INVESTIGATING THE USE OF A MOBILE FLASHCARD APPLICATION REMEMBA ON THE VOCABULARY DEVELOPMENT AND MOTIVATION OF TURKISH EFL LEARNERS

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MAY 2017

INVESTIGATING THE USE OF A MOBILE FLASHCARD APPLICATION REMEMBA ON THE VOCABULARY DEVELOPMENT AND MOTIVATION OF TURKISH EFL LEARNERS

A THESIS SUBMITTED TO THE GRADUATE SCHOOL OF EDUCATIONAL SCIENCES OF BAHÇEŞEHİR UNIVERSITY

BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN THE DEPARTMENT OF ENGLISH LANGUAGE EDUCATION

MAY 2017

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ABSTRACT

INVESTIGATING THE USE OF A MOBILE FLASHCARD APPLICATION REMEMBA ON THE VOCABULARY DEVELOPMENT AND MOTIVATION OF TURKISH EFL LEARNERS

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Master's Thesis, Master's Program in English Language Education
Supervisor: Assist. Prof. Enisa Mede

May 2017, 106 pages

The major purpose of this study is to investigate the effects of *Rememba*, a mobile flash card application with a spaced repetition system, on the vocabulary development and motivation of Turkish EFL students enrolled in a language preparatory program at a foundation (non-profit, private) university in Istanbul, Turkey. The study also attempts to find out the perceptions of the students and the teacher about incorporating this mobile tool in their classroom practices. The participants of were 38 students and one teacher of an upper-intermediate level preparatory class. In this quasi-experimental study, data were gathered from pre- and post- tests, a motivation questionnaire, open-ended questions and reflective journals. The obtained findings revealed that the implementation of *Rememba* resulted in significantly higher vocabulary gains and enhanced motivation of the learners. The findings also suggested that both students and the teacher perceived the use of this mobile tool positively while teaching and learning vocabulary in their classroom.

Keywords: Mobile Assisted Language Learning, Vocabulary Development, Student Motivation, Mobile Flash Cards, EFL

ÖZ

MOBİL BİR KELİME KARTI UYGULAMASI OLAN REMEMBA'NIN İNGİLİZCE'Yİ YABANCI DİL OLARAK ÖĞRENEN TÜRK ÖĞRENCİLERİN KELİME GELİŞİMİ VE MOTİVASYONU ÜZERİNDEKİ ETKİSİNİN ARAŞTIRILMASI

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Mayıs 2017, 106 sayfa

Bu çalışmanın amacı kelime kartları içeren ve aralıklı tekrar sistemi ile çalışan bir cep telefonu uygulaması olan *Rememba'nın,* bir vakıf ünversitesinin hazırlık okuluna kayıtlı, İngilizce'yi yabancı dil olarak öğrenen Türk öğrencilerin kelime öğrenimi ve motivasyonları üzerindeki etkisini araştırmaktır. Bu araştırmanın diğer bir amacı, öğrencilerin ve öğretmenin derste kullanılan bu uygulama hakkındaki algılarıyla ilgili bilgi toplamaktır. Katılımcılar İngilizceyi yabancı dil olarak öğrenen üst-orta düzey seviyede 38 öğrenciden oluşmaktadır. Veri toplamak için nitel ve nicel yöntemler kullanılmıştır. Nicel veriler ön test ve son test olarak kullanılan kelime testi ve motivasyonu ölçen anketten oluşmaktadır. Nitel veriler için öğrenciler ve öğretmen tarafından tutulan yansıtıcı günlükler ve açık uçlu sorular analiz edilmiştir. Araştırma sonunda, kullanılan mobil uygulamanın, öğrencilerin kelime öğrenimlerinde ve motivasyonlarında olumlu bir etkisi olduğu görülmüştür. Ayrıca, öğrenciler ve öğretmen uygulamanın kelime öğrenimi ve öğretiminde kullanılması ile ilgili olumlu görüşler bildirmişlerdir.

Anahtar Kelimeler: Mobil Öğrenme, Kelime Öğrenimi, Yabancı Dil Olarak İngilizce, Mobil Kelime Kartları

To my family and all supporting friends

ACKNOWLEDGEMENTS

Firstly, I would like to express my deepest gratitude to my advisor Assist. Prof. Enisa Mede for her invaluable suggestions and constructive guidance throughout the planning and development of this study. I am grateful that she provided me with all the support and encouragement I needed during this tough process.

Besides my advisor, I would like to thank my thesis committee: Assist. Prof. Aylin Tekiner Tolu and Dr. Nafiye Çiğdem Aktekin for the valuable feedback for this research.

I owe special thanks to my dearest parents Derya Duymaz and Hamdi Aydaş, my husband Cankat Köse and friends who always supported me with their help and understanding through this challenging phase.

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Introduction

This chapter provides theoretical background information about the present study related to the use of mobile assisted vocabulary learning in English language preparatory programs. The chapter highlights the importance of mobile assisted learning in the modern era. Following this, it gives brief information regarding the second language vocabulary development. The chapter, then, explains the purpose of the study, research questions and significance of the study. Lastly, the key terms used in this study are briefly defined.

1.1 The Importance of Mobile Assisted Language Learning (MALL) and Vocabulary Development

With the advance of cutting-edge technology, teaching and learning a second language have started to be reshaped over the recent years. In this respect, varied practices, such as computer-assisted language learning software, digital portfolios, e-books, are used by practitioners, and mobile phones are among the most significant ones offering a great potential for learning. Since mobile phones eliminate time and place constraints, learners may gain considerable advantages from them by studying whenever and wherever they want. Additionally, it is a well-known fact that students in this era are called “digital natives” and nearly all of them are somehow interested in technology, computers and especially smart phones which are an integral part of MALL. Considering the vast number of outstanding features of smart phones such as portability and immediacy, the use of smart phones can pave the way for effective learning not only inside but also outside the classroom.

Vocabulary learning is a crucial part of second language learning. Vocabulary is defined by Ur (2012, p.20) as "lexical items of the language" and she emphasizes that so as to understand a text, comprehension of between 95% and 98% of its words is essential. Barani et al. (2010) also state that learners need a wide range of vocabulary to meet their needs in communication. As a matter of fact, having a certain range of vocabulary knowledge is necessary for EFL learners in order to comprehend both written and spoken language. Therefore, lack of sufficient

vocabulary knowledge is one of the major reasons why EFL learners have difficulty in the comprehension and expression of the target language. For this reason, as ELT practitioners, we need to find effective vocabulary teaching strategies and guide our students for effective self-study methods.

Taking the needs and the interests of the students into consideration, integration of MALL to consolidate the vocabulary development of the students is utilized in this study. First and foremost, the effects of a mobile application, *Rememba* on the vocabulary development and motivation of Turkish EFL learners will be explored. Then, the perceptions of teachers and students regarding the implementation of this mobile application in their classrooms will be investigated.

1.2 Theoretical Framework

In recent years, the need to find ways for effective vocabulary teaching and learning has been expressed by many researchers (Carter & McCarthy, 2014; Hunt & Belgar, 2005). Nam (2010), for example, emphasizes the fact that vocabulary is essential for four language skills of reading, writing, listening and speaking, and in case of lack of vocabulary knowledge students consider it as "an obstacle to learning". Therefore, the wider vocabulary knowledge the students have, the more competent they could be in other skills of language. Laufer (1997) also points out that in order to understand written and spoken texts, EFL learners need to know 3.000 or so high frequency words of the target language. In a similar vein, Wilkis (1972) puts forward that "without grammar very little can be conveyed, without vocabulary nothing at all can be conveyed" (p.111). This suggests that having a certain size of vocabulary knowledge is crucial for students while learning English so they should be equipped with effective strategies for vocabulary learning. The need for a large amount of vocabulary yet having limited time in the classroom makes the use of MALL an enticing option. The scientific inquiry of this research is to find a motivating and effective way to help EFL learners consolidate their vocabulary knowledge outside the classroom.

The literature on vocabulary learning and teaching emphasizes the significance of extending efforts to practice vocabulary outside the classroom (Ma & Kelly, 2009; Zull, 1998). Nevertheless, most of the time students seem reluctant to study outside the class or do not expend enough effort to do so. Considering this issue, mobile

applications could be a solution so as to help students be motivated to study vocabulary by being free from time and space boundaries (Norbrook & Scott, 2003). Jones et al. (2006) also came up with different factors such as *freedom, fun, ownership and continuity* which explain why mobile devices are motivating. Thanks to this invaluable asset of mobile learning, students could be encouraged to study and practice the target words more beyond the boundaries of the classroom.

The fact that spaced repetition has a tremendous impact on long-term word retention is one of the crucial findings in the field of vocabulary learning (Nation, 2001, p.76). It is not possible for students to learn all the target words after their first encounter; therefore, repetition or recycling of the words at certain intervals is highly required. Studies also demonstrate that spaced repetition is more advantageous than massed repetition (Baddeley, 1990; Nation, 2001). In other words, if the target words are repeated across a period of time, usually at increasing intervals, learning and retention of the words become more effective than repeating them at a single, uninterrupted period of time. To elaborate, studying the target words for an hour without later revisions would be called as massed repetition. On the contrary, studying the target words for 20 minutes each time with 5, 10, and 20-minute intervals respectively would be a spaced repetition study. As it is seen, although the total amount of study time is the same in both examples, in the latter one, an hour of study is spread over a longer period of time by using spaced repetition study. It was proved by the studies (Baddeley, 1990; Dempster, 1987) that better retention of the words was seen in the learners making use of the spaced repetition than the others who used the massed repetition method. That is to say, recurrent revision of the words prevent them from being forgotten.

Based on these overviews, the present study emphasizes the use of a mobile application, *Rememba*, by Turkish EFL learners in preparatory programs noting the opportunities and potentials it could bring to the vocabulary development and motivation of the students. The study also attempts to find out the perceptions of the students and the teacher about implementing this mobile tool while teaching and learning vocabulary in language classrooms.

1.3 Statement of the Problem

In most Turkish universities, English is the medium of instruction. Prospective students have to improve their language skills and strategies as well as developing their vocabulary and grammar to be able to follow the undergraduate courses offered at various disciplines. A large number of university students in Turkey need to learn English for their departmental studies. However, majority of students have difficulty in expressing themselves in the target language because of their limited vocabulary knowledge (Altun, 1995). In a similar vein, Laufer (1997) argues that one of the main reasons behind this difficulty is the lack of students' vocabulary knowledge. Finally, most of the students consider vocabulary learning as a boring process since it requires a lot of repetition and recycling (Zheng, 2012).

In light of these observations, the present study aims to fill in this gap by integrating a mobile tool (*Rememba*) to teach, learn and practice vocabulary in English language preparatory classes. Implementing such a device will provide students with the opportunities to learn, recycle and consolidate the words they have learned not only inside but also outside of the classroom. Finally, using smart phones as a learning tool, which play a significant role in young people's lives, may increase the motivation of students intrinsically and have a positive impact on their vocabulary development as well.

1.4 Purpose of the Study

Having vocabulary knowledge within a sufficient range is a requirement in language learning for the comprehension and the expression of the target language (TL). A large number of EFL learners have difficulty in understanding and expressing both the oral and written forms of L2 (English) due to lack of vocabulary knowledge. That is why; they need more opportunities to consolidate their vocabulary knowledge. The purpose of this study, therefore, is to investigate the use of a mobile application, *Rememba*, and see its effects on the vocabulary development and motivation of EFL learners. The study also attempts to find out the perceptions of teachers and students about implementing this mobile tool to teach and learn vocabulary in their classes.

1.5 Research Questions

In the light of the above discussion, this study aims to find the answers to these research questions:

1. Is using *Rememba* as mobile flash cards based on spaced repetition effective in terms of the vocabulary development of Turkish EFL students in upper intermediate level preparatory classes?
2. How does *Rememba* help the participating students promote their motivation to store and practice vocabulary?
3. What are the perceptions of students and the teacher about using *Rememba* as a mobile tool to store and practice vocabulary in preparatory classes?

1.6 Significance of the Study

Mobile phones are one of the most widespread and popular technological devices in our modern age, and they play a significant role especially in young people's lives. Use of mobile technology is also growing rapidly in the field of education since it empowers learners by allowing them to reach the learning materials and study them at any time and place (Ally, 2009). Likewise, it enables educators to reach teaching resources without time and place restrictions and help them to make their lessons more effective. Attewell (2005) points out that the United Kingdom, Sweden, Italy and the United States are the pioneers of mobile assisted language learning. However, in Turkey the number of research conducted on the use of mobile applications is scarce. Besides this, many studies with regard to the use of m-learning explore the use of SMS or MMS (Çavus & İbrahim; Kennedy & Levy, 2008; 2009; Saran, 2009; Stockwell, 2007); however, there is little research on the use of mobile applications via smart phones.

Based on these overviews, what this study aims to show is that the mobile application, *Rememba*, is an effective tool for EFL learners to consolidate the target words outside of the classroom. As a vocabulary learning strategy, students should be provided with alternative and motivating ways for self-study. Institutions and EFL instructors can benefit a great deal from the use of smartphones since they enable learners to study at any time and place, and make the learning process more enjoyable. The findings of this study may guide English language preparatory

schools through the implementation of mobile assisted learning regarding vocabulary teaching.

1.7 Definitions

EFL: English as a Foreign Language (Mayo, 2003).

ELT: English Language Teaching. (Harmer, 2007)

L1: First language (Cook, 2001). In this study, L1 refers to learners' mother tongue; Turkish.

L2: Second language (Winke, 2007). In this study, L2 refers to English.

MALL: Mobile assisted language learning (Miangah & Nazarat, 2012)

MMS: Abbreviation for Multimedia Messaging Service. It is a versatile messaging service, and besides traditional messaging service, it provides richer content including images, audio and video clips (Forster, 2002, p.224)

NS: Native speaker (Davies, 2000). In this study, NS refers to the instructors who were raised speaking English as their main language.

TL: Target Language (Smith, 1981). In this study, TL refers to English language.

Chapter 2
Literature Review

2.1 Introduction

This chapter presents theoretical background of the vocabulary learning in a foreign language and mobile assisted language learning. It starts with an overview of the theories and taxonomies with respect to vocabulary learning. The chapter continues with the section focusing on mobile learning and the integration of it into language learning. Finally, the chapter concludes with the previous studies related to mobile assisted language learning (MALL).

2.2 Vocabulary Learning in a Foreign Language

Vocabulary learning is a fundamental part of foreign language learning, and without it, it is almost impossible for learners to establish oral and written communication (Schmitt, 2010). Harmer (1994, p.153) acknowledges, "If language structures make up the skeleton of language, then it is vocabulary that provides the vital organs and the flesh". Therefore, vocabulary learning is an indispensable component of learning a foreign language, and vocabulary teaching needs to be given enough importance in a learning environment which is rich in written and oral language. Another noteworthy fact which demonstrates the importance of vocabulary learning for mastering a foreign language is that there is a high correlation between vocabulary knowledge and language proficiency (Anderson, 2005; Schmitt, 2010). One of the empirical evidences for aforementioned fact is provided as a result of a study by Anderson (2005). In his study, by using DIALANG tests, he made a comparison of vocabulary tests scores with the scores from other language skills such as reading, listening and writing, and he found a strong relationship between vocabulary knowledge and language skills. In another study conducted by Stæhr (2008) the link between vocabulary size and the other four skills was explored among EFL learners in Denmark. The results indicated that the knowledge of the most frequent 2000 word families led to a better performance in the listening, reading and writing test scores received by the participants. As it is clearly seen from

the studies mentioned above having sufficient vocabulary knowledge is crucial for language use.

2.2.1 Vocabulary knowledge. Defining vocabulary knowledge is a complicated issue and "the exact nature of lexical knowledge has always perplexed researchers and teachers" (Schmitt, 2014, p.913). Schmitt (2010) considers vocabulary knowledge as a continuous process consisting progressive levels of knowledge, which starts with recognizing a group of letters or sounds as a word and continues with the connection between the form and meanings, understanding the word in different contexts and using the word in an appropriate way. Also, while defining vocabulary knowledge, making the distinction between receptive and productive knowledge is common among the researchers (Laufer 2004; Maera 1990; Nation, 2004).

Receptive knowledge is defined by Nation (2004) as the ability to understand the form of a word while reading or listening and recalling its meaning. Productive knowledge, on the other hand, requires using the word appropriately in speaking or writing. This definition is also supported by Zareva et al. (2005) who state that receptive vocabulary is employed for comprehension whereas productive vocabulary is necessary for production. According to Webb (2008) knowing students' receptive vocabulary size enables teachers to see if learners will be able to understand a text or a listening task, while knowing their productive vocabulary size could be the indicator of a degree to which students will be able to speak or write. As discussed above, receptive and productive knowledge make up the two significant aspects of vocabulary knowledge and having an understanding of them could give researchers and teachers invaluable insight as to EFL learners' vocabulary development.

2.2.2 Main approaches to vocabulary teaching and learning in second/foreign language education. The obvious importance of vocabulary knowledge to the other skills in a foreign language has led researchers and educators to investigate ways to facilitate better vocabulary instruction (Jenkins & Dixon, 1983). Zimmerman (1997) notes the fact that vocabulary development is "arguably central to language acquisition and use" (p. 17); therefore, the use of effective vocabulary instruction methods is prominent. The two most noteworthy instructional approaches to vocabulary teaching in foreign language classes are explicit and

implicit teaching/learning, and there is an ongoing debate as to whether effective vocabulary teaching should give priority to explicit or implicit learning. With regard to the main approaches to vocabulary instruction in foreign language education, the following section will summarize explicit and implicit approaches to teaching/learning.

2.2.2.1 Explicit teaching and implicit learning. Explicit and implicit vocabulary teaching are the two common methods used to teach in language classes (Ketabi & Shahraki, 2011). In explicit teaching, students are exposed to pre-determined words through direct instruction. It is pointed out by Hunt and Beglar (2005) that the aim of explicit vocabulary instruction is to direct learner's attention. According to this theory, so as to develop vocabulary, students need to be explicitly taught not only specific words but also word learning strategies. Since explicit learning is generally considered to be facilitative, it provides higher chances for the acquisition of information thanks to direct attention to it. For a better vocabulary learning, explicit teaching of particular learning strategies were suggested by many researchers (Cohen, 1998; Cohen, Weaver & Li, 1995; Oxford & Scarcella, 1994).

Empirical evidence also demonstrates that explicit instruction in word meanings, where a word is identified and information about meaning or usage provided, is more effective in teaching words than exposure to the words in books alone (Coyne et al., 2007; Justice et al., 2005).

On the other hand, implicit vocabulary learning is based on Krashen's Input hypothesis (1989), he contends that as a consequence of several exposures in different contexts, meaning of new words are acquired subconsciously. In other words, in implicit vocabulary learning, students are expected to learn the target words through reading or listening. Ma and Kelly (2006) state that while implicit learning is natural and effortless, explicit learning is something requiring more mental effort by learners. As it is seen, implicit learning differs from explicit one in that the information is acquired without the conscious effort of the learner. That is to say, no intentional effort to learn a word is required. The process consists of learning from receptive skills such as reading and listening, and requires repeated exposures to words in different contexts (Hulstijn, 2003).

Lastly, explicit learning theory does not totally disagree with the advocates of implicit learning; it rather accepts it as a complementary part of vocabulary learning (Ellis, 1994).

To summarize, while the explicit method suggests teaching vocabulary explicitly by directing learners' focus on the target words, implicit vocabulary learning takes place subconsciously through the exposure to listening, or reading. It cannot be stated that one method is superior to the other; therefore, providing students both with explicit and implicit learning opportunities could facilitate a more effective vocabulary development in second/foreign language classrooms.

2.2.3 Taxonomies of Vocabulary Learning Strategies. Teaching vocabulary learning strategies (VLS) is crucial in English language teaching and learning particularly in terms of their effects on the vocabulary development of language learners (Nation, 2001). With regard to this, a great number of researchers so far have indicated a significant connection between vocabulary learning strategies and learning results by means of a correlational approach (e.g., Fan, 2003; Gu & Johnson, 1996) or by comparing similarities and differences in strategy use by learners with varying level of success (Gu, 1994; Moir & Nation, 2002). It is also stated by Catalan (2003) that using vocabulary learning strategies effectively can considerably facilitate and improve vocabulary retention (Catalán, 2003). The findings of this study propose that EFL learners need to be provided with appropriate VLSs so that they can have sufficient vocabulary knowledge in the target language.

Schmitt (1997) proposes a critical overview of the vocabulary learning strategy use in L2. He divides vocabulary learning strategies (VLSs) into two major parts as discovery and consolidation. The initial stage, discovery, starts when learners encounter an unknown word for the first time and try to determine the meaning of it. As Schmitt suggests, in the discovery stage, learners employ two different strategies which are determination and social strategies.

Based on Schmitt's taxonomy, determination strategies are used when learners try to grasp the meaning of a new word by guessing it through context, structural knowledge of language, or using reference materials. To illustrate, in order to accomplish it, learners can analyze part of speech / affixes and roots, use dictionaries/wordlists/flashcards. Social Strategies are the second way of discovering the meaning of an unknown word, and it entails interacting with other people to get

help with it. For instance, learners may ask their teacher or classmates for L1 translation, example sentence or synonyms.

Following the discovery of a word, consolidation strategies need to be used by learners so as to remember and retain vocabulary. Therefore, learners make use of a number of social, memory, cognitive and metacognitive strategies to practice the target words further. As for social strategies, studying and practicing the meanings of the words collaboratively, interacting with native speakers or a teacher's checking students' flashcards for accuracy could be given as examples. Memory strategies, encompass associating the word with some previous knowledge using some form of imagery or grouping such as using semantic maps, scales for gradable adjectives, or relating the word to its synonyms or antonyms. It is also stated by Oxford (1990) that memory strategies such as acronym, grouping and imagery enable learners to store and retrieve information. In a study conducted by Ghorbani and Riabi (2011), the findings proved the effectiveness of instruction through memory strategies for long-term retention. Cognitive strategies in Schmitt's taxonomy entail verbal or/and written repetition through the use of mechanical practices such as word lists, flash cards, and vocabulary notebooks. Lastly, metacognitive strategies in this taxonomy refer to the self-directed learning where learners have the ability to plan and reflect on their own learning. To be more specific, testing oneself with word tests, using spaced word practices, or deciding on which words to study primarily or which ones to skip are some instances of metacognitive strategies (Schmitt, 1997). Regarding metacognitive strategies, Anderson (2002) contends, "the use of metacognitive strategies activates one's thinking and leads to improved performance in learning in general" (p. 3). Thus, it can be concluded that learners employing these strategies in vocabulary learning, which are summarized in Table 1 below, can have a better understanding of their own role in this process as they are conscious of different ways to reach their learning goals.

Table 1

Schmitt 's Taxonomy of VLSs (1997)

Dimension	Strategy	What learner does
Discovery	Determination Strategies	Analyse part of speech Check for L1 cognates Guess from textual context Bilingual dictionaries Monolingual dictionaries Word lists Flash cards
	Social Strategies	Ask teacher for L1 translation/synonym/example sentence Ask classmates for meaning Discover new meaning through group work activity
Consolidation	Social Strategies	Study and practice meaning in a group Teacher checks students' flash cards word lists for accuracy Interact with native-speakers
	Memory Strategies	Study word with a pictorial representation of its meaning Image word's meaning Connect word to a personal experience Connect the word to its synonyms and antonyms Use new word in sentences Study the sound of a word
	Cognitive Strategies	Verbal repetition Written repetition Word lists Flash cards
	Metacognitive Strategies	Testing oneself with word tests Use spaced word practice Skip or pass new word Continue to study over time

Nation (2001) also puts forward a general classification of strategies for vocabulary learning as summarized in Table 2. The strategies mainly include three parts as 'planning', 'source' and 'processes', each of which involves significant sub-strategies. The initial class of this taxonomy, planning, includes choosing what words to focus on and when to focus on them. Choosing words, choosing aspects of word knowledge and choosing strategies in addition to planning repetition are the strategies in this category. The next category is related to receiving information about the word, which can be achieved through analyzing the word, using context, applying to a reference source in L1 and L2 such as monolingual or bilingual dictionaries, and using connections in L1 and L2. The final category is "processes" which is about establishing word knowledge.

In relation to establishing knowledge, Nation (2010) proposes three stages as noticing, retrieving and generating. First of all, noticing means seeing the target word item and consciously paying attention to it. Nation (2001) believes that learners need to be guided to notice the word and perceive it as a useful language item. In order to provide students with guidance, teachers can highlight the target words on the board (Folse, 2004), give a definition/synonym/antonym. Helping them keep a vocabulary notebook or prepare word cards could also be among the practices which foster noticing. He states that motivation and interest are also among the significant factors affecting learners' attention immediately. If learners consider a word as important or interesting, they will focus on it and thus they are more likely to remember it later on.

In addition, retrieval is one of the critical processes resulting in recalling the words. Nation (2001) holds the idea that if retrieval is facilitated during a task, the memory of words will be reinforced. Retrieval is also put into two categories, one of which is receptive retrieval and the other one is productive retrieval. Receptive retrieval occurs when learners encounter a previously studied word in a reading or listening and perceives its meaning. On the other hand, productive retrieval requires using the word meaningfully in a written or spoken context. Nation (2001) postulates that both forms of retrieval are essential in order for users to make connections between form and meaning. In order to reinforce retrieval, the importance of repeated exposure and recycling is emphasized by various researchers (Nation, 2002; Schmitt, 2008; Wallace, 1982). Although it is not possible to give the exact number of repetition to learn a vocabulary item, Nation (2001) states that repetition ranging

between 5 to 20 times is essential to learn words. In a similar vein, a study conducted by De Groot (2006) indicated that 10-second repetitions had a profound impact on learning a vocabulary item. Along with the number of repetition, another crucial point, which is about recycling, is made by Nation (1990, p.45). According to him, recycling is essential, and when neglected it causes learners to forget "many partially-known words". Therefore, recycling activities and consolidation of newly learned words need to be integrated into vocabulary instruction, otherwise; it is inevitable that learners will forget most of the new words.

According to Nation's taxonomy, the final stage in the category of "processes" is called "generating", which means being able to use or recall the previously learned words in a different context, with a different meaning or with its other collocations. To put it another way, for generative use Nation (2001) states that learners need to form "new aspects of knowledge" (p.222) of the word that they have learned before. Generative use could be on receptive or productive level, as well. When learners encounter a new aspect of a word in listening or reading, receptive form occurs. However, if a word is used in a different way by learners in speaking or writing, it is considered as a productive form.

Table 2

Nation's Taxonomy of VLSs (2001)

General Class of Strategies		Types of Strategies
Planning	choosing what to focus on and when to focus on it	Choosing words Choosing the aspects of word knowledge Choosing strategies Planning repetition
Sources	Finding information about words	Analyzing the word Using context Consulting a reference source in L1 and L2 Using parallels in L1 and L2
Processes	Establishing knowledge	Noticing Retrieving Generating

To wrap up, the two taxonomies by Schmitt (1997) and Nation (2002) propose vocabulary learning strategies which can be employed by EFL learners to facilitate their vocabulary development. As teachers we can get language learners to familiarize themselves with these strategies and assist them in building their vocabulary knowledge by implementing them in our classroom practices.

2.2.3.1 Types of VLSs in Language Classrooms. As described in the previous part of this study, there are various VLSs categorized under different sections. Using flashcards and spaced repetition are also among the VLSs highly suggested by Nation (2001) and Schmitt (1997). As in this study, the effects of using digital flashcards based on spaced repetition on ELF learners' vocabulary development was explored, the following part presents detailed information about these two strategies.

2.2.3.1.1 Use of Word Cards / Flash Cards as a VLS. Flash cards are one of the ways to benefit from Schmitt's (1997) and Nation's (2001) vocabulary learning strategies, where the learner studies a set of cards and tries to remember its meaning (Nation, 2001). In Schmitt's taxonomy (1997), flash cards could be used both in the "discovery" stage, where the learners study the part of the speech, definition, synonym/antonym of the target word, and in the "consolidation" stage where they further practice the target words through flash cards. In Nation's taxonomy of VLSs (2001) flash cards could be used while "establish knowledge". Word cards assist students in retrieving the word meaning and the form from the memory (Nation & Webb, 2010), and thanks to them students can learn a great amount of receptive and productive vocabulary at the first stage of word learning (Waring, 1997). Additionally, integration of word cards can enhance the diversity of in-class activities and enable students to use their time on unknown words efficiently (Rosszell & Brown, 2009). However, one of the opponents of this theory claim that word cards are not so helpful for students in terms of word use (Oxford & Crookall, 1990). Although it may be boring and repetitive, it is one of the simple and fastest ways to memorize words, particularly for the ones finding it difficult to acquire L2 vocabulary and having limited time to learn a language.

A word card can comprise the word, a sample sentence, or a simple picture (Baleghizadeh & Ashoori, 2011). While teaching vocabulary to ESL/EFL students, or while students are preparing their cards, both sides of these cards are used. To put

in another way, while on the one side the target word is written in L2, the other side of the card includes the translation and pronunciation. Besides this, an example sentence from the dictionary could be provided to facilitate the contextual use.

Related literature on the use of flashcards in EFL contexts demonstrate that flashcards have been used for a long time not only for teaching but also for learning purposes (Nation, 2001; Waring 1997). In some studies, flashcards were proved to be an effective way of learning vocabulary (e.g., Akın & Seferoğlu, 2004; Erten & Tekin, 2008; McCarten, 2007).

Despite the fact that the use of flashcards for vocabulary learning dates back to many years, the number of studies, especially the ones with mobile technologies, carried out in this area is restricted.

2.2.3.1.2 Spaced Repetition. It is impossible to ignore the fact that repetition is essential for vocabulary learning in a foreign language. Studies in the field of memory (Badley, 1990) and vocabulary learning (Bloom & Shuell, 1981; Mondria, 1994) clearly demonstrate that spaced repetition is more effective than massive repetition. The difference between massed repetition and spaced repetition is that while the words are repeated "during a single and continuous period" of time in massed repetition, spaced repetition involves repeating the words "across a period generally at ever-increasing intervals" (Kukulska-Hulme, 2005, p.77). As for spaced repetition, for instance, the target words could be revised five minutes after initial learning, another five minutes after a few hours, five minutes on the following day, five minutes three days later and lastly five minutes a week later. As it is seen, although the total amount of time allocated for studying is twenty-five minutes, it is spread across time rather than spending the same amount at a single time.

Even though it may change depending on the type of words and structures, Pimsleur (1967) recommends a memory schedule which can be regarded as a guide while determining the intervals between repetitions. Table 3 below shows the schedule which suggests increasing spaces between repetitions. In other words, if the first interval is five seconds, then the next one may come twenty-five seconds later (5^2=25), the following one is 5^3=125 seconds, the next one is 5^4=625 seconds (approximately 10 minutes), and so on.

Table 3

Pimsleur's Memory Schedule (Pimsleur, 1967, p.73)

Repetition	1	2	3	4	5	6	7	8	9
Time spacing before the next repetition	5 secs	25 secs	2min	10 mins	1 hour	5 hours	1 day	5 days	25 days

In Pimsleur's (1967) memory schedule, the underlying reason for determining the amount of time between spaces is that most of the forgetting occurs after the initial stages of learning a vocabulary item, and then it slows down as the time passes by. As it is clearly illustrated in Figure 2.1, there is a sharp decline in the probability of retrieving a word as the seconds pass by. It shows us that if learners do not repeat the words shortly after they have learned, they will most probably completely forget them. For this reason, on the condition that we provide learners with the chances of the repetition of the new words at the right time, we can help them totally refresh their memories and retrieve the words correctly.

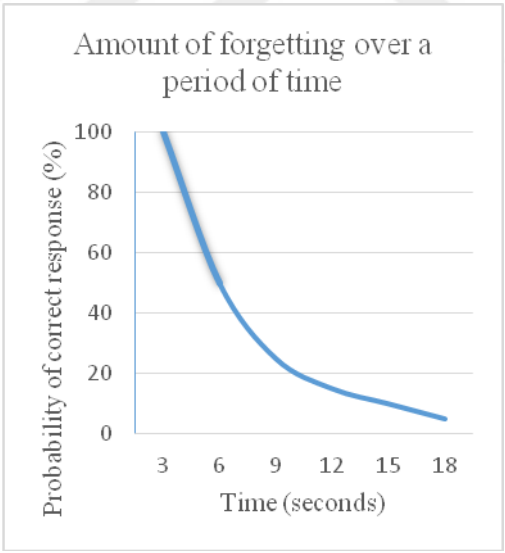

Figure 1. Amount of forgetting over time (Pimsleur, 1967, p.74)

2.3 The Role of Mobile Devices in Language Learning and Teaching

Although there are varied definitions of mobile devices in literature, in a most common sense they refer to "portable" and "personal" devices involving mobile phones, smartphones, personal digital assistants (PDAs) handheld computers, and

personal digital media players such as iPods (Neilsmith, 2004). Thanks to mobile phones, which have the features of texting, audio, and multimedia, it is possible to enhance language learning performances of learners (Bloch, 2008; Sykes & Reinhardt, 2013). As it is shown in Figure 2.2, mobile devices have the potential to create multiple opportunities for educators to promote and sustain learning.

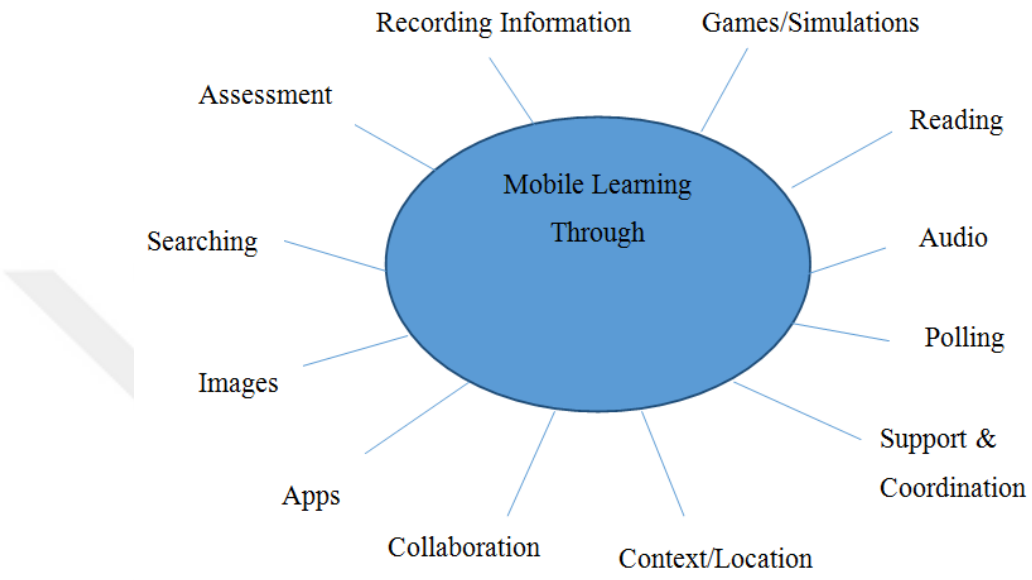

Figure 2. How mobile devices can be used for learning (Naismith et al, 2004, p.2)

There is no doubt that among these mobile devices, smartphones are one of the most widespread ones. According to Ericsson Mobility Report (2015), the number of smartphone users recorded as 2.6 billion in 2014 will dramatically increase to 6.1 billion by 2020. What this statistic shows us that by 2020 70 % of the people around the world will be using smartphones. These findings are also in line with another research which reports that there were approximately 22,6 million smartphone users in Turkey, and it is expected to reach 40 million users by 2018 (eMarketer, 2014).

Another survey carried out by Pew Research Centre indicates that 81% of the participants aged between 18 and 34 own a smartphone (Poushter, 2016). As these statistics suggest, smartphones are notably popular in our era, and along with their qualities like being portable and personal, they could be an outstanding tool for mobile learning.

Despite the fact that mobile devices offer a number of advantages and ease our lives, as every technology they may have some weaknesses such as small screen size, short battery life, insufficient storage, network speed, and some problems regarding software applications (Kukulska-Hulme, 2007). Hence, it is highly important to take these points into consideration while utilizing mobile devices for educational purposes. However, currently with the rapid emergence of new technologies, most of these problems are not an issue anymore due to the fact that mobile devices have bigger screens with high resolution, and they have the feature of storing and delivering great amount of information (O'Connell & Smith, 2007).

2.4 Motivating Features of Mobile Devices in Learning/Teaching

In recent years, the use of mobile devices is widespread for learning purposes (Jones & Issrof, 2007). The extensive use of mobile devices indicates that there must be strong motivational factors which lead learners to benefit from these devices. In this respect, Jones et al. (2006) put forward six root reasons why mobile learning could be motivating for learners; control (over learners' goals), ownership, communication, learning-in-context, continuity between contexts, and fun. In the following part, these motivational factors will be briefly described.

2.4.1 Control over learners' goals. The first motivational factor is that thanks to mobile devices, learners have the chance to choose the materials or the activities they will study whenever and wherever they want. Therefore, it gives them a sense of control in line with their goals and interests, so it is highly possible that they will be intrinsically motivated.

2.4.2 Ownership. Another motivating feature of mobile learning is that mobile devices create a feeling of *ownership.* Since mobile devices are personal possessions of the learners, they may create a personal space for the learners where they can study and learn. To illustrate, a case study conducted by Twining et al. (2005) suggested that the ownership of tablet PCs had a substantial impact on learners' motivation.

2.4.3 Communication. There is no doubt that most of the mobile devices especially smart phones enable learners to communicate with each other. Thus, they can have the opportunity to work in collaboration, which is motivating for many students under the suitable circumstances (Dede, 1996).

2.4.4 Fun. Another significant reason why mobile learning is motivating is that mobile devices are generally associated with entertainment particularly by young people. Therefore, this feature of mobile devices may motivate and encourage learners to study in a *fun* way.

2.4.5 Learning in context. In addition to being *fun*, mobile devices motivate learners in a learning/teaching environment because of the fact that by means of these devices learners can instantly reach the resources and the information whenever they need. To elaborate, when learners encounter an unknown word which is essential to comprehend a reading text, they can access online dictionaries from their mobile devices, and meet their needs in that learning context. Nyiri (2002) asserts that knowledge is information in context and as mobile devices make the delivery of context-specific information possible, they can lead to learning and the construction of knowledge.

2.4.6 Continuity between contexts. Lastly, because mobile devices are portable, they allow learners to use the information they have stored in different settings. Learners, as a result, can support their learning processes in different places without depending on one particular location.

In brief, control, ownership, fun, communication, learning in context and continuity between contexts are the major factors which indicate that mobile learning is highly motivating for learners. However, there is still a need for further research with regard to the motivational issues in mobile learning (Sharples et al, 2007).

2.5 Cognitive Aspects of Mobile Learning

Instructional design for learning is a complicated process which could be clarified by cognitive psychology theories (Van Merrienboer & Sweller, 2005). In this part, to explore the principles regarding instructional design for mobile learning, the cognitive load theory and dual coding theory will be briefly described.

2.5.1 Cognitive load theory. The cognitive load theory (CLT) is a major theory which provides us with a framework for instructional design by examining cognitive processes. Sweller (1999) clearly explains this theory as follows:

> The theory assumes a limited capacity of working memory that includes partially independent subcomponents to deal with auditory/verbal material and visual/2- or 3-dimensional information as well as an effectively unlimited long-term memory, holding schemas that vary in their degree of automation. These structures and functions of human cognitive architecture have been used to design a variety of novel instructional procedures based on the assumption that working memory load should be reduced and schema construction encouraged (p.251).

Basically, cognitive load theory suggests that our short-term/working memory is limited in capacity unlike our long-term memory. If we are exposed to information beyond the capacity of our short-term memory, it cannot be transferred to our long-term memory; hence, it is forgotten. For this reason, the materials that will be used for learners should not create too much load on their working memory.

Finally, according to cognitive load theory and mobile learning, the instructional materials that we will provide the learners with should be simple enough in order not to create a burden on their working memory. In addition, since the information is stored in our short-term memory for a short time, we need to create opportunities for the learners where they repeat, practice and retrieve the information and then transfer it to their long-term memories (Sweller, van Merrienboer & Paas, 1998). Therefore, in mobile learning, we can guide students to practice the materials in short periods yet in a regular way distributed over time.

2.5.2 Dual coding theory. Dual coding theory (DCT) asserts that there are two separate channels which enable learning; in one of them verbal information is processed and in the other one nonverbal images are processed. According to Clark and Paivio (1991) recall is generally improved when information is processed through both channels rather than just one.

Studies show that the integration of sound, pictures, animations, and video as well as text has a considerable impact in vocabulary acquisition (Chun & Plass, 1996; Chun & Payne, 2004). In a study conducted by Rosen et.al, (2012) students

were presented with abstract words in four different situations (no animation/ no sound effect, animation/no sound effect, no animation/sound effect, and animation/sound effect, and it was found that integrating animation and sound effect enhanced learning the most. However, in a study carried out by Kalyuga et.al (1999), auditory presentation of text turned out to be more effective than visual-only presentation. Yet, when the text was introduced in both auditory and visual forms, the visual form created a cognitive load that hindered learning. Therefore, it should be noted that too many elements in different modes may confuse learners since they lead to overload on working memory and hence prevent effective learning. In brief, while designing vocabulary teaching materials in mobile learning, appropriate incorporation of words, audio or pictures should be taken into consideration in order to help students process verbal and non-verbal information and make connections between them.

2.6 Mobile Assisted Language Learning (MALL)

For years, there has always been an attempt to come up with the most effective methods to teach a foreign language. In order to achieve this goal, numerous methods and approaches have emerged. With the advent of technology, educators have started to integrate it into their teaching not only to meet the educational needs of the learners but also to add flair to their lessons. Especially with the emergence of Computer Assisted Language Learning (CALL) in 1970s, teachers have deployed technology in their lessons more and more (Sarıçoban & Özturan, 2013). In the last phase of CALL, mobile assisted language learning (MALL) came into existence coined as "integrative CALL" (Sarıçoban & Özturan, 2013, p.214) which enables learners to study whenever and wherever they want.

To begin with, Kukulska-Hulme (2013) defined MALL as the use of "mobile technologies in language learning, especially in situations where device portability offers specific advantages" (p. 3701). Likewise, Li (2008) explains it as follows: "it focuses on the mobility of learning practice, and emphasizes the interaction between the learner and learning content, peers or the instructors which can improve effectiveness, flexibility and convenience of learning"(p.64). With the emergence of MALL, foreign language curriculum has started to be reshaped since MALL

technologies are convenient, easy-to-use and ubiquitous (Oblinger & Oblinger, 2005; Kukulska-Hulme & Shield, 2008; Kukulska-Hulme, 2009; Shih, 2007).

In brief, it could be stated that MALL provides learners with the opportunity to study without time and place restrictions both in and outside of the class and may help educators to promote learning and teaching.

2.6.1 Implementation of MALL in language classrooms. Based on the data they obtained from various projects, Herrington et al. (2009) make suggestions about the integration of mobile learning into a higher education, which is crucial for MALL. The following table shows the design principles for mobile learning.

Table 4

Design Principles for Mobile Learning (Herrington et al., 2009, p.134)

Principles	Use
Real world relevance	Use mobile learning in authentic contexts.
Mobile contexts	Use mobile learning in contexts where learners are mobile.
Explore	Provide time for exploration of mobile technologies.
Blended	Blend mobile and non-mobile technologies.
Whenever	Use mobile learning spontaneously.
Wherever	Use mobile learning in non-traditional learning spaces.
Whomsoever	Use mobile learning both individually and collaboratively.
Affordances	Exploit the affordances of mobile technologies.
Personalise	Employ the learners' own mobile devices.
Mediation	Use mobile learning to mediate knowledge construction.
Prod*use*	Use mobile learning to produce and consume knowledge.

These suggested principles above provide valuable insight into the implementation of mobile devices in education, and they can be considered as a guideline while designing innovative curriculum resources via mobile technologies.

Furthermore, main universal instructional design principles are also analyzed and evaluated by Elias (2011) for mobile learning. Some of these principles are particularly important to MALL: 'equitable use', 'flexible use', 'tolerance for error', and 'instructional climate' (p.148). In the following part, these four principles are briefly described.

2.6.1.1 Equitable use. As for mobile learning, Elias (2011) recommends the delivery of content "in the simplest possible format" (p.148). With regard to this, while integrating mobile technologies into language teaching, we need to make sure that the content is not confusing yet user-friendly for the learners and it must be accessible by everyone.

2.6.1.2 Flexible use. As for flexible use, Elias suggests providing the content "in small chunks". Therefore, we need to consider the fact that the resources we deploy should not be too long; instead, they ought to be "manageable learning chunks" (Bradley et al, 2009, p.281). Besides this, Elias emphasizes the importance of being flexible while designing mobile learning by allowing learners a space to create their own materials via mobile technologies.

2.6.1.3 Tolerance for error. Thanks to mobile devices, learners may have the opportunity to reach learning materials when needed. In this way, mobile learning may create a great potential to decrease learner errors by offering "just in time training and support" (Elias, 2011, p.249).

2.6.1.4 Instructional climate. This principle highlights how teachers affect the way a course is delivered. To elaborate, in mobile learning teachers can "push regular reminders, requests, quizzes, and questions to students" (Elias, 2011, p.148) via short message service (SMS), or free applications in an easy and free and/or affordable way.

To summarize, for the implementation of MALL in language classrooms, major design principles offered by Herrington et al. (2009) and Elias (2011) should be taken into consideration to promote an effective mobile assisted language learning environment for foreign language learners.

2.7 Studies on the Integration of Mobile Learning into Vocabulary Teaching and Learning in Language Education

Thanks to the advances in technology, mobile learning has recently started to be integrated into foreign language education. Thereby, various studies have been conducted in order to investigate the effects of mobile learning in different aspects

(Chen & Li, 2010; Cavus & İbrahim,2009; Edge et al., 2012.; Lakshmi & Nageswari, 2015; Saran, 2009; Thornton & Houser, 2005; Ünal, 2015).

To begin with, in a study carried out by Thornton and Houser in Japan (2005), the use of mobile phones in vocabulary teaching was investigated. They sent vocabulary lessons to the learners at specific intervals and compared them with a control group studying the same materials through Web or paper. The findings revealed that mobile phones were preferred by 71% of the participants. In addition to this, almost all of the participants stated that they considered mobile phones as a useful teaching tool.

Some studies attempted to explore smart phones with regard to context awareness and personalization. To illustrate, a Personalized Context-Aware Ubiquitous Language System (PCULS) was used by Chen and Li (2010) to teach English vocabulary to high school students. Thanks to PCULS, students were able to adapt their content to their vocabulary learning. The results of their study demonstrated that learners studying vocabulary through personalized system including context awareness performed better than the ones using the same system without context awareness.

A number of mobile applications have also been used in language education to promote learning. For instance, a study conducted by Lakshmi and Nageswari (2015) indicated that the mobile application IELTS Academic was helpful for the learners for an accurate academic vocabulary use.

In another study conducted by Edge et al. (2012), an application called MemReflex, which includes adaptable flashcards and provides instant feedback, was utilized. Their study demonstrated that the application was effective in terms of audio and text modalities. Besides this, they found out that MemReflex had a positive impact on learner accuracy, confidence, and perceptions of control and success.

In addition to the MALL studies which have been conducted in various educational contexts abroad, the use of MALL to assist vocabulary development was explored in Turkey as well (Çavuş & İbrahim, 2009; Saran, 2009; Ünal, 2015). To illustrate, Çavuş and Ibrahim (2009) developed an SMS sending system called MOLT. They sent messages at regular intervals to teach technical words. Their results indicated that participants had a positive attitude toward the tool, and they were able to learn the new words sent to their mobile phones.

In another study conducted by Saran (2009), the impact of the use of multimedia messages through mobile phones for the language learners' vocabulary development was investigated. In the study, three groups were formed and each group received the same materials in three different ways: multimedia messages, web pages and printed materials. The results demonstrated that MALL had a positive impact on the vocabulary development of the learners, and the participants had positive thoughts about the mobile learning application used in the study.

In a similar attempt, Ünal (2015) compared the use of mobile and paper based vocabulary notebooks in a private university in Turkey. At the end of an eight-week study, the results of quantitative and qualitative data showed that mobile based vocabulary notebooks affected the EFL learners' vocabulary achievement positively.

To wrap up, as summarized above, several studies have demonstrated that MALL has the potential to impact EFL learners' vocabulary development in a positive way. However, particularly a few studies explored the use of mobile flash cards based on spaced repetition system in Turkey. This study, therefore, aims to shed light on this missing part of literature and provide implications for mobile assisted vocabulary teaching and learning in EFL classrooms.

2.8 Conclusion

As stated in the previous parts of this study, vocabulary learning plays a key role in foreign language learning and teaching. It is essential for foreign language learners to expand their vocabulary knowledge so as to be proficient in four skills; reading, writing, listening and speaking. In an attempt to define vocabulary knowledge, two clear distinctions are put forward, which are receptive and productive vocabulary knowledge. While receptive knowledge refers to understanding the meaning of a word in reading and listening, productive knowledge requires learners to use a vocabulary item appropriately in speaking or writing. Vocabulary learning can take place either explicitly or implicitly. In explicit learning, target words and vocabulary learning strategies are directly taught to learners, whereas implicit learning incidentally happens while learners are exposed to different contexts and learn the words subconsciously. As Nation (2002) stated, both implicit and explicit teaching enhance vocabulary learning; thus, it is not right to say that one is superior to another.

Taxonomies of vocabulary learning strategies are determined by Schmitt (1997) and Nation (2001). Schmitt (1997) divides these strategies into two main parts: discovery and consolidation strategies. While the first one includes determination and social strategies, the latter one involves social, memory, cognitive and metacognitive strategies. In a similar vein, Nation (2001) classifies these strategies as planning, source and processes.

Employing word cards/flash cards are one of the most useful ways that could be used both as Schmitt's discovery and consolidation strategy. According to Nation's taxonomy, flash cards could be used in the first stages of the strategy called "processes" which includes noticing, retrieval and generating. By means of flash cards, learners can benefit a great deal to expand their receptive and productive vocabulary knowledge at the first stages of word learning (Waring, 1997).

It is an undeniable fact that repetition is essential for vocabulary learning. Studies indicate that in vocabulary learning, spaced repetition is more effective than massed repetition. While applying spaced repetition into teaching, Pimsleur's memory schedule could be considered as a guidance, which is based on the idea that most of the forgetting occurs soon after the learning and it slows down in time.

Mobile learning has taken a prominent role in foreign language teaching in recent years, and as a part of it, smart phones are one of the most commonly used mobile devices. While integrating them into teaching, considering pedagogical issues, some design principles are proposed by Elias (2011) such as equitable use, flexible use, tolerance for error, and instructional climate. Therefore, instructors need to take them into consideration while embarking on the integration of effective mobile learning into language teaching. Also, mobile learning stimulates motivation due to six major factors: control, ownership, fun, communication, learning in context and continuity between contexts.

As for the instructional design in mobile learning, dual coding theory affirms the fact that to process visual and verbal information we have two separate channels. For vocabulary learning, by using pictures and audios we can activate both of these channels and enhance vocabulary learning, however, we need to be extra cautious while integrating these elements because too many elements in different channels may lead to cognitive load on learners, hence hindering effective learning. Therefore, while designing materials for vocabulary instruction in mobile learning we need to take dual coding and cognitive load theory into consideration.

Despite the fact that there are numerous studies carried out on mobile learning, there is not much research in Turkey investigating the effects of mobile flash cards applications based on spaced repetition. For this reason, this study will attempt to fill in this gap in the literature in ELT by investigating the use of a mobile flash cards application using a spaced repetition system to assist the vocabulary development of EFL learners in a foundation (non-profit, private) university in Turkey.

Chapter 3
Methodology

This chapter aims to explain the methodology of the study by describing the research design of the study, setting, participants along with the data collection tools and procedures, reliability and validity, and lastly, limitations. The procedures include types of sampling, data collection instruments, data collection procedures, and data analysis.

The research questions investigated in this study are as follows:

1. Is using *Rememba*, a mobile application for flash cards based on spaced repetition system, effective in terms of the vocabulary development of Turkish EFL students in upper intermediate level preparatory classes?
2. How does *Rememba* help the participating students promote their motivation to store and practice vocabulary?
3. What are the perceptions of students and their teacher about using *Rememba* as a mobile tool to store and practice vocabulary in preparatory classes?

3.1 Philosophical Paradigm

Paradigm is defined by Guba and Lincoln (1994) as "the basic belief system or worldview that guides the investigator, not only in choices of method but in ontologically and epistemologically fundamental ways" (p.105). Qualitative and quantitative research methods are one of the most commonly used research paradigms by investigators. Qualitative research attempts to understand phenomena through the views of the participants in natural settings. Quantitative research, on the other hand, makes use of objective analysis using numeric data to answer the research questions (Ary et al., 2013).

As for the major types of quantitative educational research, Ary et al. (2013) suggests six types such as experimental, quasi-experimental, nonexperimental, survey, ex post facto, and correlational. While experimental research encompasses a study of the impact of the systematic manipulation of one variable(s) on another variable, in nonexperimental quantitative research, the researcher determines

variables and may look for relationships among them without manipulating the variables. Ex post facto research, on the other hand, is akin to an experiment, yet the researcher does not manipulate the independent variable, which has already taken place in the natural course of events. In experimental research, when it is not possible to randomly assign subjects to experimental treatments, the researcher needs to use already assembled groups such as classes. In this case, the research is called quasi-experimental. Lastly, correlational research collects data from individuals on two or more variables and then attempts to find out if the variables are correlated.

For the purposes of this study, a mixed method including both qualitative and quantitative approaches was used, which enabled triangulation in order to get in-depth information with regard to research questions. Specifically, two intact classes were chosen as the experimental and control group which the researcher had been teaching for a total of eight weeks. Since the two intact classes were selected non-randomly due to convenience purposes, the study was based on a pre-test/post-test quasi-experimental design.

3.2 Research Design

A mixed method approach including quantitative and qualitative elements was used in this study as it is shown in Figure 3.1. The quantitative part of the study is based on pre-test/post-test quasi-experimental design. The qualitative part of the study consisted of the reflective journals of the students and the teacher, as well as a questionnaire encompassing open ended questions. The following figure provides the visual model of the research design in this study:

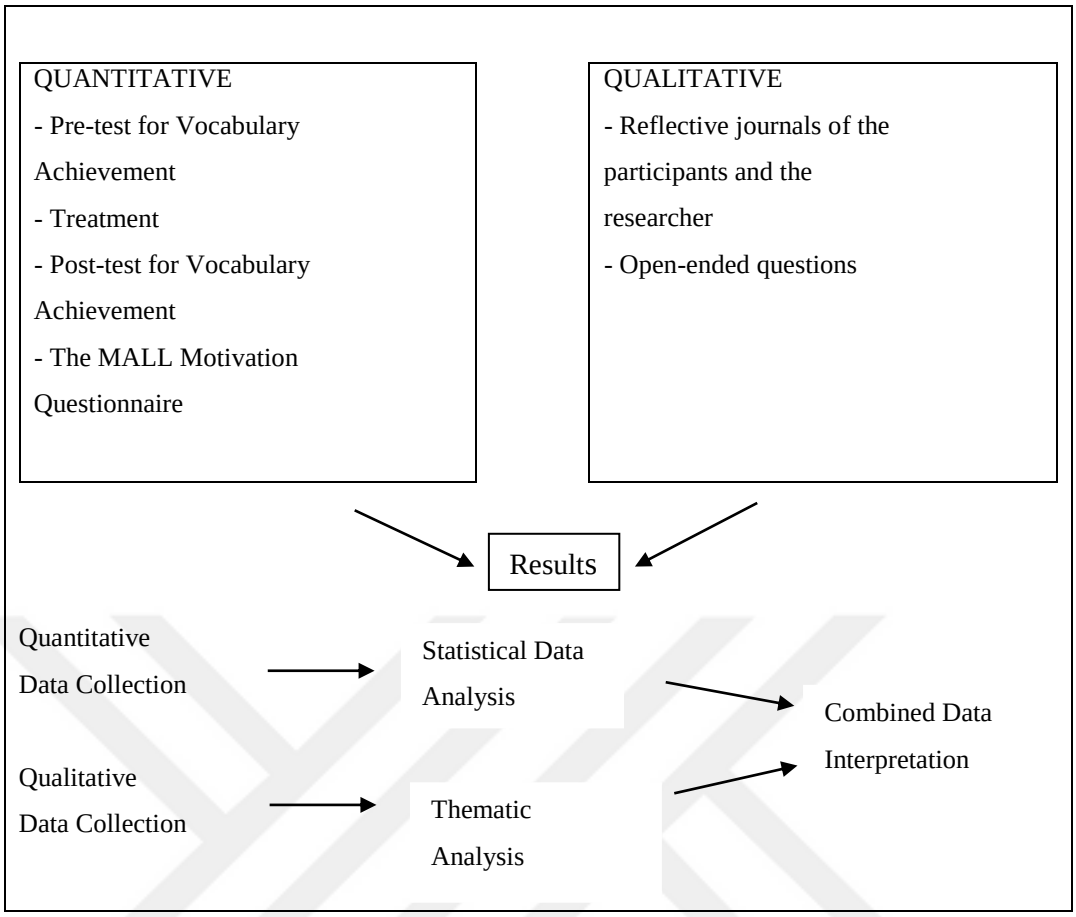

Figure 3. Visual model of the research design in the study.

As this study is based on a quasi-experimental research design, the experimental group received mobile assisted vocabulary instruction whereas the control group followed regular classroom instruction as shown in Figure 3.1. In order to compare the vocabulary development of the students, a pre- and post- test was implemented to both groups at the beginning and end of the seven-week teaching module. Besides, a MALL motivation questionnaire was applied at the end of the study to find out whether the treatment affected the motivation of the participants. Finally, to complement the quantitative data from the tests and the questionnaire, qualitative data was gathered through reflective journals to reveal the perceptions of the experimental group about learning and teaching vocabulary through MALL. The following table displays the design of the present study:

Table 5

Research Design of the Study

	Groups	
	Experimental	Control
Pre-Test	X	X
Treatment	X	
Post-test	X	X
Reflective Journals	X	
Questionnaire on Motivation	X	

3.3 Setting

This study was conducted at an English Language Preparatory School of a foundation university in İstanbul, Turkey. This program, which was established in 2009, includes about 800 students who are mostly Turkish EFL students while the others mostly come from Eastern and African countries. The goal of the program is to provide the students with English language and skills to help them pursue their studies in their respective departments. It is crucial for students to learn English at an upper-intermediate level in order to be competent in the fields such as English reading and understanding, listening and note-taking, and speaking. In addition, the program creates opportunities for the students to help them discover and experience different cultures and embrace a sense of responsibility before embarking upon their undergraduate studies at this university. Technology-integrated language teaching is also considered to be an essential part of this program.

The course system is based on a modular system for preparatory students. The Academic Year involves a total of 5 eight-week modules and 5 levels (A1, A2, B1, B2 & Pre-faculty level for academic studies) each taking about 8 weeks. The students are required to complete each module successfully with an overall grade of minimum 60% so as to advance to a higher level. The average number of the students in each classroom is between 20 and 24. The students have about 24 hours English classes a week taught in an integrated way with 2 teachers for each class. The medium of instruction is English and the methods used are both communicative and task based learning. The students take different kinds of exams such as vocabulary quizzes, process-writings, timed-writings, speaking tasks, mid-term exams, and end of module exams in order to reach the level of proficiency and take

the proficiency exam to complete this program. In addition to the exams, the students are responsible for the tasks on an online learning management system called LMS. Through this online system, students can follow their absenteeism, reach the important documents related to the course and weekly materials, and upload the tasks set by the instructor. Besides this, other online components to study and practice vocabulary, reading, listening and grammar are integrated to the courses for each level.

As for the vocabulary, each level is provided with a vocabulary list including the target words of the level and the students take two vocabulary quizzes during a module. The use of level appropriate vocabulary is also assessed in writing and speaking exams. With regard to teaching, vocabulary is taught through context which is integrated into reading and listening lessons.

3.4 Target Population and Participants

The participants of this study were the students studying at upper-intermediate level at a foundation university in İstanbul, Turkey. The students were placed at this level as a result of an achievement test conducted at the preparatory school and the students were assigned to classes homogenously considering their English level. They were all supposed to pass the proficiency exam given by the university at the end of the term to be able to start their various departmental studies which vary. Their ages ranged from 18 to 22. The two intact classes at upper-intermediate level were purposefully chosen due to their accessibility to the researcher. At this level students take 15 hours of teaching a week and each student receives 15 minutes of tutorial each week to get one –to- one feedback from the teachers about course related tasks. There were 19 students in each group and 38 students in total. While the experimental group included 11 girls and 8 boys, the control group included 9 boys and 10 girls. Each class had the same teaching hours with the same teachers.

3.5 Procedures

In this part of the study, the sources of data, the types of sampling, data collection instruments, implementation, data analysis procedures, reliability and

validity of the study besides limitations and finally delimitations were presented in detail respectively.

3.5.1 Sources of data. In this part of the study, the types of sampling, data collection instruments, implementation, data analysis procedures, reliability and validity of the study besides limitations and finally delimitations were discussed.

3.5.2 Data collection procedures. In this section, types of sampling and data collection instruments were provided.

3.5.2.1 Types of sampling. Sampling enables researchers "to study a portion of the population rather than the entire population" (Ary et al., 2013, p.149). There are two main types of sampling procedures; one of them is probability sampling and the other one nonprobability sampling. Probability sampling includes sample selection in a random way, which means every member in the population has the same probability of being selected in the sample. On the other hand, nonprobability sampling is used when sampling units are not selected by chance yet according to certain purposes. Nonprobability sampling includes three major types which are convenience, judgement/purposive, and quota sampling (Ary et al., 2013).

In this study, non-probability sampling, mainly convenience sampling was used due to the convenient accessibility of the experimental and control groups for the researcher.

3.5.2.2 Data collection instruments. In this study, data was gathered through both quantitative and qualitative methods. The quantitative part included a vocabulary test as a pre- and post- test, and the MALL motivation questionnaire at the end of the study. As for the qualitative part, reflective journals gathered from the students and the teacher regarding the implementation of *Rememba,* and open ended questions were used.

3.5.2.2.1 Vocabulary test. In this study, a multiple choice vocabulary test (see Appendix A) consisting of 70 items was conducted as a pre- and post-test to assess the learners' vocabulary development before and after the MALL (*Rememba*) implementation. It was prepared using an online test generator

(http://www.wordsmyth.net/) which takes sentences including the target words from level appropriate dictionaries and turns them into a multiple choice question. However, the options were adapted by a testing expert since the online tool randomly generates them without considering the distractors or their parts of speech (adjective, noun, verb etc.).

Before the test was administered to the students, a general background questionnaire was given to find out about the demographic information and the smart phone use of the participants. For the vocabulary test, 70 words were randomly chosen from the upper-intermediate word list, which includes approximately 250 words, provided by the institution. Before conducting the test, it was reviewed by a native speaker, an expert in English language testing and an experienced English language instructor in terms of reliability and clarity. Then, the test was piloted in an upper-intermediate class consisting of 19 students to make sure that it is level-appropriate. The data collected from this pilot study was analysed using SPSS statistical package and its Cronbach's alpha value was found to be .817, which shows that the reliability of the test is statistically high (Ary et al., 2010). Finally, the test was administered to both groups on the same day, and in total approximately 80 minutes was allocated for the students to answer the questions.

3.5.2.2.2 The MALL motivation questionnaire. In order to see the effects of the mobile application on the motivation and the perceptions of the participants in the experimental group, the MALL Motivation Questionnaire (See Appendix B) was used. The questionnaire included two parts. The questionnaire was originally developed and used by Fageeh (2013) in a study to investigate the effects of MALL applications on vocabulary acquisition and motivation of the EFL learners. The second part consisted of questions exploring the students' use of the mobile application *Rememba* and their perceptions about it. The questions in the second part were adapted from a questionnaire developed by Saran (2009) and used in a study to explore the use of mobile phones for supporting vocabulary acquisition of English language learners. In the following part, the adaptations made in both parts will be described in detail.

The first part of the questionnaire included 10 items concerning the motivational effects of the mobile application *Rememba* and MALL. The 10 items were based on a 5-point Likert style scale ranging from 1 (Strongly Agree) to 5

(Strongly Disagree). The items of the original questionnaire were adapted including the MALL application *Rememba*. Specifically, the first adapted item was the 2nd statement. While in the original item it was: "I feel more motivated to do my vocabulary assignments when there is internet connectivity for my mobile phone or after I get the assignments via Whatsapp", it was turned into "I feel more motivated to study vocabulary when I use "*Rememba*". This adaptation was found necessary because in this study participants did not get vocabulary assignments. Another adaptation was made in item 4 which states: "Using the Online Dictionary application on my smart phone makes it easy for me to look up and learn new words, their derivations, their etymologies and their usages in illustrative examples.", and it was turned into "Using *Rememba* application on my smart phone makes it easy for me to look up and learn new words, their parts of speech and their usages in illustrative examples." This item required adaptation since the participants did not focus on the derivations or etymologies of the words; rather, they just focused on the parts of speech of the new words. Also, in the items 3,4,5,6 the name of the mobile applications used in the original study was changed to "*Rememba*" as it is the mobile application used as a treatment in this study. Lastly, in item 10, the word "assignments" was changed into "tasks" since the participants did not receive vocabulary assignments.

The second part of the questionnaire included 7 open-ended questions so as to investigate the students' perceptions about the use of the mobile application *Rememba.* The items of the original questionnaire were adapted including the MALL application *Rememba* to fit it into the context of this study. To be more specific, the first item was originally as follows: "Did you read the MMSs sent you? ", and it was changed into "Did you repeat the word cards after you received notifications?". Another adaptation was made in item 2. The original item was "How many times did you read each MMS? and it was turned into "How many times a week did you repeat the word cards? ". Items 3, 4, 6 were omitted as they are not relevant to the current study, and no changes were made in items 7, 8,9,10. Lastly, since the original questions were in Turkish and there were not any international students in the class, the items were not translated into English.

The questionnaire was administered to 19 students in the experimental group after the post-test at the end of the 7th week. In other words, it was applied at the end

of a 7-week- implementation of flash cards application based on a spaced repetition system to find out whether it is motivating for the learners or not.

3.5.2.2.3 Reflective journals. A reflective essay illustrates what a person thinks on a certain subject or some experience, including reactions, feelings, thoughts and general understanding and analysis of an issue, in a personal way (Dewey, 1993). In this study, to gather in-depth information about the perceptions of the participants in the experimental group and the teacher, reflective journals were written by each student and the teacher of the experimental group (see Appendix C). While the students reflected on their experiences regarding the use of the flash card application *Rememba*, the teacher took field notes while observing the students preparing their flash cards on their smart phones.

The following table shows an overview of the procedures followed while answering the research questions of this study:

Table 6

Overview of Research Questions and the Procedures Followed

Research Question	Data Collection Procedures	Data Analysis
1. Is using *Rememba*, an application for mobile flash cards based on spaced repetition, effective in terms of the vocabulary development of Turkish EFL students in upper intermediate level preparatory classes?	Vocabulary Pre-Post- Test	Descriptive Statistics Independent sample t-test
2. How does *Rememba* help the participating students promote their motivation to store and practice vocabulary?	The MALL Motivation Questionnaire	Descriptive Statistics
3. What are the perceptions of students and their teacher about using *Rememba* as a mobile tool to store and practice vocabulary in preparatory classes?	Reflective Journals	Content Analysis (Miles&Huberman, 1994)

3.5.3 Implementation. For the purposes of this study, a quasi-experimental research design was adopted. During the study, in the experimental group, the

vocabulary teaching and learning was supported by mobile assisted language learning (MALL) via a mobile application, "*Rememba*" whereas the control group received no treatment. Specifically, vocabulary instruction in both groups was mostly delivered explicitly as it is suggested by many researchers (Coyne et al., 2007; Justice et al., 2005; Cohen 1998); however, sometimes implicit learning opportunities were provided as well since it also enhances vocabulary learning (Nation, 2002).

In this study, the data were collected in a foundation university in Istanbul, Turkey. Data collection instruments included pre-post vocabulary test, the MALL Motivation questionnaire and reflective journals. In the following part, data collection procedures were described in detail.

Prior to the application of the study, a pilot study was conducted in the second module of the 2016-2017 academic year to check the usability of the pre- and post-tests. A vocabulary achievement test was developed by an online tool and the researcher, which included 70 items. In the pilot study, the tests were administered in an upper-intermediate class including 19 students. Having analysed the results, no changes were made in the items. Following this stage, the study was carried out with 38 students at upper-intermediate level by the end of the first semester of the 2016-2017 academic year. Before the study, permission was taken from the head of School of Languages.

As a start, before the implementation, data were gathered about the participants' demographics and smart phone use. Later on, a pre-test was given to the two groups on the same day. Following this, the mobile application "*Rememba*" was introduced in the experimental group, and the students were informed about the procedures regarding the use of it in and outside of the class. At the end of the first week, the implementation of the mobile application started. Starting from week 1 to the end of week 7, each week students created digital word cards on their smart phones using "*Rememba*". In week 1, they created 10 cards because of the introduction of the mobile application. In week 4 and 7 they also created 10 cards because in those weeks, there were fewer teaching hours due to the midterm and final exams. In the other weeks, the students created 20 word cards each week. Meanwhile, with regard to their experiences about this implementation, each week the students and the teacher kept reflective journals to reinforce the quantitative data about the impact of digital word cards based on a spaced repetition system. At the

end of week 7, the post-test was conducted to see the differences between the vocabulary developments of both groups. Lastly, after the post-test, the MALL motivation questionnaire was administered in the experimental group in order to see the effects, if any, of the application on the participants' motivation. The following table provides an overview of the overall study in a chronological order:

Table 7

Overall Study in a Chronological Order

Activity	Date
70 target words were randomly chosen from the official wordlist.	25.12.2016
Vocabulary Tests were developed and proofread	26.12.2016
Pilot study was conducted	02-03.01.2017
The results of the piloted vocabulary tests were analysed	06-11.01.2017
Permission was taken from the Head of the School of Languages to gather data	16.01.2017
WEEK 1 Vocabulary Teaching 4 hours in total	24-26.01.2017
Pre-Tests to both groups	23.01.2017
Introducing the mobile application "Rememba" Explaining how to prepare word cards, what to include (parts of speech, definition or synonym, a sample sentence	25.01.2017
Students choose 10 words from the word list of week 1 and prepare 10 word cards on their mobile phones. Reflective journals collected	27.01.2017 (week 1)
WEEK 2 Vocabulary Teaching 4 hours in total	30.01.2017-03.02.2017 (week 2)

Table 7 (cont.d)

Activity	Date
Students choose 10 words from the word list of week 2 and prepare 10 word cards on their mobile phones.	01.02.2017
Students choose 10 words from the word list of week 2 and prepare 10 word cards on their mobile phones. Reflective journals collected	03.02.2017
WEEK 3 Vocabulary Teaching 4 hours in total	06.02.2017-10.02.2017 (week 3)
Students choose 10 words from the word list of week 3 and prepare 10 word cards on their mobile phones.	08.02.2017
Students choose 10 words from the word list of week 3 and prepare 10 word cards on their mobile phones. Reflective journals collected	10.02.2017
WEEK 4 Vocabulary Teaching 2 hours in Total	13-16.02.2017 (week 4)
Students choose 10 words from the word list of week 4 and prepare 10 word cards on their mobile phones. Reflective journals collected	16.02.2017
WEEK 5 Vocabulary Teaching 4 hours in total	20-24.02.2017 (week 5)
Students choose 10 words from the word list of week 5 and prepare 10 word cards on their mobile phones.	22.02.2017
Students choose 10 words from the word list of week 5 and prepare 10 word cards on their mobile phones. Reflective journals collected	24.02.2017
WEEK 6 Vocabulary Teaching 4 hours in total	27.02 – 03.03.2017 (week 6)

Table 7 (cont.d)

Activity	Date
Students choose 10 words from the word list of week 6 and prepare 10 word cards on their mobile phones.	01.03.2017
Students choose 10 words from the word list of week 6 and prepare 10 word cards on their mobile phones. Reflective journals collected	03.03.2017
WEEK 7 Vocabulary Teaching 3 hours in total	06-09.03.2017 (week 7)
Students choose 10 words from the word list of week 7 and prepare 10 word cards on their mobile phones. Reflective journals collected	07.03.2017
Implementation of the study	25.01.2017- 07.03.2017
Post-Tests to both groups	08-09.03.2017
The MALL Questionnaire	09.03.2017

3.5.3.1 Instruction in the experimental group. This group received 4 hours of vocabulary instruction each week except week 4 and 7. In week 4, 2 hours, in week 7, 3 hours of vocabulary instruction was given since these weeks were shorter because of the exam days. The target words were taught in context using Power Point Presentations with related visuals. Following the vocabulary instruction, the students created their own digital word cards using the mobile application *"Rememba"* (Figure 3.2 & 3.3). Every week, except week 1, 4 and 7, the learners created 20 word cards by choosing the target words from the official word list of the related week. In week 1,4 and 7 the students created 10 word cards since extra time was allocated for the introduction of the mobile application in week 1, and there were less teaching hours in week 4 and 7. Every week approximately 2 hours were allocated for the creation of the digital cards in the class. A word card on *"Rememba"* included the target word with its part of speech on one side, and a translation/definition plus a

sample sentence on the other side. While the students were creating their cards in the class, the teacher checked their example sentences for accuracy and meaning, and provided guidance. Upon creating the cards, the students shared their own cards with the other students via the application and added them to their own accounts.

Figure 4. The face side of the word card

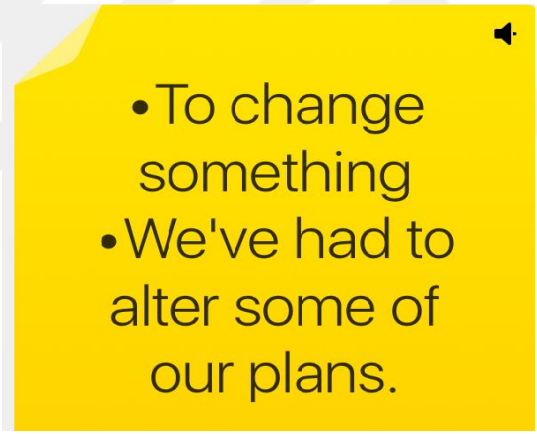

Figure 5. The back side of the word card

Another remarkable feature of "*Rememba*" is that it encourages users for spaced repetition by sending notifications at certain intervals. The intervals between the notifications were closer once the students add the cards to the system and these intervals increase in time because it is based on the idea that most of the forgetting occurs soon after learning (Baddeley, 1990; Pimsleur, 1967). In other words, since this application is based on spaced repetition system, it helps learners retrieve the words soon after the learning takes place by sending notifications at ever-increasing intervals. Figure 3.4 below shows the memory schedule of a student offered by the application.

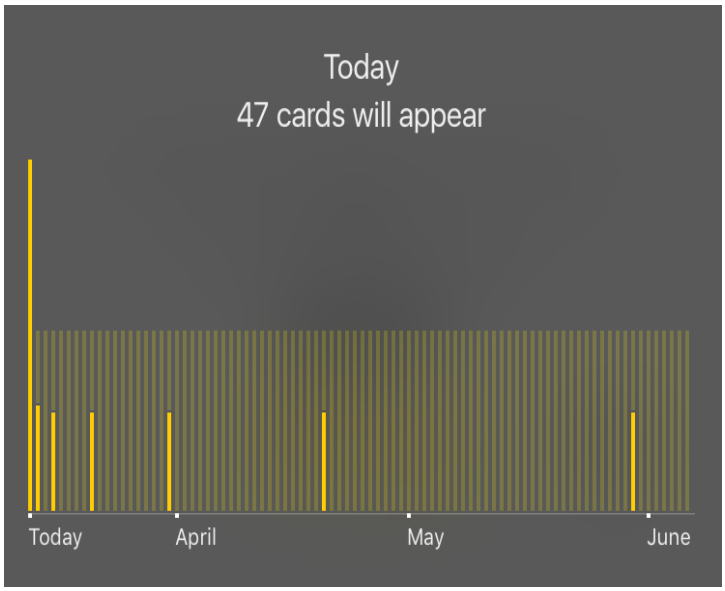

Figure 6. Memory schedule of a student

In addition to this, since the application sends notifications to the students reminding them to revise the cards, it has the potential to create a "push effect", which is suggested by Ellias (2011) as one of the instructional design principles.

As for the interface of the application, it seems user-friendly and simple. The content was created in the "simplest possible format" (p.148) as proposed by Elias (2011); therefore, the word cards just included the word with its part of speech on one side, and its meaning and an example sentence on the other side. Hence, it was appropriate to facilitate learning in small manageable chunks (Bradley, 2009).

3.5.3.2 Instruction in the control group. The control group received the same amount of vocabulary instruction as the experimental group by the same instructor, and they were exposed to the same target words. The same materials were used while introducing the target words, and they were mostly taught explicitly using PPT presentations including the target word with its part of speech, a picture related to it, an example sentence, and collocations (Coyne et al., 2007; Justice et al., 2005). Yet sometimes implicit learning opportunities were created as well (Nation, 2002) by introducing the target words in a reading text, or listening and expecting the students to deduce the meaning themselves. However, the students in the control group were not exposed to the mobile application *Rememba*, so they did not create any word cards. That is to say, they did not receive the treatment.

To sum up, the learners in both groups were taught by the same teacher using the same materials with the same teaching hours. The only difference between the two groups regarding vocabulary teaching/learning was the use of the mobile application *Rememba* by the participants in the experimental group. So as to see the impact, if any, of the implementation on the vocabulary development of the learners, the scores of the both groups taken from the pre-post-tests were compared. Lastly, the reflective journals weekly written by the students and the teacher along with the MALL motivation questionnaire after the treatment were utilized to gather data about the perceptions and the motivation of the learners in the experimental group.

3.5.4 Data analysis procedures. In this study, not only quantitative but also qualitative data were collected and analysed. As for the quantitative part, vocabulary achievement test and MALL motivation questionnaire were conducted. In order to determine the data analysis methods, sample size was taken into consideration. Since the sample size of each group was less than 30, a non-parametric test was conducted to analyse the data. To analyse the pre-post vocabulary tests, independent sample t-test was performed using SPSS (Statistical Package for the Social Sciences) version 23. In this way, the vocabulary developments of both groups before and after the implementation were compared. The level of significance for the statistical analyses was set at .05.

Besides this, so as to complement the quantitative data, qualitative data were gathered by means of the reflective journals kept by the participants and the teacher/researcher, and the open-ended questions in the second part of the MALL Motivation Questionnaire. The data were analysed through content analysis (Miles & Huberman, 1994). As the first step, labels were determined considering the research questions by means of open coding. Upon completing open coding, the main themes were determined under the labels with regard to the use of MALL in vocabulary teaching and learning.

To identify the degree of inter-rater reliability, two experts in the field of English Language Teaching (ELT) identified themes from the codes. The interrater reliability was found to be .82 which indicated close agreement (McHugh, 2012).on the general themes apart from the different verbalizations of similar concepts.

3.5.5 Reliability and validity. Validity and reliability are significant factors to have faith in the results obtained for a study (Ary et al., 2010). Validity is defined as "the extent to which scores on a test enable one to make meaningful and appropriate interpretations" (Ary et.al, 2010, p.224). Reliability, on the other hand, shows how consistently a test measures whatever it intends to measure.

Mertler and Charles (2005) explore experimental validity in two different aspects: internal validity and external validity. Internal validity refers to the validity of conclusions reached regarding the cause and effect relationship between the independent and dependent variables (Creswell, 2012, p.303). To put it in another way, if the effects observed in a study are the result of the independent variable rather than unintended variables, then it could be concluded that the study has internal validity. To ensure internal validity, a researcher needs to take the possible threats into consideration which are history, testing, maturation, selection bias and unstable instrumentation (Mertler & Charles, 2005). In this study, internal threats were minimized in the following ways.

First of all, history effect was controlled by administering the pre/post tests on the experimental and the control group at the same time. Testing could be another threat to internal validity, which means the pre-test in a study could affect the results of the post-test (Jha, 2014). However, testing effect is less likely to occur in this study as the pre-test could have similar effects on both groups, and there are 7 weeks between the pre-test and the post-test. In addition to this, maturation threat was minimal since both of the groups included participants who were almost at the same age and had similar socioeconomic backgrounds. Another threat to internal validity is selection bias which refers to, for example, "the inclusion of high ability students in the experimental group and average ability students in the control group" (Jha, 2014, p.150). In the present study, students were assigned to both groups almost equally in terms of gender, age and English level by the institution so the threat of selection bias was controlled in this way. Lastly, so as to control the unstable instrumentation effect, the same teacher taught and administered the instruments in the experimental and the control group.

The second aspect of validity is external validity which refers to the extent of the generalization of the findings obtained in a study to bigger groups (Brewer, 2000; Robson, 2002). The generalization of the results in this study is limited due to convenience sampling. Yet, it is possible to generalize the findings of the present

study to the populations holding the same characteristics as described in the methodology part.

As for the reliability, "the effect of error on the consistency of scores" was taken into consideration (Ary et al., 2010, p.237). According to the researches, random errors are the underlying reason for reliability problems, and the random errors are caused by "the individual being measured, the administration of the measuring instrument, and the instrument" (p.237). In the present study, the administration of the measuring instrument as a source of error was controlled since the instruments were administered and scored by the same person/researcher in both groups. The scoring procedure was also objective and precise as the quantitative part of the study included multiple choice questions with only one correct answer. As for the other type of error "the instrument", it is stated that "brevity of a test is a major source of unreliability" (p.237). In other words, a test as a data collection instrument should not be too short; otherwise, it may lead to unreliable results. Therefore, in order to control this type of error, the vocabulary achievement test included 70 items including equal number (10 words) of target words from each week. A pilot study was conducted before the study and Cronbach's alpha value of the vocabulary achievement test was found to be .817, which shows that the reliability of the test is statistically high. Regarding the qualitative part of the study, not only open ended questions but also reflective journals of the students and the teacher were used to collect sufficient data.

3.6 Limitations. In spite of the fact that the present study has achieved its objectives; there are still some limitations that need to be taken into consideration. First of all, the number of participants was not very large (N=38) in this study. Conducting the study with larger populations could yield more reliable results which could be generalized to different groups and achieve higher external validity. Additionally, due to time constraints in the school program, the current study took seven weeks in total. Extending the treatment of the study over a longer period of time might lead to more in-depth findings. Besides, the present study was carried out only with English language learners at upper-intermediate level. Adding different proficiency levels could provide comparative results as well as increasing the external validity. Finally, due to the fact that some students did not repeat the word

cards when they receive notifications, it might have caused ambiguity in the obtained results.

3.7 Delimitations. "Delimitations are the boundaries purposely put on the study, usually to narrow it for researchability" (Mertler & Charles, 2005, p. 66). To put it in another way, they are the purposeful choices made by the researcher to limit the scope of a study. In this study, there are a few delimitations decided by the researcher.

To begin with, the participants studying at an English preparatory school were purposefully chosen since majority of the studies in literature explore the impact of mobile learning tools on high school students or participants learning English for different purposes. They were studying English for academic purposes, and as they were upper-intermediate level, they had a chance to complete the program in a year. Therefore, they were highly motivated to learn English.

In addition to this, as a mobile flash card application, *Rememba* was chosen by the researcher because of the fact that it is free, easy to use with a simple design and interface, and it uses a spaced repetition system. Due to these reasons, this mobile tool was selected for this study.

Chapter 4
Results

4.1 Overview

This chapter presents the results of the present study which aims to explore the effects of MALL via the mobile application *Rememba* on the vocabulary development and motivation of EFL learners at a private university in Turkey, and the students' and the teacher's perceptions about it. In the following section, firstly the findings about the demographics and smart phone use are presented. Following this, the results of the vocabulary pre-post-test, the MALL motivation questionnaire, and the reflective journals are provided respectively.

4.2 Findings about the Smart Phone Use and Demographics

In this section, initially, demographic information of the participants is provided. Following this, the findings about the smart phone use gathered before the implementation in the experimental group are presented.

4.2.1 Gender and age. The study included one experimental group and one control group comprising of students at upper-intermediate level. While the experimental group was supported with MALL, the control group did not receive any treatment. The distribution of female (*%55*) and male (*%45*) participants were almost equal in both groups, and their ages were between 18 (*%35*) and 19 (*%50*) as illustrated in Table 8 below:

Table 8

Distribution of the participants regarding their age and gender

	Experimental Group		Control Group		Overall	
Gender	n	%	n	%	n	%
Female	11	58	10	52	21	55
Male	8	42	9	48	17	45
Total	19	100	19	100	38	100
Age						
18	7	37	6	32	13	35
19	9	47	10	53	19	50
20	-	-	1	5	1	3
21	1	5	1	5	2	6
22	2	11	1	5	3	6

4.2.2 Results of the smart phone use in the experimental group. Before the implementation of the study, data were gathered about the smart phone use in the experimental group. The results indicated that all the participants had at least one smart phone, and more than half of them (*%53*) had been using it for more than four years as shown in Table 9. Therefore, it meant that all the participants were familiar with the smart phone use, so the study could be implemented in the group.

Table 9

Smart Phone Use in the Experimental Group

	Experimental Group	
Number of smart phone	n	%
1	18	95
2	1	5
None	0	0
Duration of smart phone use		
0-6 months	1	5
1-2 years	2	10
2-4 years	6	32
4+ years	10	53

4.3 Findings about the Differences Regarding the Vocabulary Development of the Students after the Implementation of the Mobile Application *Rememba* and Traditional Vocabulary Teaching for Turkish EFL Learners

In this section, the means and the standard deviations for the experimental and control group on the pre-test, post-test and their gain scores are presented in Table 10 to investigate the effects of the treatment on the vocabulary development of the participants. The gain scores, which means the difference between the pre and post-test scores, of the experimental group was *35.4* while it was *27* for the control group. The results revealed that the performance of the experimental group on the vocabulary test was better than the control group as shown in Figure 7.

Table 10

Means and Standard Deviations of the Pre- and Post- Test and Gain Scores

	M	N	SD	SEM
Control Pre-test	20.05	17	3.99	.96
Control Group Post-test	47.05	17	6.59	1.59
Experimental Group Pre-test	17.00	15	7.22	1.86
Experimental Group Post-test	52.47	15	7.68	1.86
Control Gain Scores	27.00	17	3.87	.93
Experimental Gain Scores	35.40	15	3.50	.90

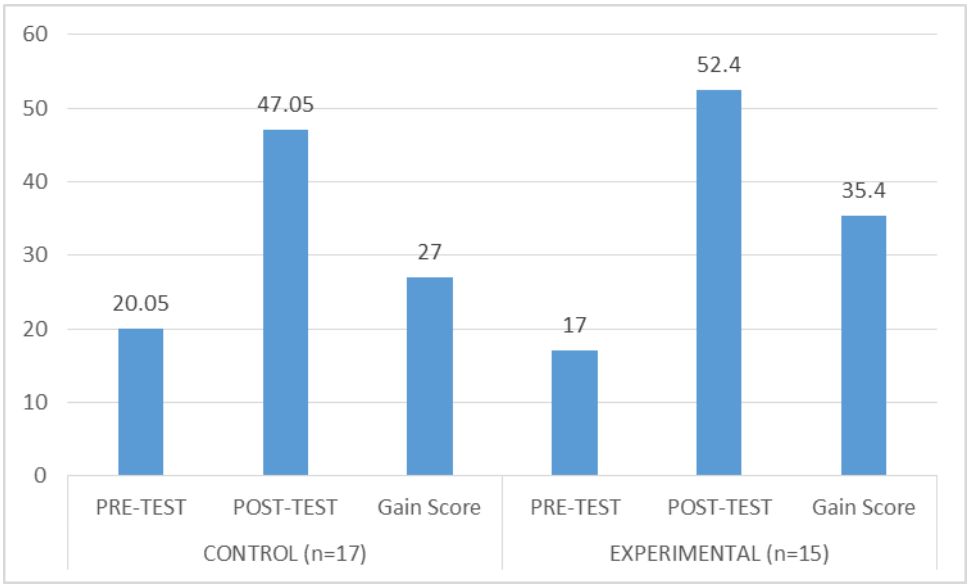

Figure 7. Comparison of pre-test, post-test and gain scores

In order to determine if the difference between the gain scores of the both groups was statistically significant, independent samples t-test was carried out by using SPSS statistical package version 23. The independent variable in the present study was the mobile learning application *Rememba*, which was used as a treatment. The dependant variable, on the other hand, was the vocabulary test administered before and after the treatment. As shown in Table 11 there was a significant difference between the groups ($p<.05$) in terms of their gain scores on the vocabulary test. Participants in the experimental group got statistically more vocabulary items ($M=35.4$, $SD=3.50$) than the students in the control group ($M=27$, $SD=3.87$); $t(32)=2.20$, $p=.03$. In other words, the mobile application used in the study resulted in a significant improvement in the vocabulary development of the participants in the experimental group.

Table 11

The Comparative Results of the Independent Samples t-test

	Levene's Test for Equality of Variances				
	F	Sig.	*t*	df	p
Average of differences between the scores of pre- and post- test	1.67	.20	2.20	32	.03

*p<.05

4.4 Findings Regarding the Students' Motivation after the Implementation of MALL Application

This section provides the findings collected via the MALL motivation questionnaire so as to explore the effects of the treatment on the motivation of the participants in the experimental group after the implementation.

To begin with, the findings described in Table 12 demonstrate that *73%* of the participants (n=15) felt enthralled while using their smart phones to learn new vocabulary items. It means that they considered smart phones as an attractive tool to study vocabulary. Additionally, *66.6%* of the participants reported that they felt motivated, and *66.7%* of them thought that using *Rememba* to learn new vocabulary was great fun. As for the convenience of the application, nearly *75%* of the students believed that it was easy to look up and learn new words with their parts of speech

and usages using *Rememb*a. In addition to this, with regard to the use of *Rememb*a in the future, *59 %* of the participants stated that they would continue to use it.

Another interesting finding was about the change in their study habits, and regarding this, *66.7%* of the participants reported that they had developed an e-life style using *Rememba* on a daily basis to practice new words. One of the most interesting findings was about the question concerning the comparison between digital and paper based word cards. Findings indicated that while *53.3 %* of the students preferred digital word cards, *33.3%* of them stated they were neutral and *13.3 %* reported that they preferred paper based cards. It shows us that although slightly more than half of the participants would like to use digital word cards, there were still some students who preferred paper based word cards. However, *72.7%* of the participants reported that they could get more vocabulary tasks done by working on their smart phones compared to working with paper and pencil sheets. This finding makes it clear that the students preferred to use their smart phones more when they believed it was convenient and practical. Also, majority of them (*66.6 %*) stated that they were increasingly engaged in learning vocabulary via mobile devices compared to paper and pencil methods.

Lastly, a great majority of them (*87.6 %*) reported that over time, smart phones had become less of a distraction and more of a tool for learning new vocabulary for them. To sum up, the findings of the MALL Motivation Questionnaire indicate that the mobile application *Rememba* had a positive impact on the majority of the participants regarding their motivation. However, there were still few students who believed that studying on paper was more useful for them compared to digital word cards.

Table 12

The results of the MALL Motivation Questionnaire in frequencies and percentages

	n	%
I feel enthralled using smart phones to learn English vocabulary.		
Strongly Agree	6	40
Agree	5	33.3
Neutral	4	26.7
Disagree	-	-
Strongly Disagree	-	0

Table 12 (cont'd)

I feel more motivated to study vocabulary when I use "*Rememba*"		
Strongly Agree	5	33.3
Agree	5	33.3
Neutral	2	13.3
Disagree	2	13.3
Strongly Disagree	1	6.7
It is great fun to learn new vocabulary via *Rememba* application on my smart phone.		
Strongly Agree	4	26.7
Agree	6	40
Neutral	3	20
Disagree	1	6.7
Strongly Disagree	1	6.7
Using *Rememba* application on my smart phone makes it easy for me to practice new words, their parts of speech and their usages in illustrative examples.		
Strongly Agree	7	46.7
Agree	4	26.7
Neutral	3	20
Disagree	1	6.7
Strongly Disagree	0	0
I will continue to use *Rememba* application to learn and actively use newly learned vocabulary.		
Strongly Agree	1	6.7
Agree	8	53.3
Neutral	4	26.7
Disagree	1	6.7
Strongly Disagree	1	6.7
I have developed an e-lifestyle using *Rememba* frequently, on a daily basis, to look up and learn new words.		
Strongly Agree	4	26.7
Agree	6	40
Neutral	4	26.7
Disagree	1	6.7
Strongly Disagree	0	0
I prefer to use the digital word cards over paper based word cards.		
Strongly Agree	5	33.3
Agree	3	20
Neutral	5	33.3
Disagree	2	13.3
Strongly Disagree	0	0

Table 12 (cont'd)

I am increasingly engaged in learning vocabulary via mobile devices compared to paper and pencil methods		
Strongly Agree	5	33.3
Agree	5	33.3
Neutral	3	20
Disagree	2	13.3
Strongly Disagree	0	0
Over time, smart phones have become less of a distraction and more of a tool for learning new vocabulary.		
Strongly Agree	5	35.7
Agree	6	42.9
Neutral	3	21.4
Disagree	0	0
Strongly Disagree	0	0
I can get more vocabulary tasks done when I am working on my smart phone than when I am working with paper and pencil sheets.		
Strongly Agree	4	26.7
Agree	7	46.7
Neutral	3	20
Disagree	0	0
Strongly Disagree	1	6.7

4.5 Findings about the Students' use and perceptions about *Rememba*

In order to explore the students' use of the mobile application *Rememba,* and investigate their perceptions about it, the second part of the MALL Motivation Questionnaire was administered to 19 students after the implementation. In the following part, firstly the results concerning the use of the mobile application and then the findings with regard to their perceptions are presented.

4.5.1 Findings about the students' use of *Rememba*. To start with, in order to identify the number of participants using the application to repeat the word cards, the first question "Did you repeat the word cards after you received notifications?" was asked. The results as shown in Table 13 revealed that while *79%* (n=15) of the students used the application, *21%* (n=4) of them did not use it. The reasons why some of the participants did not utilize it were that they felt lazy (n=1), they were not

available when they received the notification (n=2), and they didn't want to study English in general (n=1).

As *Rememba* is a mobile application based on a spaced repetition system, another question was asked about the frequency of the repetition that the participants performed. The results indicated that *26.3%* of them repeated the words once a week, and *21.1%* twice a week. Besides, *36.9%* of the participants stated that they repeated the word cards on *Rememba* more than twice a week on average.

The last question was posed in order to find out about the participants' perceptions about the number of notifications sent to them via *Rememba*. The results demonstrated that according to *57.9%* of the participants, the number of notifications was sufficient. However, *36.9%* of them stated that it was more than enough.

To sum up, based on the results of the questionnaire it could be concluded that the majority of the students made use of the mobile application *Rememba* and repeated the word cars at least once a week. Last but not least, more than half of the students stated that the time scheduling offered by the application was appropriate for them.

4.5.2 Findings of the perceptions of students about *Rememba*. One of the aims of the study was to find out about the perceptions of the students concerning the mobile application *Rememb*a. That is why, the questionnaire included open ended questions to gather data about it. The initial question was posed to learn about the reason why the participants liked, if they did, the application. 19 students responded to that question and the results as demonstrated in Table 13 revealed that 6 of them liked the application since it sent them notifications as a reminder to repeat the word cards. In addition to this, 5 of the respondents reported that they liked using *Rememba* because it helped them retrieve the words easily, and 2 of them stated that it encouraged them to practice the newly learned words. Being a convenient way to prepare word cards, accessible to reach at any time and everywhere, offering L1 meaning and the pronunciation of the words, and not being boring are the other reasons why the students liked the application utilized in the present study. Only one student expressed that he did not like the application at all. In brief, nearly all the students liked the application and the main reasons for it were that it facilitated the retrieval of the words, and the feature of sending notifications acted as a push effect as it encouraged them to study and repeat the newly learned words.

Table 13

The Rememba Features You Like the Most

Responds	Students
It helps me to remember the words easily	S1, S2,S3,S11,S19
The feature of sending notifications	S7,S11,S12,S13,S14,S15
I can listen to the pronunciation of the words	S4
An easy way to repeat the words	S6
Helps me to learn L1 meanings	S9
It encourages me to study / repeat the words	S10,S18
Makes it easy to prepare word cards	S15
Helps us to study the words whenever we want	S19

Another open ended question was about the features of the application that the students dislike and the reasons for it. 12 out of 19 students responded to the question, and their responses are shown in Table 14. Besides, 6 students stated that there was nothing they disliked about the application. 4 of them reported that they did not like it because it sent too many notifications. Moreover, while one student expressed that he did not like the colours of *Rememba*, another respondent pointed out that it was tiring to prepare word cards using the application.

Table 14

The Rememba Features You Dislike

Responds	Students
Nothing	S6,S7,S8,S10,S12
It sends too many notifications	S1,S2,S3,S11
Colors are not nice	S4
It's tiring to prepare	S5

The final open-ended question was asked to identify whether the students consider the application as an effective method for their vocabulary development or not. 19 students answered this question and the responses were shown in Table 15.

The findings indicated that a great majority of them (n=17) thought it was an effective method to study and practice vocabulary. 7 of them reported that it was useful as it sends them notifications to repeat their word cards and so it helps them retrieve the words easily. Also, they stated that it helped them keep the words in their memories for a long time, which means they felt that they could keep the words in

their long-term memory since they repeated the words at certain intervals thanks to the notifications sent by the application. Another significant finding was about the convenience of the application. 2 students mentioned the fact that they could reach the word cards with L1 meanings of the words whenever they wanted; therefore, they considered it as a useful method to study vocabulary. The last reason why they liked the application was that the word cards included their own example sentences consisting of the target word. On the other hand, 2 students stated that they did not find the application as an effective method thinking that it was not appropriate for their learning styles. In brief, almost all the students considered that *Rememba* was a useful method to benefit from for their vocabulary development, yet 2 of them were opposed to that idea since they believed that their own learning strategies were more effective.

Table 15

Do you think using Rememba is an effective method to study vocabulary? Why?

Responds	Students
Yes	S1,S2,S3,S4,S5
Yes, it helps us to remember the words and make them permanent	S6,S9
We can reach it at any time and learn the L1 meanings of the words	S7, S13
Yes, thanks to its notifications it reminds the words that we are likely to forget	S11, S14,S15,S16
Sending frequent notifications is a successful method	S17
Notifications make the words stay in our memories for a longer time	S18
Yes, when we repeat the words after receiving notifications, makes the learning process easier	S19
Yes because we learn the words with our own example sentences	S12
No, everybody should have his/her own method	S8
It is not appropriate for my learning style	S10

4.6 Findings of the Reflective Journals from the Students and the Teacher

In an attempt to gather in depth information regarding the perceptions of the students about *Rememba*, reflective journals kept by the students and the teacher were used. In this part, firstly the findings of the reflective journals kept by the students in the experimental group and then the teacher are described.

4.6.1 Findings of students' reflective journals. The findings of the reflective journals of the students were analysed under six main categories which are the convenience of the mobile application, its push effect, facilitating the retrieval of the words, other factors making it a useful vocabulary learning strategy, negative opinions about it, and finally suggestions by the students to improve *Rememba*.

4.6.1.1 The convenience of the mobile application Rememba. The findings of the reflective journals of the students revealed that they found the mobile application convenient to use as they could reach their smart phones whenever and wherever they wanted. The following excerpts below support this finding:

> […] I can use it everywhere when I am home, at school, on the bus etc... (S1, Journal Data, 03.02.2017)
>
> […] I can read and study whenever I want, it is always available and useful. (S3, Journal Data, 03.02.2017)
>
> […] It is like a pill to learn vocabulary; you can use it whenever you want; For example, when you are on the bus you can just take out your mobile phone and revise your word cards. (S10, Journal Data, 16.02.2017)
>
> […] It is a useful application because I can look at the words everywhere easily. I had already been using such a strategy but now this application has made my job easier. (S12, Journal Data, 16.02.2017)
>
> […] I think it is an effective strategy because it is very quick and easy to use. (S5, Journal Data, 03.03.2017)

Based on the comments of the participants, it can be concluded that the students considered *Rememba* as a useful tool since it provides an easy access to the word cards without time and place restrictions. To put it simply, the feature of being ubiquitous makes *Rememba* a convenient tool for EFL learners to study vocabulary.

4.6.1.2 The push effect of the mobile application Rememba. The findings gathered from the reflective journals indicated that the mobile application used in the study had a push effect on the students since it encouraged them to study by sending them notifications at certain intervals. This finding is supported by the comments below:

> […] It is a useful app because it sends notifications and make me study. (S7, Journal Data, 24.02.2017)
>
> […] Notifications encourage me to practice the words. (S13, Journal Data, 24.02.2017)
>
> […] The feature of sending notifications as a reminder to study the word cards makes it a great application. (S18, Journal Data, 03.03.2017)
>
> […] Sending notifications at regular intervals makes us repeat the words, and makes learning easier. (S2, Journal Data, 07.03.2017)
>
> […] It reminds us to study by sending notifications. (S18, Journal Data, 03.03.2017)
>
> […] I study regularly by following the notifications. (S19, Journal Data, 03.03.2017)

In brief, by sending notifications at certain intervals *Rememba* encouraged students to study the word cards on their smart phones. In other words, it had a push effect on students, which could be considered as a motivational factor for students to study vocabulary on their mobile phones. To put it simply, the notifications sent via *Rememba* led the learners to study the target words at spaced intervals.

4.6.1.3 How Rememba eased the retrieval of the words for the students. In their journals students reflected that using *Rememba* helped them retrieve the newly learned words easily and keep the words in their long term memory. The following excerpts support this finding:

[…] I learned all the target words in week 1. Now I can remember how to use them better. (S2, Journal Data, 27.01.2017)

[…] I can remember the upper words such as “alter”, “fundamental”, “devote” etc. easily and use them while writing an essay. (S1, Journal Data, 10.02.2017)

[…] I can keep the words in my mind for a longer time thanks to this application. (S12, Journal Data, 16.02.2017)

[…] After I started using it regularly I realized that it helped me to remember the words easily. (S4, Journal Data, 24.02.2017)

[…] I used to learn a word but forget it immediately. However, now thanks to the notifications I repeat the words so I can remember them easily. It is good for long-term retention. (S8, Journal Data, 07.03.2017)

[…] It is very useful for me because I forget the words that I learn at school quickly. Thanks to this application, I remember the words every day. (S15, Journal Data, 07.03.2017)

In brief, the statements by the students demonstrated that using *Rememba* assisted them in the retrieval of the target words and keeping them in their long-term memory. It means that the learners using *Rememba* did not have difficulty in recalling the previously learned words as they stated that they could remember the target words easily when needed.

4.6.1.4 Other factors making Rememba a useful tool for the vocabulary development of the learners. As for the other factors which make *Rememba* a useful tool for the vocabulary development, participants pointed out four major points. First of all, they stated that *Rememba* helped them learn the vocabulary items with their parts of speech. In addition, seeing the words in context, thanks to example sentences, gave them a better understanding of using the words productively. Besides this, repetitions, an important component of vocabulary learning strategies, supported their vocabulary development by expanding their vocabulary knowledge. Lastly, the students thought that studying vocabulary by means of *Rememba* was fun. The following quotations below support these findings:

[…] I have learned all the words with their parts of speech. (S13, Journal Data, 03.03.2017)

[…] If we use this application regularly, we can learn the words with their parts of speech, and thanks to the example sentences, we can see how a word is used accurately. So we don't have difficulty while writing an essay. (S15, Journal Data, 10.02.2017)

[…] Thanks to repetitions, I expanded my vocabulary knowledge a lot. (S9, Journal Data, 07.03.2017)

[…] It has made vocabulary learning easier for me as it got me to repeat the words all the time. (S1, Journal Data, 24.02.2017)

[…] Repetitions have made the learning permanent. (S5, Journal Data, 03.03.2017)

[…] It is a fun way to study vocabulary. (S7, Journal Data, 10.02.2017)

[…] It is not boring, it is encouraging and useful. (S18, Journal Data, 10.02.2017)

In brief, students' remarks analysed from their reflective journals indicated that they considered *Rememba* as a useful tool since it helps them study the words with their parts of speech, example sentences, and repetitions in a fun way. In other words, it is obvious that *Rememba* helped the participants benefit from some useful vocabulary strategies without getting bored.

4.6.1.5 Weaknesses of Rememba. Despite the fact that the majority of the students held positive opinions as to Rememba, some students expressed the negative sides of it. To elaborate, while a student did not like it considering that it was boring, the others did not favour it because of owning different study habits and facing battery problems. The following excerpts below support these findings:

[…] I think it is boring (S14, Journal Data, 10.02.2017)

[…] I like studying on paper. It is more useful for me. (S6, Journal Data, 03.03.2017)

[…] My style is different. I prefer to write on paper so I don't like it. (S11, Journal Data, 16.02.2017)

[…] As mobile phones' battery die quickly, students probably do want to use this application. (S14, Journal Data, 03.02.2017)

[…] Applications reduce phones' battery usage. (S12, Journal Data, 07.03.2017)

[…] I don't like it because of the battery problem. (S17, Journal Data, 03.03.2017)

Overall, the reflections of the students revealed that some of them did not like using the application due to its being boring, having different study habits, and experiencing battery problems.

4.6.1.6 Suggestions to improve Rememba. As to the findings related to the suggestions on how to improve *Rememba* further, the participants put forward that pictures, videos, a dictionary, tests and games could be integrated into the application. Also they suggested that they could work on the ready-made word cards by just adding an example sentence. The following reflections made by the students support these findings:

[…] There could be pictures and videos in the application. (S3, Journal Data, 10.02.2017)

[…] Adding tests and games to the application could be better. (S4, Journal Data, 10.02.2017)

[…] It will be better if the school adds the target words with their definitions, so we can just enter the example sentences. (S19, Journal Data, 24.02.2017)

[…] The application could ask questions to test the students, or games could be integrated to make learning more effective. A dictionary could be added. (S10, Journal Data, 07.03.2017)

To sum up, taking the comments made by the participants above into consideration, the mobile application *Rememba* could be improved by integrating other features such as pictures, videos, tests, games, and a dictionary. In this way, it could be more attracting and motivating for the EFL learners who want to study vocabulary via *Rememba*.

4.6.2 Findings of the teacher's reflective journal. In an attempt to gather data about the perceptions of the teacher, the reflective journals kept by her were analysed. The findings were categorized under four main themes which are the motivation of the learners, changes in their study habits, their vocabulary development and the problems observed by the teacher.

4.6.2.1 Motivation of the learners. Based on the observations of the teacher, the findings with regard to the motivation of the learners revealed that most of the participants seemed motivated and eager to utilize the application throughout the study except for the first week. The following excerpts support this finding:

> […] Although in the first week some of the students were not so eager to utilize the application, now they seem more eager to use it. It is maybe because they have become more familiar with the application and had a better understanding of the benefits it could potentially bring for their vocabulary development. (T, Journal Data, 03.02.2017)
>
> […] Some students are into technology; therefore, they seem motivated while studying on their phones. (T, Journal Data, 10.02.2017)
>
> […] Majority of the students were on task when they were asked to prepare their word cards on their smartphones (T, Journal Data, 16.02.2017)
>
> […] Most of the students were willing to study on their phones. (T, Journal Data, 24.02.2017)

To wrap up, the findings of the reflective journals of the teacher demonstrated that even though the students were reluctant to use the application in the first week, in time majority of them got familiar with it and seemed motivated and willing to use it throughout the rest of the study. Therefore, it could be concluded that *Rememba* had a positive impact on the motivation of the learners in terms of vocabulary learning and teaching.

4.6.2.2 Changes in the study habits of the learners. Findings concerning the study habits of the students indicated that *Rememba* had a push effect on the students by encouraging them to study on a regular basis thanks to the reminders it sends to the students. The teacher specifically reported that she observed a change in the study habits of the students as they started to study vocabulary regularly by means of *Rememba*. The following comments support this finding:

> […] It seems to have a positive effect on their study habits as they are repeating and recycling the words at certain intervals thanks to the application. (T, Journal Data, 10.02.2017)
>
> […] Generally students study vocabulary just before the vocabulary quiz but now I see that they repeat the words outside of the class every day thanks to this application. So it seems that the application has had a push effect on students by encouraging them to study. (T, Journal Data, 16.02.2017)
>
> […] Since the application sends notifications to the students as a reminder to repeat the word cards, it appears that most of them are studying vocabulary on a regular basis rather than just before an assessment component like a vocabulary quiz or a midterm exam. (T, Journal Data, 07.03.2017)

Briefly, it was observed by the teacher that the push effect of *Rememba* led to some changes in the study habits of the students by encouraging them to study target vocabulary items on a regular basis.

4.6.2.3 Vocabulary development. As for the findings regarding the vocabulary development of the students, the teacher's reflections revealed that using *Rememba* seemed to have a positive impact on the retrieval of the newly learned words. Additionally, the students in the experimental group were more likely to identify the parts of speech of the target words correctly and produce example sentences including them. Some of the following quotations derived from the teacher's reflections are presented below:

> […] While I was trying to elicit the meanings of the week 3 words they seemed to be slightly better at remembering and retrieving the target words compared to the control group. (T, Journal Data, 10.02.2017)
>
> […] While eliciting the parts of speech of the target words of the week, they were able to answer correctly most of the time. (T, Journal Data, 24.02.2017)
>
> […] They seem to be slightly better than the other class in terms of receptive and productive vocabulary knowledge of the target words. Most of the students could come up with example sentences including the target words in an almost accurate and meaningful way. (T, Journal Data, 07.03.2017)

To wrap up, based on the reflections of the teacher it could be concluded that the use of *Rememba* eased the retrieval of the newly learned words for the students. Besides this, it was observed that compared to the control group, the students were slightly better at identifying the parts of speech of the target words and use them productively in an accurate and meaningful way.

4.6.2.4 Problems observed. The analysis of the reflective journals by the teacher showed that especially two strong students were not motivated to use *Rememba* due to having different learning strategies. The other problems observed were related to technical things such as battery and storage problems. The following quotations below support these findings:

> […] Specifically two strong students (S6 and S11) did not like the idea of studying the words on their smart phones claiming that they learn better when they study on paper. (T, Journal Data, 27.01.2017)
>
> […] Again the same students (S6, S11) seemed unwilling to study on their mobile phones. When I asked them about the reason, S6 told me that he had a different method to study vocabulary which worked well all the time. He contends that his method is the best way to study vocabulary for him, so he is not into any different methods. (T, Journal Data, 03.02.2017)
>
> […] Also S11 expressed similar thoughts to S6 by saying that she learns much better while studying on paper. The reason behind it may derive from the fact that she is accustomed to using a different strategy for vocabulary learning. (T, Journal Data, 10.02.2017)
>
> […] A student did not want to prepare her word cards on her phone claiming that she needs to charge her phone. (T, Journal Data, 03.03.2017)
>
> […] One student voiced in the class that she faces storage problems; that is why, she seemed unwilling to study on her phone. (T, Journal Data, 07.03.2017)

In brief, in the light of the reflections written by the teacher, the students experienced some issues with regard to motivation and technical problems such as battery and storage problems.

Chapter 5
Discussion and Conclusions

5.1 Discussion of Findings for Research Questions

The purpose of this study was to investigate the use of a mobile flashcard application *Rememba* on the vocabulary development and the motivation of Turkish EFL learners. In addition to this, this study attempted to find out about the perceptions of the students and teacher about implementing this mobile device in their classroom practices. In this study, data were gathered by means of quantitative and qualitative data instruments including pre- and post- test, the MALL motivation questionnaire and reflective journals. In the following section, the findings of the each research question will be thoroughly discussed.

5.1.1 Discussion of the findings of RQ 1: Is the use of a mobile flash card application *Rememba* based on spaced repetition system effective in terms of the vocabulary development of Turkish EFL students in upper intermediate level preparatory classes? The purpose of the first research question was to investigate the impact of the mobile flash card application *Rememba* on the vocabulary development of the Turkish EFL learners in upper intermediate level preparatory classes. The results indicated that there was a significant difference between the gain scores of the vocabulary tests received by the experimental and control groups. In other words, the experimental group who received the treatment by using *Rememba* had a quite positive impact on the vocabulary development of the target group of students.

One of the reasons why the use of this application resulted in better vocabulary achievement results might be due to the fact that it is based on a spaced repetition system, which makes the learners repeat the word cards at certain intervals. This argument is in line with the research (Leitner, 1972; Mondria, 1994; Pimsleur, 1967) which has shown that learning new words via spaced repetition of flashcards is one of the most effective ways to quickly expand one's vocabulary knowledge. In a similar vein, Pham et al. (2016) developed a mobile application called "English Practice" which makes use of a card-based design working on spaced repetition

system. The study was carried out with 2774 online users for a period of three months and explicitly revealed that the use of the mobile app led to better vocabulary retention.

Another reason why using *Rememba* had a positive impact on the vocabulary development of the learners might be because of its push effect thanks to the notifications it sends to the users. The results are in accordance with the study of (Warren et al., 2014), which demonstrated that the use of push notification had a considerable effect on user retention as it functions as a reminder and encourages learners to utilize the application. To put it another way, *Rememba* reminds learners about the repetition of the word cards; thus, students could be more likely to be encouraged to study the target vocabulary on a regular basis.

In addition to the push effect of *Rememba*, the flash cards in the application could be considered as "manageable learning chunks" (Bradley et al, 2009, p.281) as they include short example sentences and short definitions of the words; therefore, it was unlikely that it created a cognitive load on the learners' memory while using the application. This finding was echoed in the study conducted by Saran (2008) where multimedia messages including small amount of information were sent to the learners for vocabulary learning/teaching. In this way, the cognitive load was reduced and it was found out that the students receiving multimedia messages learned more word items than the ones studying on web and paper-based materials. Similarly, Gassler et al. (2004) suggests dividing the contents into small pieces of information. Hence, it can be concluded from the findings that mobile word cards have a remarkable potential to be utilized widely in the future for mobile learning application.

Last but not least, as it is noted by Kukulska-Hulme (2013), the portability of mobile phones offers distinctive benefits for learners. In this study, the students had a chance to access the word cards they prepared in the class via mobile phones whenever and wherever they wanted, which could facilitate vocabulary learning beyond the borders of the classroom. In other words, mobile phones created "continuity between contexts" (Jones et al. 2006) and could support learning processes in different places without depending on one particular location or time. That is why; the students could have achieved better gain scores as a result of pre-post vocabulary tests. This finding was also in accordance with the study conducted by Çavuş and Ibrahim (2009) which demonstrated that using SMS text messaging

served as an effective mobile learning tool to teach and learn English vocabulary since it provided the learners with the opportunity to study and practice without time and place restrictions.

5.1.2 Discussion of the findings of RQ 2: Does using *Rememba* as a mobile tool to store and practice vocabulary have, if any, impact on the motivation of the participating students? The purpose of the second research question was to find out about the impact of the mobile application *Rememba* on the motivation of the participating students. In order to gather data regarding motivation, the MALL Motivation Questionnaire was administered after the treatment in the experimental group. The results revealed that a great majority of students felt motivated to use the application since they found it enthralling, fun and convenient which are among the motivational factors of MALL as suggested by Jones et al. (2006). To illustrate, the results indicated that nearly all the students considered using *Rememba* as an easy way to practice newly learned words. One of the reasons for this finding is most probably because of the fact that their smart phones are portable so they ensure easy access to their word cards whenever they want. That is to say, they had a control over their learnings, and this sense of control could have given them intrinsic motivation (Jones et al., 2006). In addition to this, the results of the MALL motivation questionnaire showed that majority of the students developed an e-style learning by using *Rememba* on a daily basis, which shows that using *Rememba* created a continuity between the school context and self-study outside of the school. It is an indicator of the fact that *Rememba* acted as a catalyst to motivate the students for vocabulary learning by creating continuity between contexts - a motivational factor as stated by Jones et al. (2006). These findings are also in accordance with the ones gathered from the open-ended questions and the reflective journals of the participants.

The findings are also in line with a study conducted by Fageeh (2013) attempting to investigate the advantages of mobile applications concerning their potential for reinforcing vocabulary learning and motivation. The results indicated that the students in the experimental group had enhanced level of motivation after the treatment.

In another study Huang (2016) developed a 5-step vocabulary learning (FSVL) strategy and a mobile learning tool to explore their impact on the learning motivation and performance of EFL students in a situational English vocabulary learning environment. The results indicated that the learning motivation and performance of the students taught using the FSVL strategy and mobile learning tool were better than those of students taught using the FSVL strategy and traditional learning tools.

In a similar vein, Ciampa (2014) conducted a case study in order to investigate the experiences of a grade 6 teacher and learners using tablets as a part of their classroom instruction. It was concluded that using mobile devices as a part of classroom instruction resulted in enhanced learner motivation.

However, it is essential to keep in mind that studying vocabulary using mobile devices may not be motivating for some students whose learning strategies and study habits are different. The results of the MALL motivation questionnaire demonstrated that especially two strong students preferred to study on paper rather than using the mobile application. The results of the open-ended questions and reflective journals were also in line with this finding by giving in-depth information about the reasons why they were not into using *Rememba*. The reasons stated by the students were having a different learning strategy and study habits. This finding is in line with a study carried out by Okunbor and Retta (2008) to investigate the use of mobile phones to enhance student learning. The obtained results indicated that most of the students using the mobile-based applications found them insignificant.

In conclusion, despite the fact that using *Rememba* was found to be motivating for most of the students in this study, there were still a few students who were not motivated to study vocabulary on their mobile phones. Therefore, it is important to note that there is still a need for further research regarding the motivational issues in mobile learning (Sharples et al., 2007).

5.1.3 Discussion of the findings of RQ 3: What are the perceptions of students and teachers about using *Rememba* as a mobile tool to store and practice vocabulary in preparatory classes? As for the final question, the reflective journals of the participants and the teacher were analysed so as to identify the perceptions of them. The reflections of the participants and the teacher were analysed through content analysis.

The findings clearly showed that a great majority of the students held positive opinions about *Rememba* as a mobile tool to store and practice vocabulary, and they reported several outstanding reasons for it. First of all, the students pointed out that it was a very convenient way to study vocabulary as they could access to their word cards at any time and place. In addition to this, the application sent them notifications at spaced intervals to remind them of the revision of their cards. Therefore, it created a "push effect", which is suggested by Ellias (2011) as one of the instructional design principles for MALL. In other words, most of the students reported that receiving notifications encouraged them to study vocabulary on a regular basis. They also added that thanks to studying at certain intervals, they could recall the newly learned words easily. This finding is commensurate with the study of Thornton and Houser (2005) who postulated that mobile phones promoted the regular study habits of the students, hence leading to more exposure to the target words and more vocabulary gains. In the present study, this finding was also in line with the teacher's observations as recorded in her reflective journals. She reported that the students started to study vocabulary on a regular basis thanks to the application; thus, they were better at recalling the newly learned words compared to the control group. Another reason why the participants had positive attitudes toward the use of *Rememba* is that they liked the fun feature of it. Most of them expressed in their journals that practicing vocabulary on *Rememba* was not boring. All these three significant findings were in line with the study conducted by Başoğlu and Akdemir (2010) who concluded that effectiveness, convenience and entertaining use of mobile phones made them a preferred tool for English vocabulary learning in comparison with the hardcopy counterparts. In another study, Lin and Yu (2016) gathered data about the perceptions of the students in relation to a vocabulary learning program through MALL, and they found out that the participants gave positive feedback on the mobile-assisted vocabulary learning program including multimedia presentations. In addition, Virvou and Alepis (2005) who investigated the use of mobile phones in teaching also concluded that both instructors and students who assessed their system found it to be very beneficial.

Another interesting finding from the students' reflective journals was that the students considered *Rememba* as a useful tool since it helped them develop vocabulary learning strategies. Considering the strategies, the students mentioned that being exposed to the part of speech of a word, its L1 meaning and an example

sentence was beneficial for their vocabulary development. These vocabulary learning strategies are also suggested by Schmitt (1997) as a part of the "discovery" stage. Similarly, McCarthy (1990) contends that learning a word in a meaningful context is the best way to acquire and recall a word. This finding is also in line with the ones gathered from the teacher's reflective journals as the teacher noted that the learners in the experimental group seemed to be better at recalling the meanings of the target words with their part of speech and coming up with example sentences.

As for the problems experienced by the students and observed by the teacher, battery and storage problems were reported. This finding is also in parallel with the earlier studies conducted by Al-Said (2015), Saran (2008), and Perry (2003). Another problem reported by both the students and the teacher was the lack of motivation experienced by two specific students. These aforementioned students were reluctant to use the mobile application since they believed that they could learn better when they studied on paper. Therefore, it is noteworthy to stress that educators need to take different learning strategies preferred by students into consideration while adopting mobile technologies in their classrooms.

In brief, despite a few problems, not only the instructor but also the students of the current study found the use of *Rememba* useful due to the outstanding reasons mentioned above.

5.2 Practical Implications

The present study offers some practical implications for practitioners, course/material designers, and researchers. First of all, the findings of the present study revealed that using the mobile flash card application *Rememba* resulted in significant vocabulary gains of the learners. The gathered results also lend insights into the motivation and perceptions of the Turkish EFL learners using *Rememba*. It was found out that the use of this mobile tool led to enhanced motivation in learners. Furthermore, learners stressed the remarkable features of this app such as being convenient and fun, and having the push effect. They also found it effective for their vocabulary development since they were exposed to the target words in context along with their L1 meanings and parts of speech at certain intervals. Therefore, it would be worth integrating such a mobile application into vocabulary teaching/learning to assist with the vocabulary development as well as increasing the

motivation of language learners. In this way, learners could be encouraged to revise the previously learned words at certain intervals outside the classroom, and they would be aware of some of the strategies required for vocabulary learning.

However, it is crucial to keep in mind those students employing different learning strategies and preferring paper-based methods could resist using such a mobile application. Therefore, piloting and receiving students' feedback are highly suggested before adopting such an application in EFL classrooms.

As for the MALL instructional design, some theories such as dual coding and cognitive load theory should be taken into consideration while designing or choosing mobile-based materials. For instance, instructional materials should not include too much information or complex visual/auditory modalities as they may lead to cognitive load on learners, thus hindering the learning process. In that sense, the flash cards in *Rememba* should be designed in a simple and clear way.

Overall, the findings of the present study are crucial for the implementation of a mobile flash card application combining a spaced repetition system in EFL classrooms.

5.3 Conclusions

The present study contributes to the literature by investigating a mobile flash card application with a spaced repetition system on the vocabulary development, and motivation of Turkish EFL learners. The results indicated that the participants having used *Rememba* had better vocabulary gains. Besides this, the results demonstrated that the students, in general, were motivated to use the application and mostly shared positive perceptions in their journals. Apart from the vocabulary development and motivation, both students and teachers had positive perceptions about integrating such a mobile application in their classroom practices.

In brief, the findings of the present study demonstrated that integrating *Rememba* during the process of vocabulary teaching and learning could be considered as an effective tool to support the vocabulary development and enhance their motivation in EFL classrooms.

5.4 Recommendations for Further Research

The current study offers some recommendations for further research. To begin with, the present study was conducted with a small number of learners at upper-intermediate level (N=38). Therefore, it could be replicated using a larger sample size and with learners from different proficiency levels.

In this study, pre-post vocabulary tests just focused on the receptive vocabulary knowledge of the students. For further research, productive vocabulary knowledge could be investigated in order to see the effects of the treatment on the production of the learners as well.

In addition, this study was conducted over a seven-week teaching module; therefore, it was not so possible to include a retention test. Hence, for further research, a retention test one month after the study could be applied to be better able to understand the impact of the treatment on the retention of the learners.

Finally, this study only included two groups; one experimental group using the mobile application, and one control group receiving no treatment. For future studies, other groups using paper-based and web-based flash cards could be involved so as to compare their effectiveness and examine their impact on vocabulary development and motivation of language learners.

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APPENDICES

A. VOCABULARY PRE/POST-TEST

Bölüm I. Kişisel Bilgiler

1. Adınız Soyadınız:
2. Yaşınız:
3. Cinsiyetiniz: Kız_ Erkek_
4. Bölümünüz:
5. Mezun Olduğunuz Lise:
6. İngilizce dışında başka bir dil biliyor musunuz? Evet_ Hayır_

   Evet ise hangi seviye? Başlangıç _ Orta _ İleri _
7. Kendinize ait akıllı telefonunuz var mı?

   1 adet _ 2 adet _ 2'den fazla _ Akıllı telefonum yok _
8. Ne kadar zamandır akıllı telefon kullanıyorsunuz?

   0 – 6 ay _ 6 – 12 ay _ 1 – 2 yıl _ 2 – 4 yıl _ 4 yıldanfazla _ Hiç kullanmadım _

Bölüm II. Kelime Testi

Choose the correct option to complete the sentences below. Choose only one option.

1. The plan received _____ support throughout the country.
   A. widespread
   B. innovative
   C. sensitive
   D. skilled

2. Rome was the _____ power in the Mediterranean region for many centuries.
   A. innovative
   B. predominant
   C. sensitive
   D. steady

3. The government _____ gambling.
   A. distributes
   B. regulates
   C. comprises
   D. declines

4. Ability to read is _____ to getting an education.
   A. neutral
   B. fundamental
   C. permanent
   D. notion

5. What's done is done, and we cannot _____ the fact.
   A. alter
   B. employ
   C. conform
   D. transmit

6. Charities _____ food and medical supplies to people who are in need.
   A. employ
   B. distribute
   C. comprise
   D. decline

7. We'll need to _____ more waiters during the summer.
   A. invest
   B. alter
   C. employ
   D. distribute

8. The fitness centre _____ a pool as well as racquetball courts.
   A. comprises
   B. invests
   C. conforms
   D. pollutes

9. He found it difficult to _____ to the strict rules of the military academy.
   A. conform
   B. regulate
   C. invest
   D. comprise

10. The _____ that the earth moved around the sun was unacceptable to church leaders of the time.
   A. application
   B. distribution
   C. investment
   D. notion

11. The accident has not done any _____ damage.
   A. depressed
   B. permanent
   C. sensitive
   D. notion

12. France's population is _____ Catholic.
    A. meanwhile
    B. predominantly
    C. virtually
    D. steadily

13. Last year, there was a _____ in the number of crimes in the city.
    A. distribution
    B. regulation
    C. decline
    D. caution

14. The government makes the laws, and the police _____ them.
    A. claim
    B. discriminate
    C. pose
    D. enforce

15. They hoped the negotiations would _____ an end to the war.
    A. indicate
    B. bring about
    C. claim
    D. enforce

16. The civil rights movement fought to bring an end to _____ in this country.
    A. regulation
    B. conformity
    C. discrimination
    D. decrease

17. The woman on the phone was _____ a survey.
    A. enforcing
    B. posing
    C. claiming
    D. conducting

18. The topic of war _____ the conversation.
    A. enforced
    B. dominated
    C. indicated
    D. expressed

19. The results of the study _____ that their hypothesis was correct..
    A. claim
    B. indicate
    C. dominate
    D. conduct

20. The advertisers _____ that their product cleans better than similar products.
    A. cope
    B. bring about
    C. conduct
    D. claim

21. We may be fearful of change, but change is _____.
    A. incentive
    B. fundamental
    C. inevitable
    D. willing

22. The manager's resignation _____ several problems for the restaurant's owner.

A. discriminated
B. dominated
C. enforced
D. posed

23. How do you _____ with the stress of this job?

A. conduct
B. cope
C. regulate
D. employ

24. The competition gave the students a/an _____ to read more books.

A. indication
B. anxiety
C. expression
D. incentive

25. The customer's violent behavior _____ the store manager to call the police.

A. committed
B. expressed
C. compelled
D. indicated

26. I couldn't sleep last night and _____ was tired all day today.

A. meanwhile
B. virtually
C. furthermore
D. consequently

27. He was always _____ to play an instrument when he was young, but now he wishes he had.

A. committed
B. reluctant
C. willing
D. facilitated

28. These two statements _____ each other, so I don't understand your point.

A. injustice
B. facilitate
C. contradict
D. compel

29. The company wanted to buy the property for a new hotel, but the owners were not _____ to sell.

A. reluctant
B. permanent
C. risky
D. willing

30. No arguments could _____ him from taking on this dangerous task.

A. compel
B. deter
C. participate
D. indicate

31. The _____ of nuclear power claim that the probability of serious accident is very high.

A. communities
B. opponents
C. exceptions
D. deter

32. No parking is allowed, but a /an _____ is made for disabled drivers.

A. prejudice

B. facility

C. exception

D. shortcoming

33. His business connections _____ his finding a new job.

A. committed

B. adapted

C. facilitated

D. deterred

34. We are committed to fighting against poverty and _____.

A. opponent

B. injustice

C. participation

D. willing

35. Despite a number of _____, the project will still go ahead.

A. shortcomings

B. indications

C. unions

D. outcomes

36. Who do you think _____ the crime?

A. created

B. reminded

C. eliminated

D. committed

37. The town council _____ buying fruits and vegetables which are grown on local farms.

A. alters
B. utilizes
C. advocates
D. presumes

38. Many scientists had _____ this disaster, so necessary precautions were taken.

A. comprised
B. advocated
C. foreseen
D. utilized

39. Punishment for even small crimes could be _____ in those times.

A. enrolled
B. severe
C. socialized
D. foreseen

40. He called the police after she made _____ on his life.

A. implementations
B. advocates
C. threats
D. cautions

41. A good government is concerned with the _____ of its citizens.

A. requirement
B. welfare
C. incidence
D. underclass

42. There is a _____ amount of space in your closet, so you need to throw some things out.

A. threat
B. steady
C. finite
D. vast

43. The time is now right to _____ our plan.

A. implement
B. dominate
C. pose
D. ban

44. She was wearing a white coat, so I _____ she was the doctor.

A. facilitated
B. advocated
C. presumed
D. contradicted

45. Wearing uniform is not _____ in most of the high schools in Turkey. Students do not have to wear them.

A. controversial
B. foreseen
C. compulsory
D. finite

46. In the famous opera, the gypsy, Carmen, _____ her own death.

A. reduces
B. predicts
C. implements
D. maintains

47. Turkey's European Union (EU) membership is a/an _____ issue. While some people support it, some people oppose this idea.

A. finite
B. severe
C. underlying
D. controversial

48. Vitamin C helps the body to _____ the iron in your body.

A. utilize
B. threat
C. pursue
D. elect

49. Water is a _____ for all living things.

A. pursue
B. policy
C. requirement
D. welfare

50. We expected the restaurant to be busy but we were surprised to find it _____ empty.

A. consequently
B. temporarily
C. virtually
D. steadily

51. Thomas Edison possessed a/an _____ mind; he always tried to produce new ideas and methods.

A. acknowledged
B. innovative
C. equivalent
D. incentive

52. The city's orchestra is _____ to be one of the world's finest.

A. distributed

B. banned

C. contributed

D. acknowledged

53. The report _____ that the company made a loss of £20 million last year.

A. implements

B. invests

C. reveals

D. cautions

54. The workers are _____ the new rules and they are protesting against them.

A. conforming

B. resisting

C. revealing

D. predicting

55. You should drive with extreme _____ if you don't want to risk your life.

A. caution

B. resist

C. recovery

D. pursue

56. My father has made a full _____ from the operation. Now he is very healthy.

A. perspective

B. stability

C. recovery

D. caution

57. The company's _____ is to fire an employee after two warnings about being late.

A. capacity
B. policy
C. dependence
D. requirement

58. For a _____ child, changing schools is difficult.

A. innovative
B. conservative
C. primitive
D. sensitive

59. The company's profits have been increasing _____, so it is getting bigger and bigger.

A. virtually
B. reluctantly
C. steadily
D. consequently

60. Don't be afraid to _____ your goals.

A. pursue
B. require
C. resist
D. caution

61. Britain had _____ influence over the entire Indian subcontinent. Y

A. allocated
B. extensive
C. current
D. sensible

62. Dolapdere and Kasımpaşa are the areas in İstanbul with a high _____ of crime.

A. incidence
B. policy
C. investment
D. recovery

63. They _____ most of their money in the stock market.

A. pursued
B. invested
C. admitted
D. recommended

64. A large amount of money has been _____ for buying new books for the library.

A. revealed
B. indicated
C. allocated
D. deterred

65. Bob spent fifteen months alone on his yacht. Ann, _____, took care of the children on her own.

A. virtually
B. meanwhile
C. furthermore
D. strictly

66. The space program requires the _____ of large amounts of money.

A. expenditure
B. violating
C. meanwhile
D. policy

67. She is highly _____ and always tries hard to win.

A. priority
B. allocated
C. competitive
D. severe

68. Their new software _____ made huge profits last year.

A. priority
B. shortcoming
C. allocated
D. enterprise

69. Your children should be given _____ over your own needs.

A. expenditure
B. competition
C. enterprise
D. priority

70. Thirty-four protesters were arrested for _____ criminal law.

A. violating
B. polluting
C. allocating
D. employing

B. MALL MOTIVATION QUESTIONNAIRE

This questionnaire is designed to gather information about your opinions concerning the mobile application "*Rememba*".

There are two parts in this questionnaire. The first part includes 10 and the second part includes 8 questions. Please give your honest opinion. Your honest opinion is critically important for this study.

Your personal information will not be shared by any third-party entities for their commercial, marketing or other purposes.

PART I

1. I feel enthralled using smart phones to learn English vocabulary.
   - o Strongly Agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly Disagree

2. I feel more motivated to study vocabulary when I use "*Rememba*".
   - o Strongly Agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly Disagree

3. It is great fun to learn new vocabulary via *Rememba* application on my smart phone.
   - o Strongly Agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly Disagree

4. Using *Rememba* application on my smart phone makes it easy for me to look up and learn new words, their parts of speech and their usages in illustrative examples.
   - o Strongly Agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly Disagree

5. I will continue to use *Rememba* application to learn and actively use newly learned vocabulary.
   - o Strongly Agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly Disagree

6. I have developed an e-lifestyle using *Rememba* frequently, on a daily basis, look up and learn new words.
   - o Strongly Agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly Disagree

7. I prefer to use the digital word cards over paper based word cards.
   - o Strongly Agree
   - o Agree
   - o Neutral
   - o Disagree
   - o Strongly Disagree

8. I am increasingly engaged in learning vocabulary via mobile devices compared to paper and pencil methods.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

9. Over time, smart phones have become less of a distraction and more of a tool for learning new vocabulary.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

10. I can get more vocabulary tasks done when I am working on my smart phone than when I am working with paper-and-pencil sheets.
   - Strongly Agree
   - Agree
   - Neutral
   - Disagree
   - Strongly Disagree

PART II.

1. Size gönderilen bildirimlerden sonra kelime kartlarını tekrarladınız mı?
   Evet _ Hayır _
   Cevabınız "Hayır" ise neden tekrar yapmadınız?
2. Kelimeleri haftada ortalama kaç kere tekrar ettiniz ?
   1 _ 2 _ 3 _ 4 _ 4+ _ Hiç _
3. Gönderilen bildirimler hakkında ne düşünüyorsunuz?
   Çok az Az Yeterli Fazla Çok fazla Günde __ adet bildirim gönderilmeli
4. Bu uygulamanın hoşlandığınız yönleri nelerdir? Neden hoşlandınız?
5. Bu uygulamanın hoşlanmadığınız yönleri nelerdir? Neden hoşlanmadınız?
6. Bu uygulamanın İngilizce kelimeleri öğrenmek için iyi bir yöntem olduğunu düşünüyor musunuz? Neden?
7. Uygulama ile ilgili varsa diğer düşünceleriniz nelerdir?

C. REFLECTIVE JOURNALS

For Students

1- Reflect on your experiences you have had so far while using *Rememba*. (Week 1)

_____

_____

2- Do you think Rememba is a useful tool to study vocabulary? Why? Why not? (Week 2)

_____

_____

3- Reflect on how using *Rememba* has affected your motivation in terms of vocabulary learning. (Week 3)

_____

_____

4- Reflect on how using *Rememba* has affected your vocabulary development. (Week 4)

_____

_____

5- How does *Rememba* help you, if it does, study and practice vocabulary? (Week 5)

_____

_____

6- What are the weaknesses of *Rememba*? Do you have any suggestions to improve it? (Week 6)

_____

_____

7- Reflect on your experiences you have had so far while using *Rememba*. (Week 7)

_____

_____

For the Teacher

1- Reflect on your observations regarding the effects of *Rememba* on the vocabulary development of the students.

_____

_____

2- Reflect on your observations regarding the effects of *Rememba* on the motivation of the students.

_____

_____

3- Reflect on what you have observed while students are studying on *Rememba*.

_____

_____

D. CURRICULUM VITAE

PERSONAL INFORMATION

Surname, Name: Köse, Tuğçe
Nationality: Turkish (T.C.)
Date and Place of Birth: 20 November 1987, Aksaray
Marital Status: Married
Phone: +90 505 816 33 35
e-mail: tugceaydas@gmail.com

EDUCATION

Degree	Institution	Year of Graduation
MA	Bahcesehir University	2017
BA	Middle East Technical University	2009
High School	Niğde Teacher Training Anatolian High School	2005

WORK EXPERIENCE

Year	Place	Enrollment
2014-	Istanbul Şehir University	English Language Instructor
2013-2014	Bilkent University	English Language Instructor
2009-2013	İzmir Institute of Technology	English Language Instructor

FOREIGN LANGUAGES

Advanced English, Elementary German

CERTIFICATES

ICERI2016, the 9th annual International Conference of Education, Research and Innovation *"Students in the Clubs: How to Foster Learner Autonomy?"* – Speaker, November 2016 Sevilla/ SPAIN

International Training Institute, Testing and Assessment Short Course, November 2016 İstanbul/TURKEY

Microsoft and Bahcesehir University, Microsoft Recognized Educator Certificate, June 2016 İstanbul/TURKEY

GlobELT 2016: An International Conference on Teaching and Learning English as an Additional Language *"Perceptions of EFL Learners about Using an Online Tool for Vocabulary Learning in EFL Classrooms: A Pilot Project in Turkey"* – Speaker, April 2016 Antalya/ TURKEY

12th ODTU International ELT Convention: Celebrating Diversity *"What's up with the attitude? Fancy to script?"* - Speaker, May 2015, Ankara/ TURKEY

Cambridge University In-Service Certificate in English Language Teaching, Bilkent University, May 2014, Ankara/TURKEY

PUBLICATIONS

Saygılı K., Khan M., & Köse T. (2017) How do non-Turkish students whose native language is Urdu and the second language is English transfer their L1 and L2 to their L3 (Turkish)? *Fatih Sultan Mehmet University, Journal of Social Sciences* , June Issue, Under Review.

Köse T., Saygılı K. (2016) Students in the clubs: How to foster learner autonomy?, *ICERI2016 Proceedings*, pp. 5924-5931. doi: 10.21125/iceri.2016.0340.

Köse T., Çimen E. & Mede E.(2016) Perceptions of EFL Learners about Using an Online Tool for Vocabulary Learning in EFL Classrooms: A Pilot Project in Turkey, *Procedia - Social and Behavioral Sciences*, 232, 362-372, doi: http://dx.doi.org/10.1016/j.sbspro.2016.10.051.

HOBBIES

Tennis, Travelling, Music, Movies