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Application of the Mobile App Memrise as a Vocabulary Learning Tool for 10th Grade Students

MA thesis

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ABSTRACT

A great deal of studies have been conducted on vocabulary learning; however, there are still relatively few effective vocabulary learning materials available for upper secondary school students. Research has shown that in the aspect of language learning, mobile apps are quite helpful for memorization and vocabulary learning due to the fact that language learning apps are equipped with vocabulary-learning flashcards and games. The aim of this study is to determine whether mobile app Memrise helps improve the memorization of vocabulary and how Memrise can be integrated into 10th grade students' regular class learning routine.

The literature review part of this thesis gives an overview of the previous studies conducted in the field of lexis, vocabulary learning, mobile apps as well as the language learning app Memrise, providing a theoretical basis for the analysis of emperical data. The emperical part of this thesis is realized by carrying out a case study which was divided into two parts and conducted among eighteen 10th grade students at a prestigious secondary school in Tartu, Estonia, in which students were asked to do a vocabulary pre-test and then to learn chosen vocabulary with the help of Memrise app and finally to do a post-test. A follow-up interview was carried out to learn how participants used Memrise and what they thought of this language learning app. Empirical data and findings of the case study are analyzed in the context of materials presented in the literature review part of this thesis.

Keywords: vocabulary learning, upper secondary school students, language learning, mobile apps, Memrise

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Introduction

A large number of studies have been conducted in terms of various aspects of vocabulary learning, since it is one of the most significant parts of language learning. Studies conducted on vocabulary learning categorize it into incidental and deliberate vocabulary learning. Incidental vocabulary learning is the "by-product of a task", which means vocabulary is mastered without giving special attention on it while understanding the message within the context. For example, the majority of our L1 words are learned incidentally (Schmitt 2000). Webb and Nation (2017) argues that a learner "knowing a word" does not mean that the learner knows every feature of a word but partially knows the knowledge of it. Vocabulary is central to the four basic skills of language learning namely listening, speaking, reading and writing. It implies that vocabulary is crucial for almost every aspect of our daily life. One will not be able to comprehend what others speak and write without a certain amount of vocabulary gaining. Similarly, One is not able to convey his or her intended meaning with necessary and proper vocabulary without acquiring a certain amount of it. Biber and Conrad (2001) indicate that the amount of vocabualry we know and how well we know it lays an essential foundation for the learning of other more profound aspects of language, such as pragmatics, syntax, morphology, and phonology.

The importance of learning vocabualry mainly lies in two aspects: first, vocabualry as the key to communication and second, vocabulary is central to learning content (Webb and Nation 2017). Children acquire the words people speak around them after they were born and slowly develop the ability to use those acquired words themselves; books designed especially for children are to help accumulate vocabulary; key words normally are illustarted by providing pictures; dictionaries as important resource are used to boost vocabulary knowledge. All those facts of developing vocabulry knowledge mentioned above concordantly emphasize that vocabulary is the key to communication. The vocabulary being

central to learning content is reflected in many phases of our education: when we encounter unknown words, they are normally purposefully illustrated or explained by the teacher; vocabulary is often pre-taught before a new topic or theme starts to help comprehend the content; to stregnthen the memorization of vocabulary knowledge, multiple-choice and matching exercises are normally applied; to form the ability to correctly use vocabualry, writing and speaking tasks are designed; to get familir with the form of vocabualry, crossword puzzles are often used etc.

In recent years, studies on the aspect of vocabulary and how to acquire vocabualry more efficiently were conducted. In Webb and Nation's (2017) study, they categorize vocabualry as "high-frequency words" and "low-frequency words". "High-frequency words" are those words, which appear frequently in most kinds of discourse. There will be difficulty for understanding and communication when language learners are short of high-frequency words. Similarly, the term "low-frequency words" refers to those words, which appear less frequently in general discourse or more frequently only within certain specific types of discourse. This categorization indicates the relative value of words and to which words more attention should be paid in the classroom. It is recommended to pay more attention to the high-frequency words since they contribute more to a learner's vocabulary learning. . However, learners have to lower down the "learning burden", namely the amount of effort required to learn a word during the learning process (Swenson & West 1934). Learning burden results from several elements and can be reduced to a certain extent. When attention is given to difficult words by means of understanding their learning burden, the vocabulary learning can be more efficient. The type of vocabualry learning, which involves learners' attention is called "deliberate vocabualry learning". Another opposite type of vocabulary learning is "incidental vocabulary learning", which is regarded as a by-product of learning process. It is suggested that the majority of vocabulary growth in the EFL learning context

possibly is because of the deliberate learning (Cobb 2007: 38-63). Apart from this aspect, one widely agreed claim is that "extensive reading" which means to read widely and in quantity in order to have an overall comprehension of the reading material (Bamford & Day 1997)results in L2 vocabulary gaining incidentally (Huckin & James 1999: 181-193).

With the increasing speedy development of mobile technology, the advantages of it in the aspect of language learning are becoming more visible. A great number of mobile apps, especially language learning apps such as Memrise, Duolingo, and Quizlet provide users with chances to get access to multiple functions for language learning within one app because these language apps are equipped with flashcards, games, audio, videos, pictures etc. Since the time students spend in the class is limited and extra time is required to have a better learning result, mobile apps can best serve this purpose by assisting learners with an out-of-class learning environment anywhere anytime. The convenience of mobile apps is not limited in the aspect of being portable, mobile apps enable learners to get access to all kinds of information they need and satisfy personal learning needs, differences and style (Huang, Hwang & Chang 2010: 1-2). Learning with the help of mobile apps which differs from the traditional way of learning tends to increase learners motivation due to the fact that mobile apps visualize the learning process and make it fun. Most importantly, mobile apps are proved quite helpful for vocabulary learning especially for memorization and putting meaning and context into use because of the application of flashcards and games, which especially target vocabulary learning (Steel 2012: 875-880).

This study is conducted with the help of Memrise, which is one of the best language learning apps. Since founded in 2010, Memrise has quickly developed and so far, there are more than 40 million people in 189 countries learning languages with the help of it. Not surprisingly, Memrise is not only one of the most popular language learning apps in the Google Play Store but it also received Google Play I/O Best App award in 2017. Using

Memrise for the experimental part of the study assumedly will spark students' vocabulary learning interest and motivation and boost their vocabulary learning. Łuczak (2017) indicates that the most significant advantage of Memrise is that its vocabulary learning system effectively helps build up memorization due to the frequent revision technique of Memrise. Memrise system will repeatedly remind learners to review vocabulary at increasingly longer intervals by doing multiple choices and spelling exercises; therefore, with this technique language learners are able to build up a long-term memory for what they have learned (Fadhila 2016: 33-36). Meanwhile, the Memrise allows learners to create their own vocabulary courses on the Memrise webpage platform to perfectly satisfy learners' personal vocabulary learning needs and provide an out-of-class learning environment complementing the in-class language learning with extra learning and reviewing. Additionally, gamified vocabulary learning by the Memrise makes it fun and enjoyable. Memrise offers the "speed review", which is a gamified time-limited fast reviewing exercise in which learners need to earn as many points as possible with only three lives by quickly clicking on the correct answers of vocabulary exercises. When finishing the speed review, learners' received points are all shown in the LEADERBOARD, which is the ranking of their vocabulary learning results. The possibility to compete with other learners make vocabulary learning also more motivational and exciting.

It is necessary for Estonian students to learn English well. The English language in most of the Estonian schools is the first foreign language. The Estonian National Curriculum for upper secondary schools (2011) indicate that Estonian students who receive the foreign language education in upper secondary schools are expected to be independent language users who have the ability to understand and interpret content conveyed in foreign language and communicate both in written and spoken language. Additionally, it is also required that foreign language acquisition should be combined with other subject fields. This requires

relatively high comprehensive ability of the English language of upper secondary students. According to the description of the Ministry of Education and Research of the Republic of Estonia, the IB (International Baccalaureate) which is an internationally recognised educational curriculum is applied in the prestigious secondary school where this study was conducted. The language of instruction for IB programmes in Estonia is English. When IB DP (Diploma Programme) curriculum ends, there will be international examinations of all subjects. Good exam results enable students to study in both Estonian and universities abroad. IB DP programme corresponds to the grades 11-12 and the participants in this study are grade 10 students who will need to start attend their DP programme next semester. It means that it is necessary for them to improve their English to a higher level, which requires more vocabualry. Naturally, there is also the necessity to find a more effective method to learn vocabualry.

Much importance is often attached to vocabulary learning, and a great number of related studies have been conducted. According to Webb and Nation (2017), various vocabulary learning approaches are presented in teaching materials but there is a lack of clarity which approach is the best. Meanwhile, there are relatively little published materials which could guide language teachers and learners to design an effective vocabulary learning programme. This means that further studies still need to be done and there is still a long way to go to explore the best method of vocabulary learning. To the author's knowledge, so far there have been no suchstudies conducted on the topic of using the mobile app Memrise for English vocabulary learning among upper secondary school students in Estonia. This study conducted with the help of the mobile app Memrise is an attempt to fill the gap by carrying out a case study to see whether and how the Memrise could help students learn vocabualry and achieve better results.

This thesis contains mainly the introduction, literature review, experimental part and

the conclusion. The introduction states the general topic and provides some backgroud of studies in the filed of vocabulary learning and language learning with mobile apps. Meanwhile, the study aim is stated, and the general structure and content of this thesis are outlined. The literature review part of this thesis provides an overview of previous studies conducted in this field and some of the materials presented will be applied while analyzing experiment data. The experimental part is a case study, which was conducted among eighteen upper secondary school (tenth grade) students who were asked to take a pre-test on vocabulary and then to learn vocabualry with the created course on the platform of Memrise and finally to take a post-test on vocabulary. A follow-up interview was carried out to get to know what participants think of Memirse, how participants used Mmerise, and what problems might exist during the learning process. In the conclusion, each part of this thesis is summarized, and limitations as well as possibility for further study are indicated. Most importantly, the main contribution of this thesis is highlighted at the end of this thesis.

CHAPTER I

1.1 Lexis

Words which are the "building blocks" of language are important to listening, speaking, reading and writing. Without acquiring a certain amount of vocabulary, it is difficult to understand what others speak and write and it is also difficult to convey intended meaning with precise usage of vocabulary. According to Webb and Nation (2017: 6), the term "value of words" which refers to the extent how likely they are to be needed for communication is shown by their frequency in the language but for different language learners the value varies. More frequently used words tend to have greater value than less frequently used words because there are more possibilities that more-frequently-used words will be needed in different discourse. It is important to discuss the frequency from the perspective of an individual meaning of a word. For example, the word "party" in the meaning of "birthday party" is frequently used. However, "party" in the meaning of "communist party" is relatively less frequently used in daily life but more frequently in the field of politics.

Based on words' frequency in different types of discourse, it is agreed to categorize vocabulary as high-frequency words and low-frequency words, including the sub-categories of technical vocabulary and academic vocabulary, which are more frequently used within certain specific types of discourse. High-frequency words appear frequently in different types of discourses, thus a lack of knowledge of them will result in difficulty in understanding and communication. Webb and Nation (2017: 7) think that high- and low-frequency vocabulary categories indicate the importance of vocabulary, namely they point out which words are more important to learn; therefore, high- and low-frequency vocabulary categories are very useful.

Words' relative value changes when they are looked at based on their frequency in English. Webb and Nation (2017: 7) look at words at five different levels of frequency in

Nation's British National Corpus/ Corpus of Contemporary American English (BNC/COCA) word lists (Nation 2012). Observation shows that words from the first 1,000 most frequent word families are significantly familiar and words from the 20th 1,000 (namely, the 19,001 – 20,000 most frequent words) most frequent word families are less likely to appear and to be used or even unknown to native speakers of English. It is found that in a corpus consisting of 88 television programmes, first 1,000 most frequent words (based on BNC/COCA corpus) account for 85.35%; second 1,000 most frequent words account for 4.12%; and fifth 1,000 most frequent words account for 0.59%. It can be seen that that from first level of frequency to fifth level of frequency the relative value of words is diminishing. The 85.35% indicates that knowing the first 1,000 most frequent word families would promise your understanding of over 85% of the vocabulary appearing in those television programmes. This is clear evidence that the importance should be attached to the learning of the first 1,000 most frequent words. Researchers, for example West (1953) and Nation (1990, 2001, 2013) have also recommended to learn words based on their frequency. The 4% means that learning the second 1,000 most frequent words would enable you to understand 4% more of the vocabulary appearing in those television programmes. Compared to the first 1,000 words' 85% vocabulary coverage in television programmes, the second 1,000 words' 4% coverage is much smaller.. However, this does not mean mastering the second 1,000 most frequent is not important. Instead, knowing them 4% more of the vocabulary would strengthen understanding of television programmes.

Studies with a purpose of identifying most frequent words in English have been conducted for a long time (Carroll, Davies & Richman 1971; Francis & Kučera 1982; Leech, Rayson & Wilson 2001; Swenson & West 1934; Thorndike & Lorge 1944; West 1953). According to Webb and Nation (2017: 10), Michael West's General Service List (GSL) (1953) so far is the most well-known study of high-frequency words. West's word list

consists of approximately 2,000 word families, which were developed based on the occurrences of each word in a written texts corpus consisting of five million words. West's General Service List is also the most detailed and lasting even though West was not the first to develop a frequency list. Meanwhile, the GSL has been widely accepted as a good material for beginners to learn vocabulary since those 2,000 word families cover 71.5–89.6% of the vocabulary in a variety of discourse types (Brezina & Gablasova 2015; Coxhead & Hirsh 2007; Hyland & Tse 2007; Nation & Hwang 1995; Nation 2004).

Among sets of frequency lists that have been developed, three of them especially attract people's attention. The first one is the British National Corpus (BNC) lists (Nation 2006), which principally include vocabulary used in formal written texts in the UK. The second is the British National Corpus/ Corpus of Contemporary American English (BNC/COCA) lists (Nation 2012), which include vocabulary used in written and spoken English in the UK and the USA. The third one is the new-General Service List (new-GSL) (Brezina & Gablasova 2015), which includes perhaps more written than spoken English words even though it was supposed to include all the most frequent English words. Dang and Webb (2016) claim that compared to the GSL, all these three lists respectively not only include much bigger amount of vocabulary of the English language but also vocabulary, which emerge in the 21st century; therefore, these three frequency lists are more valuable for language learners these days. Webb and Nation (2017: 11) report that the new-GSL includes the greatest amount of most frequent vocabulary when vocabulary in the lists is ranked based on their frequency in nine corpora of spoken English and nine corpora of written English. In a word, when language learners use a word frequency list, the new-GSL should be most valuable.

Low-frequency words are those words, which are not considered to be high-frequency. The number of low-frequency words is much   higher than the number of high-frequency words in English. Because of insufficient exposure to the L2, the high- and low frequency

category is suitable for foreign language learners who often progress little in the aspect of lexical development (Webb & Nation 2017: 14). What should be mentioned is that during the language learning process both high-frequency and low-frequency words will be learned instead of exclusively focusing on words within one category. Of course, the proportion of high-frequency words which will be learned is larger than the proportion of low-frequency words.

As Schmitt and Schmitt (2014) suggest, the low-frequency grouping can be divided into two categories: mid-frequency and low-frequency words:

> High-frequency 1st 3,000 words families
> Mid-frequency 4th – 9th 1,000 word families
> Low-frequency less frequent than the 9,000 most frequent word families

Nation (2006) indicates the rationale behind this division is that knowledge of the 9,000 most frequent words (high-frequency and mid-frequency words) means sufficient vocabulary knowledge to comprehend speech and writing; therefore, it is useful to further divide low-frequency words into mid-frequency and low-frequency words.

Low-frequency words do not mean that they are low-frequency all the time. Webb and Nation (2017: 15) explains that, generally, low-frequency words are relatively not frequent but within certain specialized field they can be frequent. For example, "technical words" are very frequent within a specific topic or discipline but less frequent outside of that filed. Webb and Nation illustrate "technical words" with following examples:

> "puck", "rink", and "arena" are much higher in frequency in discussions about ice hockey than they are in discussions about other topics. Similarly, "adagio", "allegro", and "tremolo" are more common to discourse concerning classical music; and "decoupage", "fresco", and "palette" are more frequent in discussions of art.

Technical words are essential when there is need to learn a specific subject or topic because technical words represent specialized knowledge, which is indispensable. When most people can recognize the meaning of one low-frequency word, the essence of it is a technical word. However, technical words are not necessarily low-frequency words. Chung and Nation's (2003) research on technical words includes both high-frequency and low-frequency

technical words. For example,

> "blood", "bone", and "skin" are high-frequency technical terms relating to medicine, and "thorax",
> "trachea", and "vertebrae" are low-frequency technical terms from that discipline (Webb & Nation
> 2017: 15).

All six words mentioned above are all essential in the aspect of medicine studying, but there is good chance that those three high-frequency words are already known at the early stage of vocabulary learning.

Vocabulary learning is not easy, and it takes some effort. The amount of effort needed to learn a word is called learning burden (Swenson & West 1934), which means the measurement of learning burden is connected to the measurement of difficulty that a learner has while learning vocabulary. Higa (1965: 167-179) indicated five categories of difficulty:

1 intrinsic difficulty
2 the interaction between previously learned words and new words
3 the interaction between words learned at the same time
4 the interaction between groups of words to be learned in sequence
5 the effect of repeated presentation

Based on Higa's difficulty category, Webb and Nation (2017: 27) examine the word learning burden from the following five angles: "form-meaning connection", word form (sound and spelling), collocation, "receptive and productive use", and "interference" and also indicate factors that result in learning burden and effective measurement for learning burden reduction. From the aspect of form-meaning connection, L2 words which share the same form and meaning as L1 words are the easiest to learn, but this situation is not very common. Situation that L2 words share similarities with L1 words is more common. For example, there are approximately 60% words in English originally derived from French, Latin, or Greek; therefore, it is relatively easier for French, Italian, Greek and other related languages' speakers to learn English words through form-meaning connection. Some languages have borrowed a large number of words from English due to the fact that English is an international communication language, which has strong influence in the whole world. For

example, the word "foku" in Japanese is a loanword, which means fork. Similarly, the word "supun" in Japanese means spoon. Therefore, when learners learn borrowed words as part of their L2, the learning burden has already been reduced because of borrowings into L1 (Rogers, Webb & Nakata 2015).

Word parts, namely stems and affixes which contribute to the meaning of words appear in many French, Latin, and Greek words. It will be easier to learn words with stems and affixes when they are already known to learners. Therefore, getting to know word parts can reduce the learning burden because learners will be equipped with the ability to guess the approximate meaning of words they encounter. Dictionaries provide different senses of words in detail, but they all share a core meaning, which is the most essential meaning of a word. To reduce the learning burden of word senses, it is recommended that teachers and students pay attention to the core meaning of words instead of treating as learning additional meanings. Checking all the senses of a word provided in a dictionary and working out the core meaning also help reduce the learning burden of word senses. For example, the word "cup" as a noun can be a small, round container for tea, or a specially designed cup made of silver given as a prize in a competition. When "cup" functions as a verb, it means to hold your hands around something in the shape of a cup. The word "cup" has several senses, but the core meaning is still the "a round and small container for tea or coffee". Another example is the word "mirror", which means a piece of glass with shiny, metal-covered back that reflects light. The word "mirror" can be a verb, which means to represent something honestly. In terms of this sense, it is still connected with the core meaning "reflection". To represent something honestly namely to reflect what exists honestly. Therefore, learning burden of this word can be reduced if students remember the core meaning and connect it with different senses of this word when trying to understand.

When L2 phonological system is close to L1, the learning burden is relatively small.

For example, it is much more difficult for a non-tone language speaker to learn a tone language like Mandarin, which has a totally different phonological system. The learning burden of written form depends on how close the L2 writing system is to L1 and also on the degree of regularity within the system (Moseley 1994: 459-479). For example, it is more difficult for English speakers who use alphabetic writing system to learn Mandarin, which is a logographic writing system that requires to master a great deal of characters. A small part of English's alphabetic writing system often contains irregularities which make it quite difficult compared to regular-spelled languages, for example Malay.

It is recommended to see how part of the collocation meaning relates to the whole collocation; thus, the learning burden of collocation will be reduced. There is a small number of core idioms which refer to those idioms where the partial meaning and the whole meaning do not relate. For example, "raining cats and dogs", which means a storm with wind and heavy rains. In this phrase "dogs" refer to the strong wind and "cats" refer to the heavy rain. Precisely, "raining cats and dogs" is still related to its meaning "storm", which includes raining. However, the relation between "strong wind" and "dogs" and relation between "heavy rain" and "cats" are difficult to discover. Another example is the "red herring", which means a clue or piece of information, which is intended to be misleading or distracting. Obviously, the actual meaning is not related to the fish itself. In these cases, it is recommended to learn them exclusively and by heart.

"Receptive knowledge" and "productive knowledge" significantly influence the learning burden. Receptive knowledge is the knowledge required to listen or read and productive knowledge is the knowledge required to speak and write (Webb and Nation: 2017: 33). The receptive or productive use of a word affects its learning burden. It is more difficult to learn a word and produce it by recalling its form than just recall the meaning of the word (Griffin & Harley 1996; Laufer, Elder, Hill, & Congdon 2004; Laufer & Goldstein 2004;

Mondria & Wiersma 2004; Stoddard 1929; Waring 1997; Webb 2009).

The learning burden may come from the interference between the meanings of words. The greatest interference takes place between "near synonyms" (for example, "advance" and "progress") and the reason might be that these two words share similar meaning but are different in essence (Higa 1963: 170-175). Nation (2000: 6-10) indicates that relatedness (for example "near synonyms", opposites, and lexical sets) results in more difficulty for learning. To reduce the learning burden of interference between related words, related words can be presented separately with different timing. The learning burden of interference can be further reduced by "increasing the distinctiveness" between words. For example, when learning number "four" and "seven", number "four" can be learned through collocation "four seasons" and number "seven" can be learned through collocation "seven days". In this way, the number "four" and "seven" are much more distinctive.

1.2 Vocabulary Learning

Previous studies categorize vocabulary learning into incidental vocabulary learning and deliberate vocabulary learning. Researchers have agreement that the majority of L1 words are learned incidentally (Nagy, Herman & Anderson 1985; Nation 2001; Schmitt 2000). There are various definitions of incidental vocabulary learning, for example, Ellis (1999) defines incidental vocabulary learning as "learning words as a by-product of a task". It means that when we see or read or listen or hear something, the attention is on the comprehension of the message it carries instead of deliberately learning words, but words are gradually learned during this process by seeing or reading or listening or hearing them time by time in the context. Webb and Chang (2015: 667-686) claim that the amount of input influences the amount of incidental vocabulary learning; when there is greater amount of input, there is more probability of repetition of encountered words. Therefore, learners are more likely to

acquire those words.

When a learner acquires a word, it means that this learner "knows this word". When talking about knowing a word, people mainly take it for granted that it means to understand the meaning of the word. Laufer (1991: 82-89) made an effort to outline what knowing a word actually implies. She listed five separate categories. The first category is the form of a word including its spoken form and written form. Namely, when knowing a word, a learner should have the ability to recognize the word when hearing and pronouncing precisely to make himself or herself understood to a native speaker as well as the ability to recognize the word in written or printed version or make correct spelling. The second category is the word structure, which refers to the free and bound morphemes together with its derivatives. The third category is a word's "syntactic behaviour", which means how a word functions in a phrase or sentence. For example,

> the leaner must be aware of the fact that the noun "police" combines with plural verbs only; that the verb "give" is followed by two objects; that "begin" can combine with either the infinitive or the gerund; that the adjective "interested" is followed by a preposition "in", etc (Laufer 1991: 82-89).

The fourth category is the word meaning. Language learners should know its referential meaning including homonyms, polysemes, idioms etc. Apart from that, they should also get familiar with the affective meaning and pragmatic meaning of a word . The last category is lexical relations, which refers to a word's meaning relations with other words such as synonymy, antonymy and hyponymy as well as its common collocations. Laufer also indicates that these five categories are in the reality affected by a series of interfering factors such as deceptive morphological structure, translation equivalents of mother tongue, mother tongue's different syntactic patterning etc. which might impede the progress of vocabulary learning.

Miller (1999: 1-19) signifies that for a language learner knowing a word is not a

stagnant category, namely people mainly express themselves by means of sentences instead of isolated words from the context. Thus, it is not reasonable to make an assumption that everyone can define the word they use in the sentence. He claims that a language learner might not be able to indicate all features of a word, but it does not mean that the word is totally unknown to this leaner.

Between knowing and not knowing a word, a dichotomy does not exist; instead, from the status of not knowing to knowing a word, the process is a continuum. Namely, a learner lacks the knowledge of words from the initial stage, and then the learner partially masters the knowledge of words, and finally to a stage that the leaner completely masters the knowledge of words (Nation & Webb 2011). A learner's vocabulary knowledge increases when a word is encountered repeatedly and decreases when a word is not encountered for a long period of time. Therefore, it is likely that the majority of words are partially known to learners.

Cobb (2007: 38-63), Laufer (2003: 565-585, 2005: 582-588) and Webb (2008: 79-95) suggest that deliberate learning might result in the majority of vocabulary growth in the EFL learning context due to the fact that there is limited amount of L2 input. Compared to vocabulary gains of L2 learners in the aspect of incidental and deliberate vocabulary learning, learners' deliberate learning gains always exceed incidental gains (Webb 2002). Nonetheless, in the long run it still remains unknown which one would lead to bigger gains. Webb and Nation (2017: 49) claim that in a short period of time deliberate learning of the form and meaning of words definitely results in better knowledge of form-meaning connection, but in the long run whether deliberate learning results in better knowledge of form-meaning connection than repetitive encounters of words still remains to be discovered. Even though through deliberate learning knowledge of words could be gained by means of encountering words repeatedly, this process is very time-consuming and depends on the amount of input the learner receives.

There is an interesting discussion in which Grass (1999: 319-333) indicates that incidental vocabulary learning might not be as incidental as we expect, even though most research on this topic tends to take it for granted that incidental vocabulary learning is unintentional. Our experience of learning vocabulary without deliberate attention is rare, because the moment when we see or hear a word, we may tend to focus on the word and then deliberately to learn it. In the L2 classroom, teachers often tend to illustrate meanings of words in order to create more chances for students to learn new words. Research shows that teacher's illustration of words' meanings improves both L1 language (Elley 1989: 174-187) and L2 (Biemiller & Boote 2006: 44-62) vocabulary learning. While reading or after reading, learners might tend to refer to dictionaries to check the meanings of words they encounter. Referring to a dictionary usually influences vocabulary learning positively; even though, it cannot promise that a word will be learned (Knight 1994: 285-299). In a word, during the process of incidental vocabulary learning, potential deliberate learning also takes place and enhances incidental vocabulary learning through the application of dictionary, deliberate attention, teacher's support etc.

Studies show that vocabulary gaining is related to several variables. One of the very influential opinions declares that "exposure to reading input" results in vocabulary gaining but not conscious memorizing (Laufer 2001). It is widely agreed that L2 vocabulary gaining takes place incidentally during the process of working on "extensive reading" (Huckin & James 1999: 181-193). Here the term "extensive reading" refers to reading widely and in quantity in order to have an overall comprehension of the reading material (Bamford & Day 1997). There is a consensus among most scholars (Such as Brown, Waring, & Donkaewbua 2008: 136-163) that vocabulary gaining mainly takes place during the process of extensive reading by making guesses of unfamiliar words.

Some researchers argue that extensive reading does not help much in mastering

vocabulary, instead it helps review what learners have learned and strengthens their memory turning "partially known words" into "known words" (Nation & Wang 1999: 355–380; Waring & Takaki 2003: 130–163). Similarly, Horst, Cobb and Meara (1998: 207-223) confirm the idea that the knowledge of the words with which learners are already familiar will be reviewed and a very small number of new words will be mastered. Less positive results have been yielded through reading experiments in which texts containing from 1000 to 7000 words are applied but word gaining ranges from one to five (Pitts et al 1989; Day et al 1991; Hulstijn 1992; Knight 1994; Paribakht and Wesche 1996). Cho and Krashen's (1994: 662-667) study revealed the result of seven words of gaining after making the subject go through a booklet containing 7000 words – the "pleasure reading" without referring to a dictionary. Lahav (1996) conducted a study in which she tested learners who read four simplified books with each one around 20,000 words long. It was found that on average learners mastered three to four words from each simplified book. After that, Horst, Cobb and Meara (1998) specified their research within the simplified novel *The Mayor of Casterbridge*, which contained 21,000 words. Subjects were required to finish this novel after six reading sessions. The result showed that on average subjects mastered five words. From above it is clear to conclude that extensive reading alone does not guarantee a large amount of vocabulary gaining.

Huckin and James (1999) claim that attention of learners can influence incidental vocabulary learning. In the aspect of incidental vocabulary learning, "communicative meaning" is where learners mainly pay their attention rather than to form. Input Hypothesis created by Krashen (1989: 440-464) emphasized that vocabulary learning only takes place when attention is given to meaning. Besides, a great number of theorists these days hold the opinion that attention is needed for both meaning and form when learning vocabulary (e.g., Ellis 1995: 123-146; Robinson 1995: 283-331). Schmidt (1993: 206-226) indicates that to

certain extent "conscious attention" is needed for incidental vocabulary learning. Namely, incidental vocabulary learning is not totally the result of unconscious learning and to a certain extent it involves learners' attention to achieve the incidental vocabulary gaining.

According to Huckin and James (1999), it is possible to boost incidental learning of vocabulary by doing text-based activities. Parry (1993, 1997) conducted a study in which students were required to take notes of those unfamiliar words that they encountered during the course reading in her longitudinal studies. The study results acknowledged that students' guessing ability based on academic text has improved with the help of course context. Joe (1995: 149-158) studied the vocabulary learning of one adult learner who was supposed to do reading and retelling activities. The study result was that the subject achieved great level of incidental vocabulary gaining resulting from the task, which demands learners' attention to recall what they have read and choose appropriate words to produce what bears in mind. Similarly, in Paribakht and Wesche's (1996: 174-200) experiment, subjects were divided into "reading only" and "reading plus" groups. The "reading plus" group not only read the text but also went through "vocabulary exercises" which as Paribakht and Wesche (1994) point out:

> The categories that vocabulary exercises contain: 1) selective attention to specific words through visual signaling, 2) recognition of target words and their meanings, 3) grammatical and morphological manipulation of words and word elements in context, 4) interpretation of word meanings in relation to other words or discourse functions, and 5) production of the target word in appropriate contexts.

After comparison of two groups, result showed that "reading plus" group mastered much more words than "reading only" group. Based on the studies above, apparently, text-based activities help boost incidental learning of vocabulary.

It is found that referring to the dictionary during reading helps vocabulary learning. Luppescu and Day (1993: 263-279) discovered that the subjects who referred to dictionary while reading the text had better memory of vocabulary than those who read the text without the assistance of a dictionary. Similarly, Knight(1994: 285-299) made a comparison between groups in which learners read the text with the assistance of an electronic dictionary and

groups in which learners tried to guess the meaning of unfamiliar words based on the context. Both groups did the pre-test and post-test in which they needed to choose the right definition of words among several similar definitions. Results indicated that in both tests the group with the assistance of an electronic dictionary mastered more vocabulary. It is reasonable to conclude that learners' vocabulary learning will benefit from referring to dictionary during reading.

1.3 Mobile Apps

Azadeh, Mai and Ahmad (2014: 73-83) define mobile applications as "teaching aids", which apply the computer technologies as a base together with the use of images or sound to provide information. The existing examples are videos, movies, motion pictures, multimedia games etc. Cohen (2012) makes his own category of mobile apps. The first type are "game apps", which contain components for interaction and content for education. For example, alphabet memory cards or puzzles target letters and words formation. The second type are "creating apps", which stimulate children's creativity by allowing children to draw, paint, and create new form of objects while using certain tools. The third type are "e-storybook apps" in which texts are reader-friendly, namely texts usually are coloured and highlighted. Other features such as animation, dictionary for unfamiliar words and pronunciation are also included.

Mobile apps are proved helpful for language learners. Many apps enable users to get access to a huge amount of functions in a combined way within one app. For example, many language learning apps (e.g. Memrise, Duolingo, Quizlet etc.) combine flashcards, game, audio, videos, pictures etc. to ensure language learners a better learning result. It is reported that the access to those multiple functions is helpful for learning since students could use all functions in "integrated and seamless" ways (Steel 2012: 875-880). Kukulska-Hulme and

Shield (2008: 271-289) claim that applications of mobile devices have "potential affordances" for language learners. It means that in-class language learning is time-limited and to master the foreign language, extra time and practice should be dedicated. Mobile apps can fulfil that purpose by providing out-of-class learning environment, which assists language learners to incorporate and develop four aspects of language learning. Jackson (2015: 6-11) proposes mobile apps in the aspect of second/foreign language learning provide learners with authentic, culture-related and digital tools to develop language skills, which makes a complement for ordinary classroom activities. Therefore, language learners could use mobile apps to assist language learning out of the class complementing the fact that there is limited time in class.

Some research on mobile apps was conducted on the aspect of their influence on language skills. Steel (2012: 875-880) in her research says that mobile apps are quite helpful for vocabulary especially for memorization and putting meaning and contexts into use and other basic language skills such as reading, writing, grammar and translations. Alvarado, Coelho and Dougherty (2016: 43-58) report similarly that mobile apps enable students to participate in the language-based activities combining and developing language skills such as speaking, reading and listening in a feasible and interesting way. What's more, Steel indicates that mobile apps are regarded extremely helpful for students' learning in the aspect of vocabulary learning because many language apps provide flashcards and games, which can be used for targeting vocabulary learning. Similarly, Azadeh, Mai and Ahmad (2014: 73-83) mention that vocabulary learning could be strengthened with the help of mobile apps. In a word, mobile apps indeed seem to have positive influence on language skills especially in the aspect of vocabulary learning.

One of the most remarkable characteristics of mobile apps is their convenience. Mobile apps provide a great number of learning tools, which can be downloaded into learners'

mobile devices and be used at any time (Steel 2012: 875-880). Alexander (2004: 28-35) indicates that the advantages of mobile apps such as being convenient, being portable and allowing to learn actively have already been reported for a period of time. Similarly, Huang, Hwang and Chang (2010: 1-2) claim that mobile apps create much convenience for both learners and educators. They also indicate that mobile apps assist learners' language learning by getting access to original contexts and the function of searching information through the Internet. Additionally, mobile apps can meet personal learning needs. Every mobile app is all-level-suitable, namely mobile apps can be adapted based on a learner's language proficiency in English just to satisfy personal learning differences and style. Mobile apps are convenient enough for learners to find suitable learning content and learn at any time and on-the-go.

A great number of researchers have an agreement that mobile apps motivate language learners. Azadeh, Mai and Ahmad (2014: 73-83) hold the idea that mobile apps give students motivation to learn more as technologies develop fast. More motivation shows up from learners when they learn vocabulary because mobile apps visualize vocabulary definitions. Azadeh, Mai and Ahmad carried out a questionnaire, which included questions whether students think using a mobile app to test vocabulary knowledge is fun and whether students enjoy using a mobile app to learn to signify students' motivation. Respectively 89,46% and 90.13% of experiment subjects give positive answers. It means students indeed had high motivation when they were using the mobile app to learn. The answer Huang, Hwang and Chang (2010: 1-2) believe that a better learning environment will be created for students and their learning motivation will also be strengthened when educational mobile apps are provided. Martínez, Arancón and Hita (2014: 137-146) indicate that mobile apps which provide learners with "contextualized English practice" to tackle pedagogical issues such as "interactivity and adaptability" issues help to improve the motivation because mobile apps

within which activities, games, etc are available help language learners to make use of "notional-functional topics" presented before, but the motivation is rather weak. In conclusion, mobile apps make language learners motivated in the aspect of vocabulary learning when visualization is provided but sometimes mobile apps may not boost motivation as much as we assume.

Apart from studies of mobile apps on language learning and their benefits, research on how young children engage with mobile apps was done by Noorhidawati, Ghazal Ghalebandi and Siti Hajar (2015: 385-395). They found that children mainly engage themselves with mobile apps through "collective sensory skill, emotional expression and verbal expression". "Collective sensory skill" refers to children's sensory skills such as "touching, looking, listening, and gesturing", which appear when they are interacting with the mobile apps. "Emotional expression" namely refers to those "facial expressions and noise" that children made while interacting with the mobile apps. Similarly, "verbal expression" refers to those verbal expressions that children use while using the mobile apps. Further findings indicate that children have their independence while interacting with mobile apps and develop basic skills while processing events through apps. Likewise, Hourcade, Williams, Miller, Huebner and Liang (2013: 31-97) indicate that when children engage into tablet apps but not a hard copy of a book for their storytelling activities their social interaction with others improved and the reason is that children's engagement increases when they enjoy activities and they gain more confidence and become more relaxed Overall, when young children engage with mobile apps, their basic skills, independence develop, and social interaction improves.

Most studies on mobile apps are mainly related to their influence, benefits, effectiveness etc. rather than mobile apps users' feedback. Steel (2012: 875-880) conducted the study about language students' view on benefits of using mobile apps and found out that many students hold the opinion that the use of mobile apps influences their vocabulary

learning positively. Besides, learners cherish most mobile apps' flexibility and convenience, which allow learners to satisfy their personal learning needs by fitting their personal learning into their own lifestyles. In a word, language learners have positive feedback towards the use of mobile apps in the aspect of vocabulary learning and meeting personal learning needs.

Even though mobile apps are found helpful and motivating for language learners, negative sides of mobile apps were revealed especially from the perspective of children engaging with mobile apps. Grimshaw, Dungworth, McKnight and Morris (2007: 583-599) indicate that animation of mobile apps is distractive in the aspect of reading comprehension and children are not able to pay attention to their learning. Apart from that, Abdullah, Ghalebandi and Roffeei(2015: 385-395) claim that whether a mobile app is suitable enough for a child's learning style is not properly indicated by most mobile apps, which are available in the market. Therefore, parents should be careful and consider several factors such as children's learning styles when choosing a proper mobile app for their children.

1.4 Mobile App Memrise

Memrise is a free online learning platform, which has engaging, and playful design, thus enabling learners to learn vocabulary fast, effectively, while also having fun. Memrise helps learners learn at a speed five times faster due to its application of three key scientific principles namely "elaborate encoding", "choreographed testing" and "scheduled reminders". The "elaborate encoding" means to connect the target content that we are going to learn to what we have already learned. When language learners learn words with Memrise, it helps create the "elaborate encoding" by connecting a word to its meaning with the help of a mem suggested by Memrise. The "choreographed testing" refers to the frequent tests provided by Memrise. Words that learners have learned are tested through frequent tests, which ask learners simply to recall an answer or do multiple choice exercises or spelling exercises. The

"scheduled reminders" means that Memrise system will remind learners to review what they have learned. According to Łuczak (2017), Memrise's most important benefit is its effective vocabulary learning system, which helps learners build up memorization because of the frequent revision imposed by Memrise.

According to Łuczak (2017), Memrise enables learners to learn foreign languages and memorize other subjects' information through flashcards. One technique that Memrise applies is the crowdsourcing with which all users of the Memrise community are allowed to create their own courses, which could perfectly meet learners' individual needs and supplement conventional language classes by means of practicing and revising the class content. Another technique applied by Memrise is the "spaced repetition" methods with which language learners' memorized data will be stored. Based on the memorized data, language learners' knowledge will be assessed. The "spaced repetition" means that the Memrise system will repeatedly present learned vocabulary at increasingly longer intervals. The "spaced repetition" methods would enable language learners to be equipped with a long-term memory for what they have learned (Fadhila 2016: 33-46). Fisher (2016) indicates that Memrise combines audios, images and memory techniques to assist language learners to connect one word with another for easier recall. Memrise also provides speed review, which is a regular test that enables language learners to memorize better. Additionally, Memrise gamifies the language learning process by awarding learners points and badges, which are the representation of reputation and gives chance to compete with other learners during the learning process (Ivleva 2016). Therefore, learning words with the use of Memrise is effective and full of fun.

There are some previous studies on the influence of Memrise. Fadhila (2016: 33-46) conducted the research "Learning and Reviewing Vocabulary Through Memrise to improve Studies' Vocabulary Achievement". Subjects were 39 second-semester students who were

from Faculty of Agriculture and Animal Husbandry at the Islamic University. During the research, the students learned the vocabulary in the classroom and reviewed it at home through Memrise Application. The result of the research showed that learning and reviewing vocabulary with the application of Memrise can improve students' vocabulary learning from the mean score 60.45 from the pre-test to 86.27 from the post-test. The author conducted a questionnaire in which students were asked to answer the question "In my opinion learning vocabulary through Memrise can increase my vocabulary achievement" and 84.62% of students chose "absolutely agree" and 15.38% of students chose "agree". However, the author did not indicate how much time students devoted to Memrise learning. Thus, the effectiveness of the research still remains doubtful.

Łuczak (2017) conducted her project "Using Memrise In Legal English Teaching" with the aim of creating a Memrise course of legal English vocabulary based on the syllabus of the TOLES (Test of Legal English Skills) certificate examination at Foundation (B1) and Higher (B2) levels. Subjects were the first, second and third-year students who attended compulsory legal English courses at the Law Faculty of Kozminski University and they were invited to the create the Memrise course content together. The project's result was that over a half of students who spent around 1-3 hours on Memrise obtained satisfactory test grades, only one student who worked with Memrise during a varied timespan got good grade, and one third of students who spent less than one hour on Memrise did not pass the test. This project confirms that TOLES results are positively influenced by learning legal English vocabulary with the help of Memrise course. The author included the time that students devoted to Memrise learning and the time that students devoted to Memrise learning has positive correlation with their test results. Therefore, this research is relatively effective.

However, some negative feedback on Memrise cannot be ignored. Łuczak (2017) indicates that students who used Memrise courses to learn vocabulary give the feedback that

learning with Memrise is very "time-consuming and tiring" namely Memrise courses take a lot of time and energy to finish. Another criticism from students is that Memrise cannot recognize synonyms. Therefore, synonyms provided by learners in Memrise test will be regarded as wrong answers and naturally the system will not award points for that. What is more, the problem that Memrise having too frequent repetition of vocabulary is also reported. Sometimes Memrise system repeats certain words too frequently and correspondingly certain words have too low frequency of repetition. In a word, the criticism mainly comes from the perspective of Memrise users who experience problems such as time-consumption, tiredness, misrecognition of system, and too high or low repetition frequency.

Vocabulary learning is one indispensable part of language learning and plenty of studies have been conducted on various aspects of it so far. Findings of those studies influenced vocabulary learning for sure. However, as Webb and Nation (2017) indicate, there are a great number of approaches for vocabulary learning and they greatly vary when presented in teaching materials. It might imply that how vocabulary can be learned in a best way is still beyond clarity. Meanwhile, Webb and Nation mention that there are relatively little published materials, which could guide language teachers and learners to design an effective vocabulary learning programme. It suggests that further studies of vocabulary learning still needs to be conducted to find out the best learning approach. In the second chapter, a case study was conducted with the help of the mobile app Memrise to test whether it really has a positive influence on language learners' vocabulary learning and find out how Memrise could help learners learn vocabulary more effectively. The analysis part of chapter two is done based on the vocabulary learning studies discussed in literature review.

CHAPTER II

2.1 Aim

The aim of the present study is to find out how Memrise can be integrated into 10th grade students' regular vocabulary learning routine and test whether Memrise helps improve the memorization of chosen vocabulary. Memrise is a vocabulary learning app, which allows language learners to search online vocabulary courses targeting the language they want to learn and create their own vocabulary courses based on personal learning purpose. Therefore, Memrise provides the opportunity to integrate it into students' regular learning routine in the classroom by means of creating Memrise courses based on the vocabulary students encounter within the textbook. After students learning with Memrise courses, we are likely to know whether integration of Memrise with regular learning in the classroom has positive influence on vocabulary learning.

2.2 Setting and Participants

The research was conducted at a large and prestigious secondary school in Tartu, Estonia, providing complete secondary education from form 1 to 12. All participants (N=18) were selected from one of the six 10th grade groups at the school. Based on the grouping system of the school, this group of students all have approximately B2 level in English according to the Common European Framework of Reference for Languages (CEFR). In the English class students use the textbook *Straightforward* (upper intermediate 2nd edition), which was the source of the vocabulary chosen for the experiment within the present study. The students had four lessons of English per week when lessons were not cancelled because of other events.

2.3 Research Design and Procedures

The experimental part of this research contains an introductory questionnaire, pre-test 1, development of Memrise course 1, experiment part stage 1, post-test 1, pre-test 2, development of Memrise course 2, experiment part stage 2, post-test 2, and a follow-up interview. The experiment was divided into two separate stages, which coved different time spans. During the first stage, experimental group was marked as group A1 and control group was marked as group B1. Similarly, during the second stage of the study, experimental group and control group respectively were group A2 and B2. During the second stage of the experiment, members of experimental group A2 were members of control group B1. Similarly, members of control group B2 were members of experimental group A1.The reason why experimental group and control group swapped was due to the fact that there was not a big number of subjects in none of two groups. By swapping the experimental group and control group, every subject has a chance to be the member of experimental group; thus, the experimental data will be more comparable. During the first stage, there were seventeen participants out of nineteen students in the class with eight students in group A1 and nine students in group B1. During the second stage, there were sixteen participants out of nineteen students in the class with seven students in group A2 and nine students in group B2. The time span of the first stage of the experiment were two weeks during which students had six English lessons before post-test 1. The time span of the second stage of the experiment were four weeks during which students also had six English lessons before post-test 2. In terms of ethics, consent of being willing to participate in the experiment, which required some of subjects to use the language learning app Memrise to take vocabulary course devised on the Memrise platform was asked. Before conducting the experiment, the purpose of one introductory questionnaire, two pre-tests, two post-tests and an interview, and how experiment would be conducted were briefly explained to students.

First of all, a questionnaire was conducted among all the students in the group. The

questionnaire was devised to learn about students' vocabulary learning habits and problems. When the questionnaire was conducted, seventeen students out of nineteen were present. All seventeen students were willing to cooperate and participate in the pre-test 1. Before conducting the pre-test 1, thirty words which were assumedly unfamiliar for most of the students in the group were chosen as pre-test 1 content from Unit 8 Word List of the English textbook *Straightforward* (upper intermediate 2nd edition). Those thirty words mainly appear either in reading material or exercises in Unit 8 of *Straightforward* (upper intermediate 2nd edition). During the pre-test 1, students were expected to translate chosen words and phrases into Estonian or define them in their own words in English if they wish. One hundred percent correct answers were not expected. Students' answers which were close or to a certain extent related to the meanings of chosen words were counted as right answers. Since there are cases that words in Estonian and English share similar form but totally different meanings, guidance on telling right or wrong answers of vocabulary tests was given by an Estonian native speaker.

After the pre-test 1, each chosen word and phrase's accuracy rate was calculated and sequentially, words and phrases with first fifteen the lowest accuracy rate were chosen as the post-test 1 content. Even though the pre-test 1 contained thirty words, the post-test 1 focused on only fifteen words. Memrise course 1 named *10th Grade Unit 8 Vocabulary* was devised based on these fifteen words and phrases. When devising the course, both Estonian translation and definition in English were given. Before Memrise course 1 learning, eight students gave consent to be subjects of experimental group namely group A1 in which subjects were required to use Memrise to learn fifteen chosen words and phrases after their regular English lessons. Due to the fact that group A1 subjects needed to create their Memrise accounts and register Memrise course created for them, there was possibility that students may register themselves on different days or they may even not register at all. To avoid these

negative factors, all eight group A1 subjects registered Memrise course 1 one by one on a school computer on the same day. The default setting of daily learning goal of Memrise system was five minutes a day. This default setting provides learners with a relatively easy vocabulary learning task, which can be finished with five minutes or so.   Members in group A1 were able to get access to the course through online webpage or through mobile phone application at any time after their regular English lessons. Group A1 members were expected to learn vocabulary with Memrise course at least five minutes per day apart from their regular English lessons, and group B1 as the control group had only regular English lessons. The duration of the first stage of the experiment was depending on their English teacher's lesson plan for Unit 8 and also the school schedule. While group A1 members were learning with Memrise course, they were awarded by the system with points, which were shown on the LEADERBOARD on Memrise learning platform. Those received points have positive correlation with the amount of time that students devote to Memrise learning, and they are automatically shown on Memrise course creator's LEADERBOARD. Total points awarded to each member of group A1 during the whole process of the experiment were calculated and shown on the LEADERBOARD.

By the time students' English teacher finished teaching Unit 8, the post-test 1 was conducted in the same way as pre-test 1 in which students were expected to translate chosen words and phrases into Estonian or define them in their own words in English if they wish. When post-test 1 was conducted, one student from group A1 was absent and another student from group A1 did not learn vocabulary with Memrise course during the experiment. Therefore, these two students' pre-test 1 data was regarded as invalid and was not calculated in the analysis of experiment result.

At the second stage of experiment, the experimental group and control group at the first stage swapped. Namely, members from group A1 at the second stage became group B2;

similarly, members from group B1 became group A2. There were supposed to be nine students in the group A2 since at the first stage there were nine students in group B1. However, there were only seven students in group A2 due to the fact that two students were not willing to learn vocabulary with Memrise; one student was absent from school; one student who was absent from the first stage of experiment was willing to participate. Those two students who were not willing to learn vocabulary with Memrise were included in group B2. Since there was another absent student from group B2, there were totally nine students in group B2.

The second stage of the experiment went through the same procedure as the first stage. Before conducting the pre-test 2, thirty words which were assumedly unfamiliar for most of the students in the group were chosen as pre-test 2 content from Unit 9 Word List of the English textbook *Straightforward* (upper intermediate 2nd edition). Similarly, first fifteen words and phrases with the lowest accuracy rate in the pre-test 2 were chosen as the post-test 2 content.

After that, Memrise course 2 named *10th Grade Unit 9 Vocabulary* was devised. The second stage of the experiment took longer time than the first stage because the experiment and school mid-semester exams overlapped. The second stage was approximately four weeks long and then the post-test 2 was conducted. According to the LEADERBOARD, three students from group A2 did not learn vocabulary with Memrise during the timespan of four weeks; therefore, their pre-test 2 data was regarded as invalid and was not calculated for the result analysis.

For the result analysis, accuracy rate of each member among fifteen chosen words and phrases in pre- and post-test 1 was calculated and compared. Similarly, accuracy rate of each member among fifteen chosen words and phrases in pre- and post-test 2 was calculated and compared. Improved accuracy rate of each member of groups A1, B1, A2, and B2 was

calculated. Average and median accuracy rate of groups A1, B1, A2, and B2 were calculated. Improved average and median accuracy rate were calculated. Accuracy rate of each chosen word and phrase in groups A1 and B1 in pre- and post-test 1 was calculated and compared. Similarly, accuracy rate of each chosen word and phrase in groups A2 and B2 in pre- and post-test 2 was calculated and compared. Improved accuracy rate of each word and phrase of groups A1, B1, A2, and B2 was calculated. Besides, the average improved accuracy rate of groups A1, B1, A2, and B2 was calculated.

In the end, a follow-up interview was conducted concerning how students learned vocabulary with Memrise, motivation in terms of Memrise learning, whether Memrise helps with vocabulary learning etc. The interview was conducted in a varied timespan because the experiment was conducted at two stages and each group included almost ten students; therefore, each time four or five students were interviewed. During the interview, interviewees gave consent to recording what they said and after that recoded audio of the interview was transcribed.

This experimental method has its limitations. Since each group of 10th grade in the school has a different English teacher, it is impossible to have a large number of students as experiment subjects. Therefore, the project was divided into two stages. At the first stage, students of the same language group were divided into experimental group A1 and control group B1. At the second stage, the two groups swapped, namely group A1 became control group B2, and group B1 became experimental group A2. The application of this method makes the result more comparable because at both stages it was the same teacher who instructed the experimental group and control group, who participated in the same lessons. However, due to students' absence and unwillingness to cooperate, the number of participants in experimental groups was actually even smaller than expected. Thus, in reality the data obtained in the experiment may not be big enough to make proper conclusion about

Memrise's influence on vocabulary learning.

2.4 Result of Vocabulary Test 1

The result of pre-test 1 is shown in Table 1 (see Appendix 6) and Table 2 (see Appendix 6). To effectively indicate the right and wrong answers and where blank was left in the test, I decided to use marks such as "✔", "X", and "/". "✔" stands for the right answer; "X" stands for the wrong answer; "/" means that the student did not know an answer and left it blank. In Table 1 and Table 2, "No.1" refers to the first word listed in the pre-test 1. Similarly, "No.2" refers to the second word listed in the pre-test 1. To avoid revealing students' personal information such as names, students' names are replaced with capital letter S together with a number. Each student will carry this "S+number" as his or her name during the whole process of the experiment.

Based on Table 1 and Table 2, number of right answers for each chosen word and phrase and accuracy rate of each chosen word and phrase among seventeen students were calculated. The calculation result is shown in the Table 3 (see Appendix 7). In Table 3,the accuracy rate of each word and phrase is sequenced from the lowest to the highest. According to Table 3, it can be seen that in the pre-test 1 the biggest number of right answers for chosen words is seventeen and the corresponding accuracy rate is 100.00%. Oppositely, the smallest number of right answers for chosen words is zero and the corresponding accuracy rate is 0.00%.

For the post-test 1, fifteen words should be chosen from among these thirty words as the test content. To make sure that fifteen chosen words are as unfamiliar as possible to most of the seventeen participants, I decided to choose fifteen words with first fifteen lowest accuracy rate from among those thirty words in pre-test 1. First fourteen words with the lowest accuracy rate ranging from 0.00% to 29.41% are listed in the first half of Table 3.

However, there are four words with an accuracy rate of 35.29%. These four chosen words or phrases respectively are No.26 "dead-end job", No.11 "a clean bill of health", No.17 "acupuncture", and No.23 "spectrum". There are reasons why it is more proper to include the phrase "dead-end job" in the post-test 1 content rather than the other three. According to Webb and Nation (2017), it is easier to learn words when L2 words share similarities with L1 words; therefore, the learning burden is reduced. Here the word form of "spectrum" shares similarity with its Estonian equivalent "*spekter*". Thus, Estonian students can easily relate "spectrum" to "*spekter*" and it will not take much effort if students want to memorize this word. Besides, most students provided their answer "*spektrum*", which is simply the result of changing letter "c" from the word "spectrum" into "k". After consulting an Estonian native speaker, I regard "*spektrum*" as a wrong answer, but it implies that probably most of them actually knew what "Spectrum" meant even though they were not able to provide the right answer "spekter". Hence, it is not of great value to include the word "spectrum" in pre-test 1 if I want to test whether Memrise vocabulary course has positive influence on students' vocabulary learning.

Seeing how part of the collocation meaning relates to the whole collocation meaning will reduce the learning burden of collocation (Webb & Nation 2017). The phrase "a clean bill of health" can be regarded as a collocation whose core meaning is being healthy. If relating the phrase "clean bill", which means "nothing needs to be paid" to the word "health", it is not difficult to reach the phrase's core meaning "being healthy". The learning burden of the word "acupuncture" is relatively small because in Estonian there is a loan word "akupunktuur", which shares the similar form and same meaning as "acupuncture". Actually, the word "nõelravi" which is the synonym of "akupunktuur" is used more frequently, then the learning burden is that learners have to know "akupunktuur" and "nõelravi" are synonyms. When learners are taught that the core meaning of "akupunktuur" is treatment with needles, it

will be easy for them to connect "acupuncture" with the word "nõelravi", which literally means needle treatment, and naturally learning burden is reduced. The phrase "dead-end job" is closely related to the core meaning "dead-end", which means it is closed at one end and does not lead to anywhere when describing a road or path dead-ends. Theoretically, the learning burden of "dead-end job" can be as low as previous analyzed three words but in the reality this phrase is still quite confusing for students because most of students defined it as "endless job" or "time-consuming job". Considering the fact that students are not able to quickly make the connection between the core meaning and figurative meaning of this phrase, relatively "dead-end job" has the highest learning burden compared to the other three words and therefore it should be included in pre-test 1.

After choosing fifteen words and phrases for post-test 1, accuracy rate of each member of groups A1 and B1 was calculated and the result is shown in Table 4 (see below). According to Table 4, respectively the average number of right answers and average accuracy rate of groups A1 and B1 are calculated. The calculation formulas go as follow:

Mean (Average number of right answers) = number of right answers of the whole group / number of group members

Mean (Average accuracy rate of each group) = [Mean (Average number of right answers)/ Number of chosen words or phrases] $\times$ 100%

After calculation, in the pre-test 1, the average accuracy rate of groups A1 and B1 respectively are 10.83% and 11.85%, which are very close.

Table 4 . Accuracy rate of each member of groups A1 and B1 out of fifteen words and phrases in pre-test 1

Group A1	Number of Right Answers	Accuracy Rate (%)	Group B1	Number of Right Answers	Accuracy Rate (%)
S4	1	6.67	S1	1	6.67
S5	0	0.00	S2	1	6.67
S7	2	13.33	S3	0	0.00
S8	4	26.67	S6	0	0.00

S9	2	13.33	S11	2	13.33
S10	1	6.67	S14	0	0.00
S12	3	20.00	S15	4	26.67
S13	0	0.00	S16	6	40.0
			S17	2	13.33

Table 7 . Comparison of accuracy rate of each member of groups A1 and B1 in pre- and post-test 1

Group A1	Pre-test 1 Accuracy Rate (%)	Post-test 1 Accuracy Rate (%)	Improved Accuracy Rate (%)	Group B1	Pre-test 1 Accuracy Rate (%)	Post-test 1 Accuracy Rate (%)	Improved Accuracy Rate (%)
S4	6.67	66.67	60.00	S1	6.67	20.00	13.33
S5	0.00	53.33	53.33	S2	6.67	20.00	13.33
S7	13.33	—	—	S3	0.00	66.67	66.67
S8	26.67	66.67	40.00	S6	0.00	20.00	20.00
S9	13.33	93.33	80.00	S11	13.33	73.33	60.00
S10	6.67	86.67	80.00	S14	0.00	40.00	40.00
S12	20.00	93.33	73.33	S15	26.67	33.33	6.66
S13	0.00	26.67	26.67	S16	40.0	73.33	33.33
				S17	13.33	66.67	53,34

Accuracy rate of groups A1 and B1 in the post-test 1 is calculated and the result is shown in Table 6 (see Appendix 8). Compared to both groups' pre-test 1 accuracy rate indicated in Table 4 , we get the Table 7 (see above). In Table 7 , the accuracy rate of S7 in post-test 1 is not available. It means that S7 was absent when post-test 1 was conducted. Therefore, the missing data of S7 is replaced with "▬".

Table 7 indicates that all members from groups A1 and B1 got higher accuracy rate in the post-test 1. After post-test 1 accuracy rate of most group A1 members significantly improved except S7 and S13's accuracy rate, which respectively are "▬" and 26.67%. Otherwise, the highest improved accuracy rate within group A1 members is 80.00% and the lowest is 40.00%. According to LEADERBOARD result 1, S13 who got the lowest improved accuracy rate devoted the least amount of time to Memrise learning. S9 and S10 have the 4th and 5th ranking based on their received points on LEADERBOARD, namely they have devoted medium amount of time and got the most improved accuracy rate. S9 and S10

claimed that they used Memrise generally once a day whenever they remembered and each time respectively ten minutes and five minutes. Surprisingly, S8 who used the most time to learn with Memrise got just 40% of improved accuracy rate. The reason might be related to the way how S8 worked with the app.S8 revealed that she noticed the ranking on the LEADERBOARD and she used Memrise quite often simply because she wanted to receive the first ranking. Meanwhile, students reported that they chose the correct answers when using Memrise not only based on what they remember but also their short memory of the length of the answer with the corresponding word since the length of definitions of certain words were very long. Hence, it is possible that while S8 was using Memrise, she did not try to recall those newly learned words , which led to the fact that she did not achieve the most improved accuracy rate.

It is worth noting that S4 actually did not learn vocabulary with Memrise during the process of experiment but still obtained 60% of improved accuracy rate, which is much higher than S8's improved accuracy rate, even though she devoted the most time for Memrise learning. Group B1 members' improved accuracy rate varies greatly ranging from 6.66% to 66.67%. Based on data and analysis above, it is difficult to tell whether students got improved accuracy rate from regular English lessons learning or learning with Memrise; hence, whether Memrise has a positive influence on students' vocabulary learning remains arguable.

All experimental group members' learning results were shown by points they received on the LEADERBOARD. When clicking on the button "all the time", those points a learner has received during the whole process of learning will be shown. Group A1 member S4 did not appear on the LEADERBOARD, namely S4 did not learn anything with Memrise course 1. Therefore, it is reasonable to not to count S4 and S7's data when calculating the average accuracy rate of group A1 in pre- and post-test 1. Hence, the average accuracy rate of group A1 in pre-test 1 is recalculated and in post-test 1 is calculated. According to those two

formulas mentioned above, one gets the following:

Table 8 The average accuracy rate of groups A1 and B1 in pre-and post-test 1

Groups	Average accuracy Rate in Pre-test 1 (%)	Average accuracy Rate in Post-test 1 (%)	Improved Average Accuracy Rate (%)
Group A1	11.11	70.00	58.89
Group B1	11.85	45.93	34.08

Table 8 (see above) indicates that the average improved accuracy rate of groups A1 and B1 respectively are 58.89% and 34.08%. According to Table 9, it can be assumed that Memrise has positive influence on students' vocabulary learning. However, the average accuracy rate is extremely sensitive to extreme values. Therefore, when there are several extreme values in the data sets, the average value changes drastically. For example, in the pre-test 1, both in groups A1 and B1 there were students who had 0.00% accuracy rate, which significantly affects the average accuracy rate. To a certain extent, the average accuracy rate does not indicate the effect of Memrise from the individual level, thus, more argumentation is needed for the fact whether Memrise has a positive influence on students' vocabulary learning.

The median separates extreme values, therefore, it is not significantly affected by extreme values. Here the median accuracy rate of groups A1 and B1 in pre- and post-test 1 is calculated. The calculation result is shown in Table 9 (see below). The improved median accuracy rate of groups A1 and B1 respectively are 66.67% and 33.33%. The improved median accuracy rate of group A1 is approximately two times of median accuracy rate of group B1. These sets of data might imply that Memrise indeed has a positive influence on students' vocabulary learning.

Table 9 The median accuracy rate of groups A1 and B1 in pre- and post-test 1

Groups	Median accuracy Rate in Pre-test 1 (%)	Median accuracy Rate in Post-test 1 (%)	Improved Median Accuracy Rate (%)
Group A1	10.00	76.67	66.67
Group B1	6.67	40.00	33.33

In pre-test 1 and post-test 1 each chosen word and phrase's accuracy rate is also calculated, the result is shown in Tables 10 and 11 (see Appendix 9). Each chosen word and phrase's improved accuracy rate is shown in Table 12 (see Appendix 10). Obviously, each word and phrase's improved accuracy rate in group A1 is more or less higher than the corresponding word and phrase in group B1 except the phrase "dead-end job". Therefore, there is the tendency that Memrise positively helps with vocabulary learning.

Besides, each word and phrase in group A1 has obtained significant improved accuracy rate ranging from 42.86% to 100.00% except the phrase "dead-end job" with only 5.36% of improved accuracy rate. On the contrary, the phrase "dead-end job" in group B1 has surprisingly much higher improved accuracy rate 33.34%. In the pre-test 1, the accuracy rate of "dead-end job" in groups A1 and B1 are respectively 37.5% and 33.33%, which are relatively close. In the post-test 1, two accuracy rates become 42.86% and 66.67% respectively. This might imply that regular in-class English lessons help more with phrases due to the fact that the teacher would give explicit explanation of meaning of phrases and often arrange exercises for students.

In group B1 each word and phrase's improved accuracy rate varies from 0.00% to 66.67%. The word "fluorescent" in group B1 has an improved rate 0.00%, namely its accuracy does not change in post-test 1. The word "fluorescent" has its Estonian equivalent "helendav", which is more frequently used than the loan word "fluorestseeriv" even though "fluorestseeriv" share similar form with "fluorescent". The learning burden of the word "fluorescent" increases when students have to know that "fluorestseeriv" and "helendav" are synonyms. The reason why "fluorescent" in group B1 does not have higher accuracy rate in post-test 1 might be due to the fact that "fluorescent" is a low-frequency word, precisely a technical word, which is not used daily. Besides, this word comes from one reading material

in which "fluorescent" only appears once. On the contrary, the improved accuracy rate of "fluorescent" in group A1 is 57.14%, which is much higher than the 0.00% of group B1. This may imply that Memrise helps counteract the learning burden of a word and assists with vocabulary learning.

2.5 Result of Vocabulary Test 2

The result of pre-test 2 is shown in Table 13 (see Appendix 12) and Table 14 (see Appendix 12). Based on Table 13 and Table 14, the number of right answers for each chosen word and phrase and accuracy rate of each chosen word and phrase among sixteen students are calculated. The calculation result is shown in Table 15 (see Appendix 13). In Table 15, the accuracy rate of each word and phrase is sequenced from the lowest to the highest. Sequentially, from the lowest to the highest accuracy rate, first fifteen words are chosen as the content for the post-test 2. Among these fifteen chosen words, the highest accuracy rate is 37.50% and the lowest accuracy rate is 0.00%. Memrise course 2 was created based on these fifteen chosen words. After choosing fifteen words and phrases for post-test 2, accuracy rate of each member of groups A2 and B2 in pre-test 2 was calculated and the result is shown in Table 16 (see below). According to Table 16, the average number of right answers and average accuracy rate of groups A2 and B2 respectively are calculated. The calculation result is that average accuracy rate of group A2 is 9.52% and of group B2 is 16.30%.

Table 16. Each member's accuracy rate of 15 chosen words in group A2 and B2 in pre-test 2

Group A2	Number of right answers	Accuracy rate	Group B2	Number of right answers	Accuracy rate
S1	1	6.67%	S4	1	6.67%
S2	1	6.67%	S5	0	0.00%
S6	1	6.67%	S8	3	20.00%
S11	1	6.67%	S9	2	13.33%
S14	2	13.33%	S10	2	13.33%
S17	1	6.67%	S12	5	33.33%
S18	3	20.00%	S13	2	13.33%

			S15	4	26.67%
			S16	3	20.00%

After the pre-test 2, students who used to be in the group A1 became members of group B2 and the students who used to be in the group B1 became members of group A2. However, S3 and S7 were absent from school and S15 and S16 were not willing to participate in Memrise learning in group A2, hence, S15 and S16 were added into group B2. Since S5 and S6 was absent when post-test 2 was conducted and S11 and S17 did not learn vocabulary with Memrise, the average accuracy rate of groups A2 and B2 were recalculated and the respective result is as follow: the average accuracy rate of group A2 is 11.67% and the average accuracy rate of group B2 is 18.33%.

Table 19. The accuracy rate of each member of groups A2 and B2 respectively in pre- and post-test 2

Group A2	Pre-test 2 Accuracy Rate (%)	Post-test 2 Accuracy Rate (%)	Improved Accuracy Rate (%)	Group B2	Pre-test 2 Accuracy Rate (%)	Post-test 2 Accuracy Rate (%)	Improved Accuracy Rate (%)
S1	6.67	80.00	73.33	S4	6.67	46.67	40.00
S2	6.67	93.33	86.66	S5	0.00	▬	▬
S6	6.67	▬	▬	S8	20.00	66.67	46.67
S11	6.67	60.00	53.33	S9	13.33	46.67	33.34
S14	13.33	60.00	46.67	S10	13.33	40.00	26.67
S17	6.67	26.67	20.00	S12	33.33	73.33	40.00
S18	20.00	66.67	46.67	S13	13.33	46.67	33.34
				S15	26.67	53.33	26.66
				S16	20.00	40.00	20.00

The accuracy rate of each member in groups A2 and B2 in post-test 2 was calculated and the result is shown in Table18 (see Appendix 14). Based on the Table 18 , the average accuracy rate of groups A2 and B2 in the post-test 2, which respectively are 75.00% and 51.67%. Compared to the accuracy rate of groups A2 and B2 in pre- and post-test 2, we get the Table 19 (see above). During the post-test 2, S5 and S6 were absent, therefore, these two students' data is replaced with "▬". Table 19 shows that all the members of group A2 and B2 got higher accuracy rate except S5 and S6 due to the fact that they were absent when post-test 2

were conducted. It is worth noting that the S11 and S17 in group A2 in reality did not learn vocabulary with Memrise; therefore, it is better to not to include their data when comparing with group B2 members. When S11 and S17 are excluded, the highest improved accuracy rate in group A2 is 86.66% and the lowest is 46.67%. In group B2 the highest improved accuracy rate is 46.67% and the lowest is 20.00%. Obviously, the lowest improved accuracy rate in group A2 is exactly the same as the highest improved accuracy rate in group B2. This might point out that Memrise helps with vocabulary learning.

According to LEADERBOARD result 2 (See appendix 17), S2 who devoted the most time to Memrise learning correspondingly achieved the most improved accuracy rate. S18 and S1 respectively received the second and the third ranking on the LEADERBOARD. Even though S18 and S1 devoted very similar amount of time to Memrise learning, S1 received much higher improved accuracy rate. During the follow-up interview, S18 revealed that due to the fact that there were school mid-term examinations, he only used Memrise during the first two weeks of the experiment when he had spare time but spent each time five minutes or even less on it. In the case of S1, she started to learn vocabulary with Memrise during the last two weeks of the experiment and each time she spent ten to fifteen minutes on vocabulary learning. Even though S18 and S1 generally spent really similar amount of time on Memrise vocabulary learning, it is so far still difficult to tell whether S1 received higher improved accuracy rate because of the fact that she devoted each time longer time for the vocabulary learning or the fact that S1 learned vocabulary with Memrise during the last two weeks. S1 would pay more attention to chosen words when spending each time longer time on Memrise. When S1 learned chosen words with Memrise within the last two weeks, S1 tends to have fresher memory of newly learned vocabulary than S18. Both of these two situations could lead to the better result of S1.

S14 devoted the least time to Memrise learning and received the lowest improved accuracy rate. However, S18 who devoted the second most amount of time to Memrise learning also received the lowest improved accuracy rate. S14 claimed in the follow-up interview that he used Memrise whenever he remembered but most of the time, he forgot to turn on it. He usually spent five to ten minutes on Memrise. Based on the LEADERBOARD, points that S18 received are approximately two times of points that S14 received, which means the amount of time that S18 spent on Memrise generally was approximately two times as much as S14. But each time S14 always tended to spend more time than S18 on the vocabulary learning. Therefore, it is possible to conclude that the total amount of time spent on Memrise vocabulary learning may not be the key factor, which contributes to the higher improved accuracy rate. Krashen (1989: 440-464) claims that when learners pay attention to the meaning, vocabulary learning takes place. Therefore, it is reasonable to infer that bigger amount of time spent on Memrise each time tends to involve more attention during the learning process and might lead to a higher improved accuracy rate.

What cannot be neglected is the fact that S11 did not learn vocabulary with Memrise but achieved an improved accuracy rate 53.33%, which is higher than the improved accuracy rate of S14 and S18. In the interview S11 revealed that she was not willing to do something not related to her study. But according to her teacher, S11 generally is a very hard-working student, which might be the reason why S11 achieved a good result. It means that the regular English lessons not only help with vocabulary learning but also help achieve better learning results compared to those who learn vocabulary with the help of Memrise. Considering the fact that most of the students of group B2 received improved accuracy rate 46.67% or less, it is possible to conclude that Memrise generally helps with vocabulary learning, but it is not absolute since factor such as personal learning habits may change the learning results.

Table 20. Comparison of average accuracy rate of groups A2 and B2 in pre-test 2 and post-test 2

Groups	Average accuracy Rate in Pre-test 2 (%)	Average accuracy Rate in Post-test 2(%)	Improved Average Accuracy Rate (%)
Group A2	11.67	75.00	63.33
Group B2	18.33	51.67	33.34

After calculating the average accuracy rate of groups A2 and B2 respectively in pre-test 2 and post-test 2, we get the Table 20 (See above). Table 20 also shows that the improved average accuracy rate of groups A2 and B2 respectively are 63.33% and 33.34%. Considering the fact that the accuracy rate 0.00% of S5 in pre-test 2 is not counted while the average accuracy rate is calculated, the average accuracy rate here is not significantly affected by extreme values. Similar to the first stage of experiment, the median accuracy rate of groups A2 and B2 in pre-test 2 and post-test 2 is calculated. The result is shown in Table 21 (See below). The improved median accuracy rate of groups A2 and B2 respectively are 63.33% and 30.00%. Obviously, the improved average accuracy rate and the improved median accuracy rate of group A2 are the same; in the case of group B2, they are very close which means that both group A2 and B2 do not contain data with extreme values. Both the improved average accuracy rate and the improved median accuracy rate of group A2 are approximately two times as much as the corresponding improved accuracy of group B2. In conclusion, the group A2 improved more and achieved a better test result with the help of Memrise and Memrise can positively influence learners' vocabulary learning.

Table 21. Comparison of median accuracy rate of group A2 and B2 in pre-test 2 and post-test 2

Groups	Median accuracy Rate in Pre-test 2 (%)	Median accuracy Rate in Post-test 2 (%)	Improved Median Accuracy Rate (%)
Group A2	10.00	73.33	63.33
Group B2	16.67	46.67	30.00

In pre-test 2 and post-test 2, the accuracy rate of each chosen word and phrase is

calculated and the result is shown in Table 22 (see Appendix 15) and Table 23 (see Appendix 15). Each chosen word and phrase's improved accuracy rate is shown in Table 24 (see Appendix 16). Obviously, the improved accuracy rate of each chosen word and phrase in group A2 is genrally higher than the improved accuracy rate of the same word and phrase in group B2 except phrases "all-consuming", "villain", "know no bounds" and "on the rampage".

Both phrases "all-consuming" and "villain" received 100% improved accuracy rate in both groups A2 and B2. Phrase "on the rampage" received 0.00% improved accuracy rate in both groups A2 and B2. According to the post-test 2 result, eight students out of twelve left the translation of "on the rampage" blank and three of them gave totally unrelated translation or definition and only one of them wrote down the correct translation. The reason why this phrase received 0.00% improved accuracy rate in group A2 might be because students did not learn vocabulary consistently with Memrise and they stopped using it sometime before the conduction of the post-test 2; hence, their memory faded away. According to *Collins Dictionary* (Last access 28.04.2019), "rampage" is one of the 3,000 most commonly used words in the Collins dictionary; therefore, "rampage" can be regarded as a high-frequency word based on the suggestion of Schmitt and Schmitt (2014). Theoretically, it should be easy to memorize the phrase "on the rampage" when students already know the meaning of "rampage". However, this phrase appears only once in the extensive reading of Unit 9. Thus, it is possible that the teacher did not focus much on this phrase and did not require students to memorize it either. Those could be some reasons why "on the rampage" got zero improved accuracy rate in group B2. The improved accuracy rate of the phrase "know no bounds" in group A2 is 75.00%, which is actually lower than the 87.50% in group B2. This shows that learning vocabulary with the help of Memrise app does not absolutely guarantee a better result and it is also possible to achieve a better learning result when taking only regular

English lessons without using Memrise. Despite the lower improved accuracy rate of the phrase "know no bounds", it is still possible to conclude that Memrise generally has a positive influence on vocabulary learning and helps students achieve better learning results.

2.6 Analysis of the Follow-up Interview and Discussion of Results

The follow-up interview was conducted after the experiment among fourteen students who used to be members of the experimental groups. Those who were only members of the control groups were excluded. The interview was conducted to get to know what participants thought of their experience of using Memrise and how they were using it. Firstly, all interviewees were asked to talk about their general feeling of learning vocabulary with Memrise. Ten students said they generally liked it but four students who did not use Memrise when they were members of the experimental group claimed that they did not want to use Memrise because it was not interesting or attractive for them. Obviously, learning vocabulary with the help of Memrise app is not absolutely motivating for them. Secondly, interviewees were asked how frequently they used Memrise and how much time they used every time. The result is that none of them used Memrise constantly during the experiment period and most of them learned vocabulary with Memrise either in several days at the beginning or in last few days before the experiment ended or they simply used Memrise whenever they remembered. The way how subjects used Memrise reflects that they were not motivated enough to use Memrise if the fact that school examinations overlapped with this study in one short period of time does not count. During that short period of time, students may not have enough time for Memrise vocabulary learning.

Among ten students who used Memrise, eight students generally used it maximum once per day. One student used only once during the experiment and one student used it sometimes once per day and sometimes several times per day. Five students spent five to ten minutes

each time on Memrise; one student spent ten to fifteen minutes each time; two students spent fifteen to twenty minutes each time; only one student spent around twenty five minutes each time on Memrise; only one student spent less than five minutes all together. Four students did not use Memrise at all. One of them said she simply did not want to use it because it was not part of her compulsory study and at the same, she was too busy to spare time for Memrise. Other three students said they simply forgot to use Memrise either because they were lazy people or Memrise itself was not motivating enough. However, they still believed that Memrise should help with their vocabulary learning. This result suggests that the amount of time students spend every time on Memrise could be one crucial factor, which decides their vocabulary learning result. When one spends relatively longer time on Memirse, he or she tends to pay more attention to it; thus, the learning result might be better. This assumption can be tested in a further study. In the aspect of motivation, learning vocabulary with the help of Memrise app did not seem to be motivating enough for participants. Before conducting this experiment, over half of all participants were not willing to be members of the experimental group. Only after encouragement most of them agreed to collaborate and started to use Memrise. However, there were still four students who did not use Memrise when they were members of the experimental group. Two students refused to be members of the experimental group and thus both of them were in the control group all the time. During the process of the experiment, participants' opinion changed a little bit. After using Memrise, most agreed that Memrise was interesting and motivating . When asked what features made it motivating , most of them said that learning vocabulary with the help of Memrise was like playing a game, which was new and fun. Only two students mentioned that their motivation came from the LEADERBOARD, which showed the ranking of their received points. In a word, Memrise to a certain extent can be motivating for some learners because of its gamified learning style and its scoreboard. Even though most subjects in this study agreed that learning

vocabulary with the help of Memrise app was motivating, they were not able to specify what exact features were motivating. Since the scoreboard could only be seen after one round of learning, most subjects reported that they did not know there was scoreboard. When subjects can check the scoreboard anytime they want, motivation should be boosted.

Another main thing that interviewees were asked were problems that they observed while using Memrise. Overall, students reported that the words' definitions were too long that they had to keep scrolling down the content on the mobile phone screen while doing multiple choices exercises since each two definitions had already covered the whole screen. Meanwhile, some participants noticed that they chose the correct answer sometimes based on the length of definitions instead of their memory. Therefore, too long definitions of words may cause that less attention is paid to the deliberate learning of vocabulary with the help of Memrise app because subjects could choose correct answer without even thinking. Therefore, this might be the reason why some subjects spent long time on Memrise but did not have a better learning result.

Some discovered that the system of Memrise differentiated capital and small letters. For example, in the spelling exercise of the word "Vital", the answer "vital" will be regarded as a wrong answer by the system. Similarly, some found that the system took the note of the word as part of it. For example, in the spelling exercise of the word "Minute adj.", "adj." only showed that the word was an adjective. However, the system regarded "Minute" as a wrong answer because the "adj." was missing. Most students preferred there were more spelling exercises, but most exercises were actually multiple choices. Another problem indicated was that Memrise randomly repeated certain words and sometimes the repetition was too often. Since the fact that Memrise system differentiates capital and small letters and regards as part of the word, Memrise system regards some correct answers as wrong ones. Then Memrise system keeps repeating those "wrong answers" until subjects provide exactly the same

answers. This could be one possible reason why Memrise sometimes has too much repetition and subjects lose interest and are not motivated enough.

According to results of study and interview, it is obvious that the vocabulary learning result has a positive correlation with learners' motivation and amount of time used on Memrise every time. The motivation of students could be boosted by encouraging students to compete with each other and adding pictures, memes etc. to illustrate a word. The illustration by pictures, memes etc. was not used in this study but could be considered for further study in order to lower students' learning burden of vocabulary. The amount of time that students spend on Memrise every time is difficult to control but possible to manage it in the in-class learning environment. To find out how Memrise could help students learn vocabulary more effectively, the motivation and amount of time used on Memrise every time should be considered.

As for integrating the use of Memrise into students' regular English lessons, it is recommended to consider those problems appearing while students were learning vocabulary with Memrise. The teacher could combine Memrise with word list of the textbook or vocabulary required by the national curriculum by means of creating a Memrise course together with brief definition in English or Estonian. Teachers can require students to set their daily learning goals and make learning and reviewing vocabulary with Memrise as part of the compulsory home assignments as a different way of reviewing what students learn in their regular lessons.To prevent the fact that students may forget to review vocabulary after school, teachers should write all home assignments including using Memrise to finish the daily learning goal on the dashboard of the school e-learning system Stuudium. Teachers can monitor whether students have reviewed words by checking the daily ranking of received points shown in the LEADERBOARD. To lower the learning burden of vocabulary, the teacher could illustrate words by adding pictures, memes etc. on Memrise webpage platform.

To make students more motivated, teachers could reward students in a certain way. To compensate for the fact that most of the exercises in Memrise are multiple choices, teachers could add more spelling and other type of exercises in the in-class learning.

Conclusion

Vocabulary learning is crucial to language learning because vocabulary is the key to communication and vocabulary is central to learning content (Webb and Nation 2017). Therefore, a great number of studies on the aspect of vocabulary learning have been conducted. The rapid development of mobile technology makes it possible to learn languages with the help of mobile devices, which enable learners to get access to various learning resource through the internet. The emergence of mobile apps brings language learning with the help of mobile devices to a new level. Advantages of mobile apps in the aspect of language learning, especially vocabulary learning are more visible these days. Steel (2012: 875-880) indicates that mobile apps are helpful for vocabulary learning because they are equipped with flashcards and games, which target vocabulary learning. One of the most popular language learning apps is Memrise, which is mainly designed for vocabulary learning. Study shows that Memrise helps build up memorization of vocabulary because of its frequent revision technique (Łuczak 2017). This study is conducted with the use of Memrise among upper secondary school students who are studying the IB (International Baccalaureate) programmes in English. The Estonian National Curriculum for upper secondary schools (2011) requires upper secondary school students to be independent language users who can understand and use their foreign language freely. Then it is necessary for Estonian upper secondary school students to improve their English to a higher level. Since there have been no such studies conducted among Estonian upper secondary school students with the use of Memrise, it is also necessary to conduct this study to find out how Memrise can help them learn vocabulary more effectively.

Some important studies were conducted in the fields of lexis, vocabulary learning, mobile apps as well as Memrise. Swenson and West (1934) defines the amount of effort needed to learn a word as learning burden, which is connected to the difficulty a learner has

while learning vocabulary. To make vocabulary learning easier, the learning burden should be reduced. Webb and Nation (2017) indicate that when L2 words share the same form and meaning as L1 words, they are the easiest to learn. When L2 words share similarities with L1 words, building the connection between the L2 word and the corresponding L1 word helps reduce the learning burden. Seeing how part of the collocation relates to the whole collocation meaning reduces the learning burden when learning collocations. Most of the vocabulary growth in the EFL learning context is because of deliberate learning (Cobb 2007: 38-63). Webb and Nation (2017: 49) claim that in a short period of time, deliberate learning of vocabulary for sure leads to a better knowledge of vocabulary. Learning languages with the help of mobile apps involves deliberate learning. The study by Steel (2012) shows that mobile apps are indeed helpful for memorization of vocabulary as well as other basic skills such as reading, writing, grammar and translation of languages. Meanwhile, mobile apps are motivating for language learners. The mobile app Memrise which is used in this study is proved to be motivating and helpful to improve vocabulary learning by Fadhila (2016: 33-46).

This study aimed to test whether the vocabulary learning mobile application Memrise has a positive influence on students' vocabulary learning and how Memrise can be integrated into 10th grade students' regular lessons. To do that, a case study which was done at two different stages was conducted among 18 10th grade students at a large and prestigious secondary school in Tartu. The case study was divided into stage 1 and stage 2 in which pre-test 1 and post-test 1 and pre-test 2 and post-test 2 were conducted. Pre-tests 1 and 2 were created based on thirty words and phrases respectively chosenfrom the word list of Unit 8 and Unit 9 of the textbook *Straightforward*. After pre-tests 1 and 2, fifteen words and phrases respectively were chosen as the test content of post-tests 1 and 2. During the study, students in experimental group were supposed to learn fifteen chosen words and phrases with

Memrise course and review them by doing multiple choice and spelling exercises. The daily learning goal of Memrise course was five minutes per day and students were supposed to use the Memrise every day at least five minutes per day. The first and second stage of the study lasted respectively two weeks and four weeks. When participants finished the learning of Unit 8 and Unit 9, immediately post-tests 1 and 2 were conducted to test how much participants had improved in terms of vocabulary accuracy compared to the results of pre-tests 1 and 2. After the experiment, a follow-up interview was conducted in groups to get to know what participants thought of Memrise and how they used Memrise and whether Memrise personally had a positive influence on individual.

At the first stage of the vocabulary test, not all members of experimental group had higher improved accuracy rate compared to the control group. However, at the second stage, all experimental group members who learned vocabulary with the help of Memrise acquired higher improved accuracy rate than the highest accuracy rate in the control group. However, one member from the experimental group did not use Memrise but had higher improved accuracy rate than one member who used it. At both first and second stage of the vocabulary test, the improved average and median accuracy rate of experimental group was much higher than the control group and the improved accuracy rate of each chosen word and phrase in the experimental group was generally higher than the corresponding one in the control group.

According to the analysis of the vocabulary pre- / post-test 1 and pre- / post-test 2 conducted with the help of Memrise, it can be concluded that generally, Memrise has a positive influence on students' vocabulary learning and helps students improve more during the learning process and achieve better results but it is not absolute since the learning result is also affected by personal learning habit, attention etc. The results also indicate that Memrise could counteract a little bit the learning burden of words during the process of vocabulary learning and bigger amount of time spent on Memrise each time tends to lead to better

learning results.

A follow-up interview was conducted among those who used to be members of the experimental groups. Overall participants enjoyed learning vocabulary with the help of Memrise by doing gamified multiple choice and spelling exercises. Most of them reported that Memrise more or less was motivating for them to use since learning with Memrise was either new or different and relaxing compared to learning vocabulary by simply reading the textbook. Two participants revealed that Memrise was not motivating therefore they forgot to use it at times. Apart from that, four students confirmed that Memrise simply was neither attractive nor motivational for them because either there was not anything rewarding or they simply were not willing to do. However, almost all of them believed that Memrise should help with the vocabulary learning if they used it consistently. Meanwhile, participants also reported some problems they observed during the learning process: Memrise system repeated words too often; the system differentiated capital and small letters; the system regarded the note of a word as part of the spelling of the word; definitions of words were too long etc.

Based on the follow-up interview, it is concluded that Memrise can be integrated into 10th grade students' regular English lessons in the way that Memrise courses are created on Memrise webpage platform by adding the word list of each corresponding unit into Memrise together with relatively short definitions either in English or Estonian. Meanwhile, learning and reviewing vocabulary with the help of Memrise app will be part of students' compulsory home assignments and will be written on the dashboard of the school e-learning system Stuudium. Teacher will monitor the vocabulary learning results by checking the LEADERBOARD every day and probably introduces rewarding system to the class based on the LEADERBOARD rankings as a method to motivate students.

Within this experiment, there are some limitations, which cannot be neglected. Firstly, the number of participants was not big enough due to the fact that each group of students had

a different teacher and within each group the number of students was generally small. To make sure the group was taught only by one teacher, the number of participants was maximum eighteen. Even though participants were equally divided into two groups, the number of participants of experimental group and control group varied greatly due to the fact some were absent either in pre-test or post-test or some who were supposed to learn vocabulary with Memrise but actually did not and their data became invalid when counting all the data. Those facts could change data of results drastically making the results not very convincing. Therefore, the experiment was conducted at two different stages and at the second stage members of experimental group and control group swapped to make the results more comparable. The second limitation was that the result was greatly influenced by personal learning habits. Participants of experimental group used Memrise within a period of time, but they did not use it consistently every day in the meaning that some used it at the beginning of the experiment; some used it days before the experiment stopped; some used whenever they remembered. Memrise mobile version has several functions but some only sticked to one function and some used several of them. When controlling these variables, the results of the future experiment might be more precise. More elements which affect the learning result might be discovered.

Further experiment can be conducted among a bigger number of participants to make the results more comparable. Meanwhile, relatively bigger number of words and phrases can be chosen for Memrise course content otherwise the system starts to repeat certain words too frequently and students would easily get bored. Furthermore, the future experiment can use the latest version of Memrise since Memrise updated right after the conduction of this experiment and it already had some changes especially in the aspect of the LEADERBOARD, which shows the ranking of received points of learners. Before updating, learners could only check their ranking of received points after finishing their daily goal but

after updating learners can check the ranking whenever they want. This might be more motivating for learners especially for those who like competing for a higher ranking to easily spend more time learning and reviewing vocabulary. Considering the fact that other vocabulary learning apps like Duolingo, Quizlet, Babble and so on have different functions and might be more suitable and motivating for learners, it is recommended to try different vocabulary learning apps in the future to find out which app or which function could help leaners achieve best learning results.

Similar to the research conducted by Luczak (2017) to test whether Memrise helps with legal English teaching, this study confirms previous finding that Memrise has a positive influence on vocabulary learning and helps achieve better results. Meanwhile this study also finds that Memrise does not guarantee a better learning result because factors such as personal learning habit, attention etc. will affect the learning result. In spite of those limitations mentioned above, this study still fills the gap by discovering that the learning burden of words could be counteracted a little bit from certain extent while learning vocabulary with the help of Memrise app and a better learning result is positively correlated with the amount of time that learners spend on the use of Memrise each time. What is more, this study provides teachers and students with an instruction of how Memrise could more effectively help with vocabulary learning.

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Appendix 1
Introductory questionnaire

Name _____

I am interested in learning more about your vocabulary learning habits and difficulties. Could you please answer the following questions on the basis on your own experience?

Thank you for cooperation!

GaoHeng Wu

1. Where do you study new vocabulary? (circle all the suitable answers, e.g. A)◯

    A In the English class

    B Outside of the English class (e.g. during the break, at home etc)

    C Other (specify): _____

2. How important is it for you to study new vocabulary? (circle the suitable number)

not important at all   very important

1   **2**   **3**   **4**   **5**   **6**
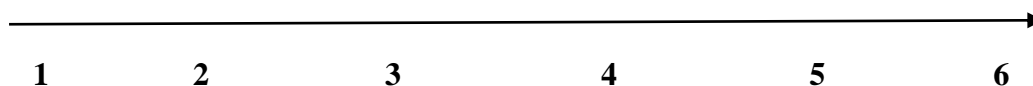
3. How many days a week do you usually study English vocabulary?   _____

4. When you study English vocabulary, how much time do you usually dedicate to it per day?

    A 0 – 15 minutes   **Comment:**

    B 15 – 30 minutes

    C 30 – 45 minutes

    D 45 – 60 minutes

    E More than one hour

5. How do you usually study vocabulary? (Please describe what you usually do for it.)

6. What difficulties do you usually have while studying vocabulary?

Appendix 2
Vocabulary pre-test 1

Name: _____

Translate the following words and phrases into Estonian <u>or</u>, if you wish to, define them in your own words in English.

1. Throbbing
2. Stiff
3. Run-down
4. Swollen
5. Plague
6. Melodramatic
7. Vital
8. Pampering
9. Under the weather
10. Hypochondria
11. A clean bill of health
12. At death's door
13. Stroke
14. Clinical negligence
15. Acute
16. Infirmary
17. Acupuncture
18. Irritable
19. Makeover
20. Chronic
21. Get in the way
22. Stimulate
23. Spectrum
24. Revitalize
25. Staggering
26. Dead-end job
27. Migraine
28. Fluorescent
29. Go off your food
30. Sniff

Appendix 3
Vocabulary post-test 1

Name: _____

Translate the following words and phrases into Estonian <u>or</u>, if you wish to, define them in your own words in English.

1. Hypochondria

2. Clinical negligence

3. Infirmary

4. Staggering

5. Under the weather

6. Pampering

7. Fluorescent

8. Acute

9. Go off your food

10. Vital

11. Revitalize

12. Throbbing

13. Dead-end job

14. Run-down

15. Plague

Appendix 4
Vocabulary pre-test 2

Name: _____

Translate the following words and phrases into Estonian <u>or</u>, if you wish to, define them in your own words in English.

1. Like-minded
2. Grotesque
3. Emulate
4. All-consuming
5. Obsession
6. Minute adj.
7. Sympathetic
8. Immortality
9. Vallain
10. Cynical
11. Armed
12. Mugging
13. Hijacking
14. Vandalize
15. Kidnapping
16. Smuggling
17. Estate
18. Suspended
19. Cold-calling
20. Arrogant
21. Cast a spell
22. Despise
23. Traffic warden
24. Dungeon
25. Know no bounds
26. Pedestrian
27. On the rampage
28. Vengeance
29. Sophisticated
30. Vindictive

Appendix 5
Vocabulary post-test 2

Name: _____

Translate the following words and phrases into Estonian <u>or</u>, if you wish to, define them in your own words in English.

1. Grotesque

2. Emulate

3. All-consuming

4. Minute adj.

5. Villain

6. Cynical

7. Mugging

8. Cold-calling

9. Despise

10. Traffic warden

11. Know no bounds

12. On the rampage

13. Vengeance

14. Sophisticated

15. Vindictive

Appendix 6
The result of pre-test 1

Table 1 Pre-test 1 result of vocabulary no.1 to no.15

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14	No. 15
S1	/	✔	/	✔	/	✔	/	✔	/	/	/	/	/	/	/
S2	/	✔	/	✔	/	✔	/	✔	/	/	/	✔	/	/	/
S3	/	/	/	/	/	✔	/	/	/	/	/	X	/	/	/
S4	✔	X	X	✔	X	/	X	/	X	/	✔	✔	X	/	/
S5	/	✔	X	✔	/	✔	/	/	/	/	/	X	/	X	/
S6	/	/	/	/	/	✔	/	/	/	/	✔	✔	/	/	/
S7	/	✔	/	✔	✔	✔	/	/	/	/	/	X	/	/	/
S8	/	✔	X	✔	✔	✔	X	/	/	X	✔	✔	✔	X	X
S9	/	✔	/	✔	/	✔	X	✔	/	/	/	X	✔	/	/
S10	/	/	/	✔	/	/	/	/	✔	X	/	✔	✔	X	/
S11	/	/	/	✔	/	✔	/	✔	/	X	✔	✔	✔	/	/
S12	/	✔	/	✔	/	✔	/	/	✔	✔	/	✔	✔	/	✔
S13	/	/	X	X	/	✔	/	/	X	/	/	✔	X	/	X
S14	/	✔	X	X	/	✔	/	/	X	/	✔	✔	X	/	/
S15	/	✔	X	✔	/	✔	✔	/	✔	/	✔	✔	✔	/	/
S16	✔	✔	/	✔	✔	✔	✔	✔	/	/	/	X	✔	X	/
S17	✔	/	X	✔	X	✔	✔	X	X	X	X	✔	✔	X	X

Table 2 Pre-test 1 result of vocabulary no.16 to no.30

	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22	No. 23	No. 24	No. 25	No. 26	No. 27	No. 28	No. 29	No. 30
S1	/	/	✔	X	✔	✔	✔	✔	/	/	/	✔	/	/	✔
S2	/	/	✔	X	✔	✔	✔	✔	/	/	X	✔	/	/	✔
S3	/	/	✔	✔	/	✔	✔	/	/	/	/	✔	/	/	✔
S4	/	/	/	X	✔	✔	✔	/	/	/	X	✔	/	X	✔
S5	/	/	✔	X	✔	X	✔	✔	/	/	/	✔	/	/	✔
S6	/	/	X	X	✔	✔	X	X	/	/	/	✔	/	/	✔
S7	/	/	/	X	✔	✔	✔	/	/	/	✔	✔	/	/	✔
S8	✔	X	✔	✔	✔	✔	✔	X	/	✔	✔	✔	/	X	✔
S9	/	✔	✔	✔	✔	✔	✔	✔	X	/	✔	✔	/	/	✔
S10	/	✔	✔	✔	✔	✔	✔	/	/	/	X	✔	/	/	✔
S11	/	✔	✔	✔	✔	✔	/	/	/	/	✔	✔	/	/	✔
S12	/	✔	✔	✔	✔	✔	✔	/	/	/	/	✔	/	/	✔
S13	/	/	X	X	✔	✔	✔	✔	/	/	X	/	/	/	✔
S14	/	/	/	✔	✔	✔	✔	✔	/	/	X	✔	/	/	✔
S15	/	✔	✔	X	✔	✔	✔	X	/	✔	✔	✔	/	/	✔
S16	/	/	✔	✔	✔	✔	✔	/	/	/	✔	✔	✔	/	✔
S17	X	✔	✔	X	✔	✔	✔	X	X	/	X	✔	/	X	✔

Appendix 7
The accuracy rate of each word and phrase in pre-test 1

Table 3 The accuracy rate of each word and phrase in pre-test 1

Number of Chosen Words	Number of Students Who Have Right Answers	Accuracy Rate of Each Chosen Word (%)	Number of Chosen Words	Number of Students Who Have Right Answers	Accuracy Rate of Each Chosen Word (%)
No.3	0	0.00	No.11	6	35.29
No.14	0	0.00	No.17	6	35.29
No.24	0	0.00	No.23	6	35.29
No.29	0	0.00	No.13	8	47.06
No.10	1	5.88	No.19	8	47.06
No.15	1	5.88	No.2	10	58.82
No.16	1	5.88	No.12	11	64.71
No.28	1	5.88	No.18	12	70.59
No.25	2	11.76	No.4	13	76.47
No.1	3	17.65	No.6	15	88.24
No.5	3	17.65	No.22	15	88.24
No.7	3	17.65	No.20	16	94.12
No.9	3	17.65	No.21	16	94.12
No.8	5	29.41	No.27	16	94.12
No.26	6	35.29	No.30	17	100.00

Appendix 8
The result of post-test 1 and accuracy rate of each student in post-test 1

Table 5 Result of post-test 1

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14	No. 15
S1	/	/	/	/	/	✔	/	/	/	/	/	/	✔	/	✔
S2	/	/	/	/	✔	✔	/	/	X	/	/	/	✔	X	X
S3	✔	/	✔	✔	X	✔	/	✔	/	✔	✔	✔	/	✔	✔
S4	/	/	✔	✔	✔	✔	/	✔	/	✔	✔	✔	X	✔	✔
S5	✔	X	✔	✔	✔	✔	/	/	X	✔	/	X	X	✔	✔
S6	/	/	/	/	/	✔	/	/	/	✔	/	/	/	/	✔
S7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S8	✔	X	X	✔	✔	✔	✔	✔	X	X	X	✔	✔	✔	✔
S9	✔	✔	✔	✔	✔	✔	✔	✔	X	✔	✔	✔	✔	✔	✔
S10	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	X	X	✔	✔
S11	✔	✔	✔	/	✔	✔	/	✔	✔	/	/	✔	✔	✔	✔
S12	✔	✔	✔	/	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔
S13	/	/	/	/	X	/	/	/	✔	/	/	✔	X	✔	✔
S14	✔	/	/	/	X	/	/	/	✔	/	/	✔	✔	✔	✔
S15	/	/	/	✔	✔	/	/	/	/	✔	/	✔	✔	/	X
S16	X	X	✔	✔	X	✔	✔	✔	✔	X	✔	✔	✔	✔	✔
S17	✔	/	✔	✔	✔	✔	/	✔	/	✔	✔	X	/	✔	✔

Table 6 Accuracy rate of each student in post-test 1

Group A1	Number of Right Answers	Accuracy Rate (%)	Group B1	Number of Right Answers	Accuracy Rate (%)
S4	10	66.67	S1	3	20.00
S5	8	53.33	S2	3	20.00
S7	—	—	S3	10	66.67
S8	10	66.67	S6	3	20.00
S9	14	93.33	S11	11	73.33
S10	13	86.67	S14	6	40.00
S12	14	93.33	S15	5	33.33
S13	4	26.67	S16	11	73.33
			S17	10	66.67

Appendix 9
Comparison of accuracy rate of each chosen word and phrase between groups A1 and B1 in both pre-test 1 and post-test 1

Table 10 Comparison of each word's accuracy rate between groups A1 and B1 in pre-test 1

Vocabulary and Phrases	Number of Right Answers	Accuracy Rate of Group A1 (%)	Vocabulary and Phrases	Number of Right Answers	Accuracy Rate of Group B1 (%)
Hypochondria	1	12.50	Hypochondria	0	0.00
Clinical negligence	0	0.00	Clinical negligence	0	0.00
Infirmary	1	12.50	Infirmary	0	0.00
Staggering	1	12.50	Staggering	1	11.11
Under the weather	2	25.00	Under the weather	1	11.11
Pampering	1	12.50	Pampering	4	44.44
Fluorescent	0	0.00	Fluorescent	1	11.11
Acute	1	12.50	Acute	0	0.00
Go off your food	0	0.00	Go off your food	0	0.00
Vital	0	0.00	Vital	3	33.33
Revitalize	0	0.00	Revitalize	0	0.00
Throbbing	1	12.50	Throbbing	2	22.22
Dead-end job	3	37.50	Dead-end job	3	33.33
Run-down	0	0.00	Run-down	0	0.00
Plague	2	25.00	Plague	1	11.11

Table 11 Comparison of each word's accuracy rate between groups A1 and B1 in post-test 1

Vocabulary and Phrases	Number of Right Answers	Accuracy Rate of Group A1 (%)	Vocabulary and Phrases	Number of Right Answers	Accuracy Rate of Group B1 (%)
Hypochondria	5	71.43	Hypochondria	4	44.44
Clinical negligence	3	42.86	Clinical negligence	1	11.11
Infirmary	5	71.43	Infirmary	4	44.44
Staggering	5	71.43	Staggering	4	44.44
Under the weather	6	85.71	Under the weather	4	44.44
Pampering	6	85.71	Pampering	7	77.78
Fluorescent	4	57.14	Fluorescent	1	11.11
Acute	5	71.43	Acute	4	44.44
Go off your food	3	42.86	Go off your food	3	33.33
Vital	5	71.43	Vital	4	44.44
Revitalize	4	57.14	Revitalize	3	33.33
Throbbing	5	71.43	Throbbing	5	55.56
Dead-end job	3	42.86	Dead-end job	6	66.67
Run-down	7	100.00	Run-down	5	55.56
Plague	7	100.00	Plague	7	77.78

Appendix 10
Comparison of improved accuracy rate of each word and phrase between groups A1 and B1

Table 12 Comparison of improved accuracy rate of each word and phrase between groups A1 and B1

Vocabulary and Phrases	Increased Accuracy Rate in Group A1 (%)	Vocabulary and Phrases	Increased accuracy Rate in Group B1 (%)
Hypochondria	58.93	Hypochondria	44.44
Clinical negligence	42.86	Clinical negligence	11.11
Infirmary	58.93	Infirmary	44.44
Staggering	58.93	Staggering	33.33
Under the weather	60.71	Under the weather	33.33
Pampering	73,21	Pampering	33.34
Fluorescent	57.14	Fluorescent	0.00
Acute	58.93	Acute	44.44
Go off your food	42.86	Go off your food	33.33
Vital	71.43	Vital	11.11
Revitalize	57.14	Revitalize	33.33
Throbbing	58.93	Throbbing	33.34
Dead-end job	5.36	Dead-end job	33.34
Run-down	100.00	Run-down	55.56
Plague	75.00	Plague	66.67

Appendix 11
LEADERBOARD 1

Appendix 12
The result of pre-test 2

Table 13 Pre-test 1 result of vocabulary no.1 to no.15

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14	No. 15
S1	/	/	/	/	✔	X	✔	✔	/	/	✔	✔	✔	✔	✔
S2	/	/	/	X	✔	/	✔	X	/	/	✔	✔	✔	✔	✔
S4	✔	/	✔	X	✔	/	/	✔	/	/	✔	X	X	/	✔
S5	/	/	/	X	✔	/	✔	✔	/	/	X	X	/	✔	✔
S6	✔	/	/	/	X	/	✔	/	/	/	✔	/	X	✔	X
S8	✔	/	X	X	✔	X	✔	X	X	X	✔	✔	✔	✔	✔
S9	✔	✔	/	/	✔	/	✔	✔	/	/	✔	/	/	✔	✔
S10	✔	✔	/	X	✔	/	✔	✔	/	/	✔	/	/	✔	✔
S11	/	/	/	X	✔	/	✔	✔	/	✔	✔	/	X	✔	✔
S12	/	✔	/	X	✔	/	✔	✔	/	✔	✔	✔	X	✔	✔
S13	/	/	✔	X	X	/	✔	/	/	/	✔	/	✔	✔	✔
S14	/	/	✔	X	✔	/	/	✔	/	/	✔	X	✔	✔	✔
S15	X	/	/	X	✔	/	✔	✔	/	/	✔	X	✔	✔	✔
S16	✔	✔	/	/	✔	/	✔	✔	/	/	✔	✔	/	✔	✔
S17	X	/	/	/	✔	/	✔	X	/	/	✔	/	✔	✔	✔
S18	✔	✔	/	/	X	/	✔	✔	/	/	✔	✔	✔	✔	✔

Table 14 Pre-test 1 result of vocabulary no.16 to no.30

	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22	No. 23	No. 24	No. 25	No. 26	No. 27	No. 28	No. 29	No. 30
S1	✔	X	✔	/	✔	X	X	/	X	/	✔	/	/	/	/
S2	✔	X	✔	/	✔	/	/	X	/	/	✔	/	/	X	/
S4	✔	✔	✔	X	/	✔	/	X	✔	/	✔	X	/	/	/
S5	✔	/	/	X	/	/	/	X	/	/	✔	/	/	X	/
S6	✔	X	✔	/	✔	✔	X	✔	/	X	/	X	/	/	/
S8	✔	✔	✔	/	✔	✔	X	X	✔	X	X	/	✔	✔	/
S9	✔	✔	✔	/	✔	✔	X	X	✔	X	✔	/	/	✔	/
S10	✔	✔	/	X	X	/	X	✔	/	X	✔	/	/	X	/
S11	✔	/	✔	/	✔	✔	X	/	/	/	✔	/	/	/	/
S12	✔	X	✔	/	✔	✔	X	/	✔	/	✔	/	✔	✔	/
S13	✔	✔	✔	/	/	✔	X	✔	✔	/	✔	/	/	/	/
S14	✔	✔	X	/	/	✔	/	/	✔	/	✔	✔	/	/	/
S15	✔	X	✔	X	✔	✔	✔	✔	✔	X	/	/	✔	✔	/
S16	✔	✔	✔	/	/	✔	X	/	✔	X	✔	/	✔	/	/
S17	✔	✔	X	/	X	/	/	/	/	X	X	✔	/	/	/
S18	✔	✔	✔	/	✔	✔	X	/	✔	X	✔	/	✔	/	/

Appendix 13
The accuracy rate of each word and phrase in pre-test 2

Table 15 The accuracy rate of each word and phrase in pre-test 2

Nr of chosen words	Number of students who have right answers	Accuracy rate of each chosen word	Nr of chosen words	Number of students who have right answers	Accuracy rate of each chosen word
4	0	0.00%	1	7	43.75%
6	0	0.00%	13	8	50.00%
9	0	0.00%	17	9	56.25%
19	0	0.00%	20	9	56.25%
25	0	0.00%	24	9	56.25%
30	0	0.00%	8	11	68.75%
22	1	6.25%	21	11	68.75%
10	2	12.50%	18	12	75.00%
27	2	12.50%	26	12	75.00%
3	3	18.75%	5	13	81.25%
23	4	25.00%	7	14	87.50%
29	4	25.00%	11	15	93.75%
2	5	31.25%	14	15	93.75%
28	5	31.25%	15	15	93.75%
12	6	37.50%	16	16	100.00%

Appendix 14
The result of post-test 2 and accuracy rate of each student in post-test 2

Table 17. Post-test 2 result

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14	No. 15
S1	X	✔	✔	✔	✔	✔	✔	✔	✔	X	✔	/	✔	✔	✔
S2	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	✔	/	✔	✔	✔
S4	/	✔	✔	X	✔	✔	X	X	✔	✔	X	X	✔	/	/
S5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
S8	✔	✔	✔	✔	✔	✔	✔	/	X	X	✔	/	✔	✔	X
S9	✔	/	✔	✔	✔	/	X	/	X	✔	✔	/	/	✔	/
S10	✔	/	✔	/	✔	/	X	/	X	✔	✔	X	/	✔	/
S11	X	/	✔	✔	✔	✔	✔	✔	X	✔	X	/	✔	✔	/
S12	✔	/	✔	✔	✔	✔	✔	✔	X	✔	✔	X	✔	✔	/
S13	✔	✔	✔	✔	✔	✔	/	X	/	X	✔	/	/	/	/
S14	✔	✔	✔	✔	✔	✔	✔	X	/	✔	/	✔	/	/	/
S15	X	/	✔	✔	✔	/	✔	/	X	✔	✔	/	✔	✔	/
S16	/	/	✔	/	✔	/	✔	/	✔	/	✔	/	/	✔	/
S17	/	✔	✔	X	X	X	✔	X	/	X	X	X	X	✔	/
S18	X	✔	✔	✔	✔	✔	✔	✔	X	/	✔	/	✔	✔	/

Table 18. Each member's accuracy rate of 15 chosen words in groups A2 and B2 in post-test 2

Group A2	Number of right answers	Accuracy rate	Group B2	Number of right answers	Accuracy rate
S1	12	80.00	S4	7	46.67
S2	14	93.33	S5	—	—
S6	—	—	S8	10	66.67
S11	9	60.00	S9	7	46.67
S14	9	60.00	S10	6	40.00
S17	4	26.67	S12	11	73.33
S18	10	66.67	S13	7	46.67
			S15	8	53.33
			S16	6	40.00

Appendix 15
Comparison of accuracy rate of each chosen word and phrase between groups A2 and B2 in both pre-test 2 and post-test 2

Table 22. Comparison of each word's accuracy rate between groups A2 and B2 in pre-test 2

Vocabulary and phrases	Number of right answers	Accuracy rate of group A2	Vocabulary and phrases	Number of right answers	Accuracy rate of group B2
Grotesque	1	25.00	Grotesque	4	50.00
Emulate	1	25.00	Emulate	2	25.00
All-consuming	0	0.00	All-consuming	0	0.00
Minute adj.	0	0.00	Minute adj.	0	0.00
Villain	0	0.00	Villain	0	0.00
Cynical	0	0.00	Cynical	1	12.50
Mugging	3	75.00	Mugging	3	37.50
Cold-calling	0	0.00	Cold-calling	0	0.00
Despise	0	0.00	Despise	1	12.50
Traffic warden	0	0.00	Traffic warden	3	37.50
Know no bounds	0	0.00	Know no bounds	0	0.00
On the rampage	1	25.00	On the rampage	0	0.00
Vengeance	1	25.00	Vengeance	4	50.00
Sophisticated	0	0.00	Sophisticated	4	50.00
Vindictive	0	0.00	Vindictive	0	0.00

Table 23. Comparison of each word's accuracy rate between groups A2 and B2 in post-test 2

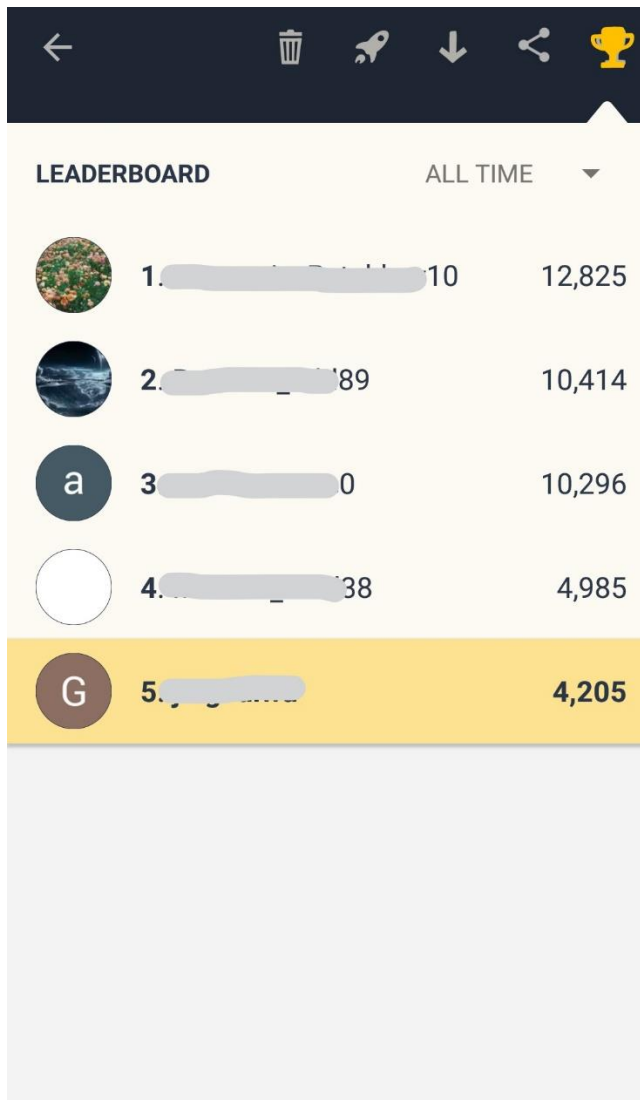| Vocabulary and phrases	Number of right answers	Accuracy rate of group A2	Vocabulary and phrases	Number of right answers	Accuracy rate of group B2
Grotesque	2	50.00	Grotesque	5	62.50
Emulate	4	100.00	Emulate	3	37.50
All-consuming	4	100.00	All-consuming	8	100.00
Minute adj.	4	100.00	Minute adj.	5	62.50
Villain	4	100.00	Villain	8	100.00
Cynical	4	100.00	Cynical	4	50.00
Mugging	4	100.00	Mugging	4	50.00
Cold-calling	3	75.00	Cold-calling	1	12.50
Despise	2	50.00	Despise	2	25.00
Traffic warden	2	50.00	Traffic warden	5	62.50
Know no bounds	3	75.00	Know no bounds	7	87.50
On the rampage	1	25.00	On the rampage	0	00.00
Vengeance	3	75.00	Vengeance	4	50.00
Sophisticated	3	75.00	Sophisticated	6	75.00
Vindictive	2	50.00	Vindictive	0	00.00

Appendix 16
Comparison of improved accuracy rate of each word and phrase between groups A2 and B2

Table 24 Comparison of improved accuracy rate of each word and phrase between groups A2 and B2

Vocabulary and Phrases	Increased Accuracy Rate in Group A2 (%)	Vocabulary and Phrases	Increased accuracy Rate in Group B2 (%)
Grotesque	25.00	Grotesque	12.50
Emulate	75.00	Emulate	12.50
All-consuming	100.00	All-consuming	100.00
Minute adj.	100.00	Minute adj.	62.50
Villain	100.00	Villain	100.00
Cynical	100.00	Cynical	37.50
Mugging	25.00	Mugging	12.50
Cold-calling	75.00	Cold-calling	12.50
Despise	50.00	Despise	12.50
Traffic warden	50.00	Traffic warden	25.00
Know no bounds	75.00	Know no bounds	87.50
On the rampage	0.00	On the rampage	0.00
Vengeance	50.00	Vengeance	0.00
Sophisticated	75.00	Sophisticated	25.00
Vindictive	50.00	Vindictive	0.00

Appendix 17
LEADERBOARD 2

Appendix 18
Interview questions

1. How did you like the Memrise?

2. How often did you use the Memrise?

3. How much time did you spend on Memrise every time?

4. How exactly did use Memrise?

5. Is learning vocabulary with the help of Memrise app motivating? Why?

6. What were your reasons that you did not learn vocabulary with the help of Memrise app?

7. Were there any problems that you noticed while using Memrise?

8. Did you know there was a scoreboard called LEADERBOARD?

9. Would you like to continue to use Memrise?

RESÜMEE

TARTU ÜLIKOOL
ANGLISTIKA OSAKOND

GaoHeng Wu

Application of the Mobile App Memrise as a Vocabulary Learning Tool for 10th Grade Students

Mobiilirakenduse Memrise kasutamine sõnavara õppimise vahendina 10. klassis

Magistritöö

2019

Lehekülgede arv: 91

Annotatsioon:

Käesoleva uuringu eesmärk on teha kindlaks, kas mobiilirakendus Memrise aitab parandada sõnavara meeldejäämist ja kuidas saab Memrise'i integreerida 10. klassi õpilaste tavapärasesse klassiõppesse.

Juhtumiuuring, mis jagati kaheksaks osaks, viidi läbi kaheksateistkümne 10. klassi õpilase seas Tartu prestiižses koolis, kus õpilastel paluti sooritada sõnavara eeltest, seejärel õppida valitud sõnavara Memrise abil ja lõpuks sooritada antud sõnade kohta uus test. Seejärel viidi läbi intervjuu, et teada saada, kuidas osalejad kasutasid Memrise'i ja mida nad sellest keeleõppe rakendusest arvasid. Sõnavara testide andmete analüüs näitas, et üldiselt need, kes õppisid sõnu Memrise abil, saavutasid sõnavara testis parema täpsuse. Tulemus näitab, et Memrise tõepoolest mõjutab positiivselt sõnavara õppimist ja aitab saavutada paremaid õpitulemusi, kuid see ei ole absoluutne. Edaspidi tasuks läbi viia uuring suurema osalejate arvu ja sõnavara mahuga.

Märksõnad: sõnavara õppimine, gümnaasiumiõpilased, keeleõppe, mobiilirakendused, Memrise

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Lõputöö on lubatud kaitsmisele.

Natalja Zagura

20.05.2019