of the study. The conclusion, in chapter 6, will summarise the main findings in terms of the RQs, the implications of the study, as well as its limitations.

CHAPTER 2: LITERATURE REVIEW

This chapter discusses how Information and Communication Technology (ICT) has been currently applied to teach and learn English, and includes a description of Quizlet and paper flashcards, as well as a review of previous studies about these two tools. It is divided into three sections: section 2.1 Current use of ICT in English learning, section 2.2 Quizlet and paper flashcards as vocabulary learning tools, and section 2.3 Previous studies on Quizlet and paper flashcards.

2.1 Current use of ICT in English learning

ICT is a common term not only in the field of science and technology but also in the field of second language acquisition. It refers to "technologies that provide access to information through communication mediums" (Sonawane, 2003, p. 2). ICT is integrated with language learning and teaching in order to "communicate, and to create, disseminate, store, and manage information" (Tinio, 2003, p. 4). In this digital age, having the knowledge about ICT can be beneficial to language teachers and learners since the technologies can offer better learning opportunities (Hennessy & Haβler, 2015).

ICT has been applied widely to teach and learn English as a second language (ESL) throughout the world. The applications of ICT are categorised into "learning resources" (i.e., educational software and online resources), "instructional organisation of learning" (i.e., lecturing tools, course management systems, and testing systems), and "communication" (i.e., emails and social networks). The purposes of ICT application in English learning are not only to develop learners' four language skills (i.e., speaking, listening, reading and writing) and their knowledge of English grammar, but also to widen their vocabulary in the language. Using ICT to teach and learn English vocabulary is considered as "one of the traditional foci of ICT use in EFL teaching". It aims to "process learners input, diagnose errors and provide feedback" (Levy, 2009, p. 770).

ICT can be advantageous to English language acquisition. Firstly, the technologies can foster learner autonomy, which refers to the ability "to determine the objectives, to define the contents and progressions, to select methods and techniques to be used, to monitor the procedures of acquisition and to evaluate what has been acquired" (Holec, 1981, p. 30). Schemenk (2005, p. 107) also asserts "the popularity of learner autonomy may be at least partially related to the rise of computer technology and the growing importance of computers in language learning environments

worldwide". This is because ICT provides learners with a great amount of self-study materials (Godwin-Jones, 2011). Being autonomous can help the learner learn a language more effectively as well as efficiently, and to master necessary communication skills (Little, 2003). Furthermore, the integration of ICT into English language education strengthens learner motivation. The reason for this may be that the technologies help to create interactive environments with digital texts, audios and videos that provide English language learners with authentic materials and make their learning enjoyable (Muehleisen, 1997). For instance, in referring to YouTube video clips, "YouTube has the potential to connect learners with authentic English input through what is quite possibly already a part of their life experience, and provides a context through which they can interact, exchange ideas, share feelings, and participate in a web-based environment" (Kelsen, 2009, p.3). Furthermore, online games, which offer "extrinsic rewards like levels, points, and badges" and give the sense of belonging as well as competition to learners, can motivate them both extrinsically and intrinsically (Flores, 2015). Motivation is claimed to have a strong relationship with L2 language proficiency since, according to Gardner (1985, p. 10), the motivated learner willingly spends time and effort on learning and learn the language regularly.

However, the use of ICT in English language learning can be negatively affected by several factors. One of these is the lack of appropriate infrastructure, including facilities, web access and technological support. This happens in many developing countries and prevents the success of using ICT in teaching foreign languages like English (Thomas & Reinders, 2010; Dang, Pham, Ngo, & Ngo, 2012). Another factor is the teacher's negative attitudes towards the technologies, which may result from ICT integration failures and the lack of knowledge of ICT (Rahimi & Yadollahi, 2011). Furthermore, many people in the digital age are obsessed with the novelty of new technologies, and do not consider their education potential appropriately. This leads to unsuccessful integration of ICT in education (Ngo, 2016). Therefore, the use of new technologies in teaching and learning English requires in-depth research.

2.2 Quizlet and paper flashcards as vocabulary learning tools

2.2.1 Quizlet

In this current research, Quizlet is investigated for its effectiveness in vocabulary acquisition in comparison to the efficacy of paper flashcards, as it has been growing in popularity with 40 million users every month (Dizon, 2016). The vocabulary-learning app was created in 2005 and first released to the public in 2007 (Lander, 2016). People can use it free of charge on not only "the Apple iOS and Google Android mobile platforms", but also PCs (Dizon, 2016). Figure 1 illustrates

the home page of Quizlet. In the following descriptions, I will use English as the target language and Vietnamese as the learner'sfirst language. Quizlet has capacities with other language combinations.
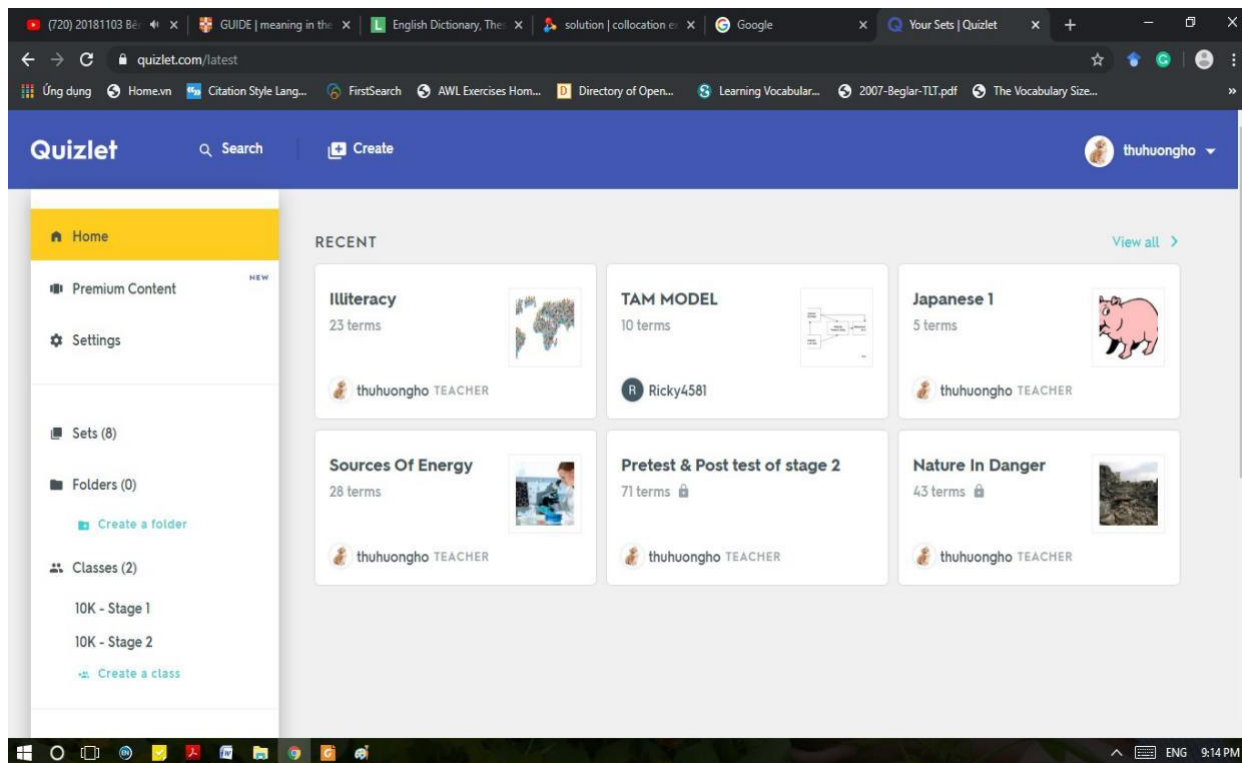
Figure 1. Quizlet home page

Quizlet provides users with a number of activities, which are called modes (Appendix A includes the screenshots of these modes). They are categorised as Study and Play modes. Study modes include Flashcards, Learn, Write, Spell and Test.

Flashcards: The study mode provides users with Quizlet flashcards (i.e., digital flashcards), which are basically similar to paper ones (see Appendix A). Each Quizlet flashcard has two sides. Its front side has the written form of a target word, its syntactic category, its use in a sentence sample and a speaker icon. Users can listen to the word by clicking the icon. The backside of a Quizlet flashcard contains the Vietnamese translation of the target word and possibly a picture – its pictorial representation (if the word is concrete). The user can easily flip the digital card by clicking it. Thus, like paper flashcards, users can use Quizlet flashcards to retrieve meanings and forms of words. In the study mode, output by the user is not compulsory. Producing any kind of output mainly depends on the user. It may be written and spoken. The written output may be handwritten.

Learn: In the study mode, the user answers questions about written forms and meanings of target words. They are flashcards, multiple-choice and short-answer questions. Right after he or she

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gives an answer, they are informed whether it is right or wrong. Then, they have to answer again any short-answer question that has been answered incorrectly. Written output is required when the user answers short-answer questions. No output is required when questions are flashcards and multiple-choice ones. The user needs receptive knowledge, but not productive one to answer multiple-choice questions. Nevertheless, when answering flashcard questions, the user may produce spoken and written output.

Write: The study mode provides the user with short-answer questions about written forms or Vietnamese translations of target words. Right after he or she gives an answer, they are informed whether the answer is right or wrong. If the user answers any question wrongly, they will have to answer it again. Written output is required in the mode.

Spell: When using Spell, the user listens to a target word and is provided with its L1 translation. Then, they have to type it. Right after the user answers any question, they are informed whether the answer is right or wrong. For example, the user hears the sound */gaɪd/* and is provided with its Vietnamese translation, which is *hướng dẫn*. Then they have to write down the English spelling of *guide*. If the user answers any question wrongly, they will be provided with the right answer, and have to re-answer the question before moving to the next one.

Test: In the study mode, the learner is able to take a test, which includes multiple-choice, short answer, matching and true/false questions about written forms and meanings of words. Once the user answers all questions, he or she will be given the test result. The user will know which questions they answered correctly, and which ones were answered wrongly, as well as correct answers when their answer was incorrect. Similarly to Learn, in the study mode, written output is compulsory, as the user has to answer short-answer questions. On the other hand, no output is required when questions are multiple-choice, matching or true-false ones.

In addition to these Study modes, Quizlet offers users with Play modes (i.e., games), namely Match, Gravity and Live.

Match: The play mode is a vocabulary learning game, and it is for individual use. When playing Match, the learner races against the clock to drag and drop each vocabulary item on its correct Vietnamese translation. When the user matches the English word with its correct Vietnamese translation, both of them will disappear. In contrast, if they make any wrong matching, the word and Vietnamese translation will still exist. No output is required. In the game, the user needs only receptive knowledge to recognise target words and their correct Vietnamese translations, then match them.

Gravity: This is also a digital game to learn vocabulary. The play mode is for individual use. When playing Gravity, the user has to type target words and their meanings quickly and correctly to

prevent asteroids from falling. If the user answers a question correctly, the asteroid will disappear. On the other hand, if the answer is wrong, the asteroid will fall on the Earth, and the right answer will be provided. Then, the user has to answer the question again.

Live: The play mode is a group game. It requires at least four players who are divided into groups. The players need to work with members in their groups to answer correctly multiple-choice question as fast as possible. If any group answers incorrectly a question, they have to restart the game.

All of these Quizlet modes help language learners to learn vocabulary, and they offer certain types of input, feedback and output producing opportunities, which are presented in Table 1.

Table 1. *Input, feedback and output producing opportunities provided by Quizlet*

	Input	Feedback	Output producing opportunities
Flashcards	Written input: • Written form of target word • Their Vietnamese translation • Their syntactic category • Their pictorial representation • Their use in a sentence sample Spoken input: Their spoken form	Correct form orVietnamese translation of targetword on the flip sideof the card	No output is required.
Learn	Written input: • Written form of target word • Their Vietnamese translation • Their syntactic category • Their pictorial representation • Their use in a sentence sample Spoken input: Their spoken form	Immediate correctivefeedback	Written output is required.
Write	Written input: • Written form of target word • Their Vietnamese translation • Their syntactic category • Their pictorial representation • Their use in a sentence sample Spoken input: Their spoken form	Immediate correctivefeedback	Written output is compulsory.
Spell	Written input: • Written form of target word • Their Vietnamese translation • Their pictorial representation Spoken input: Their spoken form	Immediate correctivefeedback	Written output is required.

Test	Written input: • Written form of target word • Their Vietnamese translation • Their syntactic category • Their pictorial representation • Their use in a sentence sample	Correctivefeedback	Written output is required.
Match	Written input: written form andVietnamese translation of target word	Immediate feedback	No output is required.
Gravity	Written input: • Written form of target word • Their Vietnamese translation • Their syntactic category • Their pictorial representation • Their use in a sentence sample	Immediate correctivefeedback	Written output is compulsory.
Live	Written input: • Written form of target word • Their Vietnamese translation • Their syntactic category • Their pictorial representation • Their use in a sentence sample	Immediate correctivefeedback	No output is required.

There are several studies on Quizlet as a vocabulary-learning tool (Chien, 2015; Dizon, 2016; Lander, 2016; Sanosi, 2018). Participants in these studies were university students learning English as a foreign language. In terms of its effectiveness to vocabulary acquisition, previous research suggested that language learners made significant vocabulary gains after learning new words with Quizlet (Dizon, 2016; Sanosi, 2018). Besides, the studies on learners' perceptions of Quizlet revealed that they considered it as a convenient, user-friendly and useful learning tool (Chien, 2015; Dizon, 2016; Lander, 2016). Additionally, Dizon's (2016) study revealed that most of the participants spent from 20 minutes to one hour learning target words on Quizlet. Furthermore, in Chien's (2015) research, Quizlet was preferred over other digital applications.

2.2.2 Paper flashcards

Paper flashcards are considered a traditional vocabulary-learning tool. Hung (2015) defined the paper flashcard as the "doubled-sided card", which is used in direct vocabulary learning activities and allows "learners to practise form-to-meaning and meaning-to-form recall in repeated retrieval of L2 words, by flipping the front and backsides of the cards". The paper flashcard used in this research has the English word, its phonetic transcription, syntactic category as well as a sample sentence on the front side; and its Vietnamese translation, (as well as a picture if the word is concrete) on the back side.

According to Nation (2013, p. 437), learning vocabulary with the tool helps language learners form the association between "a foreign language word form (written or spoken) and its meaning". This is important for the learners as "form-meaning connections" enable them to communicate effectively in the language (Nation, 2013, p. 73; Van Patten, 2004, p. 5). For example, regarding Vietnamese EFL learners, the form of an English word (i.e., target word) can be *click,* and its meaning in Vietnamese is *nhấn*. Furthermore, Elgort and Nation (2010) asserted that paper flashcards are an efficient and effective deliberate vocabulary learning technique. The tool allows learners to make vocabulary gains over a short period of time and foster the word retention (Hustijn, 2003; Elgort, 2010). The effectiveness of paper flashcards on vocabulary learning can be explained by Schmidt's (1990) noticing hypothesis. According to the hypothesis, learners' deliberate attention to words can speed up their vocabulary acquisition. In addition, the tool facilitates retrieval practice. According to McNamara and Healy (1995) and Barcroft (2007) the effort users make when retrieving forms and meanings of words can help them to remember the vocabulary items faster and longer. Also, learning with paper flashcards enables spaced repetition, which is effective for vocabulary acquisition. The reason for the positive influence of spaced repetition on vocabulary learning is that recalling, "spaced items" is more difficult, and "successful but difficult retrievals are better for memory than successful but easy retrievals" (Nation, 2013, p. 454). Komachali's and Khodareza's (2012) research revealed that after using paper flashcards to learn target words, Iranian EFL learners made significant vocabulary gains.

According to Nation (2013, p. 458), there are two individual learning activities that can be done with paper flashcards, which are retrieving forms and retrieving meanings of target words. The following describes how Vietnamese EFL learners perform the two activities.

Retrieving forms: In the activity, the learner views the backside of a paper flashcard, which lists the Vietnamese translation of a target word, and recalls its form in English (i.e., target language), which is in the front side of the card.

Retrieving meanings: In the activity, the learner views the front side of a paper flashcard, which lists the target word in English, and recalls its L1 translation (i.e., Vietnamese).

When performing the two individual learning activities, the learner is able to know whether he or she remembers either form or meaning of a target word correctly when flipping the card. Besides, similarly to Flashcards mode of Quizlet, the activities do not require learners to produce any output. Producing output through these vocabulary-learning activities with paper flashcards mainly depends on learners. They may write down the target word and its L1 translation (written output), as well as pronounce the word while looking at its phonetic transcription (spoken output). In addition, paper flashcards can be used for a group game. In the game, learners are divided into

groups. They have to work with their group members to group the cards containing the words with the cards having their L1 translations. Table 2 illustrates the input and feedback that individual learning activities with paper flashcards offer to learners, and the output produced by them.

Table 2. *Input and feedback given by individual learning activities with paper flashcards and output produced by learners*

Paper flashcard activity	Input	Feedback	Output
Retrieving forms	Written input: Written form of target word Their Vietnamese translation Their syntactic category Their pictorial representation (i.e., picture) Their use in a sentence sample	Correct form or meaning of a target word is on the flip side of the card	Output is not required.
Retrieving meanings	Their phonetic transcription		

2.3 Previous studies on Quizlet and paper flashcards

There have been several studies comparing the efficacy of Quizlet with that of paper flashcards in English vocabulary acquisition (Lees, 2013; Dizon & Tang, 2017; Ashcroft, Cvitkovic, & Praver, 2018). In Lees' (2013) research, 81 EFL learners of intermediate level were divided into two groups (i.e., A and B) and learned 30 English words. The target words were separated into two lists. Group A learned the words in list one with Quizlet, and those in list two with paper flashcards. Group B used paper flashcard to learn the words in list one and Quizlet for the words in list two. Thus, all the participants in the study were given equal opportunities to learn vocabulary with the two tools, which also helped to counterbalance the order effect. Post-tests were used to compare the efficacy of Quizlet with that of paper flashcards to vocabulary acquisition. In addition to that, participants' perceptions of the tools were investigated through a survey, which might give some explanation for their test scores. The research findings suggested that there was no significant difference between the test scores of participants using Quizlet and those using paper flashcards. Also, participants reported that they were slightly more engaged in learning vocabulary with Quizlet than with paper flashcards. Nevertheless, in Lees' (2013) study, there were no pre-tests, so participants' vocabulary gains may not have been measured precisely. Also, no delayed post-test was used to investigate the effects of Quizlet and paper flashcards on the retention of target words. Additionally, the intervention of the research lasted over a short period of time (i.e., each group learned the target

words in each list during 15 minutes), and the number of target words was fairly small. Therefore, it might have been difficult for Quizlet and paper flashcards to have any effect on the participants' vocabulary acquisition.

Dizon and Tang (2017) investigated the significant differences between receptive and productive vocabulary gains of the EFL learners using digital flashcards in Quizlet, as well as Cram, and those using paper flashcards "in conjunction with three vocabulary learning strategies – dropping, association, and oral rehearsal". Participants were 52 first-year students in two universities in Japan. They were separated into two groups, and learned the words in the New General Service List for 12 weeks – a long period of time. Similarly to Lees' (2013) research, in the study, the participant's perceptions of the tools were examined through a survey. In addition to that, the amounts of time they spent on learning target words with the tools were investigated. Research findings suggested that the participants preferred digital flashcards to paper flashcards, and the students in digital flashcard groups spent more time outside the classroom learning vocabulary. On the other hand, pre-test and post-test results revealed that there were no significant differences between the vocabulary gains of digital flashcard group and paper flashcard group. This might be influenced by the fact that the participants in paper flashcard group were instructed to use vocabulary-learning strategies. Nevertheless, the two groups might not be compatible since the participants were divided into the groups "according to the availability of PCs in their respective classes" (Dizon & Tang, 2017), not based on the results of a baseline test. Also, like Lees' (2013) research, there was no delayed post-test in the study.

Ashcroft, Cvitkovic and Praver (2018) investigated the effects of Quizlet and paper flashcards on the vocabulary acquisition of EFL beginners, intermediate and advanced EFL learners. Participants comprised of 139 undergraduates, which is a fairly large sample size, and divided into two groups. One group included 75 participants, and the other 74 participants. However, the numbers of EFL learners at the three English levels in the two groups were not similar. Each of the groups learned 120 target English words in Academic Word List (AWL) Sub-lists 1 and 2 in six two 90-minute classes. One group learned AWL Sub-list 1 with Quizlet, and AWL Sub-list 2 with paper flashcards. The other group used paper flashcards to learn AWL Sub-list 1, and Quizlet with AWL Sub-list 2. Pre-tests, immediate post-tests and delayed post-tests were used to compare the effectiveness of the two tools on vocabulary learning. Research findings suggested that EFL beginners and intermediate EFL learners made bigger vocabulary gains after learning vocabulary with Quizlet than after using paper flashcards. On the other hand, there was no difference in the vocabulary gains of advanced EFL learners after they used Quizlet and after they learned with paper

flashcards. However, in the research, participants' perceptions of the two tools were not investigated. A similarity among the three studies reviewed above is that all of them investigated the effects of Quizlet and paper flashcards as a group. They, however, did not look into individual learner's performance, although "individual analysis" plays an important role in the research on ICT-supported learning activities (Kawaguchi, 2016). In addition, these studies did not investigate the linguistic environments created by Quizlet or paper flashcards. In investigating the effect of vocabulary learning tools, the linguistic environment with input, output and feedback is the key factor contributing to the learner's language development (Krashen, 1985; Swain, 1993; Long & Robinson, 1998). Also, with the integration of ICT into second language learning, the linguistic environment can be multimodal and interactive, so it may be necessary to investigate the interactivity of the learning environment. Interactivity is "a characteristic of learning environments that enable multidirectional communication" (Moreno & Mayer, 2007). They allow "two-way actions (between learner and instructor)"; thus, in these environments, learning activities take place due to not only teachers' but also students' actions. Furthermore, Moreno and Mayer (2007) emphasise that for learning these actions need to be for educational purposes, which means that they "help the learner change his or her knowledge consistent with the instructional goal". There are five types of interactivity, namely dialoguing, controlling, manipulating, searching and navigating.

From the literature review, it has become clear that further research on the efficacy of digital tools for second language learning is needed. There have been some studies on the use of Quizlet and paper flashcards in vocabulary acquisition. There is a research gap in the relationships between: (1) the learning effect (i.e., vocabulary gains); (2), linguistic environment provided by the tools; and (3) learner perception on the tools. Especially, none of the previous study has investigated linguistic environment, which the language-learning tool creates. Therefore, the current study proposes to examine these three aspects relating to the two vocabulary learning tools, Quizlet and paper flashcards to identify possible reasons of the efficacy of the tool.

CHAPTER 3: THEORETICAL FRAMEWORKS AND RESEARCH QUESTIONS

The previous chapter discussed the current use of digital applications in English learning, components of linguistic environments, Quizlet and paper flashcards as vocabulary learning tools, and reviewed previous studies on the two tools. This chapter presents the theoretical frameworks, research questions and hypotheses of the study. It contains two sections: section 3.1 Cognitive affective theory of learning with media and Miyamoto's evaluation of blended learning projects, section 3.2 Research questions and hypotheses, and section 3.3 Summary.

3.1 Cognitive affective theory of learning with media and Miyamoto's evaluation of blended learning projects

Miyamoto's (2001) evaluation of blended learning projects: According to Miyamoto (2001), the effectiveness of a digital language-learning tool should be evaluated from the viewpoints of language development, learners' perceptions and linguistic environment. The profound importance of linguistic environment to language acquisition was discussed in the previous chapter (see 2.2). Besides, Miyamoto (2001) suggests that learners' frequency in using a learning tool partly depends on their perception of it. In other words, language development is a measure of the efficacy of the tool, and how learners perceive it, as well as the linguistic environment created by the tool can give some insights into language development. Kawaguchi (2016) also applied the evaluation procedure to assess "an e-tandem L2 learning activity via text-based synchronous computer-mediated communication (SCMC). Participants of the research were divided into pairs. Each of the pairs included a Japanese native speaker learning L2 English, and an English native speaker learning L2 Japanese. They had text conversations on topics assigned by the researcher. Research findings suggest that the linguistic environment created by SCMC e-tandem learning facilitated the negotiation of meaning and corrective feedback. Also, almost all the participants made significant syntactic and morphological developments through the e-tandem practice.

Cognitive affective theory of learning with media (CATLM; Moreno & Mayer, 2007): CATLM "extends the cognitive theory of multimedia learning (Mayer, 2001) by integrating assumptions regarding the relationship between cognition, metacognition and motivation and affect" (Moreno, 2007). According to Moreno (2006), media is defined as "the physical system or vehicle used to

deliver instruction – such as a teacher's lecture, a textbook, or a desktop computer". Therefore, the theory can be applied to investigate both ICT-supported learning environment and non ICT-supported one.

There are three assumptions of CATLM, which are relevant to the research. Firstly, Baddeley (1992) asserted that humans process information of different modalities within separate channels.

Modality refers to "the sensory channel that is initially used by learners when they process information" (Moreno, 2006). Auditory and verbal information is processed within auditory channel, while visual channel handles visual and pictorial information. Another assumption based on Sweller's (1999) research is that the channels have limited capacity for cognitive processing, so each channel can only deal with a limited amount of information at one time to process information. Lastly, as stated by Pintrich (2003), motivational and affective factors can influence learners' engagement in learning (as cited in Moreno & Mayer, 2007). For instance, if the learner is greatly interested in a learning activity, he or she will spend time and make the effort to do the task.

3.2 Research questions and hypotheses

The current study aims to bridge the research gap identified through the review of theoretical frameworks as well as the literature review in the previous chapter, so research questions (RQ) addressed by the research are as follows:

RQ 1: Do EFL learners achieve any significant vocabulary gains with either Quizlet or paper flashcards?

RQ 2: Is there any significant difference in the vocabulary gains between the learners using these tools?

RQ 3: Is there any difference between the multimodal linguistic environments created by Quizlet and paper flashcards?

RQ 4: What are Vietnamese high school students' perceptions towards the two tools?

The hypothesis for each research question is as follows:

RQ 1: Based on the discussion about Quizlet and paper flashcards as well as the review of previous studies on the two tools, it is predicted that participants make significant vocabulary gains after interventions regardless of digital or traditional vocabulary learning tools.

RQ2: It is predicted that the groups using Quizlet make more vocabulary gains than those using paper flashcards based on CATLM (Moreno & Mayer, 2007). Firstly, according to the theory, "humans have separate channels [visual and auditory channels] for processing different information modalities", and each of them has the limited working memory capacity (Moreno & Mayer, 2007). The learner is able to use more separate channels (i.e., both visual and auditory channels) with Quizlet than with paper flashcards (i.e., visual only). With paper flashcards participants have to process aspects of the word (i.e., written form, spoken form, meaning and syntactic category) within the visual channel. The learning loads may easily exceed the limited working memory capacity of the channel, which leads to cognitive overload and impedes meaningful learning (Mayer & Moreno, 2003). In contrast, when using Quizlet, the students process the spoken form of the word in the auditory channel, and other aspects in visual channel. This prevents them from being cognitively overloaded, as the information processing is divided into multiple channels. Consequently, it is expected that Quizlet can help participants acquire vocabulary more effectively than paper flashcards. Another assumption of CATLM (Moreno & Mayer, 2007) is that affective factors can have the influence on learning. For instance, if the learner is fond of a learning activity, he or she may be more cognitively engaged in the activity. Quizlet, not paper flashcards, offers vocabulary-learning games, and young students in the world are reported to play digital games regularly (Kawaguchi & Watkins, 2015). Therefore, Quizlet's gaming functions may have affective functions to promote their learning activities (Decarrico, 2001). Also, the learners' cognitive engagement in learning vocabulary with Quizlet may be higher.

RQ 3: According to the discussions of components of multimodal linguistic environments on Quizlet and paper flashcards, it is predicted that the multimodal linguistic environments created by the tools may be different in terms of input, output producing opportunities, interactivity and feedback.

RQ 4: Based on the discussion of Quizlet and paper flashcards in the previous chapter, participants are predicted to have positive perceptions of the two vocabulary learning tools.

3.3 Summary

This chapter discussed the two frameworks the current research adopted. Then, research questions were presented, which aim to bridge the research gap based on the literature review presented in the

previous chapter. Finally, hypotheses to the research questions based on the theoretical were posited.

The next chapter presents the research design provided to answer the research questions.

CHAPTER 4: RESEARCH DESIGN

The previous chapter described the theoretical frameworks used in this study, research questions, and hypotheses for the effectiveness of Quizlet and paper flashcards in developing EFL learners' English receptive vocabulary and the students' perceptions of the tools. This chapter presents the research design adopted for the current study. It is divided into five sections: section 4.1 Mixed methods approach, section 4.2 Participants, section 4.3 Learning materials and two vocabulary learning tools, section 4.4 Procedure for data collection, section 4.5 Data analysis methods, and section 4.6 Summary.

4.1 Mixed Methods Approach

The present study is quasi-experimental in nature as it consisted of pre-tests, interventions and post-tests with an intact class of 39 high school students in Vietnam. A mixed research method, which involved the integration of quantitative and qualitative data collection, was adopted in this research in order to answer the research questions presented in the last chapter. There are two reasons for choosing this method. Firstly, Patton (1990) stated, "different methods are appropriate for different situations" (p. 39). This means the research design of a study should be decided from the view of its purposes, research contexts and the sources available. This study compares the effectiveness of Quizlet and paper flashcards for receptive vocabulary learning, and examines participants' perceptions towards the tools. Furthermore, the study investigates the differences among multimodal linguistics environments created by either Quizlet or paper flashcards. In order to achieve these purposes, it is appropriate to use a mixed research approach involving quantitative and qualitative analysis.

Secondly, a qualitative approach enables the researcher to investigate not only what happened but also why it happened (Marshall & Rossman, 1995, p. 39). In fact, previous studies about Quizlet and paper flashcards (Lees, 2013; Ashcroft, Cvitkovic, & Praver, 2016; Dizon & Tang, 2017) analysed English language learners' achievement from quantitative viewpoints, i.e., vocabulary gains after they used the two tools. However, these studies did not identify reasons for the significant or insignificant difference in the efficacy of Quizlet and paper flashcards to develop vocabulary. This research aims to bridge the gap by including qualitative research method.

Mixed research methods also allow the researcher to satisfy triangulation. Methodological triangulation refers to using more than one method to investigate one phenomenon (Bekhet & Zauszniewski, 2012). The integration of quantitative and qualitative research often leads to the use of triangulation in research. The current project involved tests, a questionnaire, video recordings and screen captures for collecting data for qualitative and quantitative analyses. The advantages of such triangulation consist in obtaining different kinds of data, thus"increasing confidence in research data, creating innovative ways of understanding a phenomenon, revealing unique findings, challenging or integrating theories, and providing a clearer understanding of the problem" (Thurmond, 2001).

In summary, this study involves mixed methods to examine quantitative and qualitative differences in the effectiveness of Quizlet and paper flashcards as well as the reasons for the differences.

4.2 Participants

Participants of this research were an intact class of 39 tenth graders (36 females and three males) from a public high school in Hai Duong province, Vietnam. The gender imbalance among these participants may be due to the fact that male students in the country take science and mathematics rather than English. All of them were born and brought up in Vietnam, and they were 16 years old at the time of the research. Their first language is Vietnamese, and they have been receiving formal English language instructions for over seven years since grade 3. Similarly to other high schoolers in Vietnam, these students attend three compulsory 45-minute English lessons every week (Ministry of Education and Training, 2018, p. 52). In these lessons, the students are taught English vocabulary, grammar and four language skills, i.e., speaking, listening, reading and writing. They are expected to achieve the vocabulary size of 2500 English words when graduating from high school (Ministry of Education and Training, 2018, p. 25).

Reflecting the young generation in Vietnam and other Asian countries, all of the participants have smart phones and computers with Internet connectivity. They use the gadgets on a daily basis for communication, gaming, learning and so on. Therefore, they did not meet any difficulty in accessing Quizlet.

4.3 Learning Materials and Two Vocabulary Learning Tools

Learning material used in the project are four reading passages (see appendix A) of units 4, 5, 10 and 11 in *Tiếng Anh* (Hoàng et al., 2006, pp. 47, 57, 115-116, 125) - English textbook for Vietnamese 11th graders. Each of the texts is around 300 words in length. The reading passages were chosen to teach participants, as a great number of vocabulary items included in the texts may be new to the participants - 10th graders. Additionally, as the words may be included in the national English exam, which they will have to take at the end of year 12, the students may be motivated to participate in the research. 121 vocabulary items (see appendix B) in the passages were chosen as the target vocabulary for the research. These included 45 nouns, 21 noun phrases, 23 verbs, nine phrasal verbs, one verb phrase, 16 adjectives, four adverbs and two set phrases. In addition, these are intermediate, upper-intermediate and advanced English words; so many of the vocabulary items might be new words to participants.

Paper flashcards and Quizlet are two learning tools used in this research. These two different tools are used in the intervention in order to find out whether the digital app (i.e., Quizlet) is more effective than the traditional tool (i.e., paper flashcards) or vice versa. The researcher prepared all paper flashcards and digital ones for participants, so they have the same learning tools. This controlled variables, which may affect the validity of research findings. Ethics clearance was obtained from WSU Ethics Committee (clearance No. H13054) before this study commenced. Further, in order to abide by research ethics, the participants were not required to spend any money and time when participating in the study, e.g., setting up Quizlet, making flashcards and so on.

These two tools are similar in terms of basic construction, however, involve some differences reflecting their "digital" and "paper" natures (see § 2.3 for a detailed description of Quizlet and paper flashcards). Each student had to learn 121 vocabulary items using the tools in this quasi-experimental study.

Quizlet: The researcher created 121 digital flashcards (see appendix C) on Quizlet, which were divided into eight sets. Participants were given access to this set of digital flashcards. Each of the flashcards had a target word, its part of speech and a sentence example on the front. The sentence example was added to the flashcard because when noticing it, learners may process syntactic information of the target word. Thus, the word "may be stored in long-term memory (entering the mental lexicon) more quickly" (Zhang, 2009). Additionally, the front of the flashcard contained a speaker icon. By clicking it, participants can listen to the target word. The back of the digital flashcard had L1 (Vietnamese) translation of the target word. According to Laufer and Shmueli (1997), L1 translations can help learners remember target words better than L2 definitions

as they pay full attention to the target vocabulary items. Furthermore, the flashcards containing concrete words had pictures on the back. As the picture is a "real instantiation of the word", it can enhance learners' retention of the vocabulary item (Nation, 2013, p. 449).

As a vocabulary learning app, Quizlet provides users with study and play modes to acquire new words. Study modes consist of Flashcards; Learn, Write, Spell and Test. Play modes include Match, Gravity and Live (see Table 1 in § 2.3.1 about the description of study and play modes on the app).

Paper flashcards: 121 paper flashcards (21 x 29.7 cm) (see appendix C) were prepared by the researchers and used for teaching. Also, 39 sets of paper flashcards (4.25 x 5.5 cm) (see appendix C) containing all target words were created by the researcher and distributed to participants. These paper flashcards had the same example sentences on the front, and L1 translation of target words, as well as pictures on the back as Quizlet flashcards did. The only difference between them is phonetic transcriptions of target words on the front of paper flashcards. The participants had been taught the International Phonetic Alphabet since they were at primary school (Ministry of Education and Training, 2018, pp. 24-25). Therefore, with paper flashcards containing phonetic transcriptions of target vocabulary items, they could revise pronunciations of the words. There are two individual learning activities that learners can perform with paper flashcards. These are (i) retrieving forms and (ii) retrieving meanings of target words (§ 2.3.2 describes the activities).

4.4 Procedure for Data Collection

4.4.1 Teaching schedule

The study involved a quasi-experiment (see Figure 2) for around two months. including pre-test, immediate and delayed post-tests. The experiment was conducted at the participants' school during after-school hours, so their study was not affected. Participants received two interventions. All of them were taught 50 target words in the intervention 1 (over two weeks) and 71 target words in intervention 2 (also over two weeks). Furthermore, before the interventions, the participants were required to take Vietnamese bilingual version of Vocabulary Size Test (Nation & Beglar, 2007; Le Thi Cam Nguyen & Nation, 2011) (see appendix D) as the baseline test in one hour at their school. All the choices in the version are written in Vietnamese – the students' first language. Thus, according to Le Thi Cam Nguyen and Nation (2011) it purely assesses test-takers' English vocabulary knowledge, not grammar and reading skills. The participants were divided into two

equivalent groups based on the test results, which means that both groups have the similar in terms of their vocabulary abilities. A consisted of 20 participants, and B included 19 ones. The groups had the same number of participants whose English vocabulary sizes ranged from 1000 to 2900 words. On the same day, after taking the baseline test, the participants were made familiar with both paper flashcards and Quizlet, so they might not encounter any problem when using the learning tools. In intervention 1, A used paper flashcards, and B Quizlet. They swapped the learning tools in intervention 2. This method was used due to an ethical reason: both groups should be given equal opportunities to learn vocabulary items using Quizlet and paper flashcards. Also, the method helped to counterbalance the order effect.

Prior to the experiment, the researcher arranged the time and dates of these teaching sessions with participants, so that they would not experience any inconvenience. During the experimental period, each group attended two 60-minute teaching sessions each week over four weeks. All the lessons were delivered by the researcher in both Vietnamese and English. This is standard in English classes in Vietnam and other Asian countries like China or Japan, so the students could understand them adequately. Each of the teaching sessions followed a set routine. Firstly, the researcher used either Quizlet or paper flashcards to teach participants target vocabulary. Next, they were required to read the reading passage in seven minutes. Following this, the participants had to tell, which sentences contained target words. Then the teacher used these sentences to explained collocations, as well as parts of speech of the words to the participants. After this participants used either Quizlet or paper flashcards to learn target words individually in ten minutes. They decided themselves, which learning activities they would like to do with either Quizlet or paper flashcards.

The last activity was a group game. In the lesson with paper flashcards, the game was that participants in small groups had to group the cards containing the words with the ones having their L1 translations. In the lesson with Quizlet, the group game was Live. Teaching sessions with Quizlet were delivered at the computer lab of their school, which had a projector and computers. Teaching sessions with paper flashcards were delivered in the participants' classroom at their school, which had a blackboard, tables and chair.
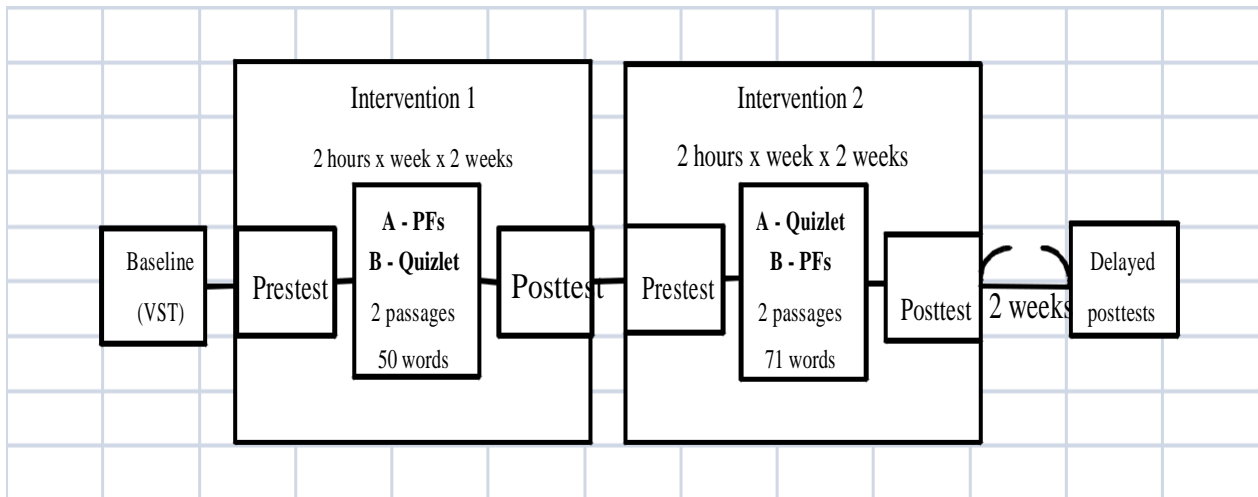
Figure 2. Graphic Presentation of the Experiment

4.4.2 Pre-tests, immediate post-tests and delayed post-tests

The current study aimed to compare the effectiveness of Quizlet versus paper flashcards in developing English receptive vocabulary. Therefore, two pre-tests, two immediate post-tests and two delayed post-tests (for interventions 1 and 2) (see appendix E) were used to measure participants' vocabulary gains after interventions. These were all paper-based tests, and each of the tests included two sections. In section one, participants listened to one target word at a time and had to write down the words. Section two was modelled on the Vocabulary Size Test (Nation & Beglar, 2007). It consisted of multiple-choice questions, each of which contained a target word, a simple non-defining sentence, including the word and four choices. According to Nation & Beglar (2007), the non-defining sentence gives test takers a cue about the meaning of the target word and its part of speech. All the choices in the tests were written in Vietnamese, so the vocabulary tests might assess participants' retention of target vocabulary, not their English grammar and reading skills (Le Thi Cam Nguyen & Nation, 2011).

Immediate post-test 1 and delayed post-test 1 were the same as pre-test 1. Each of the tests consisted of 100 questions, and lasted 45 minutes. Besides, immediate post-test 2 and delayed post-test 2 were similar to pre-test 2. Each of these had 142 questions and lasted one hour. The pre-test was taken one day before the lesson in order to assess participants' knowledge of target words taught in each intervention, i.e., whether they had already known these vocabulary items or not.

On the other hand, the immediate post-test was used to test how many words participants learned after the intervention, and was taken one day after the last teaching session of the intervention. Also, the delayed post-test was taken two weeks after intervention 2, and aimed to examine whether the learners retained target words after a certain period of time (see Figure 2 for

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the testing schedule). In order to ensure the validity of test results, each participant sat at one table and was not allowed to discuss answers during the test.

4.4.3 Video recordings and screen captures

Video recordings and screen captures were employed to investigate the multimodal linguistic environments created by either Quizlet or paper flashcards in order to investigate the details of what the student did. The researcher randomly selected three participants in each group (A1, A10, A17, A6, A14 and A34) during two interventions. As for paper flashcard sessions, a smart phone was used to record the students' individual learning activities. In Quizlet sessions, their individual learning activities were captured by a laptop. Each video recording of paper flashcard activities or screen capture of Quizlet activities lasted approximately 10 minutes.

4.4.4 Questionnaire

An online questionnaire (see appendix E) created by Survey Monkey (https://bit.ly/32G9BjS) was used to investigate participants' perception of Quizlet and paper flashcards as vocabulary learning tools. The questionnaire was written in Vietnamese and included eight questions. According to Fredericks, Blumenfeld, and Paris (2004), students' engagement in learning has a close relationship with their academic results. It is considered as "a multifaceted construct" as the engagement should be behavioural, emotional and cognitive engagement. Learners' deep engagement in a learning activity is established if they are behaviourally, emotionally and cognitively engaged in this. Behavioural engagement refers to the learner's participation in learning activities. Emotional engagement is defined as how learners feel about the activities, while cognitive engagement refers to how they try to gain knowledge from the activities (Fredricks, Blumenfeld, & Paris, 2004). Therefore, the first four questions in the questionnaire aims to investigate participants' cognitive and behavioural engagement. Questions one and two asked participants to report how often they learned target vocabulary with either flashcards or Quizlet outside the classroom.

The following two questions were about the length of each self-study session. Questions five and six were in the Likert format. These included two question items about the enjoyment of learning vocabulary with the tools, which aims to examine participants' emotional engagement. Furthermore, learners' perception of the user-friendliness and usefulness of a learning tool can have direct influence on their use of the tool. According to the technology acceptance model (Davis, 1989), a person's "behavioural intention" of using a technology can be predicted by his or her "perceived usefulness" and "ease of use" of the technology. Thus, other question items in questions five and six asked participants to rate their views towards the effectiveness of Quizlet and paper

flashcards in acquiring and retaining vocabulary, as well as the ease of using them. Question seven asked about their preference for either of the tools, and the last one was about reasons for their preference. The participants did the questionnaire at the computer lab of their school one week after intervention two.

4.5 Data analysis methods

The researcher collected pre-test, post-test and delayed post-test data. In the tests, one question was worth one score. The test results were analysed by t-tests. The independent t-test was administered to identify participants' significant gains after using either Quizlet or paper flashcards in each intervention. In addition, the independent t-test was employed to compare vocabulary gains of groups A and B. Besides, the data about actual learning activities with the Quizlet and paper flashcards, which were collected from video recordings and screen captures, were analysed to find out the input, output producing opportunities, interactivity and feedback provided by the tools. Also, the finding on the linguistic environments created by Quizlet and paper flashcards was employed to interpret participants' vocabulary gains. In terms of the questionnaire, descriptive statistics and the KWIC Concordance were employed to analyse participants' responses in order to investigate their perceptions of the two tools.

4.6 Summary

In conclusion, this chapter presented the research approach, participants, learning materials and tools. This was followed by the procedure for data collection and data analysis methods used in the research. The next chapter will discuss the results of this present study.

CHAPTER 5: RESULT AND DISCUSSION

The previous chapter detailed the current research methodological approach, participants, learning materials, the two vocabulary learning tools used, the procedure for data collection, and finally, the methods for data analysis used in the study. To proceed, this chapter presents results of the current study on the use of Quizlet and paper flashcards as vocabulary learning tools. It includes five sections: section 5.1 learning effects, i.e., vocabulary gains; followed by a section on learners' perceptions obtained from a questionnaire; then section 5.3 on the linguistic environments which two vocabulary tools offer; and finally 5.4 offers a summary of the chapter.

5.1 Vocabulary gains

One of the aims of the present study is to measure and compare the efficacy of Quizlet and paper flashcards in developing English receptive vocabulary. Two of the research questions (RQ) investigated in the research are as follows:

RQ 1: Do EFL learners achieve any significant vocabulary gains with either Quizlet or paper flashcards?

RQ 2: Is there any significant difference in the vocabulary gains between the learners using these tools?

The study involved two separate two-week interventions. In intervention 1, group A learned target vocabulary with paper flashcards, while group B used Quizlet. Then the groups swapped their learning tools in intervention 2.

Pre-tests 1 and 2 were administered at the onset of interventions one and two respectively. Each of the tests examined participants' prior knowledge of the target words taught in the intervention. Two immediate post-tests and, two weeks after the last training session, two delayed post-tests assessed their vocabulary gains after each intervention during which they learn target words with either paper flashcards or Quizlet. Each of the tests included a listening section and a multiple-choice section. The former quantified word-form gains, and the latter quantified word meaning. Thus, vocabulary gains of participants in this study refer to both word-form and word-meaning gains. T-test analyses were conducted to compare and identify significance in vocabulary gains of two groups through either Quizlet or paper flashcards, as vocabulary learning tools.

5.1.1 Vocabulary gains through learning vocabulary with either Quizlet or paper flashcards

The section describes gains in participants' vocabulary from pre-tests to immediate and delayed post-tests. Independent t-tests are used to analyse test scores in order to identify significance in word-form and word-meaning gains. These statistical tests typically examine vocabulary development as groups over time. The same group is examined twice (i.e., paired data) before and after the intervention. I will first present word-form gains (i.e., participants' scores on listening sections) followed by word-meaning gains (i.e., participants' scores on multiple-choice sections).

Word-form gains: Firstly, with regards to group performances, tables 3 and 4 present the results of independent t-test analyses of the scores that group A obtained on listening sections. Table 3 includes total scores (N), mean scores (Mean), percentages of the target words that group A knew or remembered on average, range values (Range), and standard deviations (SD). Table 4 contains p values (p) and t values (t).

Table 3. *Group A's word-form gains in listening sections: total scores, mean scores, percentages, range values and standard deviations*

	Intervention 1 (**paper flashcards**)			Intervention 2 (**Quizlet**)		
	Pre-test 1 (N=50)	**Immediate** post-test 1 (N=50)	**Delayed** post-test 1 (N=50)	Pre-test 2 (N=71)	**Immediate** post-test 2 (N=71)	**Delayed** post-test 2 (N=71)
Mean	1.15 (2.3%)	14.90 (29.8%)	4.25 (8.5%)	13.00 (18.3%)	32.80 (46.2%)	27.35 (38.5%)
Range	0-6	9-21	1-8	6-20	16-62	10-49
SD	1.53	3.35	2.20	3.93	13.85	11.22

(%: percentage of target words, which participants knew or remembered on average)

For group A's intervention 1 (i.e. paper flashcards) scores on the listening section of immediate post=test 1 (M = 14.90, SD = 3.35) are on average higher than their scores on the listening section of pre-test 1 (M = 1.15, SD = 1.53). An independent t-test shows that the difference is significant (t 15.3289, p < 0.0001, df = 19). Similarly, group A's scores on the listening section of delayed post-test 1 (M = 4.25, SD = 2.20) are on average higher than their scores on the listening section of pre-test 1. A paired t-test shows that the difference is significant (t = 5.0393, p < 0.0001, df = 19).

Table 4. *Group A's word-form gains in listening sections: p values and t values*

Intervention 1 (paper flashcards)		Intervention 2 (Quizlet)	
From pre-test 1 to **immediate** post-test 1	From pre-test 1 to **delayed** post-test 1	From pre-test 2 to **immediate** post-test 2	From pre-test 2 to **delayed** post-test 2
p<0.0001	p<0.0001	p<0.0001	p<0.0001
t=15.3289	t=5.0393	t=6.0942	t=5.4376

For intervention 2 (i.e. Quizlet), we obtain similar results to intervention 1. Group A's scores on the listening section of immediate post-test 2 (M = 32.80, SD = 13.85) are on average higher than their scores on the listening section of pre-test 2 (M = 13.00, SD = 3.93). A paired t-test shows that the difference is significant (t = 6.0942, p < 0.0001, df = 19). Similarly, their scores on the listening section of delayed post-test 2 (M = 27.35, SD = 11.22) are on average higher than their scores on the listening section of pre-test 2. A paired t-test shows that the difference is significant (t = 5.4376, p < 0.0001, df = 19). In summary, according to paired t-test analyses of group A's scores in listening sections, group A made considerable word-form gains after two interventions.

Tables 5 and 6 illustrate the results of in t-test analyses of the scores that group B achieved on listening sections. The students in this group utilised two vocabulary-learning tools in a reverse order, i.e. Quizlet in intervention 1 and paper flashcards in intervention 2.

Table 5. *Group B's word-form gains in listening sections: total scores, mean scores, percentages, range values and standard deviations*

	Intervention 1 (Quizlet)			Intervention 2 (paper flashcards)		
	Pre-test 1 (N=50)	**Immediate** post-test 1 (N=50)	**Delayed** post-test 1 (N=50)	Pre-test 2 (N=71)	**Immediate** post-test 2 (N=71)	**Delayed** post-test 2 (N=71)
Mean	0.11 (0.22%)	37.47 (74.9%)	15.11 (30.2%)	13.63 (19.2%)	28.47 (40.1%)	18.89 (26.6%)
Range	0-1	30-44	8-26	2-29	13-58	10-34
SD	0.32	4.71	4.59	5.48	14.63	7.18

(%: percentage of target words, which participants knew or remembered on average)

Regarding intervention 1, group B's scores on the listening section in the immediate post-test 1 (M 37.47, SD = 4.71) are on average higher than their scores on the listening section of pre-test 1 (M 0.11, SD = 0.32). A paired t-test shows that the difference is significant (t = 35.3384, p < 0.0001,

df = 18). Group B's scores on the listening section of delayed post-test 1 (M = 15.11, SD = 4.59) are on average higher than their scores on the listening section of pre-test 1. A paired t-test shows that the difference is significant (t = 14.4999, p < 0.0001, df = 18).

Table 6. *Group B's word-form gains in listening sections: p values and t values*

Intervention 1 (paper flashcards)		Intervention 2 (Quizlet)	
From pre-test 1 to **immediate** post-test 1	From pre-test 1 to **delayed** post-test 1	From pre-test 2 to **immediate** post-test 2	From pre-test 2 to **delayed** post-test 2
p<0.0001	p<0.0001	p=0.0004	p=0.0041
t=35.3384	t=14.4999	t=4.2895	t = 3.2892

As for intervention 2 (i.e. paper flashcards) group B's scores on the listening section of immediate post-test 2 (M = 28.47, SD = 14.63) are on average higher than their scores on the listening section of pre-test 2 (M = 13.63, SD = 5.48). A paired t-test shows that the difference is significant (t = 4.2895, p = 0.0004, df = 18). Group B's scores on the listening section of delayed post-test 2 (M = 18.89, SD = 7.18) are on average higher than their scores on the listening section of pre-test 2. A paired t-test shows that the difference is significant (t = 3.2892, p = 0.0041, df = 18). In conclusion, like group A, group B made substantial word-form gains after two interventions.

With regards to individual performances, the differences between A and B groups' scores on the listening section of immediate post-test 1 and those on the listening section of pre-test 1 are statistically highly significant. Figures 3 and 4 illustrate their scores on listening sections in pre-test and immediate post-test 1.

Figure 3. Group A's (paper flashcards) word-form gains in listening sections of pretest and immediate posttest 1
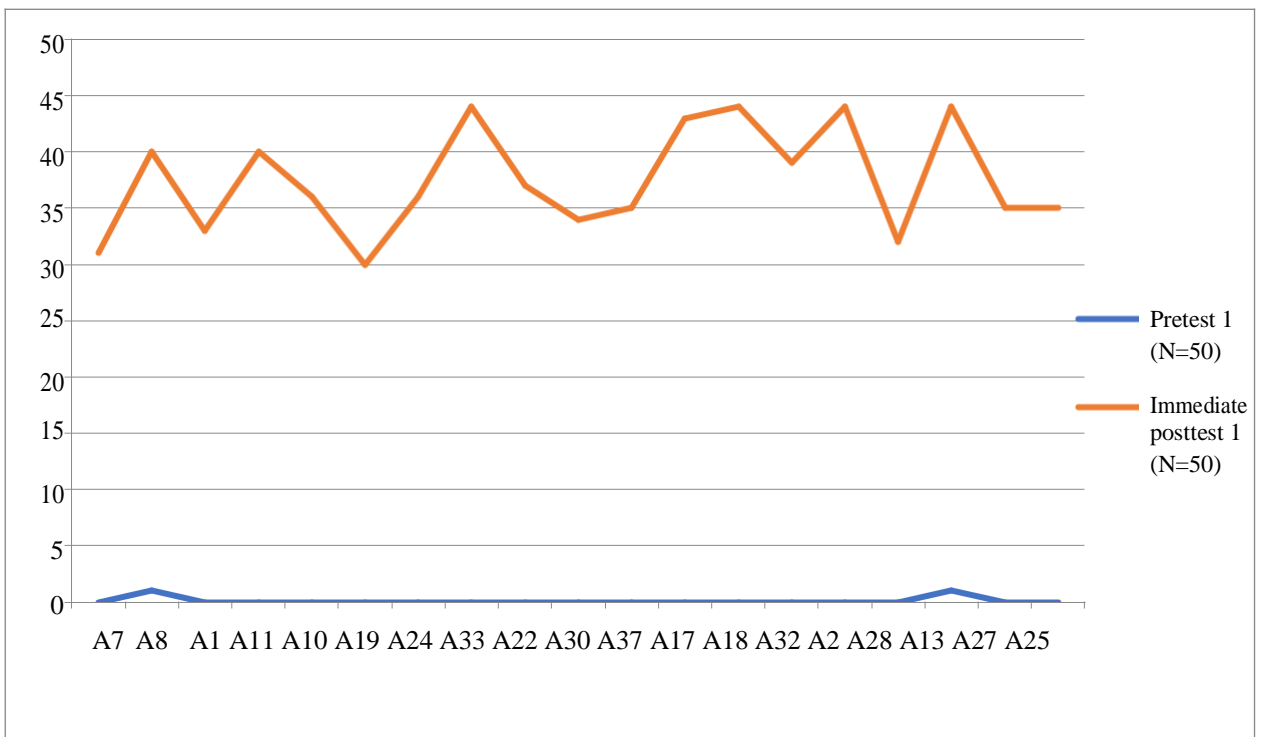
Figure 4. Group B's (Quizlet) word-form gains in listening sections of pre-test and immediate posttest 1

As can be seen from Figures 3 and 4, participants, especially those in group B, made substantial word-form gains after intervention 1. All of them barely had any knowledge of the spoken form of the target words, which were taught in the intervention. The graphs show that their scores on the listening section of pre-test 1 are close to 0. On the other hand, there were considerable improvements in their scores on the listening section of immediate post-test 1. Group A participants' scores on the section range from 9 to 21. The gap between group B participants' scores on the listening section of immediate post-test 1 and those on the listening section of pre-test 1 is even wider. Their scores on the listening section of immediate post-test 1 range from 30 to 44.

Word-meaning gains: Firstly concerning group performances, tables 7 and 8 present the results of independent t-test analyses of the scores that group A obtains on multiple-choice sections - word-meaning recall measures.

Table 7. *Group A's word meaning gains in multiple-choice sections: total scores, mean scores, percentages, range values and standard deviations*

	Intervention 1 (**paper flashcards**)			Intervention 2 (**Quizlet**)		
	Pre-test 1 (N=50)	**Immediate** post-test 1 (N=50)	**Delayed** post-test 1 (N=50)	Pre-test 2 (N=71)	**Immediate** post-test 2 (N=71)	**Delayed** post-test 2 (N=71)
Mean	32.20 (64.4%)	38.60 (77.2%)	36.10 (72.2%)	30.95 (43.6%)	58.75 (82.7%)	43.15 (60.8%)
Range	20-40	30-46	27-43	13-58	35-71	28-54
SD	5.66	4.56	4.32	11.49	12.46	8.16

(%: percentage of target words, which participants knew or remembered on average)

Regarding intervention 1 (i.e. paper flashcards), group A's scores on the multiple choice section of immediate post-test 1 (M = 38.60, SD = 4.56) are on average higher than their scores on the multiple choice section of pre-test 1 (M = 32.20, SD = 5.66). A paired t-test shows that the difference is significant (t = 6.3600, p < 0.0001, df = 19). Similarly, their scores on the multiple choice section of delayed post-test 1 (M = 36.10, SD = 4.32) are on average higher than their scores on the multiple choice section of pre-test 1. A paired t-test shows that the difference is significant (t = 2.3877, p = 0.0275, df = 19).

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Table 8. *Group A's word meaning gains in multiple-choice sections: p and t values*

Intervention 1 **(paper flashcards)**		Intervention 2 **(Quizlet)**	
From pre-test 1 to **immediate** post-test 1	From pre-test 1 to **delayed** post-test 1	From pre-test 2 to **immediate** post-test 2	From pre-test 2 to **delayed** post-test 2
p<0.0001	p=0.0275	p<0.0001	p=0.0017
t=6.3600	t=2.3877	t=7.3051	t=3.6527

As for intervention 2 (i.e. Quizlet), group A's scores on the multiple choice section of immediate post-test 2 (M = 56.50, SD = 10.75) are on average higher than their scores on the multiple choice section of pre-test 2 (M = 30.95, SD = 11.49). A paired t-test shows that the difference is significant (t = 9.9276, p < 0.0001, df = 19). Similarly, their scores on the multiple choice section of delayed post-test 2 (M = 43.15, SD = 8.16) are on average higher than their scores on the multiple choice section of pre-test 2. A paired t-test shows that the difference is significant (t = 3.6527, p = 0.0017, df = 19). In conclusion, according to paired t-test analyses, participants in group A made considerable word-meaning gains after interventions.

Table 9. *Group B's word meaning gains in multiple-choice sections: total scores, mean scores, percentages, range values and standard deviations*

	Intervention 1 **(Quizlet)**			Intervention 2 **(paper flashcards)**		
	Pre-test 1 (N=50)	**Immediate** post-test 1 (N=50)	**Delayed** post-test 1 (N=50)	Pre-test 2 (N=71)	**Immediate** post-test 2 (N=71)	**Delayed** post-test 2 (N=71)
Mean	31.05 (62.1%)	48.37 (96.7%)	39.58 (79.2%)	27.95 (39.4%)	57.63 (81.2%)	34.74 (48.9%)
Range	16-40	45-50	30-47	12-39	40-71	26-47
SD	6.70	1.67	4.43	6.84	9.74	6.55

(%: percentage of target words, which participants knew or remembered on average)

Tables 9 and 10 present results of independent t-test analyses of the scores that group B achieved on multiple-choice sections. Regarding intervention 1 (i.e., Quizlet), group B's scores on the multiple choice section of immediate post-test 1 (M = 48.37, SD = 1.67) are on average higher than their scores on the multiple choice section of pre-test 1 (M = 31.05, SD = 6.70). A paired t-test shows that the difference is significant (t = 10.4887, p < 0.0001, df = 18). Similarly, group B's scores of

multiple choice section in delayed post-test 1 (M = 39.58, SD = 4.43) are on average higher than their scores of multiple choice section in pre-test 1. A paired t-test shows that the difference is significant (t = 6.5544, p < 0.0001, df = 18).

Table 10. *Group B's word meaning gains in multiple-choice sections: p values and t values*

Intervention 1 (**paper flashcards**)		Intervention 2 (**Quizlet**)	
From pre-test 1 to **immediate** post-test 1	From pre-test 1 to **delayed** post-test 1	From pre-test 2 to **immediate** post-test 2	From pre-test 2 to **delayed** post-test 2
p<0.0001	p<0.0001	p<0.0001	p=0.0004
t=10.4887	t = 6.5544	t=11.4018	t = 4.3500

Regarding intervention 2 (i.e., paper flashcards) group B's scores on the multiple choice section of immediate post-test 2 (M = 60.00, SD = 11.44) are on average higher than their scores on the multiple choice section of pre-test 2 (M = 27.95, SD = 6.84). A paired t-test shows that the difference is significant (t = 12.2252, p < 0.0001, df = 18). Similarly, group B's scores on the multiple choice section of delayed post-test 2 (M = 34.74, SD = 6.55) are on average higher than their scores on the multiple choice section of pre-test 2. A paired t-test shows that the difference is significant (t = 4.3500, p = 0.0004, df = 18). In summary, like group A, participants in group B made great word-meaning gains after two interventions.

With regard to individual performances, as the gaps between groups A's and B's scores on the multiple-choice section of immediate post-test 1 and theirs on the multiple-choice section of pre-test 1 are statistically highly significant. Figures 5 and 6 present the two groups' scores on these multiple-choice sections.
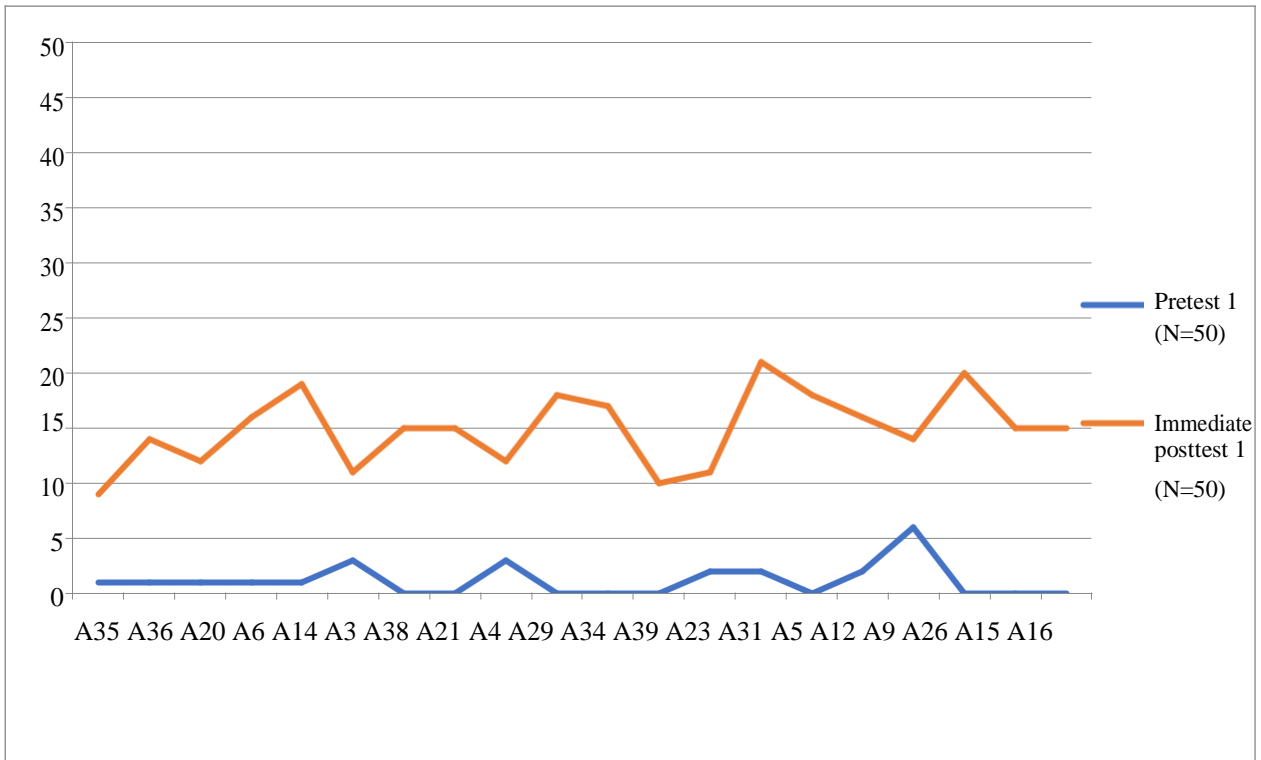
Figure 5. Group A's (paper flashcards) word-meaning gains in multiple-choice sections of pretest and immediate posttest 1
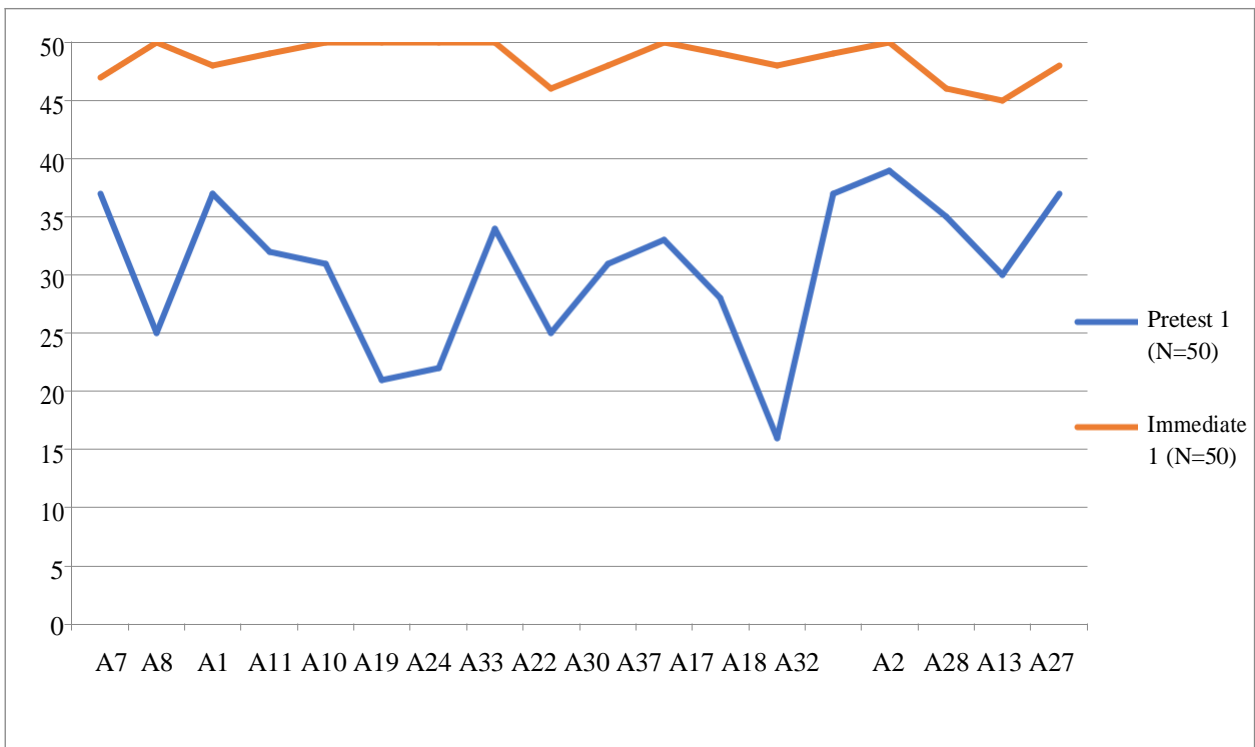
Figure 6. Group B's (Quizlet) word-meaning gains in multiple-choice sections of pretest and immediate posttest 1

Participants in both groups made considerable word-meaning gains after intervention one. As can be seen from Figures 5 and 6, their scores on the multiple-choice section of pre-test 1 range from 16 to 40. As for immediate post-test 1, group A participants' scores vary from 30 to 46. The range of group B participants' scores on the section is from 45 to 50.

All things considered, students' vocabulary gains after two interventions are significant regardless of the two different tools. Regarding word-form gains, all the participants remembered corrected the written and spoken forms of the words "handicapped", "eradicate", "relevant", "struggle", "mountainous", "illiterate", "human being", "offspring", "prohibit", "exhausted" and "rapidly", regardless of the learning tools. A possible reason is that most of the words are isolated ones, not phrases. Thus, the students did not encounter the problem of word segmentation when they wrote these vocabulary items.

Another possible reason is the phonemes in these words. On the other hand, all the participants made mistakes when writing a number of words and phrase for example, "take care of", "place of interest", "universalisation of primary education", "Vietnam society of learning promotion", "in all respects", "make use of", alternative source of energy", "disadvantaged", "highlands", "result in", "endangered species", "make use of". Many students could not hear the word "of" in the above phrases and ending sounds such as "-s", "-z" or "-d". In terms of word-meaning gains, all of the participants remembered correctly the meanings of long and complicated phrases and words, which are "Vietnam society of Learning promotion", "universalisation of primary education", "illiteracy eradication", "ethnic minority", "solar panel", "nuclear energy", "interference" and "relatively". I

In conclusion, both Quizlet and paper flashcards are useful for vocabulary learning. The next sub-section discusses the difference between the effects of paper flashcards and Quizlet on the acquisition of receptive vocabulary.

5.1.2 Comparison between vocabulary gains of learners using paper flashcards and those using Quizlet

In order to compare the vocabulary gains through using paper flashcards with the vocabulary gains through the use of Quizlet, independent t-test analyses of participants' scores in pre-tests, immediate and delayed post-tests were conducted. This statistical test typically examines the differences between the two groups' test scores. Similarly to the previous subsection, I will first present the difference among their word-form gains (i.e. participants' scores on listening sections) followed by the difference among their word-meaning gains (i.e. their scores on multiple-choice sections).

Word-form gains: Tables 11 and 12 present the results of independent t-test analyses of the scores that group A and group B achieved in listening sections of pre-test 1, immediate post-test 1 and delayed post-test 1. Each of the table includes total scores (N), mean scores (Mean), percentages of target words that either group A or group B knew or remembered on average, range values (Range), standard deviations (SD), p values (p) and t values (t). Actual score each group gained are found in the tables in the previous sub-section.

Table 11. *Group A's and group B's word-form gains in listening sections of pre-test 1and immediate post-test 1: total scores, mean scores, percentages, range values, standard deviations, p and t values*

	Pre-test 1 (N=50)				**Immediate post-test 1 (N=50)**			
	Mean	SD	Range		Mean	SD	Range	
Group A (Paper flashcards)	1.15 (2.3%)	1.53	0-6	p=0.0060 t=2.9140	14.90 (29.8%)	3.35	9-21	p<0.0001 t=17.3180
Group B (Quizlet)	0.11 (0.22%)	0.32	0-1		37.47 (74.9%)	4.71	30-44	

(%: percentage of target words, which participants knew or remembered on average)

In intervention 1, group A learned target vocabulary with paper flashcards, and group B used Quizlet. Group B's scores in the listening section of immediate post-test 1 (M = 37.47, SD = 4.71) are on average higher than group A's (M = 14.90, SD = 3.35). An independent t-test indicates that the difference is significant (t = 17.3180, p < 0.0001, df = 37). Furthermore, it is important to note that group B's scores in the listening section of pre-test 1 (M = 0.11, SD = 0.32) are on average lower than group A's (M = 1.15, SD = 1.53). An independent t-test shows that this difference is significant (t = 2.9140, p = 0.0060, df = 37).

Table 12. *Group A's and group B's word-form gains in listening sections of pre-test 1 and delayed post-test 1: total scores, mean scores, percentages, range values, standard deviations, p and t values*

	Pre-test 1 (N=50)				Delayed post-test 1 (N=50)			
	Mean	SD	Range		Mean	SD	Range	
Group A (Paper flashcards)	1.15 (2.3%)	1.53	0-6	p=0.0060	4.25 (8.5%)	2.20	1-8	p<0.0001
Group B (Quizlet)	0.11 (0.22%)	0.32	0-1	t=2.9140	15.11 (30.2%)	4.59	8-26	t=9.4916

(%: percentage of target words, which participants knew or remembered on average)

Similarly, group B's scores in the listening section of delayed post-test 1 (M = 15.11, SD = 4.59) are on average higher than group A's (M = 4.25, SD = 2.20). An independent t-test indicates that the difference is significant (t = 9.4916, p < 0.0001, df = 37). Thus, group B achieved higher scores than group A after the intervention although group B's baseline (i.e. pre-test score) in this section is statistically lower than that of group A.

Tables 13 and 14 present the results of independent t-test analyses of the scores that group A and group B achieved in listening sections of pre-test 2, immediate post-test 2 and delayed post-test 2.

Table 13. *Group A's and group B's word-form gains in listening sections of pre-test 2 and immediate post-test 2: total scores, mean scores, percentages, range values, standard deviations, p and t values*

	Pre-test 2 (N=71)				Immediate post-test 2 (N=71)			
	Mean	SD	Range		Mean	SD	Range	
Group A (Quizlet)	13 (18.3%)	3.93	6-20	p=0.6804	32.80 (46.2%)	13.85	16-62	p=0.3490
Group B (Paper flashcards)	13.63 (19.2%)	5.48	2-29	t=0.4151	28.47 (40.1%)	14.63	13-58	t=0.9485

(%: percentage of target words, which participants knew or remembered on average)

In intervention 2, group A learned target vocabulary on Quizlet, while group B used paper flashcards. Group A's scores of listening section pre-test 2 (M = 13, SD = 3.93) are on average lower than group B's (M = 13.63, SD = 5.48). The difference is not significant (t = 0.4151, p =

0.6804, df = 37). Therefore the baselines in word-meaning sections were similar between A and B. Group A's scores of listening section in immediate post-test 2 (M = 32.8, SD = 13.85) are on average higher than group B's (M = 28.47, SD = 14.63). However, an independent t-test indicates that the difference is not significant (t = 0.9485, p = 0.349, df = 37).

Table 14. *Group A's and group B's word-form gains in listening sections of pre-test 2 and delayed post-test 2: total scores, mean scores, percentages, range values, standard deviations, p and t values*

	Pre-test 2 (N=71)				Delayed post-test 2 (N=71)			
	Mean	SD	Range		Mean	SD	Range	
Group A (Quizlet)	13 (18.3%)	3.93	6-20	p=0.6804	27.35 (38.5%)	11.22	10-49	p=0.0084
Group B (Paper flashcards)	13.63 (19.2%)	5.48	2-29	t=0.4151	18.89 (26.6%)	7.18	10-34	t=2.7861

(%: percentage of target words, which participants knew or remembered on average)

Nevertheless, group A's scores of listening section in delayed post-test 2 (M = 27.35, SD = 11.22) are on average higher than group B's (M = 18.89, SD = 7.18). An independent t-test indicated that the difference, this time, is significant (t = 2.7861, p = 0.0084, df = 37).

Figure 7 illustrates group A's and group B's mean scores in the listening sections of pre-test, immediate post-test and delayed post-test 1 (i.e., word-form gains in intervention 1).

Figure 8 illustrates their mean scores in the listening sections of pre-test, immediate post-test and delayed post-test 2 (i.e., word-form gains in intervention 2). In both figures, the blue line presents changes of scores with paper flashcards intervention, and the red one with Quizlet.

In summary, Quizlet groups generally made greater word-form gains than paper flashcards groups. Nevertheless, A's scores on the listening section of immediate post-test 2 were not significantly higher than B's.
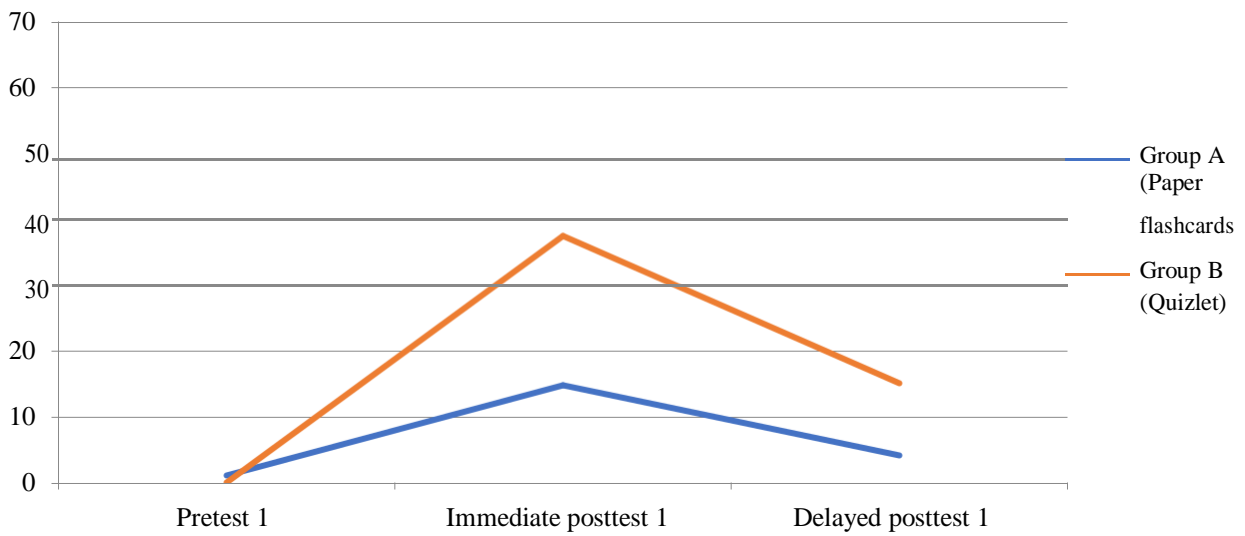
Figure 7. Word-form gains: Listening section 1
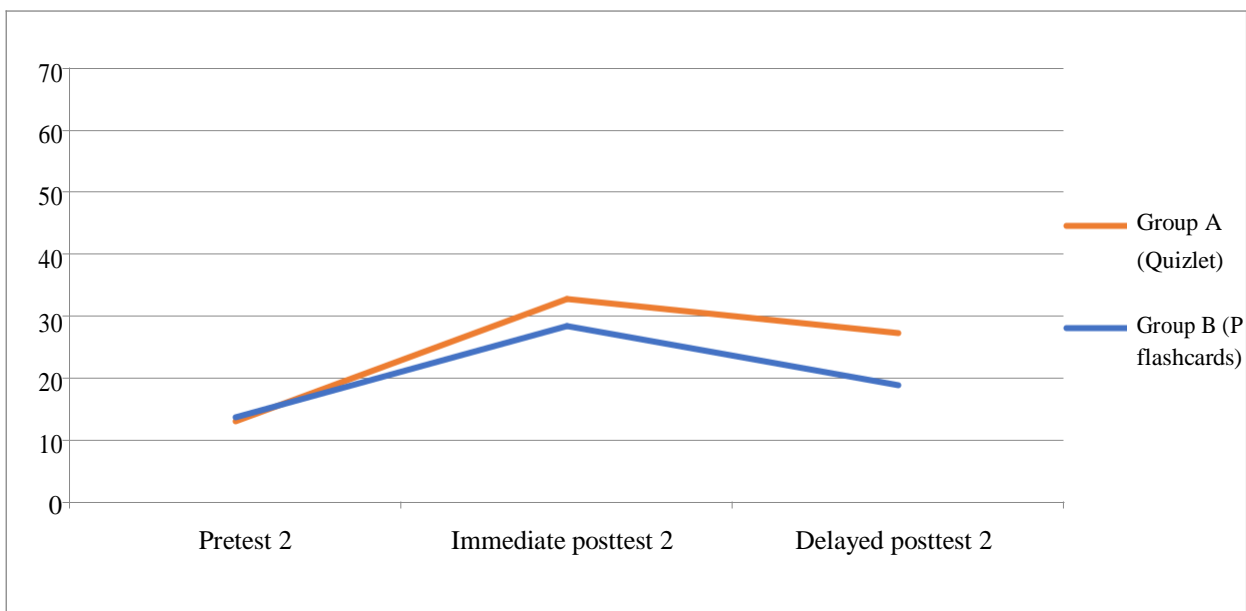
Figure 8. Word-form gains: Listening section 2

As the figures show, the two groups' scores on the listening sections of pre-tests are approximately the same. An independent t-test analysis indicates that group A's scores on the listening section of pre-test 1 is significantly higher than those of group B. However, as can be seen from figure, the mean scores of the two groups on the pre-test 1 listening section are approximately 1. Therefore, the gap between them is small. Moreover, the groups using Quizlet achieve higher scores on the

listening sections of all immediate and delayed post-tests than those using paper flashcards. Besides, gaps in intervention 1 are larger than those in intervention two.

Additionally, figure 7 shows that the difference between the two groups' scores on the listening section of immediate post-test 1 is greater than the difference between their scores on the listening section of delayed post-test 1. In contrast, as can be seen from Figure 8, the gap between their scores on the listening section of delayed post-test 2 is wider than the gap between their scores on the listening section of immediate post-test 2. Also, the gap between A and B's scores on the listening section of immediate post-test 2 is not significant. All the gaps indicate that each of the tools may have different effects on these groups. This may have resulted from their different perceptions towards the tools and the learning activities they did with them.

Word-meaning gains: Tables 15 and 16 present the results of independent t-test analyses of the scores that group A and group B achieved on multiple-choice sections (i.e., word-meaning recall measures) of pre-test 1, immediate post-test 1 and delayed post-test 1.

Table 15. *Group A and group B's word-meaning gains in multiple-choice sections of pre-test 1 and immediate post-test 1: total scores, mean scores, percentages, range values, standard deviations, p and t values*

	Pre-test 1 (N=50)				**Immediate post-test 1 (N=50)**			
	Mean	SD	Range		Mean	SD	Range	
Group A (Paper flashcards)	32.20 (64.4%)	5.66	20-40	p=0.5662	38.60 (77.2%)	4.56	30-46	p<0.0001
Group B (Quizlet)	31.05 (62.1%)	6.70	16-40	t=0.5789	48.37 (96.7%)	1.67	45-50	t=8.7902

(%: percentage of target words, which participants knew or remembered on average)

In intervention 1, group A used paper flashcards to learn target vocabulary, and group B studied with Quizlet. Group B's scores on the multiple-choice section in pre-test 1 (M = 31.05, SD = 6.70) are on average lower than group A's (M = 32.2, SD = 5.66). However, the difference is not significant (t = 0.5789, p = 0.5662, df = 37). Therefore, the baselines in word-meaning sections were similar between groups A and B. On the other hand, group B's scores on the multiple-choice section of immediate post-test 1 (M = 48.37, SD = 1.67) are on average higher than group A's (M = 38.6, SD = 4.56). An independent t-test indicates that the difference is significant (t = 8.7902, p < 0.0001, df = 37).

Table 16. *Group A and group B's word-meaning gains in multiple-choice sections of pre-test 1, immediate post-test 1 and delayed post-test 1: total scores, mean scores, percentages, range values, standard deviations, p and t values*

	Pre-test 1 (N=50)				Delayed post-test 1 (N=50)			
	Mean	SD	Range		Mean	SD	Range	
Group A (Paper flashcards)	32.20 (64.4%)	5.66	20-40	p=0.5662	36.10 (72.2%)	4.32	27-43	p=0.0176
Group B (Quizlet)	31.05 (62.1%)	6.70	16-40	t=0.5789	39.58 (79.2%)	4.43	30-47	t=2.4853

(%: percentage of target words, which participants knew or remembered on average)

Similarly, group B's scores on the multiple-choice section of delayed post-test 1 (M = 39.58, SD = 4.43) are on average higher than group A's (M = 36.1, SD = 4.32). An independent t-test indicates that the difference is significant (t = 2.4853, p = 0.0176, df = 37). In conclusion, B (i.e., Quizlet group) made more word-meaning gains than A (i.e., paper flashcards group) after intervention1.

Tables 17 and 18 present the results of independent t-test analyses of the scores that group A and group B achieved on multiple-choice sections (i.e., word-meaning recall measures) of pre-test 2, immediate post-test 2 and delayed post-test 2.

Table 17. *Group A's and group B's word-meaning gains in multiple-choice sections of pre-test 2 and immediate post-test 2: total scores, mean scores, percentages, range values, standard deviations, p and t values*

	Pre-test 2 (N=71)				Immediate post-test 2 (N=71)			
	Mean	SD	Range		Mean	SD	Range	
Group A (Quizlet)	30.95 (43.6%)	11.49	13-58	p=0.3312	58.75 (82.7%)	12.46	35-71	p=0.7574
Group B (Paper flashcards)	27.95 (39.4%)	6.84	12-39	t=0.9847	57.63 (81.2%)	9.74	40-71	t=0.3112

(%: percentage of target words, which participants knew or remembered on average)

In intervention 2, group A used Quizlet, while group B learned with paper flashcards. Group A's scores on the multiple-choice section of pre-test 2 (M = 30.95, SD = 11.49) are on average higher than group B's (M = 27.95, SD = 6.84). However, the difference is not significant (t =

0.9847, p = 0.3312, df = 37). Therefore the baselines in word-meaning sections were similar between groups A and B. Group A's scores in the multiple-choice section of immediate post-test 2 (M = 58.75, SD = 12.46) were on average higher than group B's (M = 57.63, SD = 9.74). However, an independent t-test indicated that the difference is not significant (t = 0.3112, p = 0.7574, df = 37).

Table 18. *Group A's and group B's word-meaning gains in multiple-choice sections of pre-test 2, immediate post-test 2 and delayed post-test 2: total scores, mean scores, percentages, range values, standard deviations, p and t values*

	Pre-test 2 (N=71)				**Delayed post-test 2(N=71)**			
	Mean	SD	Range		Mean	SD	Range	
Group A (Quizlet)	30.95 (43.6%)	11.49	13-58	p=0.3312	43.15 (60.8%)	8.16	28-54	p=0.0011
Group B (Paper flashcards)	27.95 (39.4%)	6.84	12-39	t=0.9847	34.74 (48.9%)	6.55	26-47	t=3.5383

(%: percentage of target words, which participants knew or remembered on average)

On the other hand, group A's scores in the multiple-choice section of delayed post-test 2 (M = 43.15, SD = 8.16) are on average higher than group B's (M = 34.74, SD = 6.55). An independent t-test indicated that the difference is significant (t = 3.5383, p = 0.0011, df = 37). In summary, A (Quizlet group) made more word-meaning gains than B (paper flashcards group) after intervention

However, A's scores on the multiple-choice section of immediate test 2 were not significantly higher than B's.

Figure 9 illustrates the two groups' mean scores in the multiple-choice sections of pre-test, immediate and delayed post-test 1 (i.e., word meaning gains in intervention 1). Figure 10 presents their mean scores on the multiple-choice sections of pre-test, immediate and delayed post-tests 2. According to Figures 9 and 10, A had higher scores in multiple-choice sections of pre-tests than B, but their gaps were not significant. Besides, Quizlet groups obtained higher scores on multiple-choice sections of all immediate and delayed post-tests than paper flashcard groups. Figure 9 shows that the difference between the two groups' scores on the multiple-choice section of immediate post-test 1 is greater than the difference between their scores on the multiple-choice section of delayed post-test 1. In contrast, as can be seen from Figure 10, the gap between their scores on the listening section of delayed post-test 2 is wider than the gap between their scores on the listening section of immediate post-test 2. Furthermore, the gap between A and B's scores on the listening

section of immediate post-test 2 is not significant. All the gaps indicate that each of the tools may have had different effects on the groups. This may have resulted from their different perceptions towards the tools and the learning activities they did with them.

Figure 9. Word-meaning gains: Multiple-choice section 1
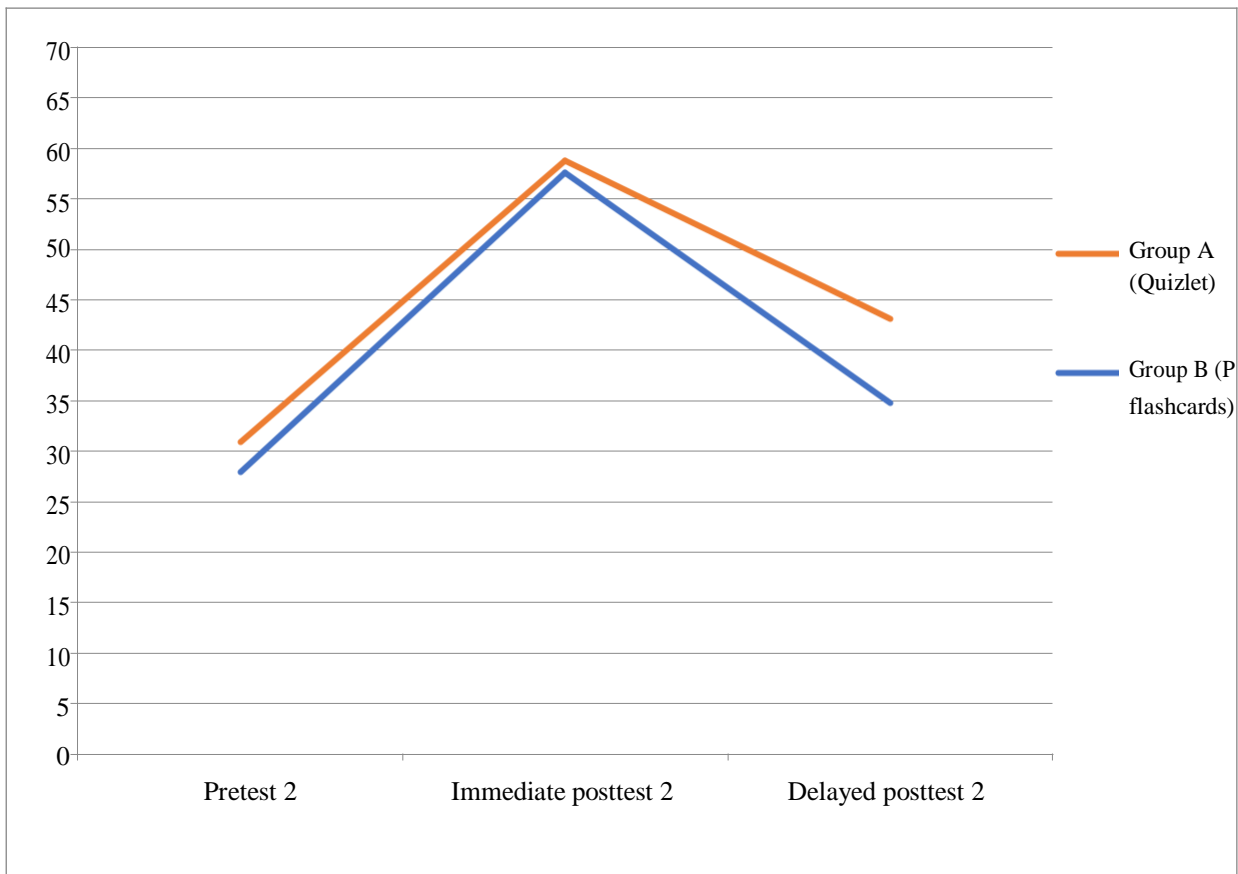
Figure 10: Word-meaning gains: Multiple-choice section 2

To sum up this section, statistical analyses reveal that when the group uses Quizlet its performance is better from pre-tests to immediate post-tests as well as from pre-tests to delayed post-tests than the group using paper flashcards in each intervention. In intervention 2, the gap between groups' test scores widens between immediate post-test 2 and delayed post-test 2. Hence vocabulary retention also appears to be higher with Quizlet learning.

5.2 Multimodal linguistic environments

This subsection assesses the multimodal linguistic environments created by each Quizlet and paper flashcards tools and how the users interact with the environments offered by them. Firstly, I will describe and compare the components of paper flashcards with those of Quizlet. I will also identify the kinds of input participants obtained from each of these two tools. Secondly, I will investigate the learning activities learners actually engaged with in each tool. For a subset of six randomly selected participants I will focus on the length of time they spent on each of the activities, the kind

of inputs they obtained and the outputs they produced. The types of interactivity allowed by either of the linguistic environments created by the tools will also be examined.

5.2.1 Quizlet and paper flashcards components and individual learning activities

Components of Quizlet and paper flashcards: Table 19 presents the components of Quizlet and paper flashcard respectively participants used to learn vocabulary in the present research. In terms of the input the user receives when using these tools, the components will provide either visual (mainly written) or spoken input. Visual input includes a pictorial representation (only for imageable words), the written form of the target word, the part of speech it belongs to, its translation into the L1 of the participants, and an example of the word used within a sentence. Paper flashcards, but not Quizlet ones, also contain the phonetic transcription of the target word (for example, the phonetic transcription of the word "girl" is /ɡɝːl/). The spoken input consists of the audible representation of the target word, which the user hears, in Quizlet, but not with paper flashcards.

Table 19. *Components of Quizlet and paper flashcards*

	Written form	L1 translation	Syntactic category	Use in a sentence sample	Picture	Phonetic transcription	Spoken form
Quizlet flashcard					( )	X	
Paper flashcard					( )		X

(): the component is only available on certain Quizlet and paper flashcards

Note that the participating students are familiar with the IPA phonetic symbols since all secondary students learn it as part of their ESL learning in Vietnam. Therefore, based on the phonetic transcription participants are able to work out how to pronounce the word. Except for the phonetic transcription of a target word, a Quizlet flashcard and a paper flashcard offer similar visual input. However, the Quizlet flashcard, but not a paper one, included the spoken form of the target word thanks to the availability of text-to-speech on the application. In other words, a Quizlet flashcard has the capacity to provide participants with spoken input, while a paper flashcard could not do so. However, all things considered, both Quizlet and paper flashcards assist the participants in learning written forms (i.e., spellings), meanings and spoken forms of target words. Furthermore, these

vocabulary-learning tools would help them establish and reinforce the links between form and meaning of the vocabulary item.

Individual learning activities: As a vocabulary learning tool, either Quizlet or paper flashcards provide language learners with several activities that can be used to acquire new words. Figure 11 is a screenshot summarising Quizlet learning activities in their two modes: Study and Play. A detailed description of each of them is provided in §2.2.1.
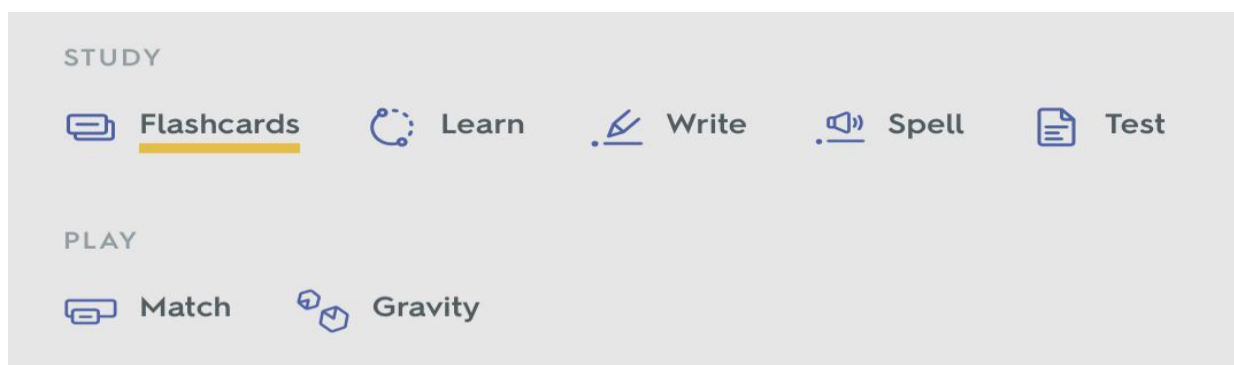
Figure 11. Quizlet learning activities

Four of Quizlet study activities, namely Flashcards, Learn, Write and Spell, provide not only visual but also spoken input. The remaining activities, called Test and two individual games, which are Match and Gravity only offer visual input. This includes the written form of the target word, its Vietnamese translation, its syntactic category and its use in a sentence as well as a pictorial representation. The spoken input is a native English spoken form of the vocabulary item. All learning activities and games on Quizlet, except Flashcards and Match, require users to produce written output. Additionally, in all Quizlet study modes and games, users are given feedback on their answers. However, although the application provides spoken input, users are not required to produce spoken output (Table 1 in §2.2.1 summarises the input and feedback each Quizlet mode offers, and the output required from users).

As compared to Quizlet, paper flashcards offer language learners more limited individual learning activities. The two activities participants were able to do individually with paper flashcards to acquire target words, were (i) retrieving forms and (ii) retrieving meanings of the vocabulary items (§2.2.2 describes the activities). Like Quizlet modes, the individual learning activities with paper flashcards offer written input, which consists of the visual form of the target word, its Vietnamese translation, its syntactic category, its use in a sentence sample and its pictorial representation. Unlike Quizlet, paper flashcards provide phonetic transcription of the word (instead

of its spoken input). Also, the learning activities with paper flashcards are more limited in receiving input and giving feedback than most of Quizlet modes. Learners have to manually flip the cards to check whether they remember forms or meanings of target words correctly. Besides, paper flashcards do not require learners to produce any specific kind of output (Table 2 in §2.2.2 details input and feedback for each learning activity with paper flashcards, and output required from learners).

In summary, Quizlet seem to bring more advantages to the participants than paper flashcards such as spoken input and a greater range of individual learning activities. Furthermore, Quizlet requires the participants to produce written output and provides them with more detailed feedback.

5.2.2 Focused analysis of participants' engagement in vocabulary learning

The present study examined the kind of activities participants were actually doing during the task-based vocabulary learning session with either Quizlet or paper flashcards. Also, it measured how long they were engaged in each of the learning activities. Six participants (A1, A10, A17, A6, A14 and A34) were randomly selected from two groups. Their learning activities with each of the tools will be recorded on video. Each video was ten-minutes long (i.e., the learning activities using Quizlet or paper flashcards.

In this subsection, firstly the lengths of time that each of the participants spent on learning activities with Quizlet or paper flashcards are analysed. Secondly, the multimodal linguistic environments created by Quizlet and paper flashcards are discussed in terms of input, output and interactivity.

Overall participants' time allocation for activities: Table 20 presents how much time each participant spent on each of the learning activities on Quizlet. As the table shows, none of the participants used all of the learning activities available on the application. Rather, there were considerable differences between what each student did with what activity and for how long. Specifically, A1 was the participant who used the most activities from both Study and Play modes of Quizlet within the allowed 10 minutes, while A17 and A6 did just one and two learning activities respectively. Five of the randomly selected participants learned target words in Flashcards, and four of them (A1, A6, A14 and A34) played the vocabulary learning game, Gravity. A17, A6 and A14 spent most of their 10 minutes on Flashcards, while A1 spent more than half of the time on Spell. A10 spent approximately similar amounts of time on Learn and Spell, while A34 spent nearly the same amounts of time on Test and Gravity.

In summary, a wide range of individual differences in the choice of activities was observed in learning vocabulary through Quizlet.

Table 20. *Time spent on individual study and play modes in Quizlet (out of 10 minutes)*

Modes	Study					Play	
	Flashcards	Learn	Write	Spell	Test	Match	Gravity
Participants							
A1	1'	1'	1'30''	5'30''	0	0	1'
A10	1'	4'37''	0	4'23''	0	0	0
A17	10'	0	0	0	0	0	0
A6	7'	0	1'	0	0	0	2'
A14	6'18''	0	0	0	0	0	3'34''
A34	0	0	0	0	4'50''	1'	4'10''

Table 21 presents how much time each participant spent on either of the learning activities with paper flashcards. Literature review in Chapter 2 suggested that there are two possible activities with paper flashcards: retrieving target forms in English and retrieving meanings. My analysis of the learner engagements with paper flashcards in this study also supports this, and there were no other activities that the learners performed. As can be seen from the table, during the allowed ten minutes, A1, A10 and A6 retrieved both target words and their meanings, while the other three learners, namely A17, A14 and A34 spent the whole ten minutes on recalling target words from memory. This means that half of the participants engaged in only one learning activity with paper flashcards.

Table 21. *Time spent on individual learning activities with paper flashcards (out of 10 minutes)*

Learning activities	Retrieving forms	Retrieving meanings
Participants		
A1	5'44''	4'16''
A10	4'	6'
A17	10'	0
A6	1'22''	8'38''
A14	10'	0
A34	10'	0

Next we move on to the analysis of the input that the randomly selected participants were exposed while they were engaged in activities using Quizlet modes and paper flashcards. Four of the students (i.e. A1, A10, A17 and A14) obtained both spoken and visual input from study modes and games available on Quizlet (see Table 20 above). Additionally, except for A34, participants received considerable spoken input when using Quizlet since they spent sizeable portions of the allowed time on study modes offering spoken input, i.e., Flashcards, Learn, Write and Spell. Unlike other students, A34 obtained no spoken but written input from Quizlet (see Table 20). Instead of spending any time for learning and revising target words, this student went directly to the test and games in the application. In terms of paper flashcards, both its learning activities offer written input only, hence all six participants obtained just written input from the paper flashcard activities.

Following this we examine the analysis of the output produced by the six participants. Output can be spoken or written. Tables 20 and 21 present activities each participant engaged in with Quizlet and paper flashcards respectively. All six participants utilised at least one of the learning activities from Quizlet's Study and Play modes, which require written output. Thus, all of them produced written language output. Paper flashcards, on the other hand, do not require output. However, analysis of video recordings of the learners' activities using paper flashcards reveal that half of the participants (A6, A14 and A34) wrote down the vocabulary items as well as their L1 translations during the activities. All things considered, Quizlet seems to offer more writing output opportunities. Regarding speaking output, neither Quizlet nor paper flashcards require it: it is totally up to learners' choice whether to produce speaking output or not through the activity. Although four out of five study modes on Quizlet offered spoken input, none of them require the learner to produce speaking output. In other words, the participants did not need to pronounce target words when using the app. According to screen captures of their individual learning activities on Quizlet, only A14 produced spoken output. This participant looked at digital flashcards, listening to pronunciations of target words and then pronounced the words. With paper flashcards, on the other hand, three learners, namely A10, A17 and A14 pronounced target words when performing the activities. So, although paper flashcards do not offer spoken input, the number of participants producing speaking output with paper flashcards (50%) was triple that of participants producing speaking output with Quizlet (17%), (see Appendix F for the time each of the six participants spent on pronunciations of target words). Although half of the learners considered here produced speaking output with paper flashcards, there is no guarantee whether the pronunciations of the words by participants were target-like. They produced speaking output based on the phonetic transcription shown in the flashcard but given the nature of "paper" flashcard the learner was not able to "hear" models of the target pronunciation. That is, it would be more beneficial for the

learner if Quizlet had a module to ask the participant to produce the target word and check or diagnose the pronunciation, which is currently not available.

Last but not least, the researcher presents the analysis of interactivity and feedback in multimodal linguistic environment created by either tool. Firstly, both linguistic environments allowed user control. That is, the participants were able to determine their learning pace and to decide which learning activities they choose to do. According to the Table 20 above, participants were able to learn target vocabulary in different modes with Quizlet. They were also able to decide how much time they would like to spend on the chosen mode. For instance, A17 spent the whole ten minutes on Flashcards. Similarly, with paper flashcards (Table 21 above), the students were able to determine which learning activity they would do. Half of them, in fact, just retrieved forms of target words during the allowed time. Secondly, Quizlet allowed dialoguing. In study modes and games of the application, the participants were able to answer questions and receive feedback on their answers (Table 1 in §2.2.1). Especially, when they used Learn, Write, Spell and Gravity, explicit corrective feedback was given immediately, and the participants had to attempt again any question that they answered incorrectly before moving on to the next one. For instance, according to the screen capture of A1' performing Spell in Quizlet, one participant listened to the word "illiterate", but typed it incorrectly. After entering the incorrect answer, Quizlet showed how to spell the word correctly. Then, she had to listen to the word and type it again. Paper flashcards, on the other hand, are more limited in providing dialoguing because the only way of obtaining feedback is when the students flip the card to check whether they remember the specific form or meaning of target word correctly (Please refer to Table 2 in §2.2.2).

In summary, in terms of input, all the six randomly selected participants obtained visual input when using Quizlet, and most of them received spoken input from Study and Play modes. On the other hand, with paper flashcards, they obtained only visual input. Regarding output, all the students produced written output when learning target vocabulary on Quizlet since most of Study and Play modes of the application require that kind of output. With paper flashcards, on the other hand, just three of the participants produced written output because neither of its learning activities requires them to do that. On the other hand, there were more participants producing spoken output with paper flashcards than with Quizlet. Lastly, concerning interactivity, in both the multimodal linguistic environments created by either tool, the participants were able to control the learning pace and obtained feedback. However, our analysis found that Quizlet provides a wider range of feedback than paper flashcards.

5.3 Learners' perceptions

This section presents the analysis of participants' responses to a questionnaire, which was administered after the completion of vocabulary training sessions in the research. It asked about their behavioural, emotional and cognitive engagement in learning vocabulary with Quizlet and paper flashcards; their opinions about the usability and usefulness of the tools; their preference for either of the tools and reasons for that (see Appendix E).

*Behavioural, emotional and cognitive engagement:*The questionnaire included questions about the frequency of learning vocabulary with Quizlet and paper flashcard outside the classroom and length of each learning session (see Appendix E). The aim of the questions is to investigate behavioural and cognitive engagement. Figure 12 illustrates self-reports of all 39 participants on how often they used each of the tools for vocabulary self-study.

	I did not study	Once - three times a week	Four - six times a week	Every day
Quizlet	10.30%	46.20%	28.20%	15.40%
Paper flashcards	7.70%	69.20%	15.40%	7.70%
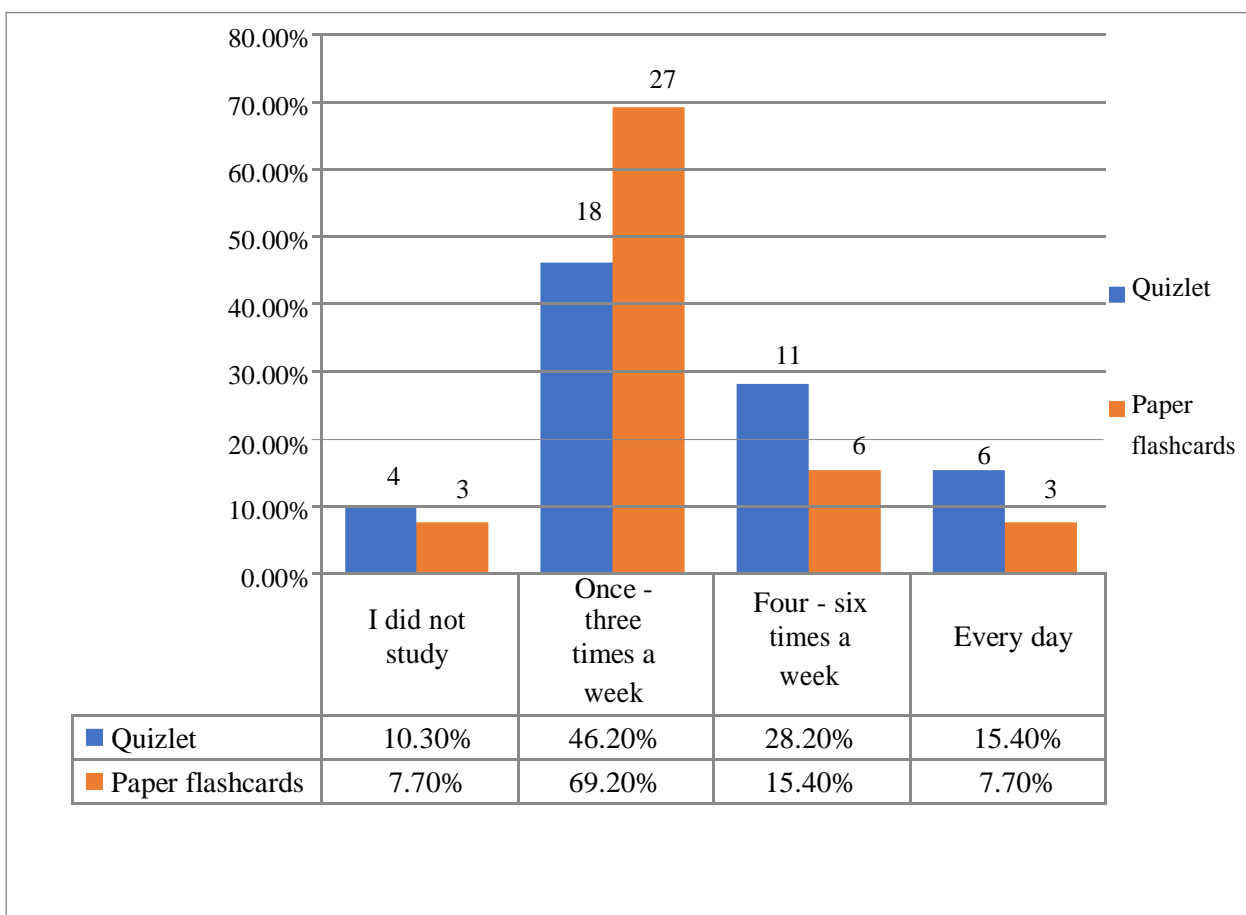
Figure 12. Frequency of learning vocabulary with Quizlet/paper flashcards outside the classroom (N=39)

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According to Figure 12, most of the participants used each of the tools from once to three times a week outside the classroom (i.e., 46.2% with Quizlet and 69.2% with paper flashcards). In contrast, out of 39 participants, only four did not use Quizlet, and three did not use paper flashcards. There were no participants who did not use either of the tools. Thus, both of the tools seem to have encouraged them to maintain a regularity of learning vocabulary beyond the classroom.

On the other hand, there were more participants using Quizlet at great frequency than those who used paper flashcards. For example, 43.6% of the students used Quizlet four times or more per week (as opposed to 23.1% with paper flashcards). This is almost double the number of those who used paper flashcards at the same frequency. However, it may be important to point out that there were slightly more participants who did not learn vocabulary with Quizlet than those with paper flashcards. Thus, individual differences turned out to be greater with Quizlet than paper flashcards.

Figure 13 presents the students' self-reports on how much time per session they spent on learning vocabulary with the tools.

	I did not study	Less than 20 minutes	20-40 minutes	40-60 minutes	More than 60 miutes
■ Quizlet	10.30%	33.30%	41.00%	12.80%	2.60%
■ Paper flashcards	5.10%	35.90%	48.70%	10.30%	0%
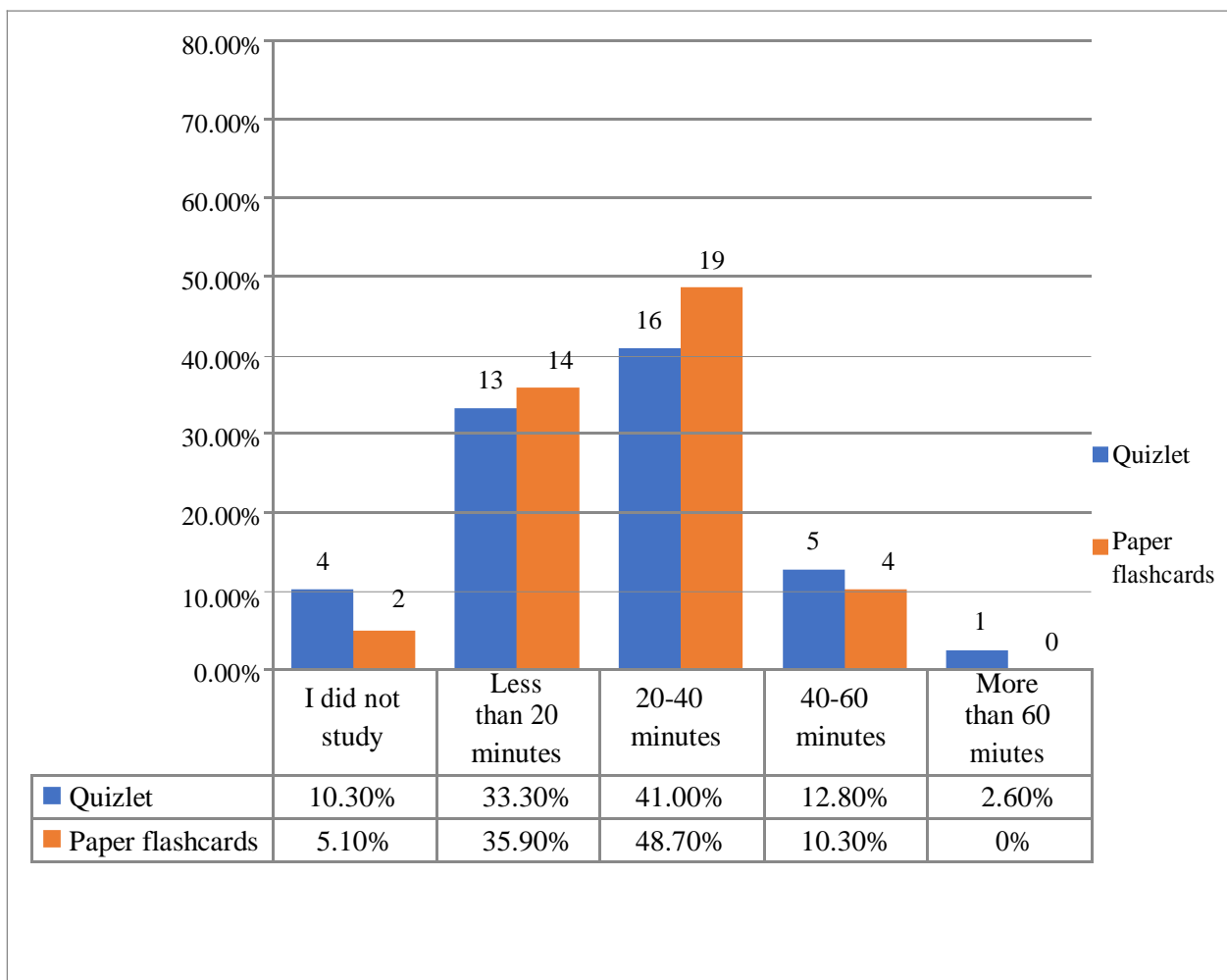
Figure 13. Length of the vocabulary learning session with Quizlet/paper flashcards outside the classroom (N=39)

The distributions of participants over different lengths of learning sessions are fairly similar between Quizlet and paper flashcards. As can be seen from Figure 13, most of them spent 40 minutes or less per session with each of the tools (i.e., 84.6% with Quizlet and 89.8% with paper flashcards). Only small numbers of students used each of the tools for 40 minutes or more per session.

In addition to the above-mentioned questions about behavioural and cognitive engagement, the questionnaire involved the question items relating to emotional engagement (see Appendix E). Participants were asked to rate their views toward the enjoyability of learning English with Quizlet and paper flashcards. Figure 14 illustrates their ratings.

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
Quizlet	0%	0%	0%	10.30%	38.50%	51.30%
Paper flashcards	0%	2.60%	15.40%	28.20%	33.30%	20.50%
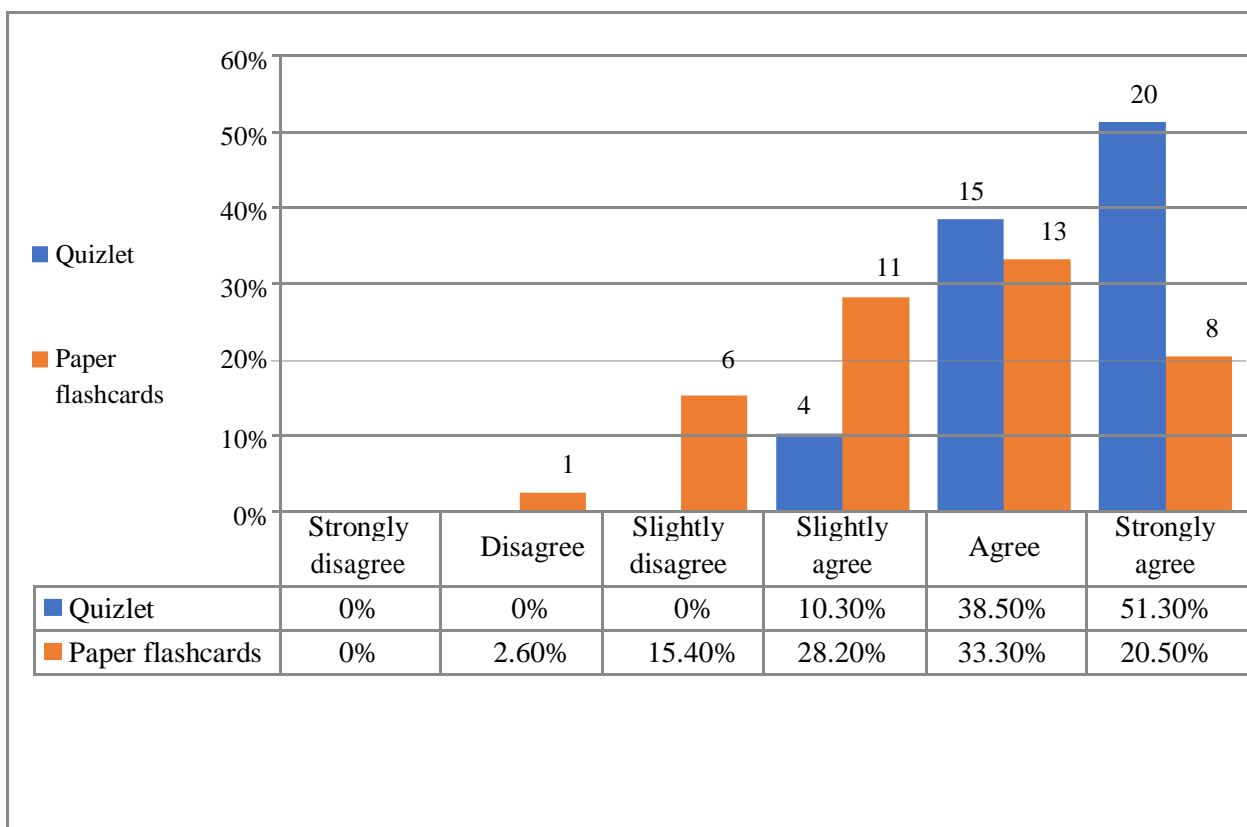
Figure 14. Ratings about the enjoyment in learning English vocabulary via Quizlet/paper flashcards

Regarding Quizlet, most of participants (51.3% or 20 students) strongly agreed that using it was enjoyable. The other agreed (15 students) and slightly agreed (four students) with the statement: no one disagreed about the enjoyability of the tool. As for paper flashcards, the majority of them (82.1%) slightly agreed, agreed and strongly agreed that using the tool was enjoyable. However, the participants who strongly agreed about the enjoyability of paper flashcards (eight students) were fewer than those with Quizlet.

In summary, participants' behavioural, cognitive and emotional engagement in learning vocabulary with the tools was generally high. According to their responses to the questionnaire, it is certainly the case that both Quizlet and paper flashcards encouraged them to study on a regular basis beyond the classroom. Additionally, the students seem to have spent similar amounts of time per session with each of the tools. This indicates the types of tool did not affect the amount of time per session spent on learning vocabulary. On the other hand, regarding the great frequency of use of the two tools, the students who used Quizlet were greater than those using paper flashcards. Also, the variation among participants' learning frequency with Quizlet was greater than that with paper flashcards. From these results, Quizlet seemed to have fostered emotional engagement in learning vocabulary more than paper flashcards.

Usability and usefulness: Firstly, the questionnaire included some question items about participants' perception of the usability of the two tools. As for Quizlet, 48.7% of them strongly agreed that using it was easy. The other agreed (38.5%) and slightly agreed (12.8%) on its ease of use: No one disagreed about that. Regarding paper flashcards, the number of students who strongly agreed about its usability (30.8%) was smaller than the quantity of those strongly agreeing about Quizlet. Furthermore, two learners disagreed and one slightly disagreed that using paper flashcards was easy. Thus, there were more participants approving of the usability of Quizlet than those who thought that using paper flashcards was easy (see Appendix F).

Secondly, the questionnaire involved several questions about usefulness. Participants rated their views towards the effect of the tools on learning speed, long-term memorisation and development of vocabulary. With regard to learning speed, the number of participants who agreed about Quizlet's usefulness was larger than those with paper flashcards. For example, 25.6% strongly agreed that Quizlet helped to learn vocabulary quickly, and just one participant disagreed. Students who strongly agreed about paper flashcards' usefulness (23.1%) were slightly fewer than those approving of Quizlet. Furthermore, three participants disagreed that paper flashcards helped to learn vocabulary quickly (see Appendix F).

Concerning long-tem memorisation, there were more students who perceived that paper flashcards were useful than those approving of Quizlet. For instance, 23.1% strongly agreed and 33.3% agreed about paper flashcards' usefulness. The numbers were slightly larger than the quantities of participants who strongly agreed (20.5%) and agreed (30.8%) about Quizlet's usefulness. Moreover, three students strongly disagreed and four disagreed that Quizlet helped to memorise vocabulary in a long term, while just two of them strongly disagreed and one disagreed about paper flashcards (see Appendix F).

In terms of vocabulary development, the number of participants approving of paper flashcards' utility (48.7%) was slightly greater than the quantity of those agreeing about Quizlet (43.6%). Also, no one disagreed that paper flashcards developed their vocabulary, while two students disapproved of Quizlet's usefulness (see Appendix F).

In summary, more participants indicated that using Quizlet was easy and increased the learning speed. On the other hand, more students perceived that paper flashcards had the positive influence on long-term memorization and development of vocabulary. In other words, they seem to believe that using Quizlet was easier, but paper flashcards were the more effective vocabulary-learning tool.

Preference and reasons: The questionnaire asked about participants' preference for either of the tools and their reasons for the choices. Figure 15 illustrates the percentages of participants who preferred either Quizlet or paper flashcards.
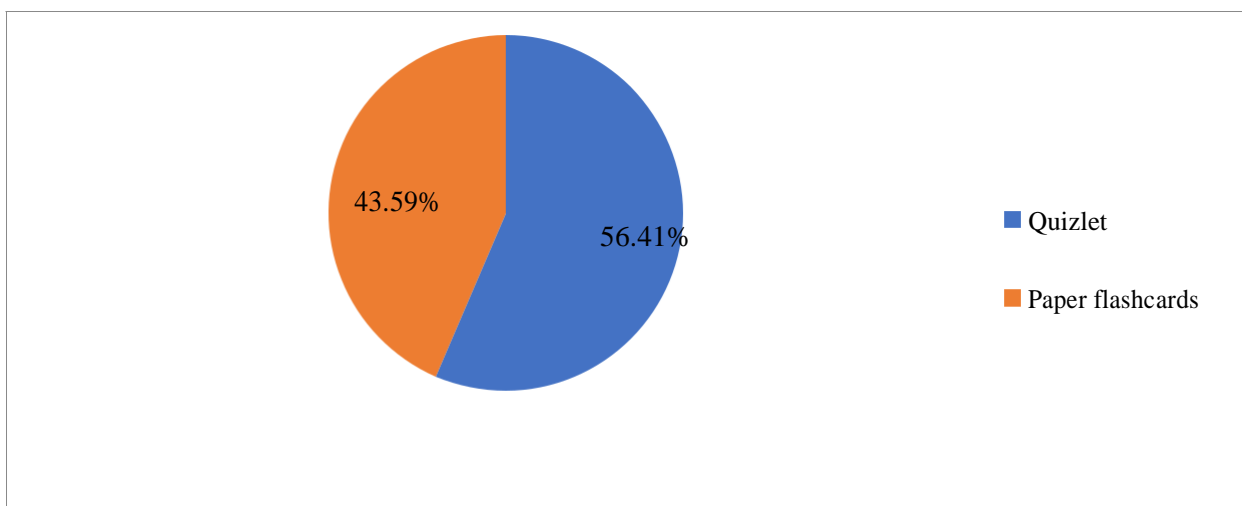
Figure 15. Preference for either Quizlet or paper flashcards

It turned out that 56.41% (22 students) preferred Quizlet, and 43.59% (17 students) paper flashcards. This indicates that the preference for Quizlet over paper flashcards is slightly higher. The questionnaire also asked about their reasons for the preference. The KWIC Concordance program (KWIC Concordance for Windows Ver.5, n.d.) was used to analyse key words appearing in their reasons. The key words include "user-friendly", "convenient", "interesting", "remember", "pictures", "pronunciations" and "games". Table 22 presents the times these words mentioned by participants.

Table 22. *Key word analysis results*

	Quizlet	Paper flashcards
User-friendly	5 times	6 times
Convenient	5 times	7 times
Interesting	10 times	6 times
Remember	13 times	9 times
Pictures	3 times	Once
Pronunciations	2 times	None
Games	4 times	None

The analysis found some similarities in the reasons for their preferences. The most frequently mentioned reason was that the tools help them to remember new words fast and longer. The word "remember" were mentioned 13 times by the students preferring Quizlet, and nine times by those preferring paper flashcards. Another reason was the enjoyability of the tools. The word "interesting" appeared 10 times in reasons for preferring Quizlet, and six times in those for reasons for favouring paper flashcards. Also, participants stated that they favoured the tools due to their usability and convenience. The words "user-friendly" and "convenient" were mentioned five times each by participants preferring Quizlet, and six and seven times respectively by those favouring paper flashcards. Besides, the two tools were favoured because of the pictures included in them. In addition to the reasons above, a number of participants had the preference for Quizlet because of games and spoken forms of target words, which are not available in paper flashcards.

In summary, both the tools foster behavioural, cognitive and emotional engagement in vocabulary learning. However, Quizlet seems to have encouraged participants to learn vocabulary at great frequency, and stimulated emotional engagement better than paper flashcards. Additionally, there were more students who perceived using the tool was easy and helped to increase the learning speed. On the other hand, more students believed paper flashcards supported long-term memorisation and development of vocabulary. Lastly, more participants preferred Quizlet to paper flashcards. The most frequently mentioned reason for their preference was either of the tools promoted vocabulary memorisation. Furthermore, some students favoured Quizlet because of some of its features, which are unavailable in paper flashcards (i.e., games and spoken forms of target words).

5.4 Summary

This chapter presents the results of the study on the efficacy of Quizlet and paper flashcards to the vocabulary acquisition of Vietnamese EFL learners. Regarding vocabulary gains, both A and B made significant word-form and word-meaning gains after two interventions using Quizlet and paper flashcards. Therefore, both these tools are effective in fostering vocabulary development. However, generally the group using Quizlet performed better with vocabulary gains and retentions from pre-tests to immediate post-tests and from pre-tests to delayed post-tests than the group using paper flashcards. Therefore, Quizlet seems to promote vocabulary retention better. Nevertheless, for immediate post-test 2, independent t-test analyses show that A (i.e., Quizlet group in intervention 2) did not have significantly higher scores than B (i.e., paper flashcards group in intervention 2). Additionally, the gap between group scores in delayed post-test 2 was greater than the gap between their scores in immediate post-test 2. In contrast, the gap between A's and B's scores in delayed post-test 1 was smaller than the gap between their scores in immediate post-test 1. Thus, each of the tools (i.e., Quizlet and paper flashcards) may influence the groups differently. In order to identify why learning vocabulary with Quizlet turned out to be superior overall, than that with paper flashcards, the learning activities participants actually engaged with the two tools were examined along with perceptions toward them. This is because the learning activities participants actually performed with the tools and their perceptions toward them may help explain the difference. In terms of multimodal linguistic environments, Quizlet brought more advantages to learners than paper flashcards. For example, in addition to visual input, Quizlet provided spoken input, which is not available with paper flashcards. Besides, learners were able to do more learning activities with Quizlet, including games (also not available with paper flashcards). In addition, Quizlet, but not paper flashcards, provided learners opportunities for writing output together with detailed feedback. According to observations from video recordings and screen captures, most of the six randomly selected participants obtained both spoken and visual input from Quizlet, and only visual input from paper flashcards.

Furthermore, all six of them produced writing output when using Quizlet, and only three did this with paper flashcards. On the other hand, unexpectedly, more participants produced spoken output when using paper flashcards, even though they received no aural input from the flashcards. Concerning learners' perceptions towards the two learning tools, participants indicated that they engaged behaviourally, cognitively and emotionally in learning vocabulary with both Quizlet and paper flashcards. Both helped them to learn vocabulary regularly outside the classroom. However,

there were more participants who used Quizlet with greater frequency than those using paper flashcards. Regarding usability and usefulness, more participants stated that Quizlet was user-friendlier and helped increase the learning speed. On the other hand, more indicated that paper flashcards helped them better memorise new words and develop their vocabulary. This evaluation of the two tools by the participants is interesting since the actual learning outcomes contradict their evaluations. That is, learning outcomes with Quizlet were better than those with paper flashcards. This means that Quizlet helped the participants to develop their vocabulary learning without their realising its learning effects: they learned vocabulary while having 'fun'. Participants might have felt that 'traditional' way of learning vocabulary using paper flashcards is a more serious and academic way to studying vocabulary. Most of them stated that either of the tools fostered vocabulary memorisation. Yet, the number of participants preferring Quizlet was greater than those favouring paper flashcards.

Thus, educational apps such as Quizlet seem to have a great potential in promoting better learning outcomes in educational contexts while maintaining the student's pedagogical motivations (Kawaguchi & Watkins 2015).

CHAPTER 6: CONCLUSION

This chapter concludes the present research on the efficacy of Quizlet and paper flashcards for vocabulary acquisition. Firstly, section 6.1 summarises the findings relating to the research questions of the study. The following, section 6.2 discusses the theoretical, educational and social implications of the current research. Lastly, section 6.3 presents the limitations of the study and offers suggestions for further studies.

6.1 Major findings of the study

The study investigated the effectiveness of Quizlet and paper flashcards for vocabulary acquisition under two theoretical frameworks: CATLM (Moreno & Mayer, 2007) and Miyamoto's study on the evaluation of digital learning tools (Miyamoto, 2001). An intact class of 39 Vietnamese high school students participated in the study. Their vocabulary gains were assessed through a pre-test, intervention, immediate post-test and delayed post-test design. Detailed data regarding the linguistic environments created by the two tools were obtained from video recordings and screen captures of six randomly selected participants' learning activities. Learners' perceptions regarding the tools were investigated through a questionnaire. In what follows, I summarise research findings, according to the research questions (RQ) shown below:

RQ 1: Do EFL learners achieve any significant vocabulary gains with either Quizlet or paper flashcards?

RQ 2: Is there any significant difference in the vocabulary gains between the learners using these tools?

RQ 3: Is there any difference between the multimodal linguistic environments created by Quizlet and paper flashcards?

RQ 4: What are Vietnamese high school students' perceptions towards the two tools?

Regarding RQ 1, according to statistical analyses, participants made significant vocabulary gains regardless of which tool they used in each intervention. This suggests that both Quizlet and paper flashcards helped them enlarge their vocabulary.

On the other hand, the answer for RQ 2 is that the groups using Quizlet made bigger vocabulary gains from pre-tests to immediate post-tests and from pre-tests to delayed post-tests.

Thus, Quizlet promotes vocabulary acquisition more effectively than paper flashcards. The finding supports the assumptions of the cognitive affective theory of learning with media (CATLM; Moreno & Mayer, 2007).

Concerning RQ 3, data analysis revealed that the multimodal linguistic environment created by Quizlet offers more input, learning activities, output opportunities and detailed feedback than the one created by paper flashcards.

RQ 4 concerns the students' perceptions toward the two tools. According to their responses to the questionnaire, they were cognitively, behaviourally and emotionally engaged in vocabulary learning activities with both tools. However, Quizlet encouraged them to learn vocabulary at greater frequency than paper flashcards. They also indicated that they had higher emotional engagement in using Quizlet than paper flashcards. They perceived that Quizlet was user-friendlier and helped them to acquire vocabulary faster. On the other hand, paper flashcards were considered to be more effective in vocabulary memorisation and development.

6.2 Implications of the study

As for theoretical implications, the findings of this research provide empirical data for CATLM (Moreno & Mayer, 2007). One of our research findings suggests that the groups using Quizlet made bigger vocabulary gains than the ones using paper flashcards. This supports the assumptions of CATLM positing, "two separate channels (i.e., auditory and visual channels) for processing different information modalities", and their limited working memory capacity. As opposed to paper flashcards, Quizlet offers input, which is both visual and auditory (the spoken form). When using the tool, learners process meanings, written and spoken forms of target words using both visual and auditory channels. This helps them manage the limited working memory capacity of each channel more efficiently, and neither of the channels is clogged up by having to process all of the required information. Another finding of our study reveals that participants preferred using Quizlet to paper flashcards, and they learned vocabulary with that tool more frequently. This supports the assumption of CATLM (Moreno & Mayer, 2007) concerning the influence of affective factors on learning.

Further, the current study confirms the importance of the linguistic environment for vocabulary acquisition. Indeed findings indicate that the linguistic environment created by Quizlet provided participants with input and output opportunities as well as feedback to a greater extent

than those provided by paper flashcards. Thus, when the groups used Quizlet they achieved more vocabulary gains than when they used paper flashcards.

The educational and social implications of the current research concern both the school level and government policy level. At the educational level, this study suggests both Quizlet and paper flashcards should be utilised in classroom settings as they have positive effects on the acquisition of English vocabulary. On the other hand, the present research findings show that digital applications like Quizlet have greater potential to develop English vocabulary than traditional learning tools like paper flashcards. Additionally, students today are greatly interested in information communication technology, which is also the case in Vietnam. In 2011, 95 % of the Vietnamese who are 15-24 years old use the Internet (Cimigo, 2011). In 2017, 84% of the people in the country have smart phones (Nielsen, 2017). Thus, teachers should consider the advantage of information communication technology to foster English vocabulary acquisition and engage students in the classroom.

At the government policy level, the government of Vietnam may benefit from this study, as it supports the belief that the use of digital tools in language learning can contribute to the development of Vietnamese students' proficiency in English L2 and it indicates that promoting the application of information communication technology in education can help towards achieving stated goals in 2008 and 2017 (Government of Vietnam, 2017a; Government of Vietnam, 2017b). Specifically, the present research would encourage the introduction of digital apps such as Quizlet to promote learning outcomes among Vietnamese students.

6.3 Limitations of the study

The present study has several limitations. First, we investigated only one high school in Hai Duong, Vietnam. It would be more informative to confirm (or otherwise) our results with other schools in other provinces. Another limitation is that the sample size is relatively small. This study involved only one intact class at high school level. However, this helped the experiment to control other variables such as different textbooks used at the school, students' majors, different teachers and so on. However, it would be necessary for future studies to examine a larger sample size to support the generalisation of the current research findings. Also the duration of the experimental study was rather short. For example, delayed post-tests were taken two weeks after the immediate post-tests, which may not be long enough to observe whether participants were able to retain in memory the

target words. Therefore, it is advisable to conduct a similar experiment over a longer span of time to measure vocabulary retention over the long term.

In conclusion, the current research investigates the efficacy of Quizlet and paper flashcards to vocabulary acquisition of Vietnamese EFL learners under two theoretical frameworks: CATLM (Moreno & Mayer, 2007) and Miyamoto's (2001) evaluation of blended learning projects. Our research suggests that a digital application, such as Quizlet, is more effective in promoting vocabulary acquisition than paper flashcards, a traditional learning tool. This is in line with the assumptions of CATLM (Moreno & Mayer, 2007) and supported by the findings about linguistic environments created by Quizlet and paper flashcards, as well as learners' perceptions of the tools.

REFERENCES

Ashcroft, R., Cvitkovic, R., & Praver, M. (2018). Digital flashcard L2 vocabulary learning out-performs traditional flashcards at lower proficiency levels: A mixed-methods study of 139 Japanese university students. *The EUROCALL Review, 26*(1), 14-28. Retrieved from https://doi.org/10.4995/eurocall.2018.7881

Baddeley, A. (1992). Working memory. *Science, 255,* 556–559.

Barcroft, J. (2007). Effects of opportunities for word retrieval during second language vocabulary learning. *Language Learning, 57*(1), 35-56. Retrieved from https://doi.org/10.1111/j.1467-9922.2007.00398.x

Bekhet, A., & Zauszniewski, J. (2012). Methodological triangulation: An approach to understanding data. *Nurse Researcher, 20*(2), 40-43. doi: 10.7748/nr2012.11.20.2.40.c9442

Chien, C. W. (2015). Analysis the effectiveness of three online vocabulary flashcard websites on L2 learners' level of lexical knowledge. *English Language Teaching, 8*(5), 111-121. Retrieved from http://jalt-publications.org/files/pdf/the_language_teacher/40.6tlt.pdf#page=27

Cimigo. (2011). Vietnam NetCitizens report 2011. Retrieved from https://www.cimigo.com/en/research-reports/vietnam-netcitizens-report-2011-english/

Dang, N. T. (2011). *Exploring CALL options for teaching EFL in Vietnam* (Master's thesis). Retrieved from https://cornerstone.lib.mnsu.edu/etds/273/

Dang, X. T., Pham, N. T., Ngo, T. M., & Ngo, V. G. (2012). ICT in ELT–Factors affecting lecturers' usage of ICT: A case study in higher education in Vietnam. *La Trobe University*. Retrieved from https://www.semanticscholar.org/paper/ICT-in-ELT-Factors-affecting-lecturers'-usage-of-a-Dang-Pham/c53c7f7b27124af7572fee3011e12c89ad52f0d5

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340. Retrieved from http://www.jstor.org/stable/249008

Decarrico, J. S. (2001). Vocabulary learning and teaching. In M. Celce-Murcia (Ed.), *Teaching English as a second or foreign language* (3rd ed.) (pp. 285-299). Boston: Heinle & Heinle.

Dizon, G. (2016). Quizlet in the EFL classroom: Enhancing academic vocabulary acquisition of Japanese university students. *Teaching English with Technology, 16*(2), 40-56. Retrieved from https://files.eric.ed.gov/fulltext/EJ1135913.pdf

Dizon, G., & Tang, D. (2017). Comparing the efficacy of digital flashcards versus paper flashcards to improve receptive and productive L2 vocabulary. *The EuroCALL Review, 25*(1), 3-15. Retrieved from https://polipapers.upv.es/index.php/eurocall/article/view/6964/7830

Elgort, I. (2010). Deliberate learning and vocabulary acquisition in a second language. *Language Learning, 61*(2), 367-413. doi: 10.1111/j.1467-9922.2010.00613.x

Egort, I., & Nation, I. S. P. (2010). Vocabulary learning in a second language: Familiar answers to new questions. In P. Seedhouse, S. Walsh, & C. Jenks (Eds.), *Conceptualising "learning" in applied linguistics* (pp. 89-104). London: Palgrave Macmillan.

Flores, J. F. F. (2015). Using gamification to enhance second language learning. *Digital Education Review, 27*, 32-54. Retrieved from https://files.eric.ed.gov/fulltext/EJ1065005.pdf

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59–109. Retrieved from https://doi.org/10.3102/00346543074001059

Gardner, R. C. (1985). *Social psychology and language learning: The role of attitude and motivation*. London: Edward Arnold.

Godwin-Jones, R. (2011). Mobile apps for language learning. *Language Learning and Technology, 15*(2), 2-11. Retrieved from http://llt.msu.edu/issues/june2011/emerging.pdf

Government of Vietnam. (2017a). *Quyết định phê duyệt điều chỉnh, bổ sung đề án dạy và học ngoại ngữ trong hệ thống giáo dục quốc dân giai đoạn 2017 – 2025(Directive on adjusting the foreign language project in the national education system period 2017 – 2025)* (No. 2080/QĐ-TTg). Retrieved from https://thuvienphapluat.vn/van-ban/Giao-duc/Quyet-dinh-2080-QD-TTg-2017-bo-sung-De-an-day-hoc-ngoai-ngu-trong-he-thong-giao-duc-quoc-dan-370658.aspx

Government of Vietnam. (2017b). *Quyết định phê duyệt đề án tăng cường ứng dụng công nghệ thông tin trong quản lý và hỗ trợ các hoạt động dạy-học, nghiên cứu khoa học góp phần nâng cao chất lượng giáo dục và đào tạo giai đoạn 2016 - 2020, định hướng đến năm 2025 (Directive on enhancing the application of information and communication technology to managing and supporting teaching, learning and research activities period 2016-2020 with projections to 2025)* (No. 117/QĐ-TTg). Retrieved from https://thuvienphapluat.vn/van-ban/Cong-nghe-thong-tin/Quyet-dinh-117-QD-TTg-Tang-cuong-ung-dung-cong-nghe-thong-tin-trong-hoat-dong-day-hoc-2017-338432.aspx

Haßler, B., Major, L., & Hennessy, S. (2016). Tablet use in schools: A critical review of the evidence for learning outcomes. *Journal of Computer Assisted Learning, 32*(2), 139-156. Retrieved from https://doi.org/10.1111/jcal.12123

Healey, D., Hegelheimer, V., Hubbard, P., Ioannou-Georgiou, S., Kessler, G., & Ware, P. (2009). *TESOL technology standards framework*. Alexandria, Egypt: TESOL.

Hoàng, V. V., Hoàng, H. T. X., Đào, L. N., Vũ, L. T., Đỗ, M. T., & Nguyễn, T. Q. (2006). *Tiếng Anh 11*. Nhà xuất bản Giáo dục.

Holec, H. (1981). *Autonomy and foreign language learning*. Oxford: Pergamon Press.

Hulstijn, J. H. (2003). Incidental and intentional learning. In C. J. Doughty, & M. H. Long (Eds.), *The handbook of second language acquisition* (pp. 349-381). Malden, MA: Blackwell.

Hung, H. T. (2015). Intentional vocabulary learning using digital flashcards. *English Language Teaching, 8*(10), 107-112. Retrieved from https://eric.ed.gov/?id=EJ1079086

Kawaguchi, S., & Watkins, J. (2015). Mobile games for L2 learning: Student and teacher perspectives. *International Journal of Technologies in Learning, 21*(2), 11-23. Retrieved from http://www.canberra.edu.au/researchrepository/items/7b6a8634-4419-4b92-b516-5d3f0e281aab/1/

Kawaguchi, S. (2016). Synchronous CMC e-tandem learning in Japanese as a second language: linguistic environment and language development. *Journal of Modern Education Review, 6*(7), 439-448. doi: 10.15341/jmer(2155-7993)/07.06.2016/002

Kelsen, B. (2009). Teaching EFL to the iGeneration: A survey of using YouTube as supplementary material with college EFL students in Taiwan. *Call-EJ Online, 10*(2), 1-18. Retrieved from http://callej.org/journal/10-2/kelsen.html

Komachali, M. E., & Khodareza, M. (2012). The effect of using vocabulary flash card on Iranian pre-university students' vocabulary knowledge. *International Education Studies, 5*(3), 134-147. Retrieved from https://files.eric.ed.gov/fulltext/EJ1066881.pdf

Krashen, S. (1985). *The input hypothesis: Issues and implications*. London: Longman.

Kuo, L. L. (2009). *The effects of YouTube listening/viewing activities on Taiwanese EFL learners' listening comprehension* (PhD thesis). Retrieved from http://www.proquest.com

Lander, B. (2016). Quizlet: What the students think a qualitative data analysis. In S. Papadima-Sophocleous, L. Bradley, & S. Thouny (Eds.), *CALL communities and culture short papers from EUROCALL 2016* (pp. 254-259). Research-publishing.net. Retrieved from https://doi.org/https://doi.org/10.14705/rpnet.2016.eurocall2016.571

Larsen-Freeman, D., & Long, M. H. (1991). *An introduction to second language acquisition research*. London: Longman.

Laufer, B. (1992). How much lexis is necessary for reading comprehension? In P. J. L. Arnaud, & H. Bejoing (Eds.), *Vocabulary and applied linguistics* (pp. 129-132). London: Macmillan.

Laufer, B., & Shmueli, K. (1997). Memorizing new words: Does teaching have anything to do with it? *RELC Journal*, *28*(1), 89–108. Retrieved from https://doi.org/10.1177/003368829702800106

Lees, D. (2013). A brief comparison of digital-and self-made word cards for vocabulary learning. *Kwansei Gakuin University Humanities Review*, *18*, 59-71. Retrieved from https://core.ac.uk/download/pdf/143638467.pdf

Le Thi Cam Nguyen, & Nation, P. (2011). A bilingual vocabulary size test of English for Vietnamese learners. *RELC Journal*, *42*(1), 86-99. Retrieved from https://www.wgtn.ac.nz/lals/about/staff/Publications/paul-nation/Vocabulary-size-test-Vietnamese.pdf

Levy, M. (2009). Technologies in use for second language learning. *The Modern Language Journal, 93*, 769-782. Retrieved from www.jstor.org/stable/25612273

Lightbown, P., & Spada, Nina Margaret. (2006). *How languages are learned*. Oxford: Oxford University Press.

Little, D. (2003). Learner autonomy and public examinations. In D. Little, J. Ridley, & E. Ushioda (Ed.), *Learnerautonomy in foreign language classrooms: Teacher, learner, curriculum and assessment* (pp. 223-236). Dublin: Authentik.

Long, M., & Robinson, P. (1998). Focus on form: Theory, research, and practice. In C. Doughty, & J. Williams (Eds.), *Focus on form in classroom second language acquisition* (pp. 15–41). New York: Cambridge University Press.

Marshall, C., & Rossman, G. B. (1995). *Designing qualitative research* (2nd ed.). Thousand Oaks, Calif.: Sage Publications.

Mayer, R. E., & Moreno, R. (2003). Nine ways to reduce cognitive load in multimedia learning. *Educational Psychologist, 38*(1), 43-52. doi: 10.1207/S15326985EP3801_6

McNamara, D. S., & Healy, A. F. (1995). A procedural explanation of the generation effect: The use of an operand retrieval strategy for multiplication and addition problems. *Journal of Memory and Language, 34*(3), 399-416. Retrieved from https://doi.org/10.1006/jmla.1995.1018

Ministry of Education and Training (2018). *English program*. Hanoi: Ministry of Education and Training.

Miyamoto S. (2001). Marutimedhiagogakugakushuukyoozai no kaihatsu to hyooka – riron to jissen to, Tokyo: Keisuisha.

Moreno, R. (2006). Learning in high-tech and multimedia environments. *Current Directions in Psychological Science, 15*(2), 63–67. Retrieved from https://doi.org/10.1111/j.0963-7214.2006.00408.x

Moreno, R., & Mayer, R. (2007). Interactive multimodal learning environments. *Educational Psychology Review, 19*(3), 309-326. Retrieved from https://doi.org/10.1007/s10648-007-9047-2

Muehleisen, V. L. (1997). *Antonymy and semantic range in English*(PhD thesis). Retrieved from http://www.f.waseda.jp/vicky/dissertation/prelimin.pdf

Nation, I. (2006). How large a vocabulary is needed for reading and listening? *The Canadian Modern Language Review/La Revue Canadienne Des Langues Vivantes, 63*(1), 59-82. Retrieved from https://doi.org/10.3138/cmlr.63.1.59

Nation, I. S. P. & Beglar, D. (2007). A vocabulary size test. *The Language Teacher, 31*(7), 9-13. Retrieved from https://www.victoria.ac.nz/lals/about/staff/publications/paul-nation/2007-Beglar- TLT.pdf

Nation, I. (2013). *Learning vocabulary in another language*. Cambridge: Cambridge University Press. doi:10.1017/CBO9781139858656

Nielsen. (2017). Smartphone keeps up the growth momentum with increasing usage incidences in key cities; whilst rural smartphone users reaching up to 68%. Retrieved from

http://www.nielsen.com/content/dam/nielsenglobal/vn/docs/PR_EN/Web_Nielsen_Smartph
    ones%20Insights_EN.pdf

Ngo, V. G. (2016). *Towards an effective integration of ICT in an EFL setting in a
    Vietnamese higher education context*(PhD thesis). doi: 10.4225/55/58af9fe53d780

Nguyen, H. N. (2015). Vietnam's national foreign language 2020 project: Challenges, opportunities
    and solutions. In S. Sharbawi, & T. W. Bigalke (Eds.), *English for ASEAN integration:
    Policies and practices in the region* (pp. 62-64). Brunei: Universiti Brunei Darussalam.

Nhan, T. (2013). Promoting content and language integrated learning in gifted high
    schools in Vietnam: Challenges and impacts. *Internet Journal of Language, Culture
    and Society, 38*, 146–153.

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). SAGE
    Publications, inc.

Pintrich, P. R. (2003). Motivation and classroom learning. In W. M. Reynolds, & G. E. Miller
    (Eds.), *Handbook of psychology: Educational psychology* (pp. 103–122). New York, NY:
    Wiley.

Pop, A. (2010). The impact of the new technologies in foreign language instruction our experience.
    Procedia-Social and Behavioral Sciences, 2(2), 1185-1189.

Rahimi, M., & Yadollahi, S. (2011). ICT use in EFL classes: A focus on EFL teachers'
    characteristics. *World Journal of English Language, 1*(2), 17. Retrieved from
    https://www.academia.edu/1985029/ICT_Use_in_EFL_Classes_A_Focus_on_EFL_Teacher
    s_Characteristics

Sanosi, A. B. (2018). The effect of Quizlet on vocabulary acquisition. *Asian Journal of Education
    and E-Learning, 6*(4), 71-77. Retrieved from
    https://ajouronline.com/index.php/AJEEL/article/view/5446

Schmenk, B. (2005). Globalizing learner autonomy. *TESOL Quarterly, 39*(1), 107-118.

Schmidt, R. (1990). The role of consciousness in second language learning. *Applied
    Linguistics, 11*(2), 129-158. Retrieved from https://doi.org/10.1093/applin/11.2.129

Schmitt, N. (2008). Review article: Instructed second language vocabulary learning. *Language
    Teaching Research*, *12*(3), 329–363. Retrieved from
    https://doi.org/10.1177/1362168808089921

Sonawane, S. S. (2003). Digitization: An overview. In A. A. Vaishnav, & S. S. Sonawane
    (Eds.),*Impact of digitization on development of information professionals* (pp. AC1-6).
    Aurangabad: Marathawada University.

Swain, M. (1993). The output hypothesis: Just speaking and writing aren't enough. *Canadian Modern Language Review, 50*(1), 158-164. Retrieved from https://doi.org/10.3138/cmlr.50.1.158

Sweller, J. (1999). *Instructional design in technical areas*. Camberwell, Australia: ACER Press.

Tinio, V. L. (2003). *ICT in education*. Manila: E-ASEAN Task Force.

Thomas, M., & Reinders, H. (Eds.). (2010). *Task-based language learning and teaching with technology*. London: Continuum.

Thurmond, V. (2001). The Point of triangulation. *Journal of Nursing Scholarship, 33*(3), 253-258.

VanPatten, B. (Ed.). (2004). *Processing instruction: Theory, research, and commentary*. Mahwah, NJ: Erlbaum.

Webb, S. (2008). Receptive and productive vocabulary sizes of L2 learners. *Studies in Second Language Acquisition, 30*(1), 79-95. Retrieved from https://doi.org/10.1017/S0272263108080042

Zhang, B. (2009). Do example sentences work in direct vocabulary learning? *Issues in Educational Research, 19*(2), 175-189. Retrieved from https://files.eric.ed.gov/fulltext/EJ1083068.pdf

APPENDIX A – MODES ON QUIZLET

1. Flahcards

2. Learn

3. Write

4. Spell

5. Test

6. Match

7. Gravity

8. Live

APPENDIX B – READING PASSAGES AND TARGET WORDS

1. Reading passages (Hoàng et al., 2006, pp. 47, 57, 115-116, 125)

Reading passage 1

Each nation has many people who voluntarily take care of others. For example, many high school and college students in the United States often spend many hours as volunteers in hospitals, orphanages or homes for the aged. They read books to the people in these places. Sometimes the students just visit them, play games with them or listen to their problems. Other young volunteers work in the homes of sick or old people. They clean up their houses, do their shopping or mow their lawns. For boys who no longer have fathers, there is a voluntary organization called Big Brothers. College students take these boys to baseball games and help them to get to know things that boys usually learn from their fathers.Some high school students take part in helping disadvantaged or handicapped children. They give care and comfort to them and help them to overcome their difficulties. Young college and university students participate in helping the people who have suffered badly in wars or natural disasters. During summer vacations, they volunteer to work in remote or mountainous areas to provide education for children. Each city has a number of clubs where boys and girls can go to play games. Some of these clubs organise short trips to the mountains, beaches or other places of interest. Most of these clubs use a lot of high school and college students as volunteers because they are young enough to understand the problems of younger boys and girls.

Volunteers believe that some of the happiest people in the world are those who help to bring happiness to others.

Reading passage 2

By July 2000, sixty-one provinces and cities throughout Vietnam had completed the programmes of "Universalisation of Primary Education" and "Illiteracy Eradication". However, by that time, only 94% of the population was able to read and write. This meant that more work had to be done to eradicate illiteracy in the country.

In the summer of 2000, the Vietnam Society of Learning Promotion started a campaign for illiteracy eradication. In the campaign, six hundred ethnic minority students from the northern highlands were asked to provide reading and writing skills to 1,200 illiterate people living in their home villages. In 2001, eight hundred volunteer students took part in the campaign. The number of

people receiving reading and writing lessons reached 4,623.

This was an effective way to help people in remote and mountainous areas to read and write. Those students who took part in the fight against illiteracy considered it an honourable job to help people in their home villages. They voluntarily spent their summer vacations teaching illiterate people to read and write. Some even prepared relevant materials for their classes. They talked about new farming techniques and family planning. Before they left, they promised to come back the next summer.

The fight against illiteracy continued in the summer of 2002. This time the Vietnam Society of Learning Promotion decided to expand its activities to the central mountainous provinces. At present, the number of illiterate people in the remote and mountainous areas is gradually decreasing. It is hoped that illiteracy will soon be eradicated in our country as more and more people are taking part in the struggle against it.

Reading passage 3

The human race is only one small species in the living world. Many other species exist on this planet. However, human beings have a great influence on the rest of the world. They are changing the environment by building cities and villages where forests once stood. They are affecting the water supply by using water for industry and agriculture. They are changing weather conditions by cutting down trees in the forests. And they are destroying the air by adding pollutants to it.

It can be said that human beings are changing the environment in all respects through their actions and by their habits. This has resulted in two serious consequences. The first is that many kinds of rare animals are killed. The second is that the environment where these animals are living is badly destroyed. As a result, the number of rare animals is decreasing so rapidly that they are in danger of becoming extinct. In order to make sure that these rare animals do not disappear, efforts have been made to protect the environments in which they live. Scientists have made lists of endangered species and suggested ways to save them. Many 74ong74nized74n74 have been set up and funds have been raised. Thousands of national parks all over the world have been established to protect endangered animals. Laws have been introduced to prohibit the killing of endangered animals and the destruction of the environments where these rare animals are living. If people's interference with the environment decreases, more species will survive and produce offspring. The Earth will be a happy planet where human beings, animals and plants peacefully co-exist.

Reading passage 4

At present, most of our energy comes from fossil fuels (oil, coal, and natural gas). However, such reserves are limited. Because power demand is increasing very rapidly, fossil fuels will be exhausted within a relatively short time. Therefore, people must develop and use alternative sources of energy. One alternative source is nuclear energy. Nuclear energy can provide enough electricity for the world's needs for hundreds of years, but it can be very dangerous. Another alternative source of energy is geothermal heat, which comes from deep inside the earth. Scientists use this heat to make energy. However, this energy is available only in a few places in the world.

The sun, water, and the wind are other alternative sources of energy. The wind turns windmills and moves sailboats. It is a clean source of energy, and there is lots of it. Unfortunately, if the wind does not blow, there is no wind energy. When water moves from a high place to a lower place, it makes energy. This energy is used to create electricity. Water power gives energy without pollution. However, people have to build dams to use this energy. And as dams cost a lot of money, water energy is expensive.

The sun releases large amounts of energy every day. This energy can be changed into electricity. Many countries use solar energy for their daily life. Solar panels on the roofs of houses can create enough energy to heat or cool an entire house. Solar energy is not only plentiful and infinite but also clean and safe.

Although there are some disadvantages, the potential of alternative sources of energy is great. However, how to make full use of these sources of energy is a question for researchers all over the world.

2. Target words

1. Nation	2. Take care of	3. College	4. Volunteer
5. Orphanage	6. Home for the aged	7. Clean up	8. Mow the lawn
9. Baseball	10. Take part	11. Disadvantaged	12. Handicapped
13. Care	14. Comfort	15. Overcome	16. Difficulty
17. Participate	18. Suffer	19. Natural disaster	20. Summer vacation
21. Remote	22. Mountainous	23. Provide	24. Education

25. Organise	26. Trip	27. Place of interest	28. Province
29. Programme	30. Highlands	31. Illiterate	32. Effective
33. Decrease	34. Gradually	35. Expand	36. Eradicate
37. Population	38. Relevant	39. Material	40. Campaign
41. Ethnic minority	42. Home village	43. Fight	44. Farming techniques
45. Family planning	46. Struggle	47. Vietnam Society of Learning Promotion	48. Illiteracy Eradication
49. Universalisation of Primary Education	50. Honourable	51. Human race	52. Species
53. Exist	54. Planet	55. Human being	56. Influence
57. Environment	58. Affect	59. Water supply	60. Industry
61. Agriculture	62. Conditions	63. Cut down	64. Destroy
65. Pollutant	66. In all respects	67. Habit	68. Result in
69. Serious	70. Consequence	71. Rare	72. In danger
73. Extinct	74. Disappear	75. Effort	76. Protect
77. Scientist	78. Endangered species	79. Save	80. Set up
81. Funds	82. Raise	83. National park	84. Establish
85. Law	86. Introduce	87. Prohibit	88. Destruction
89. Interference	90. Survive	91. Produce	92. Offspring
93. Peacefully	94. Energy	95. Fossil fuel	96. Reserve
97. Limited	98. Power	99. Demand	100. Rapidly
101. Exhausted	102. Relatively	103. Alternative source of energy	104. Nuclear energy
105. Electricity	106. Needs	107. Geothermal heat	108. Available
109. Windmill	110. Sailboat	111. Dam	112. Release
113. Solar panel	114. Create	115. Heat	116. Cool

117. Plentiful   118. Infinite   119. Disadvantage   120. Make use of

121. Researcher

APPENDIX C – SAMPLE QUIZLET FLASHCARD AND PAPER FLASHCARD

1. Sample Quizlet flashcard
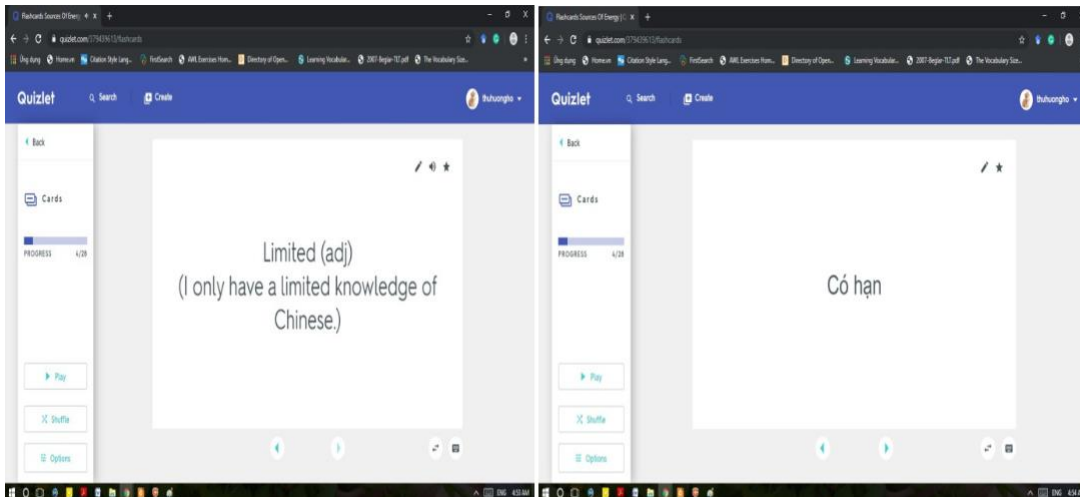
2. Sample paper flashcard
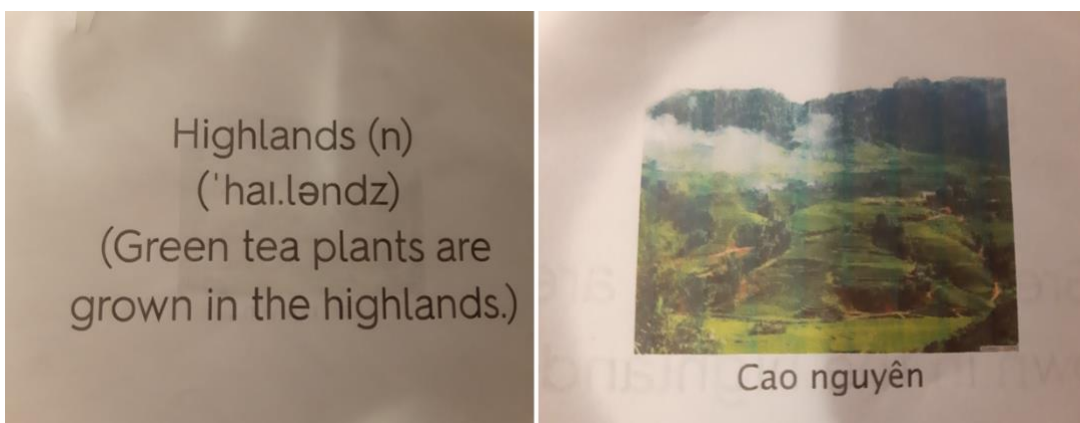
APPENDIX D – TESTS

Vietnamese bilingual version of Vocabulary Size Test (Nation & Beglar, 2007; Le Thi Cam Nguyen & Nation, 2011)

1.000 từ thông dụng nhất (cấp 1)

see: They saw it.
cắt
đợi
thấy
bắt đầu

time: They have a lot of time.
tiền
thức ăn
thời gian
bạn bè

period: It was a difficult period.
câu hỏi
giai đoạn
việc cần làm
quyển sách

figure: Is this the right figure?
câu trả lời
địa điểm
thời gian
con số

poor: We are poor.
nghèo
hạnh phúc
quan tâm/say mê
lười làm việc

drive: He drives fast.
bơi
học
ném bóng
lái xe

jump: She tried to jump.
nổi trên mặt nước
nhảy lên
đỗ/đậu xe lại
chạy

shoe: Where is your shoe?
cha/mẹ
ví đựng tiền
giấy bút
giày

standard: Her standards are very high.
gót giày
điểm số
mức lương
tiêu chuẩn

basis: I don't understand the basis.
lý do
từ vựng
biển chỉ đường
điều căn bản

1.000 từ thông dụng cấp hai
maintain: Can they maintain it?
duy trì
phóng to
cải thiện
đạt được

stone: He sat on a stone.
hòn đá
cái ghế
tấm thảm
cành cây

upset: I am upset.
mệt
nổi tiếng
giàu có
buồn bã

drawer: The drawer was empty.
ngăn kéo tủ
nhà để xe
tủ lạnh
chuồng thú

patience: He has no patience.
không kiên nhẫn
không rảnh rỗi
không có đức tin
không công bằng

nil: His mark for that question was nil.

rất tệ
số không
rất tốt
trung bình

pub: They went to the pub.
quán rượu
ngân hàng
trung tâm mua sắm
hồ bơi

circle: Make a circle.
bản phác thảo
khoảng trống
vòng tròn
cái lỗ lớn

microphone: Please use the microphone.
lò vi sóng
máy phóng thanh
kính hiển vi
điện thoại di động

pro: He's a pro.
thám tử
gã ngốc
nhà báo
người chơi thể thao chuyên nghiệp

1.000 từ thông dụng cấp ba
soldier: He is a soldier.
thương gia
sinh viên
thợ luyện kim
binh sĩ/bộ đội

restore: It has been restored.
lặp lại
phân phối lại/cấp lại
giảm giá
trùng tu/phục chế

jug: He was holding a jug.
cái bình
cuộc tán gẫu
mũ nồi/ mũ bê rê
81ong/đạn

scrub: He is scrubbing it.
cào xước

81

sửa sang
chà sạch
vẽ phác họa

dinosaur: The children were pretending to
be dinosaurs.
cướp biển
tiểu tiên nữ
con rồng
khủng long

strap: He broke the strap.
lời hứa
cái nắp
cái đĩa
quai xách

pave: It was paved.
bị chặn
bị chia ra
được viền vàng
được lát nền/trải nhựa

dash: They dashed over it.
lao tới
đi nhởn nhơ, la cà
giành nhau
liếc qua

rove: He couldn't stop roving.
say rượu
đi đây đi đó
ngâm nga
làm việc chăm chỉ

lonesome: He felt lonesome.
vô ơn
mệt mỏi
cô đơn
hăng hái

1.000 từ thông dụng cấp bốn
compound: They made a new compound.
thỏa thuận
hỗn hợp
công ty
suy đoán

latter: I agree with the latter.
linh mục

lý do đã đưa ra
người/vật nhắc đến sau
câu trả lời

candid: Please be candid.
cẩn thận
thông cảm
công bằng
thẳng thắn

tummy: Look at my tummy.
cái khăn
bụng
con sóc
ngón tay cái

quiz: We made a quiz.
bao đựng mũi tên
lỗi lớn
bài đố vui/bài kiểm tra
chuồng chim

input: We need more input.
nguồn đầu vào
công nhân
bột 83ong, bột tret
tiền

crab: Do you like crabs?
con cua
bánh mỏng và nhỏ
cổ cồn
con dế

vocabulary: You will need more vocabulary.
từ vựng
kỹ năng
tiền
súng

remedy: We found a good remedy.
giải pháp
nhà hàng
công thức nấu ăn
công thức toán

allege: They alleged it.
khẳng định , cho rằng
ăn cắp ý tưởng
chứng minh

phản bác

1.000 từ thông dụng cấp năm

deficit: The company had a large deficit.
bị thâm thủng
mất giá (giảm giá trị)
có kế hoạch chi tiêu lớn
có nhiều tiền gửi ngân hàng

weep: He wept.
hoàn thành khóa học
khóc
chết
lo lắng

nun: We saw a nun.
con giun
tai nạn
nữ tu
ánh cực quang

haunt: The house is haunted.
nhiều đồ trang trí
cho thuê
trống
có ma

compost: We need some compost.
sự ủng hộ nhiệt tình
an ủi
bê tông
phân bón

cube: I need one more cube.
đinh ghim
khối vuông
cốc vại
tấm bìa gập làm đôi

miniature: It is a miniature.
mô hình, hình mẫu
kính hiển vi
vi trùng
dấu gạch nối

peel: Shall I peel it?
ngâm nước
gọt vỏ
tẩy trắng

thái/xắt lát

fracture: They found a fracture.
vết nứt
miếng/mẩu nhỏ
áo vét-tông
đồ trang sức quý hiếm

bacterium: They didn't find a single bacterium.
vi khuẩn
cây hoa cúc
lạc đà
vật ăn cắp đem đi bán, đồ gian

1.000 từ thông dụng cấp sáu
devious: Your plans are devious.
gian xảo
được triển khai tốt
thiếu cân nhắc
quá tốn kém

premier: The premier spoke for an hour.
luật sư
giảng viên
người thích phiêu lưu
thủ tướng

butler: They have a butler.
quản gia
máy cưa
gia sư
tầng hầm

accessory: They gave us some accessories.
thị thực
lệnh chính thức
lựa chọn
đồ phụ tùng

threshold: They raised the threshold.
lá cờ
ngưỡng
trần nhà
lãi suất tiền vay

thesis: She has completed her thesis.
luận văn
bản tuyên án
năm dạy học chính thức đầu tiên
thời gian điều trị nội trú kéo dài

strangle: He strangled her.
giết bằng cách bóp cổ
nuông chiều
bắt cóc
ngưỡng mộ

cavalier: He treated her in a cavalier manner.
vô tâm
lịch sự
vụng về
như anh em

malign: His malign influence is still felt.
độc ác, xấu xa
tốt bụng
rất quan trọng
bí mật

veer: The car veered.
đổi hướng bất ngờ
lắc mạnh
nổ tiếng to
bị trượt bánh

1.000 từ thông dụng cấp bảy
olive: We bought olives.
một loại quả chứa dầu
hoa cẩm chướng
quần bơi của đàn ông
cái xẻng

quilt: They made a quilt.
di chúc
hợp đồng
chăn bông
bút lông ngỗng

stealth: They did it by stealth.
chi tiêu một khoản tiền lớn
cưỡng ép
lén lút
không quan tâm đến các khó khăn

shudder: The boy shuddered.
thì thầm
suýt ngã
nhún vai
hét lên

bristle: The bristles are too hard.
câu hỏi
tóc/lông dựng đứng
giường xếp
đế giày

bloc: They have joined this bloc.
nhóm nhạc
băng trộm cắp
đội trinh sát
một nhóm quốc gia cùng mục đích

demography: This book is about demography.
địa chất học
thủy học
nhân khẩu học

gimmick: That's a good gimmick.
giàn giáo
ví đựng tiền
hành động/vật gây chú ý
mẹo, mưu mẹo

azalea: This azalea is very pretty.
cây đỗ quyên
vải lụa
y phục của phụ nữ Ấn độ
con điệp

yoghurt: This yoghurt is disgusting.
phù sa
vết thương
sữa chua
quả mộc qua

1.000 từ thông dụng cấp tám
erratic: He was erratic.
mẫu mực
rất tệ
rất lịch sự
thất thường

palette: He lost his palette.
giỏ đựng cá
sự ngon miệng
bạn gái
bảng pha màu

null: His influence was null.
đem lại kết quả tốt

không giúp ích gì nhiều
không có gì
kéo dài

kindergarten: This is a good kindergarten.
trò tiêu khiển
nhà trẻ
balô
thư viện

eclipse: There was an eclipse.
cơn bão tố
tiếng nước văng tung tóe
vụ tàn sát hàng loạt
nhật thực

marrow: This is the marrow.
người/vật mang lại may mắn, vật khước
tủy xương
cần lái máy bay
tăng lương

locust: There were hundreds of locusts.
con châu chấu
tình nguyện viên
người ăn chay
hoa dại màu sặc sỡ

authentic: It is authentic.
xác thực
rất ồn
cũ
khô cằn

cabaret: We saw the cabaret.
bức tranh tường
chương trình ca múa trong quán rượu
con gián
nàng tiên cá

mumble: He started to mumble.
tập trung
run rẩy
tụt hậu
lẩm bẩm

1.000 từ thông dụng cấp 88ong
hallmark: Does it have a hallmark?
hạn sử dụng

dấu xác nhận tiêu chuẩn
con dấu của hoàng gia
dấu bản quyền

puritan: He is a puritan.
người thích được chú ý đến
người theo thanh giáo
người du mục gypxi
người bủn xỉn

monologue: Now he has a monologue.
kính một mắt
độc thoại
độc quyền
tranh chữ

weir: We looked at the weir.
người kỳ quặc
rừng ngập mặn
cái sáo (nhạc cụ)
đập chắn nước

whim: He had lots of whims.
đồng tiền vàng
ngựa cái
ý tưởng chợt đến
chỗ sưng tấy

perturb: I was perturbed.
bị buộc phải đồng ý
lo lắng
rối trí
ướt sũng

regent: They chose a regent.
người vô trách nhiệm
người chủ trì cuộc họp
quan nhiếp chính
người đại diện

octopus: They saw an octopus.
con cú
tàu ngầm
máy bay trực thăng
con bạch tuộc

fen: The story is set in the fens.
vùng đầm lầy
đồi trọc
khu nhà ổ chuột

thời xa xưa

lintel: He painted the lintel.
thanh dầm đỡ
xà lan
một loại cây ăn quả
phông sân khấu

1.000 từ thông dụng cấp mười

awe: They looked at the mountain with awe.
sự sợ hãi
sự quan tâm
sự ngạc nhiên
sự kính trọng

peasantry: He did a lot for the peasantry.
dân địa phương
đền thờ
câu lạc bộ của các thương gia
nông dân nghèo

egalitarian: This organization is very egalitarian.
kín tiếng
bảo thủ
thích tranh chấp
theo chủ nghĩa bình quân

mystique: He has lost his mystique.
thể lực
phép thần thông
tình nhân
râu mép

upbeat: I'm feeling really upbeat about it.
buồn chán
phấn chấn
đau lòng
nhầm lẫn

cranny: We found it in the cranny!
chỗ bán đồ cũ
khe nứt
gác xép
cái rương

pigtail: Does she have a pigtail?
bím tóc
đuôi váy (kéo lê trên mặt đất)
bụi hoa màu hồng nhạt
người yêu

crowbar: He used a crowbar.
cái xà beng
tên giả
cái dùi
cây gậy (để chống)

ruck: He got hurt in the ruck.
khung chậu
vụ ẩu đả trên phố
cuộc tranh bóng
cuộc đua trên tuyết

lectern: He stood at the lectern.
bục giảng
bàn thờ
quầy rượu
bờ vực

1.000 từ thông dụng cấp 11
excrete: This was excreted recently.
bài tiết, thải ra
làm rõ
khám phá
bị xem là phạm pháp/ bị cấm

mussel: They bought mussels.
viên bi, hòn bi
con trai , con vẹm
quả mộc qua
khăn giấy

yoga: She has started yoga.
viền ren
tập thiền
cầu lông
điệu nhảy phương đô

counterclaim: They made a counterclaim.
sự phản tố
việc trả lại hàng hóa bị lỗi
thỏa thuận đổi công
chăn bông

puma: They saw a puma.
nhà nhỏ bằng gạch
cây cọ
cơn bão tố
con báo

pallor: His pallor caused them concern.
cơn sốt bất thường
sự thờ ơ
nhóm bạn bè
vẻ xanh xao

aperitif: She had an aperitif.
ghế bành
gia sư dạy hát
mũ đính lông chim
rượu khai vị

hutch: Please clean the hutch.
tấm lưới chắn nắp cống
cốp xe
trục bánh xe
chuồng thỏ

emir: We saw the emir.
một loại chim có đuôi cong
vú em
tiểu vương
lều làm bằng tuyết của người dân
    Eskimo

hessian: She bought some hessian.
cá hồi
cần sa
vải bao bố
cây sả

1.000 từ thông dụng cấp 12
haze: We looked through the haze.
của sổ tròn trên tàu thủy
sương mù
rèm che cửa sổ
danh sách

spleen: His spleen was damaged.
xương bánh chè
lá lách
ống cống
92ong tự trọng

soliloquy: That was an excellent soliloquy!
bài hát cho sáu người
câu nói thâm thúy
sàn nhảy
đoạn độc thoại

reptile: She looked at the reptile.
bản thảo viết tay
loài động vật bò sát
người bán hàng rong
tranh vẽ bằng bột màu

alum: This contains alum.
chất độc từ cây
vải tơ nhân tạo
thuốc lá bột để hít
chất phèn

refectory: We met in the refectory.
phòng ăn tập thể
phòng công chứng
phòng ngủ tập thể
nhà kính để trồng cây

caffeine: This contains a lot of caffeine.
chất gây buồn ngủ
sợi lanh
ý tưởng lệch lạc
chất gây hưng phấn

impale: He nearly got impaled.
truy tố
bỏ tù
đâm xuyên qua
dính líu vào một cuộc tranh chấp

coven: She is the leader of a coven.
đội đồng ca
hợp tác xã
hội kín
nhóm nữ tu kín
trill: He 93ong93nize the trill.
luyến giọng
đàn violin
ném bóng
thế xoay tròn

1.000 từ thông dụng cấp 13
ubiquitous: Many weeds are ubiquitous.
khó tiêu diệt
có rễ dài và chắc
có ở khắp nơi
tàn lụi vào mùa đông

talon: Just look at those talons!
đỉnh núi

móng, vuốt nhọn của loài chim săn mồi
áo giáp sắt
kẻ ngốc nghếch

rouble: He had a lot of roubles.
đá hồng ngọc
người họ hàng
đơn vị tiền tệ của Nga
khó khăn tâm lý

jovial: He was very jovial.
có địa vị xã hội thấp
thích chỉ trích người khác
vui vẻ
94ong thiện

communiqué: I saw their communiqué.
bài chỉ trích về một tổ chức nào đó
công viên
tài liệu quảng cáo
thông cáo

plankton: We saw a lot of plankton.
loài cỏ độc mọc lây lan rất nhanh
sinh vật phù du, phiêu sinh vật sống trong nước
cây cổ thụ
đất lở

skylark: We watched a skylark.
Trình diễn máy bay trên không
vệ tinh
ảo thuật gia
con chim chiền chiện

beagle: He owns two beagles.
xe mui trần
94ong đại bác
một loài chó tai dài
nhà nghỉ

atoll: The atoll was beautiful.
đảo san hô
tranh thêu
vương miện
ghềnh đá

didactic: The story is very didactic.
mô phạm
khó tin
có các hoạt động hấp dẫn

tối nghĩa

1.000 từ thông dụng cấp 14
    canonical: These are canonical examples.
    phạm luật
    lấy từ sách tôn giáo
    hợp với qui tắc tiêu chuẩn
    mới được khám phá

    atop: He was atop the hill.
    ở dưới chân
    ở trên đỉnh
    ở phía bên này
    ở phía bên kia

    marsupial: It is a marsupial.
    loài động vật có chân rất khỏe
    cây lâu niên
    hoa hướng dương
    loài thú có túi

    augur: It augured well.
    hứa hẹn điều tốt đẹp trong tương lai
    xảy ra đúng như dự đoán
    có màu sắc rất hợp
    có âm thanh rõ và hay

    bawdy: It was very bawdy.
    không đoán trước được
    thú vị
    vội vã
    tục tĩu

    gauche: He was gauche.
    lắm lời
    linh hoạt
    vụng về
    kiên quyết

    thesaurus: She used a thesaurus.
    một loại từ điển
    một hợp chất hóa học
    một cách nói đặc biệt
    một mũi tiêm dưới da

    erythrocyte: It is an erythrocyte.
    thuốc giảm đau
    hồng cầu
    kim loại trắng có màu hơi đỏ
    một loài cá voi

cordillera: They were stopped by the cordillera.
luật đặc biệt
tàu chiến
dãy núi
thái tử

limpid: He looked into her limpid eyes.
trong trẻo
đẫm lệ
nâu huyền
đẹp

Pre-test 1, immediate post-test 1 and delayed post-test

1 I. Listen and write words (Nghe và viết lại từ)

1.	2.	3.
4.	5.	6.
7.	8.	9.
10.	11.	12.
13.	14.	15.
16.	17.	18.
19.	20.	21.
22.	23.	24.
25.	26.	27.
28.	29.	30.
31.	32.	33.
34.	35.	36.
37.	38.	39.
40.	41.	42.
43.	44.	45.
46.	47.	48.
49.	50.	

Select the correct meanings of bolded words (Chọn định nghĩa chính xác của từ đã cho)

Nation: If you want to know a nation, you must learn its history.

A. Educational institution after secondary school (trường đại học / cao đẳng)

B. art (nghệ thuật)

C. country (đất nước)

D. sport (thể thao)

2. Take care of: He has to take care of his sister.

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A. live with (sống cùng)   B. teach (dạy)
C. look after (chăm sóc)   D. turn against (trở mặt)

3. College: I met my best friend for the first time when we were at college.

A. airport (sân bay)   B. school (trường cao đẳng / trường đại học)
C. post office (bưu điện)   D. restaurant (nhà hàng)

4. Volunteer: Many volunteers work for the charity

A. unpaid worker (tình nguyện viên)   B. part-time worker (người làm công việc bán thời gian)

C. full-time worker (người làm việc toàn thời gian)   D. freelancer (người làm nghề tự do)

5. Orphanage: He grew up in an orphanage.

A. reform school (trại giáo dưỡng)   B. summer school (trường hè)

C. place for children without parents (trại trẻ mồ côi)   D. jail (trại giam)

6. Home for the aged: He sends his mother to a home for the aged.

A. pagoda (chùa)   B. nursing home (trại dưỡng lão)
C. entertainment centre (trung tâm giải trí) D. shopping mall (trung tâm mua sắm)

7. Clean up: I often clean up my room.

A. decorate (trang trí)   B. paint (sơn)
C. mess up (làm bừa bộn)   D. tidy up (dọn dẹp)

8. Mow the lawn: I cannot mow the lawn if it is wet.

A. cut the grass (cắt cỏ)   B. iron the dress (là váy)
C. wear the scarf (quàng khăn)   D. shear the sheep (cạo lông cừu)

   Baseball: He likes playing baseball.

A. chess (cờ vua)   B. video games (trò chơi điện tử)

C. ballgame played between two teams (bóng chày)   D. guitar (đàn ghita)

10. Take part: Some of the children will take part in the film.

A. hate (ghét)   B. like (thích)

C. be frightened by (sợ)   D. join in (tham gia)

11. Disadvantaged: The group gives houses away to disadvantaged people.

A. famous (nổi tiếng)   B. underprivileged (thiệt thòi)
C. talented (tài năng)   D. lucky (may mắn)

12. Handicapped: He goes to a school for handicapped children.

A. disabled (tàn tật)   B. good (giỏi)
C. gifted (có năng khiếu)   D. poor (nghèo)

13. Care: The children receive lots of care.

A. training (sự đào tạo)   B. neglect (sự lờ đi)
C. protection and provision of necessities (sự   D. opposition (sự đối địch)
chăm sóc)

14. Comfort: The doctor's words brought some comfort to his patient.

A. sorrow (sự đau khổ)   B. sadness (nỗi buồn)
C. anxiety (sự lo lắng)   D. consolation (sự an ủi)

15. Overcome: He could not overcome his fear.

A. voice (phát biểu)   B. face (đối mặt)
C. be able to control (vượt qua)   D. show (thể hiện)

16. Difficulty: He had to deal with the difficulties.

A. shame (sự xấu hổ)   B. hardship (sự khó khăn)
C. feeling (cảm giác)   D. crisis (khủng hoảng)

17. Participate: He never participates in any conversation at his workplace.

A. avoid (tránh)   B. stop (dừng)
C. dominate (chi phối)   D. join (tham gia)

18. Suffer: He might suffer after his mother's death.

A. live happily (sống hạnh phúc)   B. experience hardship (chịu thiệt thòi)
C. earn money (kiếm tiền)   D. go shopping (đi mua sắm)

19. Natural disaster: The last natural disaster killed thousands of people.

A. catastrophic event caused by nature (thiên tai)

B. house fire (cháy nhà)

C. traffic accident (tai nạn giao thông)

D. electric shock (điện giật)

20. Summer vacation: She took several overseas trips during her last summer vacation.

A. students' and teachers' holiday in the summer (kì nghỉ hè) C. sick leave (nghỉ ốm)

B. maternity leave (kì nghỉ thai sản)

D. stopover (nghỉ giữa chặng)

21. Remote: He lives in a remote district.

A. busy (nhộn nhịp)

B. faraway (xa xôi, hẻo lánh)

C. central (trung tâm)

D. urban (thuộc đô thị)

22. Mountainous: The land is mountainous and high above sea level.

A. flat (bằng phẳng)

B. hilly (nhiều đồi núi)

C. dry (khô cằn)

D. rich (màu mỡ)

23. Provide: They may provide these services

A. offer (cung cấp)

B. use (sử dụng)

C. complain about (phê phán)

D. improve (cải thiện)

24. Education: He received no education.

A. treatment (điều trị)

B. prize (giải thưởng)

C. compensation (đền bù)

D. teaching (sự dạy dỗ)

25. Organise: They are going to organise a meeting tomorrow.

A. arrange (tổ chức)

B. cancel (hoãn)

C. disrupt (làm gián đoạn)

D. close (kết thúc)

26. Trip: His overseas trip will last one week.

A. wedding (đám cưới)

B. business (công tác)

C. internship (thực tập)

D. journey (chuyến đi)

27. Place of interest: There are some places of interest in the area.

A. tourist attraction (địa điểm du lịch được ưa chuộng)

B. construction site (công trường xây dựng)

C. industrial zone (khu công nghiệp)

D. complex (chung cư)

28. Province: More than one thousand people live in the province.

A. city (thành phố)   B. capital (thủ đô)
C. downtown (khu buôn bán)   D. non-metropolitan area (khu vực nông
                                                thôn)

29. Programme: The programme aims to increase social equality.

A. country (đất nước)   B. scheme (kế hoạch)
C. company (công ty)   D. association (hiệp hội)

30. Highlands: Villages in the highlands are connected by roads.

A. districts (huyện)   B. lowlands (đồng bằng)
C. countries (đất nước)   D. uplands (cao nguyên)

31. Illiterate: Some people in small towns are illiterate.

A. blind (mù)   B. unlettered (mù chữ)
C. dumb (câm)   D. deaf (điếc)

32. Effective: He found an effective method to learn English.

A. bad (tồi tệ)   B. new (mới)
C. successful (hiệu quả)   D. simple (đơn giản)

33. Decrease: The number of students in the school may decrease next year.

A. become greater (tăng lên)   B. remain the same (giữ nguyên)
C. double (gấp đôi)   D. become smaller (giảm đi)

34. Gradually: Gradually she realized that he lied to her.

A. finally (cuối cùng)   B. quickly (1 cách nhanh chóng)
C. slowly (dần dần)   D. initially (ngay từ đầu)

35. Expand: Their business will expand.

A. grow (mở rộng)   B. shrink (thu nhỏ lại)
C. fail (sụp đổ)   D. shut down (đóng cửa)

36. Eradicate: It is difficult to eradicate the disease.

A. spread (lan truyền)   B. discover (phát hiện)
C. diagnose (chẩn đoán)   D. stamp out (trừ tiệt / xóa bỏ)

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37. Population: Most of the population of the country lived in the countryside.

A. stray dogs (chó hoang)
B. exotic animals (động vật kỳ lạ)
C. feral pigs (lợn hoang)
D. residents (dân cư / dân số)

38. Relevant: What he talked about was relevant to us.

A. new (mới)
B. important (liên quan / quan trọng)
C. unrelated (không liên quan)
D. strange (lạ)

39. Material: They needed to buy reading materials.

A. lights (đèn)
B. documents (tài liệu)
C. desks (bàn)
D. glasses (kính)

40. Campaign: There is a campaign against killing dogs for food in the country.

A. crusade (chiến dịch)
B. resistance (sự chống đối)
C. criticism (sự phê phán)
D. rule (luật)

41. Ethnic minority: Ethnic minorities often live in mountain regions.

A. group of people with cultural traditions, which are different from those of the main population (dân tộc thiểu số)
B. group of poor people (người nghèo)

C. group of disabled people (người tàn tật)
group of unemployed people (người thất nghiệp)

42. Home village: Next month I will come back to my home village.

A. nearby place (nơi ở gần)
B. marketplace (nơi buôn bán)
C. place of origin (quê hương)
D. hiding place (nơi trú ẩn)

43. Fight: There was a fight for women's rights in the country.

A. battle (cuộc chiến)
B. 102ong102nized102n (tổ chức)
C. argument (cuộc tranh luận)
D. hope (hi vọng)

44. Farming techniques: Some people in my village adopted new farming techniques.

A. ways of building bridges (phương pháp xây cầu)
B. ways of building houses (phương pháp xây nhà)
C. ways of growing crops and raising animals (phương pháp trồng trọt, chăn nuôi)
D. ways of building roads (phương pháp làm đường)

45. Family planning: People today are more concerned about family planning than ever before.

A. making new friends (kết bạn)   B. finding jobs (tìm việc)

C. birth control (kế hoạch hóa gia đình)   D. buying houses (mua nhà)

46. Struggle: There was a struggle for freedom in the country.

A. need (sự cần thiết)   B. desire (sự khao khát)

C. hope (hi vọng)   D. battle (cuộc chiến)

Vietnam Society of Learning Promotion: The Vietnam Society of Learning Promotion was founded in 2000.

A. an association which aims to improve residents' literacy levels (hội khuyến học)

B. an association which aims to improve social security (hội đảm bảo an toàn trật tự xã hội)

C. an association which aims to develop economy (hội phát triển kinh tế)

D. an association which aims to promote exports (hội tăng cường xuất khẩu)

48. Illiteracy Eradication: A project called Illiteracy Eradication will be run next month.

A. a project, which aims to teach reading and writing to people who lack these skills (chiến dịch xóa mù chữ)

B. a project which aims to eliminate poverty (chiến dịch xóa đói giảm nghèo)

C. a project which aims to improve foreign language skills (chiến dịch nâng cao khả năng ngoại ngữ)

D. a project, which aims to raise people's awareness of global warming (chiến dịch nâng cao ý thức về hiện tượng nóng lên toàn cầu

Universalisation of Primary Education: Universalisation of Primary Education aims at all people in the society.

a plan to educate everybody to primary level at least (dự án phổ cập giáo dục)

B. a plan to build primary schools (dự án xây trường tiểu học)

C. a plan to train primary teachers (dự án đào tạo giáo viên tiểu học)

D. a plan to increase primary teachers' salaries (dự án nâng lương cho giáo viên tiểu học)

50. Honourable: The soldier's death was honourable.

A. mysterious (bí ẩn)   B. terrible (khủng khiếp)

C. glorious (vinh quang / vinh dự)   D. quick (nhanh chóng)

Pre-test 2, immediate post-test 2, and delayed post-test

2 I. Listen and write the words (Nghe và viết lại từ)

1.	2.	3.
4.	5.	6.
7.	8.	9.
10.	11.	12.
13.	14.	15.
16.	17.	18.
19.	20.	21.
22.	23.	24.
25.	26.	27.
28.	29.	30.
31.	32.	33.
34.	35.	36.
37.	38.	39.
40.	41.	42.
43.	44.	45.

46.	47.	48.
49.	50.	51.
52.	53.	54.
55.	56.	57.
58.	59.	60.
61.	62.	63.
64.	65.	66.
67.	68.	69.
70.	71.	

Select the correct meanings of bolded words (Chọn định nghĩa chính xác của từ đã cho)

1. Human race: Many problems are facing the human race.

A. kind of reptile (loài bò sát)
C. kind of bird (loài chim)

B. kind of insect (loài côn trùng)
D. mankind (loài người)

Species: The species may die out soon.

A. a group of plants or animals with similar characteristics (loài động vật / loài thực vật)

B. a group of animals and plants living in the same area (nhóm động thực vật sống trong cùng một khu vực)

C. newly discovered animal (động vật mới được phát hiện)

D. new hybrid plant (thực vật lai tạo mới)

Exist: The animals may exist there.

A. live (tồn tại)

C. be ill (bị ốm)

B. die (chết)

D. be hunted (bị săn)

Planet: We will have to move to another planet.

A. a territory with its own borders as well as total sovereignty over its territory and residents (đất nước)

B. a large building with various connected rooms (chung cư)

C. a place which is larger than a village and smaller than a city (thị trấn)

D. a large, round object moving around a star in space (hành tinh)

5. Human being: A small amount of the poison can kill a human being.

A. chimpanzee (tinh tinh)

B. horse (ngựa)

C. person (con người)

D. whale (cá voi)

6. Influence: Her influence on my writing is great.

A. effect (sự ảnh hưởng)

B. dependence (sự phụ thuộc)

C. advice (lời khuyên)

D. focus (sự tập trung)

7. Environment: The teacher is teaching his students about the environment.

A. culture of a country (văn hóa)

B. natural world (môi trường)

C. system of government of a country (hệ thống chính quyền)

D. history of a country (lịch sử)

8. Affect: They may affect the project.

A. run (điều hành)

B. approve (phê chuẩn)

C. influence (ảnh hưởng)

D. fund (cấp vốn)

9. Water supply: The water supply is unsafe.

A. water source (nguồn cung cấp nước)

B. water temperature (nhiệt độ của nước)

C. water power (năng lượng từ nước)

D. water bottle (chai nước)

10. Industry: The industry is growing fast.

A. plant (cây)

B. manufacturing (công nghiệp, sự sản xuất)

C. army (quân đội)

D. population (dân số)

11. Agriculture: Developing countries have to depend on agriculture.

A. farming (nông nghiệp)

B. tourism (du lịch)

C. exports (xuất khẩu)

D. imports (nhập khẩu)

12. Conditions: Working conditions here have changed.

A. hours (giờ)

B. circumstances (hoàn cảnh, tình hình)

C. ages (tuổi)

D. relationships (mối quan hệ)

13. Cut down: They may cut down some trees to make room for a parking space.

A. uproot (nhổ rễ)

B. climb into (trèo)

C. chop down (chặt)

D. plant (trồng)

14. Destroy: Drinking can destroy young people's lives.

A. save (cứu)

B. prolong (kéo dài)

C. take over (kiểm soát)

D. ruin (phá hủy)

15. Pollutant: There is a great amount of the pollutant in the river.

A. substance that pollutes the environment (chất gây ô nhiễm)

B. valuable, shiny, yellow metal that is often used to make jewellery (vàng)

C. substance that consists of very small grains of rock (cát)

D. earth mixed with water (bùn)

16. In all respects: They appear in all respects identical.

A. partially (một phần)

B. nearly (gần như)

C. not necessarily (không nhất thiết)

D. absolutely (toàn bộ, về mọi mặt)

17. Habit: Tom was asked about his shopping habit.

A. practice (thói quen)

B. bag (túi)

C. list (danh sách)

D. trip (chuyến đi)

18. Result in: A change in temperature may result in rain.

A. prevent (ngăn chặn)

B. threaten (đe dọa)

C. cause (gây ra)

D. stop (dừng)

19. Serious: I have made a serious mistake.

A. little (nhỏ)

B. common (thông thường)

C. terrible (nghiêm trọng)

D. stupid (ngu ngốc)

20. Consequence: They accepted the consequence.

A. result (hậu quả)

B. proposal (đề án)

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C. help (sự giúp đỡ) D. punishment (hình phạt)

21. Rare: I saw some rare birds at the park.

A. migratory (di trú) B. game (khổng lồ)
C. predatory (săn mồi) D. unusual (hiếm)

22. In danger: The river is in danger of drying.

A. at risk (có nguy cơ) B. at the end (ở giai đoạn cuối)
C. in need (cần) D. at the beginning (ở giai đoạn mở đầu)

Extinct: Some animals are extinct.
A. discovered (được phát hiện) B. tamed (được thuần hóa)
C. bred (được gây giống) D. vanished (bị tuyệt chủng)

24. Disappear: The traditional way of life may disappear.

A. be maintained (được gìn giữ) B. be restored (được khôi phục)
C. be 108ong108nized (được công nhận) D. die out (biến mất)

25. Effort: It took them one year to build the bridge, but it was worth the effort.

A. money (tiền) B. time (thời gian)
C. attempt (sự cố gắng) D. risk (rủi ro)

26. Protect: He tried to protect his friend.

A. keep safe (bảo vệ) B. persuade (thuyết phục)
C. neglect (lờ đi) D. harm (gây hại)

27. Scientist: Her mother is a scientist.

A. expert in science (nhà khoa học) B. teacher (giáo viên)
C. singer (ca sĩ) D. businesswoman (doanh nhân)

28. Endangered species: Some endangered species live in the forest.

A. native species (loài bản địa) B. alien species (loài ngoại lai)
C. dominant species (loài chiếm ưu thế) D. threatened species (loài có nguy cơ bị tuyệt chủng)

29. Save: They did everything they could to save her.

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A. please (làm hài 109ong) | B. deceive (lừa)
C. rescue (cứu) | D. attack (tấn công)

30. Set up: He is going to set up a company next year.

A. work for (làm việc cho) | B. take over (tiếp quản)
C. dissolve (giải thể) | D. establish (thành lập)

31. Funds: We are short of funds now.

A. money (tiền) | B. information (thông tin)
C. time (thời gian) | D. food (thức ăn)

32. Raise: They will raise £100,000 to build a school in the area.

A. borrow (mượn) | B. invest (đầu tư)
C. collect (thu góp) | D. be paid (được trả)

33. National park: The national park will be extended by 500,000 ha.

A. a park for conservation purposes (công viên quốc gia) | B. a park serving as a social and recreational focal point for a neighbourhood (công viên địa phương)

C. a park for the purpose of industrial development (khu công nghiệp) | D. a commercially operated park having various devices for entertainment (công viên giải trí)

34. Establish: They helped to establish the school.

A. run (điều hành) | B. repair (sửa chữa)
C. found (thành lập) | D. decorate (trang trí)

35. Law: There is a law against drinking in the street.

A. prejudice (định kiến) | B. argument (sự tranh luận)
C. march (cuộc diễu hành) | D. rule (luật)

36. Introduce: The government may introduce the rule next year.

A. issue (ban hành) | B. bend (luồn lách)
C. tighten (thắt chặt) | D. end (chấm dứt)

37. Prohibit: The government will prohibit selling monkeys next month.

A. permit (cho phép) | B. encourage (khuyến khích)

C. invest in (đầu tư)   D. ban (cấm)

38. Destruction: People are concerned about the destruction of forests.

A. sale (sự bán)   B. harvest (sự thu hoạch)
C. plantation (sự trồng trọt)   D. devastation (sự tàn phá)

39. Interference: I could not tolerate their interference.

A. insolence (sự xấc láo)   B. intrusion (sự cản trở)
C. thoughtlessness (sự vô ý)   D. carelessness (sự bất cẩn)

40. Survive: The animal may survive in hot weather.

A. be sick (bị ốm)   B. die (chết)
C. remain alive (sống sót)   D. breed (sinh)

41. Produce: The cat may produce kittens.

A. bear (đẻ)   B. lick (liếm)
C. scratch (cào)   D. bite (cắn)

42. Offspring: The animal has a lot of offspring.

A. young (con)   B. fur (lông)
C. legs (chân)   D. spines (gai nhọn)

43. Peacefully: He lives peacefully alongside his neighbors.

A. modestly (khiêm nhường)   B. tranquilly (hòa bình)
C. fearfully (sợ hãi)   D. quietly (yên lặng)

44. Energy: The price of energy increased.

A. farmland (đất canh tác)   B. food (đồ ăn)
C. labour (nhân công)   D. power (năng lượng)

45. Fossil fuel: The fossil fuel was formed millions of years ago.

A. natural fuel formed underground from plant   B. fuel produced from a wide variety of
and animal remains (nhiên liệu hóa thạch)   renewable sources (nhiên liệu tái tạo)
C. fuel that is produced through contemporary   D. fuel used in a nuclear reactor to sustain a
biological processes (nhiên liệu sinh học)   nuclear chain reaction (nhiên liệu hạt nhân)

46. Reserve: There is an oil reserve in the region.

A. drum (thùng)

B. refinery (nhà máy)

C. tanker (tàu)

D. reservoir (trữ lượng)

47. Limited: The choices are limited.

A. wide (nhiều)

B. good (tốt)

C. abundant (thừa thãi)

D. restricted (hạn chế)

48. Power: Trash can be turned into power.

A. food (đồ ăn)

B. fresh water (nước sạch)

C. gold (vàng)

D. energy (năng lượng)

49. Demand: These machines are in demand.

A. production (sự sản xuất)

B. good condition (tình trạng tốt)

C. use (sự sử dụng)

D. request (sự yêu cầu)

50. Rapidly: The grass grows rapidly.

A. slowly (chậm)

B. thickly (dày)

C. steadily (từ từ)

D. quickly (nhanh chóng)

51. Exhausted: The water may be exhausted in the future.

A. purified (được lọc)

B. frozen (đóng băng)

C. used up (cạn kiệt)

D. contaminated (bị ô nhiễm)

52. Relatively: The house is relatively clean.

A. surprisingly (đáng ngạc nhiên)

B. extremely (cực kỳ)

C. comparatively (tương đối)

D. slightly (hơi, nhẹ nhàng)

53. Alternative source of energy: The alternative source of energy will never run out.

A. energy source that is an alternative to fossil fuel (nguồn nhiên liệu thay thế)

B. energy source formed underground from animal and plant remains (nguồn nhiên liệu hóa thạch)

C. energy source that may do harm to the environment (nguồn nhiên liệu gây hại cho môi trường)

D. energy source providing dirty energy (nguồn cung cấp nhiên liệu bẩn)

54. Nuclear energy: Nuclear energy is clean and safe.

A. energy captured from ocean surface waves

B. energy captured from the movement of air

(nhiên liệu từ sóng biển) (nhiên liệu từ gió)

C. energy held in the nucleus of an atom (nhiên liệu hạt nhân) D. energy emitted by the sun. (nhiên liệu mặt trời)

55. Electricity: He lived on an island with no electricity.

A. form of energy (điện) B. hi-tech device (thiết bị công nghệ cao)
C. means of transport (phương tiện giao thông) D. tap water (nước sạch)

56. Needs: Housing and education are everyone's needs.

A. rights (quyền lợi) B. necessities (nhu cầu thiết yếu)
C. desires (sự mong ước) D. concerns (mối lo ngại)

57. Geothermal heat: Geothermal heat has been used for many years in some countries.

A. heat inside the Earth (địa nhiệt) B. heat of the sun (nhiệt từ mặt trời)
C. heat of the fire (nhiệt từ đám cháy) D. heat produced when lime reacts with water (nhiệt tỏa từ phản ứng giữa vôi sống và nước)

58. Available: Fresh food is not available here.

A. expensive (đắt) B. popular (được ưa chuộng)
C. obtainable (có sẵn) D. cheap (rẻ)

59. Windmill: It is the biggest windmill on the hill

A. a high building giving people a good view of the area that they are in (chòi canh) B. a large building where royals live (lâu đài)
C. a building with vanes that turn in the wind (cối xay gió) D. a building in which the bodies of dead people are buried (mộ)

60. Sailboat: He gets onto a sailboat.

A. a small round boat made of wickerwork that is propelled with a paddle (thuyền thúng) C. a small boat with sails (thuyền buồm) B. a narrow boat with pointed ends that is propelled with paddles (thuyền độc mộc)
D. a small boat powered by an engine (thuyền máy)

61. Dam: The dam was built last month.

A. barrage (đập) B. road (đường)
C. bridge (cầu) D. house (nhà)

62. Release: They may release many balloons in the event.

A. blow up (thổi bay)   B. buy (mua)

C. let go of (thả, thải ra)   D. sell (bán)

63. Solar panel: The factory produces solar panels.

A. device for producing a current of air   B. device for checking electrical circuits (bút
(quạt điện)   thử điện)

C. device for measuring blood pressure   D. device for generating electricity from solar energy
(máy đo huyết áp)   (máy phát điện từ năng lượng mặt trời)

64. Create: They will create a poster tomorrow.

A. print (in)   B. take down (bỏ xuống)

C. make (tạo ra)   D. display (trưng bày)

65. Heat: You should heat the soup.

A. season (nêm gia vị)   B. stir (khuấy)

C. eat (ăn)   D. warm (làm nóng)

66. Cool: You need to cool the cake.

A. chill (làm lạnh)   B. bake (nướng)

C. cut (cắt)   D. decorate (trang trí)

67. Plentiful: Fruits are plentiful in the summer.

A. scarce (hiếm)   B. abundant (phong phú)

C. expensive (đắt)   D. cheap (rẻ)

68. Infinite: She bathed the baby with infinite care.

A. extremely great (vô hạn, rất nhiều)   B. little (ít)

C. special (đặc biệt)   D. proper (đủ, hợp lý)

69. Disadvantage: The app has just one disadvantage.

A. version (phiên bản)   B. strong point (điểm mạnh)

C. weak point (điểm bất lợi)   D. feature (tính năng)

70. Make use of: He tries to make use of the machine.

A. repair (sửa)   B. install (cài đặt)

C. unplug (rút phích cắm)   D. use (sử dụng)

71. Researcher: She is a leading researcher in the field.

A. someone whose job is to ensure security of society (công an)

B. someone whose job is to treat diseases (bác sĩ)

C. someone whose job is to grow plants and raise animals (nông dân)

D. someone whose job is to study a subject carefully (nhà nghiên cứu)

APPENDIX E – QUESTIONNAIRE

1. Questionnaire in Vietnamese

Câu 1. Bao lâu thì em dùng thẻ học từ vựng bằng giấy để tự ôn tập từ mới tiếng Anh?

Không học

1 – 3 lần một tuần ○

4 - 6 lần một tuần ○

Hàng ngày

Câu 2. Bao lâu thì em dùng Quizlet để tự ôn tập từ mới tiếng Anh?

Không học

1 – 3 lần một tuần ○

4 – 6 lần một tuần ○

Hàng ngày

Câu 3. Trung bình mỗi lần em dành bao nhiêu thời gian để tự ôn tập từ mới tiếng Anh với thẻ học từ vựng bằng giấy?

Không học

Ít hơn 20 phút ○

20 - 40 phút ○

40 – 60 phút ○

Hơn 60 phút

Câu 4. Trung bình mỗi lần em dành bao nhiêu thời gian để tự ôn tập từ mới tiếng Anh với Quizlet?

Không học

Ít hơn 20 phút ○

20 – 40 phút ○

40 – 60 phút ○

Hơn 60 phút

Câu 5. Em đọc và cho ý kiến về những nhận định sau

	Rất phản đối	Phản đối	Hơi phản đối	Hơi đồng ý	Đồng ý	Rất đồng ý
Thẻ học từ vựng bằng giấy giúp tôi ghi nhớ từ mới tiếng Anh rất lâu.						
Thẻ học từ vựng bằng giấy giúp tôi ghi nhớ từ mới tiếng Anh nhanh chóng.						
Sử dụng thẻ học từ vựng bằng giấy giúp tôi cải thiện vốn từ vựng tiếng Anh.						
Sử dụng thẻ học từ vựng bằng giấy để học từ mới tiếng Anh rất thú vị.						
Sử dụng thẻ học từ vựng bằng giấy rất dễ dàng.						

Câu 6. Em đọc và cho ý kiến về những nhận định sau

	Rất phản đối	Phản đối	Hơi phản đối	Hơi đồng ý	Đồng ý	Rất đồng ý
Quizlet giúp tôi ghi nhớ từ mới tiếng Anh rất lâu.						
Quizlet giúp tôi ghi nhớ từ mới tiếng Anh nhanh chóng.						
Sử dụng Quizlet giúp tôi cải thiện vốn từ vựng tiếng Anh.						
Sử dụng Quizlet để học từ mới tiếng Anh rất thú vị.						
Sử dụng Quizlet rất dễ dàng.						

Câu 7. Em thích học từ mới tiếng Anh với thẻ học từ vựng bằng giấy hay Quizlet?

Thẻ học từ vựng bằng giấy ○

Quizlet

Câu 8. Tại sao em lại thích học từ mới tiếng Anh với thẻ học từ vựng bằng giấy / Quizlet?

2. Translation of questionnaire into English

Question 1. How often did you study English vocabulary with paper flashcards outside the classroom?

 I did not study
 Once – 3 times a week o
 4 – 6 times a week
 o Every day

Question 2. How often did you study English vocabulary with Quizlet outside the classroom?

 I did not study
 Once – 3 times a week o
 4 – 6 times a week
 o Every day

Question 3. How much time per session did you spend studying English vocabulary with paper flashcards outside the classroom?

 I did not study
 Less then 20 minutes o
 20 - 40 minutes
 o 40 - 60 minutes
 o More than 60 minutes

Question 4. How much time per session did you spend studying English vocabulary with Quizlet outside the classroom?

 I did not study
 Less then 20 minutes o
 20 – 40 minutes
 o 40 – 60 minutes
 o More than 60 minutes

Question 5. Please give your opinions about the below statements

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
Paper flashcards help me learn English vocabulary quickly.						
Paper flashcards help me memorise English vocabulary in a longer term.						
Using paper flashcards helps me improve my English vocabulary.						
Learning English vocabulary via paper flashcards is enjoyable.						
It is easy to use paper flashcards to learn English vocabulary.						

Question 6. Please give your opinions about the below statements

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
Quizlet helps me learn English vocabulary quickly.						
Quizlet helps me memorise English vocabulary in the longer term.						
Using Quizlet helps me improve my English vocabulary.						
Learning English vocabulary via Quizlet is enjoyable.						
It is easy to use Quizlet to learn English vocabulary.						

Question 7. Do you prefer learning English vocabulary with paper flashcards or Quizlet?

Question 8. Why do you prefer learning English vocabulary with paper flashcards or Quizlet?

APPENDIX F – TIME SPENT ON PRONOUNCING TARGET WORDS (OUT OF 10 MINUTES)

	Quizlet		Paper flashcards	
	Input	Output	Input	Output
A1	9'	0	5'33''	0
A10	10'	0	10'	6'
A17	10'	0	10'	10'
A6	8'	0	1'22''	0
A14	6'18''	6'18''	10'	10'
A34	0	0	10'	0

APPENDIX G – PARTICIPANTS' OPINIONS ABOUT THE USABILITY AND USEFULNESS OF QUIZLET AND PAPER FLASHCARDS

	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
Quizlet helps me learn English vocabulary quickly	0%	2.6%	10.3%	23.1%	38.5%	25.6%
Quizlet helps me memorise English vocabulary in a longer term	7.7%	10.3%	20.5%	10.3%	30.7%	20.5%
Using Quizlet helps me improve my English vocabulary.	0%	5.1%	2.6%	12.8%	43.6%	35.9%
Learning English vocabulary via Quizlet is enjoyable.	0%	0%	0%	10.3%	38.5%	51.3%
It is easy to use Quizlet to learn English vocabulary.	0%	0%	0%	12.8%	38.5%	48.7%
Paper flashcards help me learn English vocabulary quickly.	0%	7.7%	10.3%	20.5%	38.5%	23.1%
Paper flashcards help me memorise English vocabulary in a longer term.	5.1%	2. 6%	7.7%	28.2%	33.3%	23.1%
Using paper flashcards helps me improve my English vocabulary.	0%	0%	2.6%	12.8%	48.7%	36%
Learning English vocabulary via paper flashcards is enjoyable.	0%	2.6%	15.4%	28.2%	33.3%	20.2%
It is easy to use paper flashcards to learn English vocabulary.	0%	5.1%	2.6%	20.5%	41%	30.8%