

INVESTIGATING THE EFFECTIVENESS OF A MOBILE DEVICE
SUPPORTED LEARNING ENVIRONMENT ON ENGLISH PREPARATORY
SCHOOL STUDENTS' VOCABULARY ACQUISITION

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ABSTRACT

INVESTIGATING THE EFFECTIVENESS OF A MOBILE DEVICE SUPPORTED LEARNING ENVIRONMENT ON ENGLISH PREPARATORY SCHOOL STUDENTS' VOCABULARY ACQUISITION

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The purpose of this study was to examine the effectiveness of a mobile device supported learning environment on English Preparatory School students' vocabulary acquisition. Mobile devices were mostly used as content delivery tools in former research studies on English vocabulary learning and there is scarce research on active content creation and task-completion using mobile devices. This study aimed to design a web-based system that connects out of class activities to the vocabulary items covered in the curriculum. The sample of the study included the elementary level students of English Preparatory School at METU. Quantitative and qualitative research methodologies were used together in the research design. A quasi-experimental design was carried out in the quantitative phase in order to understand whether the mobile device supported learning environment has a significant effect on the students' motivation and achievement in vocabulary learning compared to the traditional learning environment. Semi-structured interview sessions were carried out in order to understand the students' and the instructors' opinions regarding the mobile device supported learning environment and its usefulness for vocabulary learning. The results of the quantitative phase of the study indicated that the mobile device supported

learning environment had positive effects on the students' motivation and achievement in vocabulary learning. Qualitative data results revealed that the students favored the use of the mobile device supported learning environment but they also mentioned some challenges faced while completing the tasks. The results of the instructor interviews revealed that the method used had both benefits and challenges for the students.

Keywords: Mobile Learning, Vocabulary Learning, Contextual Learning, Visual Imagery

ÖZ

BİR MOBİL DESTEKLİ ÖĞRENME ORTAMININ İNGİLİZCE HAZIRLIK ÖĞRENCİLERİNİN KELİME BİLGİSİ EDİNİMİNE ETKİSİNİN İNCELENMESİ

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Doktora, Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü

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Bu çalışmanın amacı mobil cihaz destekli bir öğrenme ortamının İngilizce Hazırlık Okulu öğrencilerinin kelime öğreniminde etkili olup olmadığını incelemektir. İngilizce kelime öğrenimi konusunda mobil cihazlarla ilgili olarak yapılan daha önceki araştırmalarda mobil cihazlar çoğunlukla içerik sunma aracı olarak kullanılmıştır; fakat mobil cihaz kullanarak aktif içerik yaratma ve görev tamamlama konusunda çok az araştırma mevcuttur. Bu çalışmada sınıf dışı etkinliklerle müfredattaki kelimeleri birbirine bağlayan web tabanlı bir sistem tasarlanması amaçlanmıştır. Çalışmanın örneğine ODTÜ İngilizce Hazırlık programına devam eden temel düzey öğrencileri dâhil edilmiştir. Araştırma tasarımında nicel ve nitel araştırma metodolojileri birlikte kullanılmıştır. Araştırmanın nicel aşamasında, geleneksel öğrenme ortamlarına kıyasla mobil öğrenme ortamının kelime öğrenme konusunda öğrencilerin motivasyon ve başarısı üzerinde anlamlı bir etkisi olup olmadığını anlayabilmek için yarı-deneysel tasarım kullanılmıştır. Mobil öğrenme ortamı ve bu ortamın kelime öğrenimine faydası konusunda öğrencilerin ve okutmanların görüşlerini anlayabilmek adına yarı yapılandırılmış görüşmeler yapılmıştır. Çalışmanın nicel aşamasının sonuçları mobil öğrenme ortamının kelime öğrenmede

öğrencilerin motivasyon ve başarısı üzerinde olumlu etkisi olduğunu göstermiştir. Nitel veri sonuçları öğrencilerin mobil öğrenme ortamının kullanılmasından memnun olduğunu göstermiştir, fakat aynı zamanda öğrenciler görevleri yerine getirirken karşı karşıya kaldıkları bazı zorluklara değinmişlerdir. Öğretmenlerle yapılan görüşmelerin sonuçları kullanılan yöntemin hem faydaları hem de zorlukları olduğunu göstermiştir.

Anahtar kelimeler: Mobil Öğrenme, Kelime Öğrenme, Bağlamsal Öğrenme, Görsel Canlandırma

To Dilek...

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Advancements in telecommunication technologies led manufacturers to produce hand-held mobile devices and these devices continuously evolve to provide various opportunities for the users. The aspects of portability and instant access of these mobile devices led educational researchers to implement mobile learning strategies in diverse fields of study. One of these fields is teaching and learning English as Foreign Language (EFL). There are many studies in the literature focusing on possible ways to improve learning EFL by using the mobile device supported learning environments (Cavus & Ibrahim, 2009; Clarke, Keing & Lam, 2008; Lu, 2008; Stockwell, 2007; Saran, Seferoglu & Cagiltay, 2012). The common opportunity that is provided by these studies is that learners can expand their learning process outside their classrooms and continue to practice EFL in their leisure times.

Mobile learning can simply be defined as learning with the use of mobile devices and wireless technologies without the limitations of time and place (Ally, 2009). Mobile learning is mostly considered individualistic because learners interact with the learning materials on their mobile devices at their own pace. On the other hand, some researchers note that mobile learning need to consider social aspects of learning where learners co-create knowledge and support each other as a community (Sharples, Taylor & Vavoula, 2005). The focus of mobile learning is vague in the literature. Winters (2007) argues that mobile learning should be concerned with the mobility of the learner instead of the mobile device itself. In other words, the device is just a mediator which enables the learners' mobility and provides opportunities for them to take advantage

of the distinctive features of the device for learning. Mobile learning considers the learning process from the learner's perspective and the mobile device ensures that the learner's needs are addressed when the learner is not at a pre-determined place but on the move (O'Malley et al., 2003). Therefore, the type of the mobile device needs to be determined by placing the learner and his/her learning needs at the center of the design of the learning environment instead of adapting the learning environment for a specific device.

Kukulska-Hulme and Traxler (2005) identified several devices that can be categorized as mobile devices such as cell phones, smartphones, tablet PCs, laptops and handheld computers. The devices that fall in this categorization have wireless communication and portability features. For mobile learning, the size of the device should be small in order to be able to carry it everywhere (Keagen, 2005). Among these devices, the mobile phone seems to be the most appropriate one and it is the most popularly used device among students. The questionnaire that was distributed to the students in English Preparatory school of a private university revealed that all of the participants had a mobile phone and 87% of them categorized their phones as smartphone, and on the other hand, only 46% of the students have a tablet PC (Bakay, Bulut & Delialioglu, 2013). The distinction between a regular mobile phone and smartphone might not be clear, but smartphones have more powerful processing capabilities, provide better connectivity over networks and provide many more features such as touch-screen, advanced cameras, storage and applications. With their advanced features and capabilities, smartphones have the potential to be used for new ways of learning inside and outside the classroom.

English language can be considered as one of the most important languages in the world since most of the communication and sharing of information are done in English. There are several universities spending a whole year teaching their students EFL. There are many dimensions of learning a foreign language, but especially reading and vocabulary knowledge constitute the most important ones (Huckin, Haynes & Coady, 1993). Vocabulary learning is one of the crucial aspects of EFL since vocabulary forms the basic structure of sentences and it is essential for good academic reading

comprehension (Nation, 1993). Without enough vocabulary knowledge, meaningful inferences cannot be made from reading texts. Laufer (1992) found that the threshold value for vocabulary knowledge is 3.000 words for effective reading comprehension. Also, Nation (1993) states that familiarity with the most frequent 2.500 to 3.000 words is essential for language learners, and otherwise, it is not possible to gain language use skills. Therefore, enhancing the vocabulary knowledge of learners should be an essential concern in language education.

One of the most important dimensions of vocabulary learning is the presence of context for meaningful acquisition of the vocabulary items. Use of dictionary remains as a decontextualizing vocabulary learning technique which provides the definition of the words but lacks the relevant context of use for the words (Oxford & Crookall, 1990). Using decontextualizing and contextualizing vocabulary learning techniques are suggested to be used in combination since the former increases the breadth of the vocabulary knowledge whereas the latter increases the depth of it (Ma, 2009). Another important dimension of vocabulary learning is repetition. Effective vocabulary acquisition requires continuous practicing and rehearsing since these have important effects on permanent learning (Nation, 2001). According to the memory model proposed by Atkinson and Shiffrin (1968), information received by the sensory organs stays in short-term memory for a while and is not transferred to long-term memory unless it is rehearsed and practiced. Brown, Collins and Duguid (1989) states that knowledge is developed within activities, contexts and cultures and it is not possible to fully abstract knowledge away from these. Therefore, interacting with the world outside the classroom has the potential to help learners contextualize their English vocabulary learning and these real-world experiences can leave traces of meaningful vocabulary understanding in learners' long-term memories instead of mere memorization of words.

Nation's (2001) three-stage model suggests that there are three psychological processes that must take place for effective vocabulary acquisition, which are noticing, retrieving and creative/generative use. During the noticing stage, the learner becomes aware of the word and pays attention to it. In the retrieving stage, the learner repeatedly

retrieves the meaning of the word from memory and strengthens the association. In the final stage, the learner creates a different context with use of the word such as using the word in several different sentences. Considering these processes for effective vocabulary acquisition, all the three stages and especially the stage of “creative/generative use” were implemented for this study by letting learners associate the words with personally-created contexts.

Student motivation is considered as a vital factor that affects learning to a large extent. Students’ decisions to pursue learning goals, their efforts and determinations to complete tasks are highly affiliated to student motivation (Pintrich, Marx, & Boyle, 1993; Pintrich & Schunk, 2002; Broussard & Garrison, 2004). Furthermore, student performance in academic environment is found to be highly dependent on student motivation (Davis, Winsler, & Middleton, 2006; Zepeda et al., 2015). In language learning settings, motivation is accepted as one of the central elements since the remaining elements of language learning are constructed upon motivation (Gardner, 2001). Unlike other subject areas of learning, language learning requires more attention to social dimension than practicing grammatical rules or other skills. (William, 1994). In other words, social interaction is more important for language learning as compared to other subject areas. The degrees of social interactions within language learning situations such as cooperative, competitive and individualistic ones were found to have different impacts on the motivations of learners to complete language learning tasks, and among these, cooperative ones were found to have the highest impact on student motivation (Julkunen, 2001). Therefore, it is essential to consider motivational issues together with social interaction as highly influential on academic achievement in language learning settings.

1.2 Purpose of the Study

The main purpose of this study was to design and implement a mobile device supported learning environment for learners of English in order to enhance their vocabulary knowledge. The present study proposed a mobile learning system which included a vocabulary pool for each week and the students were encouraged to share their real-

world experiences using the words in the pool. In order to achieve this aim, the learners were provided with information about the vocabulary items (definition, word form, spelling and pronunciation), example uses of the words in sentences and their visual representations through the mobile learning system. Then, the learners were asked to create their own visual representations by taking photos and forming sentences that describe their photos. Specifically, this study had the following objectives:

- To investigate the effect of the mobile device supported learning environment on students' English vocabulary acquisition.
- To investigate the effect of the mobile device supported learning environment on students' motivations for English vocabulary acquisition.
- To investigate the students' perceptions regarding the use of the mobile device supported learning environment for English vocabulary acquisition.
- To investigate the instructors' perceptions regarding the method used for English vocabulary acquisition.

1.3 Research Questions

1. What is the effect of the mobile device supported learning environment on students' English vocabulary acquisition?
 - Is there a significant difference between the two groups of students' (mobile group, traditional group) gain scores in vocabulary achievement tests?
2. What is the effect of the mobile device supported learning environment on students' motivations for English vocabulary acquisition?
 - Is there a significant difference between the two groups of students' (mobile group, traditional group) motivation scores in the motivation scale?
3. What are the perceptions of students regarding the mobile device supported learning environment for English vocabulary acquisition?
4. What are the perceptions of instructors regarding the method used for English vocabulary acquisition?

1.4 Significance of the Study

In the literature, the use of mobile devices for language learning is referred to with the term “mobile-assisted language learning (MALL)” and uses of various types of mobile devices for language learning were examined under this term (Chinnery, 2006). Kukulska-Hulme and Shield (2008) reviewed several studies related to MALL and categorized the approaches used in these studies under two headings which are content-related and design-related approaches. The authors define the content-related approaches as mere usage of mobile devices for delivering content without considering any kind of further interaction of learners to enhance learning process. On the other hand, the design-related approaches differ from content-related approaches in which “learners define their own learning and even provide materials to other learners” (Kukulska-Hulme & Shield, 2008, p. 278). There are various smartphone applications that aim to enhance MALL by providing access to information anytime and anywhere but they remain “...weak in realizing mobility as a more situated, field-dependent, and collaborative learning opportunity” (Kim & Kwon, 2012, p. 53). Wang and Shen (2012) emphasize the importance of real-world experiences in mobile device supported learning environments for active creation of knowledge which is defined as “the product of interaction between people and the environment” (p. 564). In most contemporary research studies involving mobile phones for vocabulary learning, materials were sent to the learners as text messages (Cavus & Ibrahim, 2009; Clarke, Keing & Lam, 2008; Lu, 2008; Stockwell, 2007; Stockwell, 2010) or multimedia messages (Saran, Seferoglu & Cagiltay, 2012) in pre-established time intervals. These studies made use of portability of the mobile devices, but they did not include interaction of the learner with other learners and with the outside world. In their review of MALL studies, Kukulska-Hulme and Shield (2008) argue that most of these studies regard learners as passive recipients of the delivered content and there is scarce research on considering learners as active constructors of knowledge through real-world and peer-to-peer interactions. As Hashemi and Ghasemi (2011) argue, mobile learning is a way to get out of classroom boundaries and learn by interacting with the world outside in addition to what classrooms have to offer.

In a classroom setting, students are generally involved in incidental vocabulary learning strategies by guessing the word meanings from the given contexts of reading passages (Hirsch, 2003). However, use of a word in a personally created context provides better learning than use of a context which is created by another person (Hall, 1991, as cited in Nation, 1993). Therefore, classrooms limit the opportunities for students to actively create contexts relevant to target vocabulary words. Nation (1993) states that fluency of access to a word from memory is highly correlated with the number of associations the word has. Thus, vocabulary learning can be enhanced with contextual learning environments where learners can make associations with the words in specific contexts. Personal experience has a direct relationship with contextual learning since “knowledge is created through the transformation of experience” (Kolb, 1984, p. 41). Learning through experience allows learners to ground their understanding of concepts in their minds by actively building ideas together with their relations to each other (Barab, Barnett, & Squire, 2002). Mobile vocabulary learning activities have the potential for learners to grasp the meaning of a target word by associating it with a real-world experience, and in-class activities remain inadequate for students to involve in meaningful experiences of their own. There is scarce research on mobile vocabulary learning which considers learners as active constructors of knowledge in real-world settings. Therefore, the aim of this study was to design and implement a mobile device supported learning environment for EFL that connects out-of-class activities with the covered vocabulary items in the curriculum. It is a unique system that uses the capabilities of mobile devices to support active creation and sharing of content among learners anytime and anywhere.

1.5 Definitions of Terms

EveryMe: The mobile sharing application used throughout the pilot study.

MeWe: The mobile sharing application used throughout the main study.

Mobile device: A portable, wireless computing device that is small enough to be used while held in hand (Mobile Device, 2017).

Mobile learning: It can be simply defined as the use of mobile devices with the purpose of learning without the limitations of time and space.

Vocabulary: All the words that exist in a particular language object (Vocabulary, 2017).

1.6 Abbreviations

ARCS: It stands for four strategy components of Keller's (1987) model of motivational design which are Attention, Relevance, Confidence and Satisfaction.

EFL: English as Foreign Language

MALL: Mobile Assisted Language Learning

FRAME: The Framework for the Rational Analysis of Mobile Education

CHAPTER 2

LITERATURE REVIEW

This section provides information from the literature relevant to this study. The topics covered in this section are mobile learning, effects of media and method on learning, effects of student motivation on learning, vocabulary learning in EFL and research on mobile vocabulary learning.

2.1 Mobile Learning

Educational research studies on mobile learning have increased in the last decade due to new developments in information and communication technologies. Mobile learning has various definitions in the literature. Some people define it together with devices and mobile technologies while some others emphasize the mobility and mobile experiences of learners (Traxler, 2009). Ally (2009) summarizes mobile learning as learning by accessing information and learning materials through wireless technologies at anytime and anywhere. Learning with mobile devices has its own advantages compared to traditional learning environments. In other words, mobile devices have some unique features that create new opportunities for teaching and learning (Ally, 2009). Among these features, the portability feature lets learners carry their learning processes wherever they go. Accessibility and connectivity are other important features that let learners stay connected with their learning processes whenever they need. Mobile learning is mainly individualistic since learners make progress at their own pace by interacting with their own mobile devices. However, as Sharples, Taylor and Vavoula (2005) argue, mobile learning also needs to adopt the view of social-constructivism where learners build their own knowledge with the help of a supportive community for an effective learning experience. In their review of the publications regarding mobile-assisted language learning (MALL), Kukulska-Hulme

and Shield (2008) argue that the nature of mobile learning is shifting from content delivery to social interaction and collaboration. Implementing mobile device supported learning environments that include social interaction becomes much easier as mobile technologies improve in terms of enhanced connectivity to the Internet and available resources and softwares for user interaction.

Mobile learning is composed of interconnected dimensions that contribute to the effectiveness of learning outcomes such as learners, mobile devices and social interaction. All of these dimensions and their relation to each other need to be considered while designing mobile device supported learning environments. A framework for mobile learning is needed as reference to understand the roles of these dimensions for mobile learning and to address their relations to each other. Koole (2009) developed a framework called the “FRAME Model” that addresses these dimensions of mobile learning as depicted in Figure 2.1.

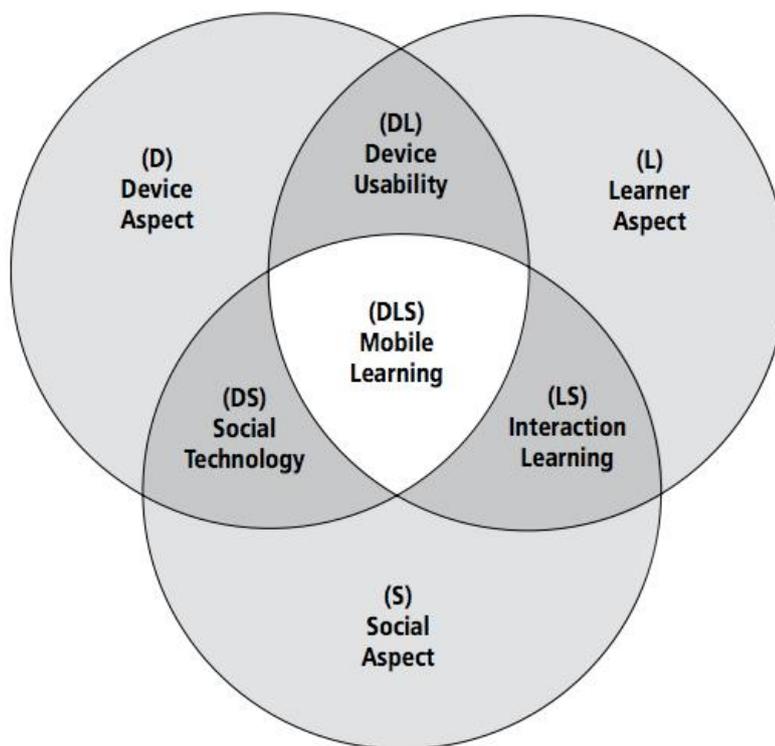


Figure 2.1 FRAME Model for Mobile Learning

The FRAME Model is composed by considering personal and social dimensions of learning as well as technical characteristics of mobile devices which mediate the learning process (Koole, 2009). In this model, three main aspects of mobile learning are identified as the device aspect, learner aspect and social aspect, which intersect with each other in a Venn diagram. The main aspects are explained as follows:

Device Aspect (D): Device aspect refers to the technical features and capabilities of mobile devices that shape their corresponding roles and functions in a mobile device supported learning environment. It is important to evaluate this aspect carefully since it forms the bridge between the learner and technology. Koole (2009) provided several criteria for the evaluation of devices for mobile learning such as their physical characteristics, file storage mechanisms, processing and input-output capabilities. While mobile device supported learning environments are designed, the type of mobile devices that will be used by the learners should be evaluated based on these criteria in order to fulfil the technical requirements of the learning environment. Satisfying these requirements constitutes great importance for the usability of devices, which has a direct effect on focusing on cognitive tasks by learners (Koole, 2009).

Learner Aspect (L): The learner aspect refers to learner characteristics that describe cognitive abilities, emotions and motivations of learners (Koole, 2009). It mainly considers the ways individuals encode, retrieve and transfer information based on their prior knowledge and personal capabilities. Koole (2009) argues that mobile learning can utilize a learner's "episodic memory", which is formed by the information received through personal experience of events (Tulving & Thomson, 1973). Episodic memory requires real-world experiences such as travelling to a city or visiting a museum instead of receiving information directly. In this model, therefore, the learner is defined as an active manipulator of information who understands the presented concepts and transfers this understanding to different contexts and situations by providing new solutions in real-world settings.

Social Aspect (S): The social aspect refers to social interaction and cooperation among learners. Koole (2009) states that the social aspect enables individuals to exchange

information by making relevant contributions through effective communication. The author expresses that there should be a common understanding among the individuals of the social community where the interaction takes place. In other words, participants need to share information with each other based on pre-defined rules in order to avoid miscommunication and misinterpretation. As a result, the social aspect is defined as the quality of communication and cooperation among learners who share their own understanding of concepts and give feedback to each other through social interaction.

Each aspect in this model intersects with the other aspects and forms intersections. Each intersection is explained as follows:

Device Usability Intersection (DL): This intersection refers to the elements of both the device aspect (D) and the learner aspect (L). Koole (2009) defines this intersection as the characteristics of mobile devices that have effects on individuals' psychological comfort and satisfaction while interacting with these devices. There are four criteria to evaluate mobile device usability in this model. Firstly, the mobile device needs to be portable in a way that the learner is able to carry it to different places under different circumstances without any hardship. Secondly, the learner needs to be able to access the stored information whenever and wherever it is needed. The third criteria is related to the learner's psychological comfort to use the mobile device. Psychological comfort is directly related with the learner's pace of getting used to the mobile device in terms of grasping the main functions of the device to complete the required tasks on it (Nielsen, 1993). The fourth criteria is related to the learner's overall satisfaction with the device regarding its aesthetic features related to user interface and physical appearance. Koole (2009) argues that the cognitive load on learners should be minimized during the design process since humans have limited capacity to retain information. In summary, the device usability intersection (DL) brings the physical and technical features of the device and the learner's characteristics and needs together.

Social Technology Intersection (DS): This intersection differs from device usability intersection since the latter is related to the interaction between a "single" device and

a “single” learner as mentioned in the device usability intersection part. Social technology intersection, however, deals with the communication of “multiple” learners through “multiple” devices and systems (Koole, 2009). The main issue to consider in this intersection is the quality of networking and connectivity of all learners through the interface of the mobile learning system. The networking capabilities of mobile devices need to be examined to identify the types of wireless connectivity standards that are supported by these devices and which ones are required for the design process. Learners need to have connectivity to the mobile learning system and they need to be able to access or share information through the system interface. Moreover, the mobile learning system needs to support tools that allow collaboration and communication for learners.

Interaction Learning Intersection (LS): This section refers to theories of learning and instruction and the main philosophy adopted in this model is social constructivism (Koole, 2009). Regarding this view, Smith and Ragan (1999) argue that learning occurs as a result of collaborative process of meaning making with respect to multiple views of participants. There are three types of interaction that occur in this intersection proposed by Moore (1989) in the context of distance education. They are called learner-content, learner-instructor and learner-learner interactions. The learner-content interaction refers to the learner’s interaction with learning materials resulting in cognitive changes on the learner. Interaction with other people is mostly emphasized in this intersection since social negotiation can help learners to realize their potentials by filling the gap between what they currently do and what they can actually do as it is proposed by Vygotsky’s (1978) “zone of proximal development”. Koole (2009) expresses that learning communities enable learners to help each other on their learning processes when mutual goals are intended to be achieved.

Mobile Learning Process (DLS): Mobile learning process refers to the intersection of device (D) aspect, learner (L) aspect and social (S) aspect of the FRAME model. An effective mobile learning process can be achieved by enhancing the cognitive environment where learners can interact with materials, instructors and other learners in a relevant way (Koole, 2009). One of the key points in this process is the

identification of accuracy and relevancy of information by learners since information is abundant on the Internet. Brown (2005) posits that there is a shift of paradigm from knowledge production to knowledge navigation. Knowledge production paradigm refers to the instructor as a decision-maker regarding the questions of what information needs be learned and how it should be learned by learners. On the other hand, knowledge navigation paradigm refers to the instructor as a mentor who helps learners to gain skills on how to acquire information and apply it to new situations by themselves. Koole (2009) argues that the role of the instructors shifts to mentors within knowledge navigation paradigm. Therefore, this new paradigm leads learners to take control of their own learning process by making use of the affordances of the mobile device supported learning environments. The term “affordance” was first defined by Gibson (1977) as “a quality or feature of an object, or of an environment, that allows an individual to perform an action.” (as cited in Woodill, 2014, p. 111). It was later adapted to educational contexts with the term “educational affordance”. Educational affordances are defined as “the relationships between the properties of an educational intervention and the characteristics of the learner that enable particular kinds of learning by him/her” (Kirschner, 2002, p. 19). The FRAME model can provide beneficial guidelines for designing mobile device supported learning environments that exploit educational affordances of mobile technologies by considering all the three aspects of mobile learning and their interactions with each other.

2.2 Effects of Media and Method on Learning

The question of whether media affect learning has been constantly questioned during past decades. There are different views on this subject in the literature. Major views on this subject were put forward by two researchers, Kozma and Clark. Their opposing arguments on the issue have formed a debate in the literature on the effect of media on learning. Kozma (1991) promotes the positive effect of media whereas Clark (1983) attributes no value to media concerning its effect on learning. The major arguments of these two researchers regarding the effect of media on learning are given in this section.

Clark (1983) holds the view that media are just vehicles for instruction and have no value for the success of students. He states that the important aspect of instruction is the method that is used to transfer cognitive skills regardless of the media used. Contrary to Clark's (1983) view of medium as a mere delivery tool, Kozma (1994) argues that learning cannot be simplified with a basic response to such delivery. He defends the idea that different media can influence instructional design by taking different characteristics of media and learners into consideration. He indicates that "...learner strategically manages the available cognitive resources to create new knowledge by extracting information from the environment and integrating it with information already stored in memory" (Kozma, 1991, p.179). He also asserts that particular features of media such as their symbol systems and corresponding processing capabilities can create new opportunities for learners. Clark (1983) argues that treatments such as the instructional method and the content must be identical while comparing two different media, and he claims that the studies comparing different media violate this requirement. Therefore, the question that needs to be asked at this point may be whether a new instructional method, which makes use of a different medium, would accomplish better learning outcomes by following the same instructional procedures of a conventional method.

Kozma (1994) argues that conventional methods are insufficient to convey real-world events into learning environments, and taking advantage of different characteristics of media can have positive impacts on learning processes in terms of designing better equipped environments where conventional methods fail to do so. Several research studies suggested that students who made use of a particular symbol system alone had more difficulty to retain knowledge than students who made use of more than one symbol system (Kozma, 1994). Moreover, these studies suggested that taking the advantages of media with different symbol systems and processing capabilities had different effects on different learners based on their characteristics and level of domain knowledge. As Kozma (1994) states, poor learners may rely on different symbol systems to build mental models in memory whereas others may accomplish the same by relying on just one symbol system such as textual information. Furthermore, the

type of the tasks used in a learning environment may take advantage of different aspects of the used symbol systems (Kozma, 1994). Based on this argument, the appropriate integration of different symbol systems of media may produce additional advantages especially for poor learners and their learning processes.

Kozma (1994) states that distinguishing between media and method, which is suggested by Clark (1983), is undesirable since they are both elements of instructional design and each of them needs to use the other's advantages in terms of designing methods based on the capabilities of media. He also adds that social problem solving environments for the students can shape the direction of the method and media in an integrated way. Moreover, he concludes that there is no reason to stop researching the influence of media on education because as the time passes there new developments regarding the capabilities of media occur, and these developments may play a critical role in designing and improving instructional methods.

In the current study, smartphones were used as media in a mobile device supported learning environment and a social sharing application was used as the learning interface. The use of smartphones provides some opportunities for learners compared to conventional learning environments. For instance, learners can reach information and participate using their smartphones without the restrictions of time and space. Moreover, the learning interface of the application enables learners to interact with each other and examine each other's work without being in the same place at the same time. In other words, learners can carry their learning process wherever they go and participate in the learning environment whenever they want. These opportunities are provided by making use of the distinctive characteristics of the medium such as mobility, immediate access and portability. However, learning opportunities provided by a medium do not guarantee positive learning outcomes. The instructional method should be considered carefully during the design of a learning environment with a specific medium. In other words, media present new opportunities for learning but method can show how these opportunities can actually be used for the learning process. The current study was designed by adapting a conventional method while the above-mentioned features of mobile device supported learning environments were exploited.

2.3 Effects of Student Motivation on Learning

There are various factors that have effect on learning and student motivation is a crucial one. Motivation can be defined as the process of initiating and sustaining an activity towards a certain goal (Pintrich & Schunk, 2002). Student motivation has a direct influence on the student's decision regarding whether to complete or not to complete a learning goal (Broussard & Garrison, 2004). It affects the amount of effort put by a student on a task and his/her determination to complete it (Pintrich, Marx, & Boyle, 1993). The literature suggests that academic performance and achievement of the students are positively correlated with their motivations to learn (Davis, Winsler, & Middleton, 2006; Zepeda et al., 2015). Therefore, it is essential to consider motivational issues in an instructional setting.

Two types of motivation are mainly mentioned in the literature, which are extrinsic motivation and intrinsic motivation (Deci, Koestner, & Ryan, 1999). Extrinsic motivation is defined as “a construct that pertains whenever an activity is done in order to attain some separable outcome” (Ryan & Deci, 2000, p. 60). Thus, it is related to external rewards that are independent from the activity itself but offered by external sources for successfully completing the activity in return. These rewards may include getting a good grade from a course, pursuing graduation to find a good quality job or completing different certificate programs to increase income. On the other hand, intrinsic motivation is defined as “the doing of an activity for its inherent satisfactions rather than for some separable consequence” (Ryan & Deci, 2000, p. 56). It is directly related to internal values to complete the activity such as willingness to participate in the activity and desire to learn its content.

There are different views regarding the effects of extrinsic motivation and intrinsic motivation on each other as well as on academic performance of students. In their study, Deci et al. (1999) found that extrinsic rewards, which are tangible, influence intrinsic motivation in a negative way but verbal rewards have a positive influence on it. On the other hand, the study conducted by Eisenberger, Pierce and Cameron (1999) demonstrated that extrinsic rewards have positive effects on self-determination, which

increases both the performance and intrinsic motivation of learners. Moreover, another research study revealed that extrinsic rewards are useful for lower grade students but not for college level students (Davis et al., 2006). In general, extrinsic rewards are not regarded as ineffective for student performance but intrinsic motivation is recognized to have better outcomes in the long term (Perrell, Erdie, & Kasay, 2017).

Motivation for language learning is conceptualized by different models and theories. Gardner's (1985) Socio-educational Model is among the most recognized ones and it includes two types of motivation, which are integrative motivation and instrumental motivation. The integrative motivation refers to the learner's willingness to learn the language for the primary purpose of communication in the target language and with the target community. It is more related to the intrinsic motivations to learn the language without additional purposes. On the other hand, the instrumental motivation is more related to the extrinsic motivations to learn the language and refers to secondary purposes of learning the language such as getting a good grade or finding a good job.

Motivation is regarded as a central element in language learning since other elements are based on motivation to show their effects on the learning process (Gardner, 2001). For instance, the strategies used for language learning cannot make any difference if the individual is reluctant to learn the language in the first place. William (1994) argues that language learning is different from other subject areas because of its social dimension, and it involves more than learning grammatical structures or acquiring skills. Therefore, presence of social interaction and communication is more crucial for language learning motivation compared to other subject areas (Dörnyei, 1998). In a research study, the motivation to complete language learning tasks was found to be influenced differently by the situation in which learning took place which are cooperative, competitive and individualistic situations (Julkunen, 2001). The study included 593 students and the learning tasks were completed in these three different situations. The results of the study revealed that only high achiever students reported positive responses in the individualistic and competitive situations. In the cooperative

situation, all of the responses were positive regarding the motivation to complete the tasks.

The language instructors' use of strategies for increasing student motivation can provide practical implications. In order to identify the most frequently used strategies for increasing student motivation, Dörnyei (1998) conducted interviews with more than 50 language instructors. Based on their responses, the following 10 strategies were listed as the most beneficial ones for student motivation in language learning:

1. Set a personal example with your own behavior.
2. Create a pleasant, relaxed atmosphere in the classroom.
3. Present the tasks properly.
4. Develop a good relationship with the learners.
5. Increase the learner's linguistic self-confidence.
6. Make the language classes interesting.
7. Promote learner autonomy.
8. Personalize the learning process.
9. Increase the learners' goal-orientedness.
10. Familiarize learners with the target language culture.

2.3.1 ARCS Model of Motivational Design

Motivation is addressed under different theories and models in the literature. Keller's (1987) ARCS model of motivational design is a commonly accepted model that is grounded on various theories of motivation and it is mainly used for sustaining student motivation throughout an instruction. It includes four strategy components, namely attention, relevance, confidence and satisfaction. These components are briefly explained as follows:

- Attention component refers to increasing the level of arousal, curiosity and interest in target learners;
- Relevance component refers to increasing the relevance of the tasks to the target learners regarding their needs, interests and motives;

- Confidence component refers to increasing target learners' level of expectations for their own achievement; and
- Satisfaction component refers to increasing target learners' level of satisfaction both through intrinsic and extrinsic reinforcements on the tasks (Keller, 1987).

Attention component is recognized as a prerequisite for the other components since it is not possible to talk about a state of motivation without catching learners' initial attention. Keller (1987) argues that arousing interest in learners is not that difficult but sustaining it is challenging since learners easily adapt to the new situation and are prone to lose their interest. Use of unusual and unexpected stimuli is suggested to keep learners' attention. In addition, use of multimedia such as illustrations, animations and interesting videos in certain parts of the instruction is regarded as beneficial for sustaining attention and curiosity. Providing concrete examples related to the concepts is also essential for arousal of interest.

The component of relevance is suggested to be built by considering learners' needs based on their prior experiences, learning preferences and goal orientations (Keller, 1987). The key point is to make learners believe that the content or the method of instruction can add value to their personal learning needs and goals. If learners perceive a contradiction between the given instruction and their personal needs, then they might decrease their efforts to achieve what is expected from the instruction. Moreover, learning needs must be fulfilled by learners' personal choices.

The third strategy component is confidence and it is suggested to be built by making students internalize the feeling of success through the promotion of positive expectancies from the instruction (Keller, 1987). It is crucial to keep a balance between the level of expectations from the instruction and the necessary student effort to meet those expectations. Students' confidence might be negatively affected if the required effort is too high compared to the expected success level. Students need to believe that the effort they make is worth the expected achievement. Furthermore, providing an appropriate level of learner independence and control over learning is important.

The last strategy component is satisfaction and it is suggested to be built by making use of extrinsic and intrinsic reinforcements throughout the instruction (Keller, 1987). Extrinsic rewards should be used with caution since they might have negative influences on intrinsic motivation (Deci et al., 1999). Learner satisfaction is also dependent on the fairness of work load, grading and reasonable learning objectives that are consistent with the content and method of instruction.

2.4 Vocabulary Learning in EFL

English language is viewed as the universal language today and being proficient in English is the primary requirement for communication and obtaining information from the world. Several universities spare a whole year before undergraduate education to provide English language education for their students. Learning English language is composed of acquiring different but interconnected core skills such as reading, listening, writing and speaking. Alongside with these core skills, vocabulary knowledge is considered as the fundamental building block of EFL, and it is essential for those core skills, especially for good academic reading comprehension (Nation, 1993; Huckin, Haynes & Coady, 1993). In the literature, several threshold levels were identified for the necessary vocabulary size to understand the basic usage of English language (West, 1953; Laufer, 1992; Nation, 1993). West (1953) suggests a list of 2.000 high frequency words to be learned in order to understand general use of the English language in simple texts. Laufer (1992) asserts that knowledge of at least 3.000 words is essential for effective reading comprehension. On the other hand, familiarity with 2.500 to 3.000 words is regarded as a threshold value for gaining the necessary skills for effective language use (Nation, 1993). Therefore, enhancing the vocabulary knowledge of learners should be an essential concern in language education.

Vocabulary acquisition in a second language differs from vocabulary acquisition in the native language since the learner already has the conceptual meanings which are linked to the words in his/her native language. Unlike vocabulary learning in the native language, it is difficult for the learner to enrich his/her vocabulary knowledge in a second language by just receiving language input (Takač, 2008). Ma (2009) argues

that there are two dimensions for vocabulary knowledge, which are breadth and depth. The former refers to the quantitative aspect of the lexical items a learner knows. In other words, it refers to the number of vocabulary items recognized by a learner superficially without considering additional conceptual connections. On the other hand, depth of vocabulary knowledge simply refers to the quality of learned vocabulary items which have a network of connections with other vocabulary items included in several contexts.

2.4.1 Cognitive Aspects of Vocabulary Learning

In the original human memory model that was developed by Atkinson and Shiffrin (1968), human memory structure includes three interconnected stages which are sensory memory, short-term memory (working memory) and long-term memory. In this model, several control processes of working memory which are presented under the immediate control of the subject. One of the most important control processes is rehearsal (Atkinson & Shiffrin, 1971). According to the model, rehearsal is the active repetition of information in working memory, either overtly or covertly, to increase its strength in the working memory and then to transfer it to long-term memory. The transfer of information to long-term memory is highly dependent upon these rehearsals (Atkinson & Shiffrin, 1971). Weinstein and Mayer (1986) identify four stages of encoding new coming information, which are selection, acquisition, construction and integration (as cited in O'Malley & Chamot, 1990). According to this perspective, the processes of receiving information to working memory and then transferring it to long-term memory take place during the first two stages, which are selection and acquisition. During construction and integration stages, several connections occur in working memory and the learner can actively retrieve information from long-term memory to working memory. Observing this process as a mere behavior change on learner remains inadequate from the cognitivist perspective. This whole process occurs as a more sophisticated cognitive structure in the learner's mind with meaningful connections among concepts and ideas (Takač, 2008). According to Craik's Levels of Processing Model (1972), the quality of learning is mainly related with the mental

manipulation of the received information through processing it in a deeper level (as cited in Schmitt & Schmitt, 1993).

Another important control process is imaging, which is the use of visual images for remembering verbal information and it is defined as an effective coding type that forms cues to retrieve information from long-term memory more accurately (Atkinson & Shiffrin, 1971). The dual-coding theory provides a detailed explanation of how the information is operated with verbal and non-verbal mental representations in memory and it is closely related with language learning (Clark & Paivio, 1991). The theory posits that these verbal and non-verbal representations are stored in separate channels of memory and form referential connections between them. Verbal representations are used for processing language and all of its forms together with speech and writing. Non-verbal representations are used for processing of non-verbal objects such as specific images, sounds and other non-linguistic elements. Knowledge and meaning are derived from processing within and between these two representations. Figure 2.2 depicts the structure of these representations for visual and verbal materials and their relation to each other.

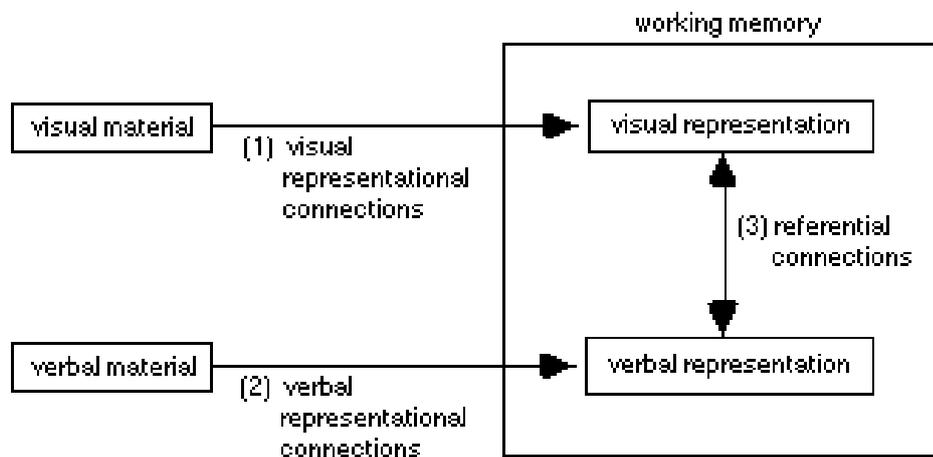


Figure 2.2 Verbal and visual representations in Dual-coding theory

The associations between these two representations are explained with two type of connections, which are associative and referential connections. (Sadoski & Paivio, 2013). Clark and Paivio (1991) indicate that associative connections are formed within

verbal and non-verbal systems separately. In the verbal part of the memory, words are connected with other related words, and in the non-verbal part, images are connected with other related images. For instance, the word “war” may create strong associative verbal connections with other related words like “death”, “hunger” and “misery” for a person who had an experience of war. In the same way, the image of a war scene may create strong associative imagery (non-verbal) connections by evoking related images to war such as a bombing or an explosion scene for the same person. On the other hand, referential connections are formed between verbal and non-verbal representations (Clark & Paivio, 1991). The authors summarize referential connections as imaging of words and naming of images between two representations and state that the number of connections between these representations depends on a person’s experiences in various contexts and events. Primary cognitive form of non-verbal representations is mental imagery and concreteness is an important aspect of mental imagery (Sadoski & Paivio, 2013). In other words, concrete phrases such as “a cup of tea” is more likely to evoke mental imagery than abstract phrases like “evil thought”. However, Sadoski and Paivio (2013) argue that abstract concepts can also evoke mental imagery through concrete experiences if the individuals are supplied with appropriate contexts and concrete circumstances. For instance, the phrase “evil thought” can evoke mental imagery related to an evil character such as Adolf Hitler when the necessary background is formed for the individuals.

In the present study, the students needed to covertly rehearse the meaning of a given word in memory until they came up with an idea of how to represent that word in a visual way.

2.4.2 Vocabulary Teaching/Learning Approaches

Vocabulary teaching is seldom used in language classes and students are generally required to study vocabulary on their own or infer the meanings of words from passages (Oxford & Crookall, 1990). Language instructors spend most of their time teaching core language skills such as reading, writing, listening and speaking skills and they do not spare much time for students’ vocabulary development. (Blachowicz

& Fisher, 2000; Watts, 1995). Generally direct vocabulary instruction is used in classrooms but Nagy and Anderson (1984) argue that it is insufficient for effective vocabulary development and it should be supported with necessary learning strategies that help students to become “independent word learners” (p. 328). Therefore, students need to become familiar with vocabulary learning techniques instead of relying on limited vocabulary instruction in the classroom.

Oxford and Crookall (1990) argue that the comprehension level of the meaning of a new word is mainly related with the presence of context. The authors critically analyzed several vocabulary learning techniques and put those under four groups, which are decontextualizing, semi-contextualizing, fully-contextualizing and adaptable techniques. Fully-contextualizing and adaptable vocabulary learning techniques include practicing core language skills of reading, speaking, listening and writing and they are beyond the scope of this study. Therefore, relevant decontextualizing and semi-contextualizing techniques are provided in this section.

Decontextualizing Techniques

Decontextualizing vocabulary learning techniques do not include any communicative context and with these techniques learners study words without knowing how to actually use them (Oxford & Crookall, 1990). These techniques include use of word-lists, flashcards and dictionary for vocabulary learning and they are mainly used for initial comprehension of target words (Schmitt, 2008).

Use of Word-lists and Flashcards

Studying with word lists is a commonly used decontextualizing technique by learners. Using this technique, learners are provided with a paired list of words together with their meanings and they try to memorize as many words as they can without using them in any context (Oxford & Crookall, 1990). This technique is mostly found to be inadequate for vocabulary development since memorizing a list of words with their meanings does not ensure representing them with relevant schemata (Carrell, 1984).

Use of flashcards is another decontextualizing technique for vocabulary learning and it is the most commonly used one among students (Oxford & Crookall, 1990). The use of flashcards is similar to the use of word lists. Using this technique, learners write a vocabulary item in front of a card and write its L1 equivalent on the back of the card. After that, they try to familiarize with the word and its L1 equivalent with a continuous effort. Actually, the only difference of flashcards from word lists is that flashcards divide the vocabulary items as subunits. Schmitt (2008) argues that using L1 equivalent of a word maybe helpful at initial stages but use of L2 contexts is necessary for increasing retention. Oxford and Crookall (1990) argue that flashcards are decontextualizing by nature but can become somewhat contextualizing depending on the extra efforts of learners. These efforts may include grouping flashcards based on a criteria, creating associations between them on a board or adding some visual context to them by attaching relevant images.

Use of Dictionary

Use of dictionary is also put under the list of decontextualizing techniques and the dictionary basically acts as a reference book for learners. It is mainly used for looking up unknown words while reading a text and rarely used for memorizing a list of words (Oxford & Crookall, 1990). There are two dictionary types, which are monolingual and bilingual. Use of monolingual dictionary is strongly advised instead of bilingual dictionary since monolingual dictionary includes the demonstration of the meaning as an alternative explanation of the word in L2 language (Baxter, 1980). On the other hand, Lupescu and Day (1993) employed a study on the use of bilingual dictionaries among Japanese students and found that the students who used dictionaries performed better while reading the given texts compared to the students who did not use dictionaries. However, Swaffar (1988) criticizes frequent use of dictionary while reading a text and argues that it prevents learners to stay connected with the context of the text and this situation leads to poorer performance on both reading skills and vocabulary development of learners.

Semi-Contextualizing Techniques

Semi-contextualizing vocabulary learning techniques include two types of contextualization. The first type of contextualization includes creating context for words by associating them with other words. Word grouping and word-concept association techniques belong to this type of contextualization. The second type of contextualization includes making use of non-linguistic elements for context creation such as visual imagery (Oxford & Crookall, 1990). In some cases both of them can be used together.

Word Grouping and Word-Concept Association

Word grouping technique is an example of creating associative context. Learners make use of this technique by deciding on criteria to group the words such as word forms, word functions or words' relation to a certain topic. When the words are grouped together based on a grouping criteria, words can be associated with a common characteristic in an organized way. Oxford and Crookall (1990) argue that this technique can be beneficial since it lets learners to associate new words with the ones they already know. However, they also note that word grouping technique has some limitations; for example, the type of relation between the grouped words may not be clear to learners. Moreover, Schmitt and Schmitt (1995) argue that similar words can create confusion for learners if most of the grouped words are relatively new to them. Word-concept association technique is used for making use of already known concepts or words to create a relevant context for the target concepts or words (Oxford & Crookall, 1990). The authors state that the simplicity or complexity of an association does not matter as long as it is meaningful to the learner.

Visual Imagery

Visual imagery technique is used by associating a word with a picture and creating a corresponding representation of this association in mind and it is also referred to as *mental imagery* or *concept imagery* in the literature (Vesely & Gryder, 2007). The term *imagery* is defined as individuals' ability to create images in their minds regarding the ideas and concepts within the language (Lindamood, Bell, & Lindamood,

1997). The theory underlying this technique is Paivio's (1971) dual-coding theory, which asserts that representations of verbal and non-verbal objects occur in separate channels in memory but are connected to each other with referential connections. Goleman (1986) argues that more than 90% of people is good at visual imagery but most of them do not use it (as cited in Oxford & Crookall, 1990). There are different types of techniques used for visual imagery such as drawing an object for a word or visualizing objects in mind for more than one word. Oxford and Crookall (1990) indicate that concrete words are easily represented as visual representations in memory but the authors also assert that abstract words can also be recalled through the use of concrete objects as associative symbols, such as using a picture that includes "skull and crossbones" for the abstract word "danger" (p. 17). Despite the benefits of visual imagery for vocabulary learning, it is seldom applied by the instructors in classrooms and it deserves more consideration (Oxford & Crookall, 1990).

Visual imagery is the most relevant vocabulary learning technique to the current study. In the literature, visual imagery is studied under two main approaches, which are use of supplied illustrations and use of self-generated imagery. Use of supplied illustrations includes providing readily-prepared visual materials to students whereas use of self-generated imagery includes asking students to draw or imagine visual representations of the given words. Smith, Miller, Grossman, and Valeri-Gold (1994) compared the effectiveness of nonverbal (pictorial) and verbal contexts in vocabulary learning by supplying visual drawings to the experimental group. They found that the experimental group students scored significantly higher than the control group students on both immediate and delayed post-tests. In another study, Center, Freeman, Robertson, and Outhred (1999) studied the effect of self-generated imagery technique by training the experimental group students to visualize the objects and events during the instruction process. They found that the experimental group students outperformed the control group students in the test of listening comprehension that included instructed vocabulary items. In another study, Bull and Wittrock (1973) compared three treatments in their study, which are use of verbal definition, use of supplied illustrations and use of self-discovered imagery for vocabulary learning. They found

that the students who used self-discovered imagery technique scored significantly better than the other students, and the difference of student scores between the verbal definition group and the supplied illustrations group was close to significance in favor of the latter. They concluded that vocabulary learning is best facilitated when imagery and self-discovery are combined together. Shen (2010) conducted two experimental studies to compare the effectiveness of imagery encoding method to verbal encoding method for Chinese vocabulary instruction. The first experiment included concrete words and the second experiment included abstract words. The researcher found no statistical difference between verbal and imagery coding methods for concrete words but there was a statistical difference for abstract words in favor of imagery coding. Even though the structure of Chinese vocabulary is different from the structure of English vocabulary, the findings of this study highlight the importance of visual learning for vocabulary instruction.

Visual imagery technique was also used in studies that aimed to support vocabulary learning with the use of technology (Johnson & Neil, 2006; Peters, 2007; Yanguas, 2009; Hsu & Yang, 2013). Yanguas (2009) made use of different types of multimedia glosses such as textual, pictorial and textual-pictorial for words while building a computerized text. The study was based on noticing and recognizing the words from a given text and the findings of the study revealed that the students who used multimedia glosses noticed and recognized words significantly better than those in the control group. Hsu and Yang (2013) designed a tool called MyVLS-Reader that assisted students while reading. The tool provided context-sensitive meaning for the vocabulary selected by the students. The instructors could create articles by including context-aware vocabulary items and assign them to the students. The students were allowed to study the vocabulary items and get tests as well. The findings of this study revealed that the treatment group developed their vocabulary better and faster than the control group.

2.4.3 Processes That Lead to the Retention of a Vocabulary Item

Retention of a vocabulary item means that it is permanently stored in the long-term memory and available for recall. In order to transfer a vocabulary item to the long-term memory, the learner requires to be involved with that vocabulary item in several stages which are noticing, retrieval and creative-generative use (Nation, 2001). In the noticing stage, the learner basically pays attention to the vocabulary item and forms an initial familiarity with its meaning. Noticing a vocabulary item can occur in many different ways such as incidentally focusing on it while reading a text or being deliberately exposed to it by the instructor in the class (Nation, 2001). Noticing the vocabulary item remains inadequate for the retention of it in memory and it may be lost if it is not retrieved afterwards. In the retrieval stage, the learner continuously retrieves the meaning of the vocabulary item from memory by either being exposed to it in different texts or actively using it in communicative language (Nation, 2001). Therefore, the learner needs to encounter or use the vocabulary item repeatedly in order to increase its strength in memory. In the final stage, the learner needs to creatively use the vocabulary item in context that is different from the context that the vocabulary item is acquired (Nation, 2001). It is the most important stage since it allows learners to store the vocabulary items in different representations by elaborating on them for alternative uses.

The success of recalling a vocabulary item depends on its quality of representation in memory and learners need to actively elaborate on the meanings of words during the acquisition stage in order to enhance their representations (Lawson & Hogben, 1996). Regarding elaboration of a word, Carter (1987) indicates that “the more that words are analyzed or are enriched by imagistic and other associations, the more likely it is that they will be retained” (p. 155). Therefore, learners need to adopt several vocabulary learning strategies to acquire new words and elaborate on them to increase their quality of representation.

Vocabulary learning strategies are mainly divided into two phases, which are “discovering the new word’s meaning” and “practicing the word’s meaning” (Schmitt

& Schmitt, 1993, p. 28). In the first phase, the strategies are used for the initial learning of a new word's meaning. These strategies include using a reference material such as a dictionary, asking others or working with others to obtain information, and guessing the meaning of a word from a reading passage or discovering it from the words' roots. In the second phase, the strategies are used for studying and remembering the meaning of a word that is already learned. Some of these strategies include verbal/written repetition of the word's meaning, use of word lists or vocabulary cards, using the word in new sentences, creating associations with the word's meaning, and making an image of the word's meaning in mind. The strategies used in both phases have their own advantages. The strategies used in the first phase can enhance learners' breadth of vocabulary whereas the strategies used in the second phase can enhance their depth of vocabulary (Ma, 2009). Hence, strategies in both phases should be used together to support both the amount and the quality of learning vocabulary. The literature suggests various strategies for retention of vocabulary items and Takač (2008) lists the most frequently used strategies as follows (p. 20):

- Making connection between the word and its corresponding equivalent in native language.
- Defining and describing the word by providing several examples and different forms such as antonyms and synonyms.
- Creating a context such as presenting a situation or a scenario to make students contextualize the word.
- Making a connection between the meaning of the word and real objects such as presenting visual aids.
- Encouraging active involvement of students such as asking them to discover the meaning from a given text or visual.

The strategies listed above go from basic learning to meaningful learning as students create additional conceptual connections with the meaning of a word. As Nagy and Anderson (1984) argue, in-class activities may remain limited to include all of these strategies and learners should be encouraged and supported for out-of-class vocabulary activities.

2.4.4 Six-Step Process for Effective Vocabulary Acquisition

Marzano's (2004) six-step process guidelines were followed as an instructional framework for the current study and the steps are summarized as follows (p. 91):

1. Provide a description, explanation, or example of the new term, provide a context for the term, and describe your own mental picture of the term. Also find or create pictures that explain the term.
2. Ask students to restate the description, explanation, or example in their own words. Descriptions must be students' original ideas instead of parroting the instructor.
3. Ask students to construct a picture, pictograph, or symbolic representation of the term.
4. Engage students periodically in activities that help them to rehearse the meaning of the words.
5. Periodically ask students to discuss the terms with one another. Let them describe their pictures to one another and identify areas of disagreement or confusion that seek clarification.
6. Involve students periodically in games that allow them to play with terms.

Marzano (2004) developed an activity sheet for students to study in the classroom named "Vocabulary Four Square" as shown in Figure 2.3. In the present study, this activity sheet was used for the comparison group by adapting it as a self-study booklet. For the experimental group, the activity sheet was adapted to be used as vocabulary groups in the mobile sharing application which is shown in the methodology chapter. The last step of including games was not implemented in this study since it is more appropriate for in-class activities and it is difficult to prepare similar games for the experimental and comparison groups.

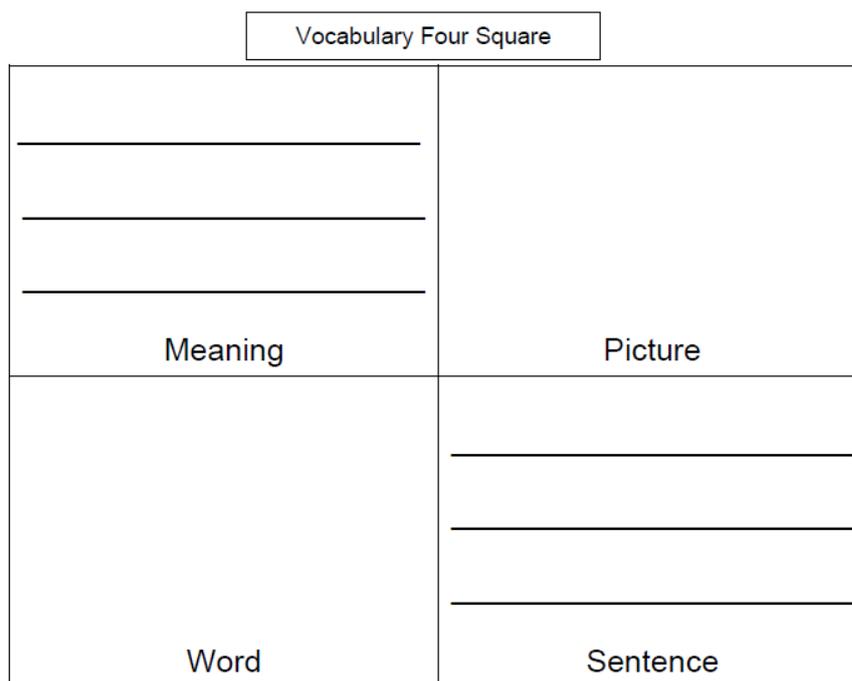


Figure 2.3 Vocabulary Four Square

Marzano (2004)'s six-step process design was applied to more than 50 studies and found to be effective in the majority of them. The following implications were drawn from these studies:

- Students need to use their own words while generating explanatory sentences to the vocabulary items instead of copying the ones provided for them.
- The explanations of the students need to come from their own lives. Otherwise, the results may not be satisfying.
- The step of representing the vocabulary items in non-linguistic forms (picture, pictograph, or symbolic representation) was found to be the most crucial part. Student achievement was found to be highly influenced by the completion rate of this step.

2.5 Research on Mobile Vocabulary Learning

The extensive development in mobile devices and mobile communication technologies over the past decade offers great potential for learning environments and this

development led researchers to integrate these technologies into language education (Kukulska-Hulme & Traxler, 2005). One of the aspects that researchers considered throughout this integration process was to analyze the effectiveness of mobile assisted language learning approaches towards learning English vocabulary (Kukulska-Hulme & Shield, 2008). Most of the former research studies considered mobile devices as content-delivery tools by making use of text messages (Thornton & Houser, 2005; Stockwell, 2007; Lu, 2008; Cavus & Ibrahim, 2009; Basoglu & Akdemir, 2010) or multimedia messages (Saran, Seferoglu & Cagiltay, 2012). On the other hand, some of the studies allowed learners to create content as well (Joseph, Binsted & Suthers, 2005; Pemberton, Marcus, & Fallahkhair, 2009).

Thornton and Houser (2005) explored the effect of study materials which were sent to the students' mobile phones by e-mails for English vocabulary learning. The main aim of the study was to investigate whether receiving materials as regular e-mails on mobile phones at different time intervals promotes English vocabulary acquisition more effectively compared to studying the same materials on paper or from a website. The participants of the study were Japanese university students. The researchers conducted two experiments. In the first experiment, half of the students received learning materials as e-mail messages on their mobile phones and the other half of the students were encouraged to study the identical materials online on a mobile friendly website for two weeks. Then, the students in two media groups were switched and the same procedure was followed for another two weeks. The gain scores between post-test and pre-test were calculated and the results revealed that students who studied vocabulary through received e-mails learned significantly more than students who studied vocabulary on the mobile website. In the second experiment, two groups of students were formed to compare the effectiveness of mobile e-mails to printed materials on vocabulary learning. For two weeks, the mobile group students received learning materials as e-mail messages whereas the printed group students were encouraged to study the identical learning materials on paper. The gain scores of each group between post-test and pre-test were calculated and compared by conducting independent samples t-test. The results revealed that students who studied vocabulary

through received e-mails learned significantly more than students who studied vocabulary on printed materials. In terms of student preferences, 71% of the students indicated that they would prefer to study vocabulary on mobile phones instead of PCs. In addition, 93% of the students stated that using mobile phones for vocabulary learning is an effective method.

Lu (2008) investigated the effectiveness of Short Message System (SMS) for vocabulary lessons in English language learning. The main purpose of the study was to examine the effectiveness of SMS vocabulary lessons compared to detailed printed materials including vocabulary words. The participants of the study were a class of 30 10th grade students from a vocational high school in Taiwan. The participants were assigned into two equal groups by taking students' grades and success levels in English lesson into consideration in order to have students with similar English proficiency levels in each group. The experiment lasted for two weeks. In the first week, the first group of students received the target words through their mobile phones and the second group received the same target words on printed materials. In the second week, the groups were switched in terms of the treatments. The second group received the target words through their mobile phones and the first group received the same target words on printed materials. The post-test results indicated that mobile phone groups performed better than paper groups regarding vocabulary gains during one-week period. On the other hand, the delayed posttest scores indicated that vocabulary gains did not differ significantly across the two conditions. These results could be interpreted as that the treatment with SMS through mobile phones increased the achievement of groups for a temporary amount of time but implied no difference in terms of knowledge retention over the long term.

Cavus and Ibrahim (2009) also investigated the potential of learning new English words via Short Message System (SMS). They developed a system called mobile learning tool (MOLT) and tested the effectiveness of this system with 45 1st-year undergraduate students. Throughout the treatment procedure, which lasted 9 days, the participants received text messages including a word and its meaning. The participants received randomly selected 16 word meanings for three times and 48 text messages in

total for the purpose of repetition. The study results indicated that there is a significant difference between the pretest and posttest results of the students in terms of success rates. According to the results of student opinion scale, the participants found the system enjoyable and motivating. In addition, the participants indicated that they could remember the words that they received on their mobile phones easily.

Another study conducted by Basoglu and Akdemir (2010) aimed to determine whether there is a significant difference of gain scores between the students who used flashcards and those students who used mobile phones as English vocabulary learning tools. The treatment procedure lasted six weeks and the participants of both groups practiced vocabulary learning by either mobile phones or vocabulary flashcards depending on their research groups. Multiple choice questions were used as data collection instrument and the results of the tests showed that posttest scores of the experimental group was significantly higher than the control group in terms of gain scores. This result revealed that use of mobile phones is more effective than traditional vocabulary flashcards method in terms of student achievement.

The study that was conducted by Saran, Seferoglu and Cagiltay (2012) proposed a different approach for delivering content to the students. The aim of this study was to determine the effectiveness of multimedia messages in vocabulary acquisition and retention of EFL students. The content of the messages included the meaning of the word, example usage of the word in a sentence, a pictorial representation of the word, information regarding word formation and an audio file for the pronunciation of the word. Two proficiency levels, elementary and pre-intermediate, were selected. Six groups of students were formed to compare the effectiveness of three different treatments, which were mobile-based, web-based and paper-based vocabulary learning. The treatments lasted four weeks and the gain scores of the students between pretests and posttests were calculated. The findings revealed that the students in the mobile group increased their gain scores significantly better than other two groups for both of the proficiency levels.

Apart from the studies that have used mobile devices as content-delivery tools, “PhotoStudy” was designed to support content creation on mobile phones (Joseph, Binsted & Suthers, 2005). Basically, this system allowed students to post a picture and an associated vocabulary item to the shared-database of the system. All of the students could study the words which were sent by the others by answering multiple-choice questions and also contribute by uploading their own picture-word pairs. The system was evaluated by the participants and almost all of them favored its use. Based on the participants’ opinions, there were some shortcomings of the system. Participants noted that some images needed to be associated with more than one word. Also, one participant noted that multiple-choice questions only tested recognition memory instead of recall memory. Although this system supported content creation, it lacked social interaction and communication among the students. Moreover, the study did not investigate the effectiveness of the system regarding student achievement in vocabulary learning.

The findings of these studies suggest that the use of mobile devices can contribute to vocabulary learning and students generally have positive attitudes towards mobile vocabulary learning systems. On the other hand, the findings of the research study which was conducted by Stockwell (2007) revealed that mobile devices are not preferred as much as computers by the students in vocabulary learning and computers were found to be more effective than mobile devices regarding student achievement. The study revealed that some students did not perceive their mobile devices as “study tools” and it was difficult for them to get into study mode. Vocabulary learning systems with mobile devices should be designed in a way that the opportunity of learning anytime and anywhere can be taken into account as an advantage, which cannot be accomplished by computers because of their static position.

2.6 Summary

Vocabulary learning is an important part of language learning and the current literature suggests that acquisition of at least 2500 to 3000 words is necessary for effective communication and reading comprehension (Nation, 1993; Laufer 1992). Vocabulary

learning strategies that are used in the classroom remain inadequate since there is not enough time for practicing each vocabulary item in-depth. Memorizing definitions and studying word lists remain as superficial knowledge and lead to decontextualized learning which has limitations for knowledge transfer (Nagy, 1995; Oxford & Crookall, 1990). In order for meaningful learning to occur, learners need to make sense out of their own experiences. As Nagy and Anderson (1984) suggest, apart from direct vocabulary instruction, students need to be guided in a way that they can learn and practice their vocabulary independently.

Mobile device supported learning environments have the potential to provide real-world activities for learners without the limits of time and space. It means that learners can maintain their learning process without confining themselves to their houses or other study places when they get out of the classroom environment. In the literature, the research studies on mobile vocabulary learning mostly focused on delivering learning materials to the learners' mobile devices in pre-established time intervals. (Cavus & Ibrahim, 2009; Clarke, Keing & Lam, 2008; Lu, 2008; Stockwell, 2007; Stockwell, 2010, Saran, Seferoglu & Cagiltay, 2012). The literature suggests a shift from using mobile devices as content delivery tools to active participation and social interaction tools for in-depth learning experiences to occur (Kukulka-Hulme & Shield, 2008). The absence of mobile vocabulary learning studies that consider learners as active constructors of knowledge through real-world and peer-to-peer interactions remains as a gap in the literature. This gap leads to superficial knowledge of vocabulary items in learners' memories since they do not know how to actually use them on their own. The current study was designed to fill this gap by providing opportunities for learners to be involved in meaningful experiences by capturing photos related to the words covered in the curriculum. The proposed learning environment allowed students to learn both from their own experiences and from the other students' experiences in real-world settings.

CHAPTER 3

METHODOLOGY

This chapter includes information about the research design of the study, participants of the study, instrumentation, design of the learning environments, pilot study, procedures of the study, validity and reliability, data analysis and limitations of the study.

3.1 Research Questions

The research questions of the study are:

1. What is the effect of the mobile device supported learning environment on students' English vocabulary acquisition?
 - Is there a significant difference between the two groups of students' (mobile group, traditional group) gain scores in vocabulary achievement tests?
2. What is the effect of the mobile device supported learning environment on students' motivations for English vocabulary acquisition?
 - Is there a significant difference between the two groups of students' (mobile group, traditional group) motivation scores in the motivation scale?
3. What are the perceptions of students regarding the mobile device supported learning environment for English vocabulary acquisition?
4. What are the perceptions of instructors regarding the method used for English vocabulary acquisition?

3.2 Research Design

The study was conducted by adopting an explanatory mixed method design including both quantitative and qualitative methods. In the quantitative part, quasi-experimental research design was used by conducting a pre-test and post-test that included vocabulary assessment questions. In addition to vocabulary tests, a motivation survey was conducted after the treatment procedure in order to compare the motivations of each group to complete the given tasks. In the qualitative part, semi-structured focus group sessions were conducted with the students in the experimental group. Furthermore, the instructors of both the experimental and comparison groups were interviewed after the treatment procedure. Figure 3.1 shows the overall research design of the study.

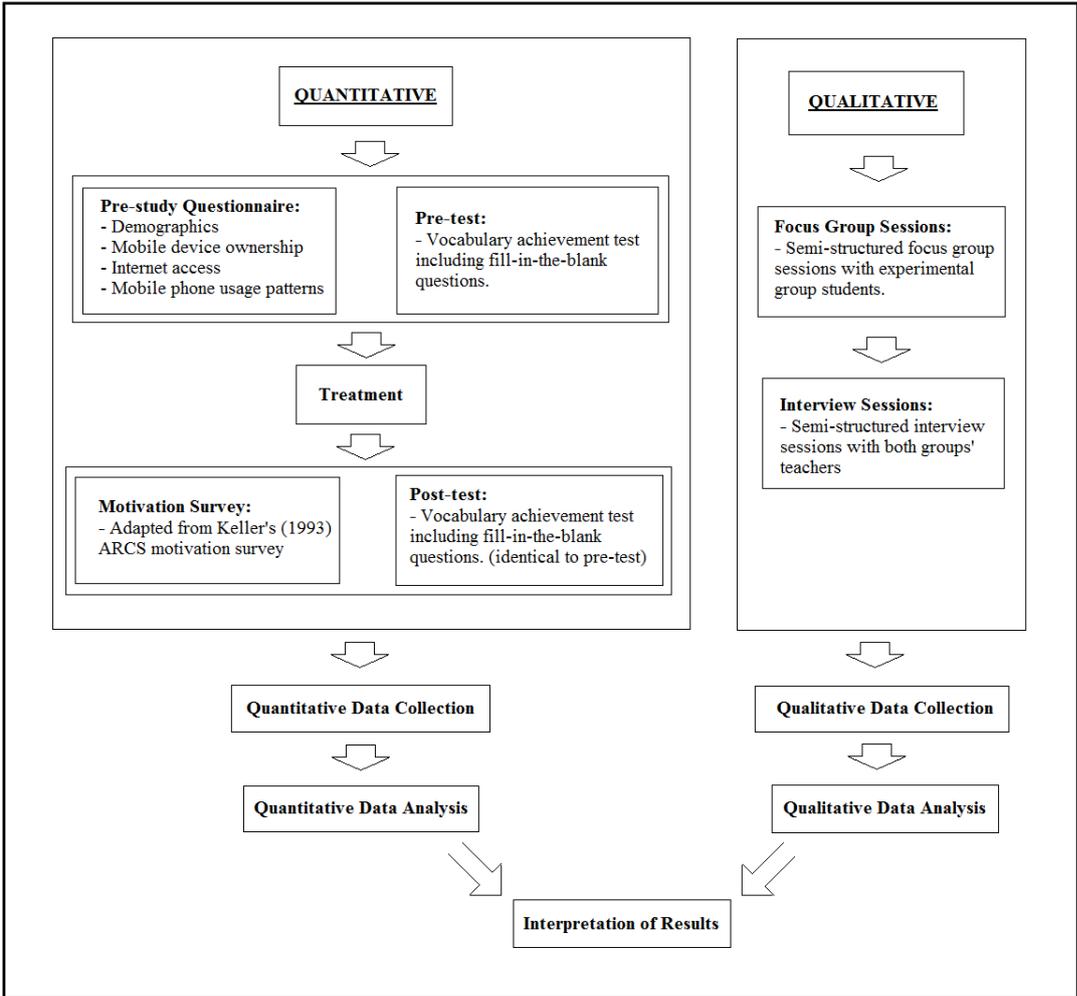


Figure 3.1 Research Design of the Study

Prior the main study, a pilot study was conducted in the Fall 2014 semester for 2 weeks in Amasya University. In the Fall 2015 semester, the study was conducted for six weeks in Middle East Technical University. Table 3.1 shows the quantitative part of the study.

Table 3.1 Design of the Quantitative Part of the Study

Groups	Proficiency Level	Before Treatment	Treatment (6 weeks)	After Treatment	
Mobile	Elementary	Vocabulary Achievement Pre-test	Vocabulary activities through smart phones	Vocabulary Achievement Post-test	Motivation Survey
Printed	Elementary	Vocabulary Achievement Pre-test	Vocabulary activities through printed materials	Vocabulary Achievement Post-test	Motivation Survey

Throughout the study, two different study types were used in the experimental and comparison groups in order to investigate and compare the effectiveness of identical vocabulary activities via two different media, which are smart phones and printed booklets, in terms of improving vocabulary acquisition of the students. Table 3.2 includes detailed explanation regarding these study types.

Table 3.2 Study Types Used in the Study

Study Type	Explanation
Smart Phones	The vocabulary items were studied via separate word groups that were formed for each vocabulary item in a mobile sharing application. In each word group, the students received information regarding the meaning, pronunciation and an example picture visually representing the word. The students uploaded their own visual representations of the word to the relevant word group by taking a relevant photo and including an explanatory sentence describing the photo.
Printed Booklets	The vocabulary items were studied via printed booklets. Each word unit in the material included information regarding the meaning, pronunciation (phonetic spelling) and an example picture visually representing the word. The students drew their own illustrations as visual representations of the words to the related blank spaces in the printed booklets together with the explanatory sentences describing the illustrations.

3.3 Participants

The target population of this study was English Preparatory school students of the universities in Turkey. However, a convenience sampling procedure was conducted by selecting the participants from METU English Preparatory School since it was not possible to access all of the students for sampling in the target population. There are several proficiency levels such as beginner, elementary, intermediate and upper-intermediate. The administration of METU English Preparatory School randomly assigns students to the classes based on their level of achievement in the placement exam and in each class there are approximately 20 students. Hence, classes of the same proficiency level can be regarded as identical in terms of student profile. In terms of deciding the proficiency level of the students, beginner students were excluded from the choice list since the study requires students to understand simple sentences and form their own sentences regarding the selected words. Elementary students were the best choice since they are capable of understanding and creating simple sentences and in need of new vocabulary knowledge at the same time. As a result, two elementary classes were chosen for the study. One class formed the experimental group and the

other class formed the comparison group. The distribution of the participants in the study is shown in Table 3.3.

Table 3.3 Distribution of the Participants

Gender	Mobile Group	Traditional Group	Total
Female	9	9	18
Male	9	10	19
Total	18	19	37

3.4 Instruments

The following instruments were used in the study to collect data.

3.4.1 Pre-study Survey Questionnaire

A pre-study survey questionnaire was developed to gather basic information about the participants (see Appendix A). The survey was divided into two sections: Section A: Basic information; Section B: Mobile device activities. A five point likert scale with never; seldom; usually; often; and always was used for the items related to mobile device activities. The content of the questionnaire included questions regarding demographics, mobile phone ownership, mobile Internet access, and mobile phone usage patterns. The obtained information from smart phone ownership and mobile Internet access questions were used to determine the lack of infrastructure among the students in the experimental group in order to supply tablet computers to the ones who did not own smart phones. As a result of the survey findings, three students in the experimental group were supplied with tablet computers.

3.4.2 Vocabulary Achievement Tests

The main instrument of the study was the vocabulary test to measure the vocabulary achievement of the students. Prior the study, a vocabulary test was prepared as a pre-test under the supervision of the co-advisor of the study from the department of English Language Teaching (see Appendix B). The test prepared was identical to the ones that are used in the Preparatory School of Middle East Technical University. The test

consisted of fill-in-the-blank questions that required students to choose the correct word from the listed words in the box. The word list included more words than needed in order to ensure that the students select the words intentionally rather than arbitrarily. The vocabulary items of the test were selected from the main reading book that is used in the classes. Equal amount of words were selected from each week's vocabulary lists. Seven words were selected for each week and in total 42 words were selected for the vocabulary test. All of the words were used during the treatment procedure in both groups for six weeks. The pre-test was piloted in order to make the necessary changes to prevent including too easy or too difficult questions with respect to the target proficiency level of the students.

3.4.3 Motivation Survey

In order to obtain information about the students' motivation to study with the given materials, a motivation survey was prepared (see Appendix C). The survey was adapted from Keller's (1993) motivation survey. The survey was translated to Turkish by Balaban (1993). The survey consists of 36 Likert type scale items where a score of 1 stands for "not true" and a score of 5 stands for "very true" for positively stated items. The negatively stated items were reversed before calculating motivation scores. Therefore, the possible minimum score to get from the survey is 36 whereas the maximum score to get from the survey is 180. The original survey was prepared with respect to the ARCS model of Keller's (1987) motivational design. In this model, ARCS stands for the four strategy components of motivation which are Attention, Relevance, Confidence and Satisfaction. These components are explained as follows:

- Attention component is used for increasing the level of arousal, curiosity and interest in target learners;
- Relevance component is used for increasing the relevance of the tasks to the target learners regarding their needs, interests and motives;
- Confidence component is used for increasing target learners' level of expectations for their own achievement; and

- Satisfaction component is used for increasing target learners' level of satisfaction both through intrinsic and extrinsic reinforcements on the tasks (Keller, 1987).

The reliability coefficient of the original scale was found to be 0.96 (Keller, 1993). In this study, the reliability coefficient was also found to be 0.96, which means that the variation of the motivational scores are highly reliable with a %4 measurement error of the scale.

There are a varying number of items for each component in the ARCS model. In addition, some items are negatively stated and, therefore, these items need to be reversed before calculating the total motivation scores. Table 3.4 shows the item distribution of the scale for each motivation component.

Table 3.4 Distribution of Items for Components of Motivation

Attention	Relevance	Confidence	Satisfaction
Item 2	Item 6	Item 1	Item 5
Item 8	Item 9	Item 3 (reverse)	Item 14
Item 11	Item 10	Item 4	Item 21
Item 12 (reverse)	Item 16	Item 7 (reverse)	Item 27
Item 15 (reverse)	Item 18	Item 13	Item 32
Item 17	Item 23	Item 19 (reverse)	Item 36
Item 20	Item 26 (reverse)	Item 25	
Item 22 (reverse)	Item 30	Item 34 (reverse)	
Item 24	Item 33	Item 35	
Item 28			
Item 29 (reverse)			
Item 31 (reverse)			

3.4.4 Student Interview Form

A student interview form (see Appendix D) was developed in order to ask the opinions of the students in the treatment groups regarding the use of mobile device supported learning environment. The main aim of the interview questions was to identify the students' overall experience of using a mobile device supported learning environment for vocabulary acquisition. The content of the interview form included semi-structured questions related to the following topics:

- Likes/dislikes about the learning environment.
- Challenges faced while completing the tasks.
- Usefulness of the system for vocabulary learning.
- Perceived usability of the system.
- Suggestions for future improvements.

The clarity of the questions in the interview form was reviewed by the advisor and the co-advisor.

3.4.5 Instructor Interview Form

An instructor interview form (see Appendix E) was developed in order to identify the instructors' involvement, experiences and opinions throughout the study. The interview form was adapted from Miller's (2011) instructor interview questions regarding the use of visuals for vocabulary learning. The mobile and traditional groups received the same study materials through different media but each group's instructor was different. The Thesis Supervisory Committee advised to compare the overall experiences of each instructor in order to obtain more conclusive data on the results.

3.5 Design of the Learning Environments

The vocabulary items to be used in the materials were selected from the main reading book of the elementary classes since the book already contained words that the students needed to be familiar with throughout the curriculum. In addition, the word selection process ensured that the level of the vocabulary items were appropriate for

the students' proficiency level. In order to go parallel with the curriculum of the classes, the vocabulary items were selected from the respective units of the main reading book. The design of the learning environments were adapted from Marzano's (2004) six-step process for vocabulary learning. In order to make a fair comparison of the effectiveness of mobile device supported learning environment to the traditional learning environment, materials were prepared identically for each group. The mobile group students received the materials through the mobile learning system whereas the traditional group students received the identical materials through the printed booklets.

3.5.1 Mobile Learning System

The mobile learning system was designed as a vocabulary pool for the students where each student in the mobile group could view the materials and make contributions at the same time. To achieve this aim, a freeware social sharing application named MeWe was used. One of the main reasons for choosing this application was its unique feature that allows its members to create separate groups for sharing information specific to that group and group members. The design of the mobile learning system required separate groups for each vocabulary item since sharing of information for every vocabulary item in the same group would have been difficult for the students to follow up as the group got updated constantly. Each word group was named by the word and the form of the word. Figure 3.2 shows the interface from the application regarding the formation of the vocabulary groups for each week.



Figure 3.2 Interface of the vocabulary groups

The materials in each group were provided by the instructor at the beginning of each week. The design of the groups were adapted from Marzano’s (2004) six-step process design. The groups had an option to specify a cover photo describing that specific group in the mobile application. This feature was used to include the name, the form and the definition of the word in English as a cover photo in each group. In this way, the students had the opportunity to recall the word’s meaning and its form immediately after they entered a vocabulary group. In addition, the instructor uploaded a picture containing the phonetic spelling of the word together with an audio file providing the pronunciation of that word. The picture of phonetic spelling and the pronunciation of the word were pinned to the top of the group in order for students to reach them comfortably as the group was updated constantly. Figure 3.3 shows an example screenshot from one of the vocabulary groups including the cover photo and the pinned sharing.

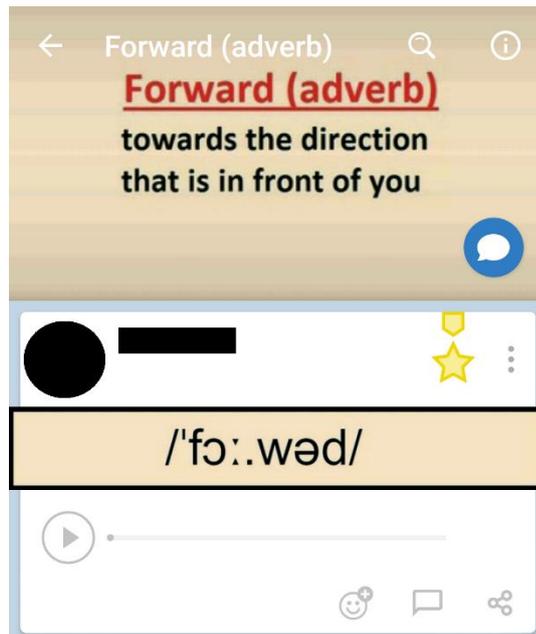


Figure 3.3 An example screenshot showing the cover photo and the pinned sharing

In each vocabulary group, the instructor uploaded an example picture together with a sentence describing that picture. As soon as the instructor shared materials in one of the vocabulary groups, the students got notifications from the application automatically. In this way, the students got notified when a new sharing was made in a vocabulary group. Similarly, when the students shared their own examples in vocabulary groups, the others got notifications instantly. This feature was useful for students to check the groups regularly since they got pushed with notifications each time someone shared something. Figure 3.4 shows an example shared post by one of the students in the mobile group.



Figure 3.4 An example shared post by one of the students

3.5.2 Printed Materials

The printed materials were designed and prepared for the comparison group in accordance with Marzano's (2004) six-step process design. Seven words were selected for each week from the main reading book. The selected words were the same as the ones that were selected for the mobile group. Each week's material was distributed to the students as a printed booklet. Each word item was designed as a separate table similar to Marzano's (2004) vocabulary four-square. The first row included the name, the phonetic spelling and the form of the word. The second row included the definition of the word in English. The third and fourth rows were divided into two columns. The first column was used to provide students with an example picture and the sentence that described the picture by including the vocabulary item in the sentence. The other column was left blank for students to draw their own illustrations and write their own sentences describing the illustration. Figure 3.5 shows an example vocabulary item in one of the booklets.

Consume /kən'sjuːm/ (verb)	
1. to eat or drink 2. to use	
<u>Photo</u> 	<u>Your Drawing</u>
<u>Sentence</u> You should consume fruits and vegetables regularly in order to stay healthy.	<u>Your Sentence</u>

Figure 3.5 An example vocabulary item in the booklets.

3.6 Pilot Study

Prior to the main study, a two-week pilot study was held to receive feedback from the students regarding their opinions about the challenges they faced, the amount of the words, perceived usability of the mobile sharing application and possible improvements. The pilot study was conducted at Amasya University and the participants of the study were freshman students who took English course as part of the curriculum. A total of 16 words were selected from the English course book of the students. A pre-study survey questionnaire was distributed to the students in order to obtain information on demographics and device availability among the students. A social sharing application (EveryMe) that incorporates private group sharing features was used throughout the pilot study. Specific groups were created in the application for each vocabulary item. Each vocabulary group included information about the related vocabulary item, such as the definition, word form and phonetic spelling. Example photos and sentences that described the photos were provided to the students in each group. Then the students were instructed to take their own photos, form their

own sentences and share them in the corresponding vocabulary groups. They were also encouraged to respond to each other's shared posts via comments and emojis.

After the pilot study, semi-structured interviews were conducted with the students. The social sharing application (EveryMe) used in the pilot study had created some problems for some students such as crashing and connectivity issues. Also some students reported that they sometimes tried a few times before successfully uploading their photos to the system. The mobile application was changed and the necessary improvements were made on the system based on the received feedback.

3.6 Procedures of the Study

Before the study, a total of 42 words were selected from the main reading book of the classes under the supervision of the co-advisor. The vocabulary items in the main reading book were not taught during the lectures by the instructors and the students needed to review them on their own. Therefore, these vocabulary items were more suitable to be included in the study in order to support students' self-study process. An equal amount of words were tried to be selected from each unit of the reading book. The pre-test was prepared by including all of the selected words and the test was identical to the ones used at the English Preparatory School. The pre-test was piloted to make the necessary corrections. After that, pre-tests were distributed both to the experimental and comparison group students at the same time in order to measure their prior knowledge of words. Together with the pre-test, the pre-study questionnaire was distributed to the students in order to obtain information about demographics and mobile device ownership. The obtained information was used to identify students who did not own a smartphone or a similar mobile device that met the required capabilities for this study. Based on the results of the survey, the students who did not own the required mobile devices were supplied with tablet computers.

Before initiating the study, the mobile sharing application was prepared by creating the first week's vocabulary groups that included the word definitions as cover photos. Each student in the experimental group was registered to the application and invited to join the vocabulary groups. The application was new to the students and that's why

they were instructed about how to use the mobile sharing application to view the shared materials and complete the given tasks. In addition, a detailed step-by-step tutorial was prepared as a handout and distributed to the students to make them remember the basic functionality of the system. The tutorial handout is shown in Figure 3.6.

Mobil Destekli İngilizce Kelime Öğrenimi Uygulaması Adımları

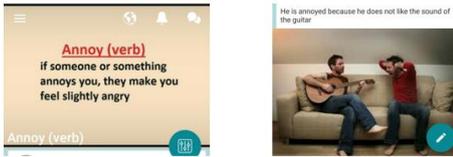
1. Akıllı telefonunuz veya tabletiniz üzerinden (iOS veya Android) "MeWe" uygulamasını indirip yükleyin ve kayıt olun.



2. Uygulamaya giriş yaptıktan sonra ana sayfadan sol bölümdeki menüye gelin ve "Search" simgesini tıklayın. Karşınıza çıkan arama çubuğuna **sınıf hocanızın ismini** yazıp aratın. Hocanızın **profil** sayfasına girip "Add to Contacts" butonuna tıklayın. **ÖRNEK:**



3. Sınıf hocanız size haftalık kelime gruplarına katılmanız için davet gönderecektir. **Hocanızdan gelen grup davetlerini kabul edin** ve gruplara giriş yapın.
4. Uygulamada kullanılmak üzere haftalık **7 adet kelime grubu** bulunacaktır. Her kelime grubunda kelimenin tanımı verilmiştir. Tüm kelimelerin cümle içerisinde kullanımı ve ilgili görsel ifadesi de yer almaktadır. **ÖRNEK: (Arka sayfada)**



5. Her grupta ilgili kelimenin anlamını yansıtacak şekilde bir **fotoğraf veya video** çekin. Çektiğiniz fotoğrafı/videoyu **tanımlayan bir cümle** yazarak ilgili gruba yükleyin. **Cümle içerisinde ilgili kelimenin olmasına dikkat edin. ÖRNEK:**



6. Kelime gruplarına başka bir arkadaşınız tarafından fotoğraf yüklediğinde size **bildirim** gelecektir. Paylaşılan fotoğrafları inceleyin ve yorum yapın.
7. Haftalık olarak size verilen "**Self Checklist**" listesini doldurun ve diğer haftanın ilk günü sınıf hocanıza teslim edin. Bu listede hangi gün hangi kelimeyi yüklemeniz gerektiği yazılmıştır. Fotoğraflarınızı önceden çekseniz bile yükleme işlemi listenizde **belirtilen günde** gerçekleştirin.

ARKA SAYFAYA GEÇİN

Figure 3.6 The tutorial handout describing the steps to complete the given tasks.

In order to let the students check their progress in completing the given tasks, self-checklists were prepared weekly and distributed to the mobile group students at the beginning of each week. Self-checklists included the vocabulary items together with the corresponding days of the week to be completed by the students. The days on the list were shuffled for each student to avoid the same words being shared in a single day. The checklists also included a rating scale to be completed by students based on their perceived difficulty to complete tasks regarding the corresponding week's vocabulary items. Self-checklists were also provided for traditional group students by including the checklist at the end of the printed booklets. The first week's self-checklist is shown in Figure 3.7 as an example checklist.

ID: _____ Name: _____ Date: _____

WEEK 1 – Self Checklist.

Please fill the form below as you complete each task given for the week.

Level of Difficulty: 1- Very Difficult 2- Difficult 3- Neutral 4- Easy 5- Very Easy

DAY	WORD	(✓)	COMMENT	Level of Difficulty (✓)				
				1	2	3	4	5
Monday	discover							
Tuesday	evaporate							
Wednesday	exist							
Thursday	remain							
Friday	properly							
Saturday	unsuitable							
Sunday	vary							

Figure 3.7 Student self-checklist.

In addition to the student self-checklist, the instructors of each group were also provided with a weekly list of vocabulary items that were included in the study. The checklist was prepared as a schedule to show the exact dates of each week’s tasks. The students had two midterm weeks in the schedule and the study discontinued in these weeks. The first three weeks of the instructor checklist is shown in Figure 3.8.

TEACHER CHECKLIST

WEEK – 1 (03.11.2015 – 09.11.2015)

WORD	MEANING	(✓)
to discover	to find information, a place or an object, especially for the first time	
to evaporate	to cause a liquid to change to a gas, especially by heating	
to exist	to be, to be real, or to appear in the real world	
to remain	to continue to be in the same state or condition	
properly	appropriately for the circumstances	
unsuitable	not having the right qualities for a particular person, purpose, or situation	
to vary	to change or be different (from one occasion to another or from one item to another)	

MIDTERM WEEK (10.11.2015 – 15.11.2015)

MIDTERM BREAK

WEEK – 2 (16.11.2015 – 22.11.2015)

WORD	MEANING	(✓)
to absorb	take in or soak up (energy or a liquid) by chemical or physical action	
source	a thing, place, activity etc. that you get something from	
effectively	in such a manner as to achieve a desired result	
to dump	to get rid of something unwanted, especially by leaving it in a place where it is not allowed to be	
surface	the top layer of an area of water or land	
unlike	completely different from a particular person or thing	
solid	firm and stable in shape; not liquid or fluid	

WEEK – 3 (23.11.2015 – 29.11.2015)

WORD	MEANING	(✓)
to provide	to give someone something that they need	
to require	to need or make necessary	
plentiful	existing in or yielding great quantities; abundant	
essential	necessary; needed	
resistance	when something or someone resists	
to maintain	to make something stay the same	
region	a particular area or part of the world, of the body, etc.	

Figure 3.8 Instructor checklist (first three-week period)

At the beginning of each week, seven vocabulary groups were formed in the mobile application at once and the students in the experimental group were added to the groups as participants. After the participants joined the groups, the experimental group instructor uploaded an example photo together with an example sentence describing the photo to each vocabulary group. In addition, the instructor uploaded the pronunciations of the words together with their phonetic spellings. The sharings of the pronunciations and phonetic spellings were pinned to the top of each group for easy access. The pronunciations of the words from British native speakers were recorded from Cambridge online dictionary. Similar to the mobile group students, the traditional group students received a printed booklet including seven vocabulary items at the beginning of each week. The vocabulary items, example photos and example sentences used in the booklets were identical to the ones shared on the mobile application.

The treatment period lasted for six weeks (apart from the midterm breaks) both for the mobile and traditional group students. During the treatment period, the mobile group students were asked to take photos that represented their own understanding of the given words. Then, they were asked to share their photos on the corresponding vocabulary groups together with sentences describing these photos. Moreover, the students were informed about the notification feature of the application which notifies participants when someone else shares a post in a vocabulary group or responds to their shared posts using comments or emoji icons. On the other side, the traditional group students were asked to draw illustrations that represented their own understanding of the supplied words. Then, they were asked to write their own sentences describing the illustrations they drew.

At the end of the treatment period, vocabulary achievement post-tests were distributed to both groups at the same time. The post-test included the same questions of the pre-test but the order of the questions was different. Together with the post-test, the motivation survey was distributed to both of the groups. After conducting the post-test and motivation survey, the students in the experimental group were invited to participate in focus group sessions. The focus group sessions were held by dividing the experimental group students into four groups. All of the students in the

experimental group participated in these sessions. Furthermore, the instructors of both groups participated in semi-structured interview sessions. The contents of the focus group and the interview sessions were recorded by a voice recorder with the consent of the participants.

3.7 Validity and Reliability

Validity and reliability are essential issues to consider before interpreting and drawing conclusions from the research findings. In the present study, both the quantitative and qualitative data were obtained from the participants and there were different procedures to follow for each of them in order to ensure validity and reliability. Validity is related to ensuring whether the researcher is measuring what is intended to be measured and reliability refers to the repeatability of the measurement such as obtaining similar results in different settings or by different researchers when the measurement is repeated (Drost, 2011).

In the quantitative part of the study there were three instruments which are the pre-study questionnaire, motivation survey and vocabulary achievement test. The pre-study questionnaire was only used for descriptive statistics; therefore, it was only reviewed for the clarity of the questions by an expert. The motivation survey was adapted from Keller's (1993) IMMS (Instructional Materials Motivation Survey) which has already proven to have good validity and internal consistency. The reliability coefficient of the original scale was found to be 0.96 (Keller, 1993). In the present study, the reliability coefficient was also found to be 0.96 and it is an indicator of high reliability ($\alpha > .90$). The vocabulary achievement test was prepared under the supervision of the co-advisor of the study. The clarity and difficulty level of the questions were reviewed both by the co-advisor and an English language instructor. The test was piloted to ensure that the questions were not too difficult or too easy for the target proficiency level of the students.

In the qualitative part of the study, several procedures were followed for the reliability of the interpretation of the data obtained from the student focus group sessions and the instructor interview sessions. First of all, the voice recorder was tested a few times

before each session in order to avoid missing information. The interview data was transcribed by using a good quality audio software and the transcriptions were reviewed for possible mistakes. The coding process of the transcriptions was conducted by making use of the inter-coder agreement procedure that included additional coders in order to evaluate the content of the data from different perspectives for the reliability of the data (Creswell, 2012). This process was handled with the help of a colleague who is experienced in qualitative data analysis. At the beginning of the coding process, the researcher informed the colleague about the objectives and the procedures of the research study. Then, the researcher and the colleague coded the transcriptions separately. At the end of the coding process, the researcher and the colleague came together to discuss the similarities and differences between the codes. Similar codes that have different names but referred to the same concepts were merged into single codes. Different codes that referred to different concepts were argued between the researcher and the colleague and they agreed to either include or discard these codes. The final codes were reviewed in order to ensure agreement between the researcher and the colleague.

3.8 Data Analysis

The quantitative part of the research study was analyzed by using descriptive and inferential statistics. The data analysis procedure was conducted by using IBM SPSS 23 (Statistical Package for Social Sciences) program. Descriptive statistics was used to report the information about demographics and mobile device ownership. Inferential statistics was used to compare vocabulary gains and motivations of the students. In order to make a comparison between the treatment group and the comparison group, independent samples t-test analysis was conducted. The level of significance for the analysis was set to .05. First of all, the students' correct answers in both vocabulary tests were calculated and then standardized out of 100 points. Secondly, the average point differences between the pre-test and post-test were calculated in order to obtain the mean gain scores for each group of the students. Finally, the obtained mean gain scores were compared by conducting independent samples t-test analysis to see whether the mean difference between the treatment and comparison groups was

significant. The independent variable of the study was the treatment type and the dependent variable was the mean gain score on the vocabulary test. The assumptions of normality, independent observations and homogeneity of variances in the t-test analysis were controlled. The assumption of independent observations was met by conducting the vocabulary tests in a classroom environment where each student could be assessed individually. Regarding the homogeneity of variances assumption, the treatment group and the comparison group needed to have equal variances. In order to meet this assumption, Levene's Test for equality of variances was conducted.

In the qualitative part of the study, the recorded data that were obtained from the interview sessions were transcribed. Then, the transcriptions were subjected to content analysis. The responses for each question were organized to identify the main themes. Then, the themes were interpreted.

3.9 Limitations and Delimitations

There were several limitations and delimitations of the current research study. First of all, the sample of the current study was selected from English Preparatory School of METU, and there were 37 participants with elementary proficiency level. Hence, the generalizations of the study results are limited to this selection. Moreover, the instructors of the experimental group and the comparison group were different. Even though the instructors did not have direct contributions to the procedure, their in-class teaching processes may have affected the results of the study.

Similar materials were provided for each group of the students (mobile group – traditional group) but the tasks were not completely identical (taking photos – drawing pictures) since it was not possible to replicate the exact same procedure of the mobile device supported learning environment for the traditional group students. The difference in the way that the students completed their tasks in each group may have affected their motivations to complete the tasks differently and it may have affected the results of the study.

The vocabulary items of the study were selected from the main reading book of the classes and the reading activities in the classes might have affected the vocabulary test results. In addition, although the student profile was similar between the experimental group and comparison group, their individual efforts to learn vocabulary might have been different. Finally, the responses of the participants to the surveys and interview questions may not reflect the absolute truth about their opinions and experiences.

CHAPTER 4

RESULTS

Prior the main study, a pilot study was held as mentioned in the methodology chapter. In this chapter, the findings of the pilot study are presented at first step. After that, the findings of the main study are presented. Finally, the summary of the results are presented.

4.1 Pilot Study Findings

In this section, the findings of the pilot study that was conducted in Fall 2014 semester are presented. Firstly, the results of the pre-study questionnaire are introduced. This questionnaire included questions to obtain information on demographics, infrastructure and mobile phone activity among the participants. After that, the results of the focus group questions are presented. The pilot study findings were used to re-design the mobile device supported learning environment for the main study.

4.1.1 Results of the Pre-study Questionnaire

A mobile learning readiness questionnaire exploring participant information on demographics, infrastructure and mobile phone activity were distributed to 1st grade students of an English course at Amasya University. In total, 40 students responded to this questionnaire from two different classes. The results of this questionnaire are presented in the following parts.

Demographics

Out of 40 respondents, 22.5% of them were males and 77.5% of them were females. All of the respondents were between the ages 18 (52.5%) and 19 (47.5%). Figure 4.1 shows the gender and age distribution of the respondents.

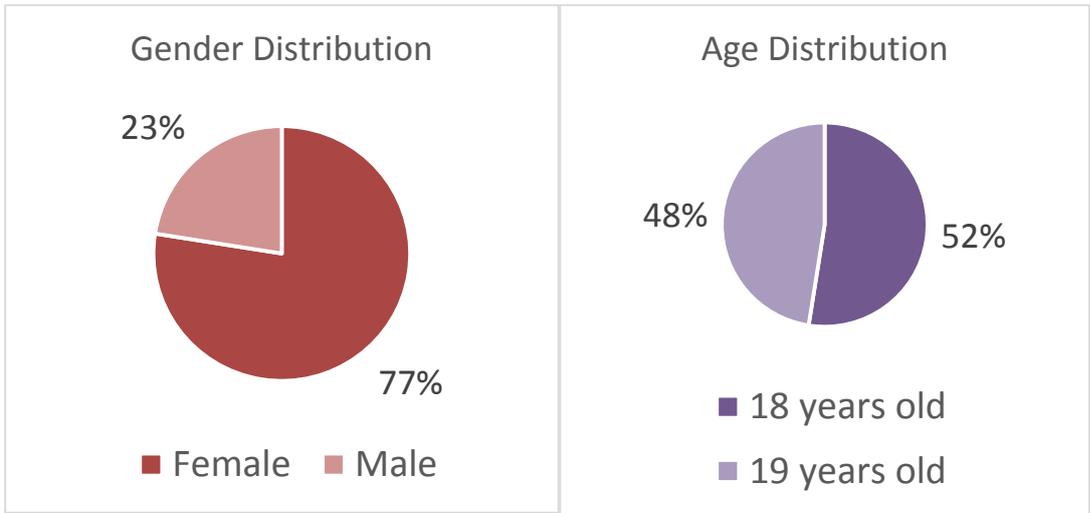


Figure 4.1 Gender and age distributions of the respondents in the pilot study

Infrastructure

In order to obtain information regarding the infrastructure of the respondents' mobile devices, availability of mobile devices and internet connection among the respondents were analyzed. All of the respondents had mobile phone and 90% of them categorized their phones as smart phone. Only 20% of the respondents had a tablet PC. All of the respondents had access to the Internet. Among them, 65% of the respondents had access to the Internet via Wi-Fi whereas 35% of the respondents had access to the Internet via 3G. Table 4.1 shows the device availability and the Internet access among the respondents.

Table 4.1 Device Availability and Internet Access in the Pilot Study

Infrastructure	%
Mobile Phone Ownership	100
Smart Phone Ownership	90
Tablet PC Ownership	20
Internet Access (3G)	35
Internet Access (Wi-Fi)	65
Internet Access (Total)	100

In terms of mobile operating systems that were used on the respondents' mobile devices, the majority of the respondents (80%) had an Android operating system running on their mobile devices. Only 7.5% of them had an iOS operating system and the rest of the respondents (12.5%) had other mobile operating systems running on their mobile devices. Figure 4.2 shows the use of mobile operating systems on the respondents' mobile devices.

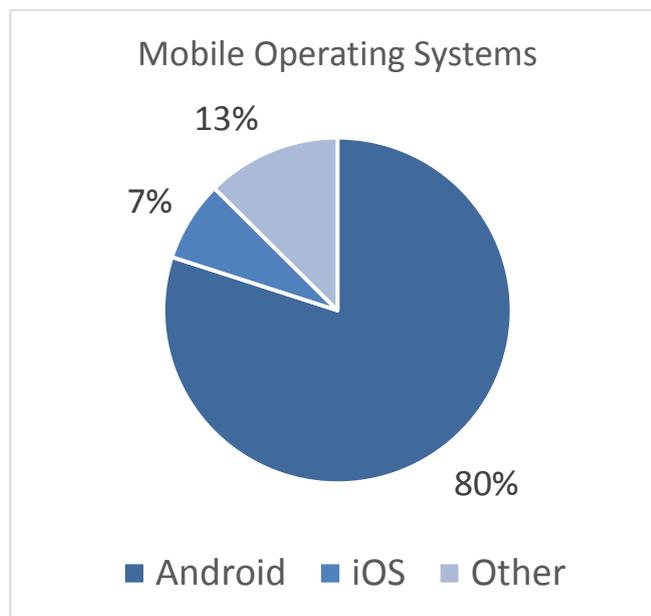


Figure 4.2 The mobile operating systems used on the respondents' mobile devices in the pilot study

Mobile Phone Activity

In order to identify the type of activities that were performed by the respondents' on their mobile devices, the respondents were asked to fill out a questionnaire regarding their frequency of performing a total of 16 activities on their mobile devices. The most frequently performed activities were surfing the Internet, surfing social networks and listening to music as 85% of the respondents indicated that they often or always performed these activities. Moreover, making phone calls (82.5%), taking pictures (72.5%) and sending SMS (60%) were other frequent activities that were often or always performed by the respondents. The less frequently performed activity was

sending MMS as 82.5% of the respondents indicated that they never or seldom sent MMS through their mobile phones. In addition, playing online games with others (72.5%) and playing offline games (50%) were other less frequent activities that were never or seldom performed by the respondents. Table 4.2 shows the overall frequency of activities that were performed by the respondents.

Table 4.2 Mobile Phone Activities Performed by the Respondents of the Pilot Study

Activity	Never-Seldom (%)	Sometimes (%)	Often-Always (%)
Making phone calls	5	12.5	82.5
Sending SMS	20	20	60
Sending MMS	82.5	10	7.5
Taking photos	5	32.5	72.5
Recording voice	42.5	37.5	20
Recording video	35	50	15
Making video calls	47.5	40	12.5
Surfing the Internet	-	15	85
Sending e-mail	45	30	25
Downloading files	10	40	50
Surfing social networks	5	10	85
Sending/receiving files	25	40	35
Playing online games	72.5	12.5	15
Playing offline games	50	30	20
Listening to music	5	10	85

4.1.2 Results of the Focus Group Sessions

After conducting the 2-week pilot study with 25 students, 14 of them participated in the focus group sessions. The focus group sessions were held by dividing the participants into two groups. The recorded sessions were transcribed and the transcriptions were subjected to content analysis. As a result of the analysis, the responses of the participants were grouped under 6 categories as follows:

- Opinions on using smartphones for vocabulary learning
- Comparison of the new method with former methods
- The procedures followed while completing the tasks

- Amount of time spent for the tasks
- Number of words
- Comments on the application

Opinions on Using Smartphones for Vocabulary Learning

The participants were asked to state their overall opinions on using smartphones for vocabulary learning. They stated that the process of thinking for an idea to take a picture forced them to learn the related vocabulary item. Moreover, they indicated that the pictures were eye-catching and it was easier for them to link the words to the use of pictures. On the other hand, the participants stated that finding an original photo idea that was different than the photos that had already been shared was very challenging.

Comparison of the New Method with Former Methods

Former methods that were used by the participants for vocabulary learning were asked them to make them compare those methods with the new method. The responses of the participants included memorization of the words with the use of a dictionary, watching movies or TV shows with subtitles, searching for different uses of words on the Internet and practicing with foreign friends. The participants were also asked to compare these methods with the new method used in this study. They stated that using visuals was more effective to recall the meaning of words. Moreover, they indicated that smartphones are widely used among students and it became easier for them to practice vocabulary through a mobile device supported learning environment. On the other side, the participants stated that completing the tasks became tiring from time to time. In addition, they expressed that it was challenging to find photo ideas for some words.

Procedures Followed While Completing the Tasks

In order to understand the overall progress made by the participants, they were asked to state what kind of procedures they followed while completing the tasks. As the first step, the participants indicated that they looked up the Turkish meanings of the words

from the dictionary. Different approaches were used by the participants while capturing photos for the related vocabulary items. Some of the participants stated that they looked up for objects inside their houses in order to capture relevant photos. Some others indicated that they came up with an idea to capture a photo while walking around. Furthermore, some of the participants stated that they searched through their smart phones' photo gallery to find a relevant photo to match with the vocabulary items.

Amount of Time Spent for the Tasks

The amount of time spent by the participants while completing the given tasks was an important issue. They were asked to state how much time they needed in average to complete a task for a vocabulary item. The responses of the participants revealed that it was not possible to give an exact time since it depended on the word and the number of possible options to capture a photo with the given word. Moreover, they indicated that they spent more time as they tried to find an interesting idea and come up with an original photo which was different than those that had already been shared. Furthermore, they added that it would take much less time to find related pictures on the Internet instead of capturing photos.

Number of Words

The number of words used for the pilot study was 8 words for a week. One of the aims of this pilot study was to identify the participants' opinions on the question of how many words would be ideal in this type of learning environment. Five respondents indicated that there was no need to change the number of words per week (8 words a week). On the other hand, 7 respondents stated that the number of words per week should be around 5. The remaining two respondents expressed that receiving one word per day would be better instead of receiving all of the words at the same time.

Comments on the Application

A freeware application (EveryMe), it allows its users to share their stories within different groups, was used throughout the pilot study. The respondents were asked to

evaluate the effectiveness and perceived usability of the application for mobile vocabulary learning. The respondents agreed that the application had a simple interface and it was easy to use. One of the main advantages of the system was its notification system according to the respondents. They indicated that instant notifications allowed them to look at what was shared and also reminded them to share something in that particular group. On the other side, they stated that notifications needed to be closed for certain actions but the system did not include such a feature to close the notifications for certain actions. For instance, when someone liked a sharing or a left a comment to a sharing, too many unnecessary notifications occurred according to the respondents. The application was reported to have some issues throughout the pilot study such as crashing instantly in some participants' phones. In addition, some participants reported that they sometimes had to try several times before uploading their photos to the system successfully. Furthermore, the Thesis Supervisory Committee advised including the pronunciation of the words in the vocabulary groups and there was no such feature to share audio files in this application. Therefore, a similar application (MeWe) that incorporates the group sharing system and audio file sharing feature was used for the main study.

4.2 Main Study Findings

In this section, the findings of the main study that was conducted in Fall 2015 semester are presented. In this phase, two different learning environments were used in two different classrooms in order to investigate and compare the effectiveness of them in terms of the students' vocabulary acquisition and motivation to learn vocabulary through the used learning environments. Firstly, the results of the pre-study questionnaire are presented. This questionnaire included questions to obtain information on demographics, infrastructure and mobile phone activity among the participants. Then, the results of the statistical analyses comparing the participants' scores on the vocabulary achievement tests and motivation survey are introduced. Finally, the results of the student and instructor interviews are presented.

4.2.1 Results of the Pre-study Questionnaire

In order to obtain information regarding demographics, infrastructure and mobile phone activity of the participants, a pre-study questionnaire was distributed to the students of English Preparatory School. In total, 37 students responded to this questionnaire from two classes. The results of this questionnaire are presented in the following parts.

Demographics

Out of 37 respondents, 51% of them were males and 49% of them were females. Most of the respondents were 18 years old (70.27%) and the rest of the respondents' ages were 17 (8.11%), 19 (16.22%) and 20 (2.7%). Figure 4.3 shows the gender and age distribution of the respondents.

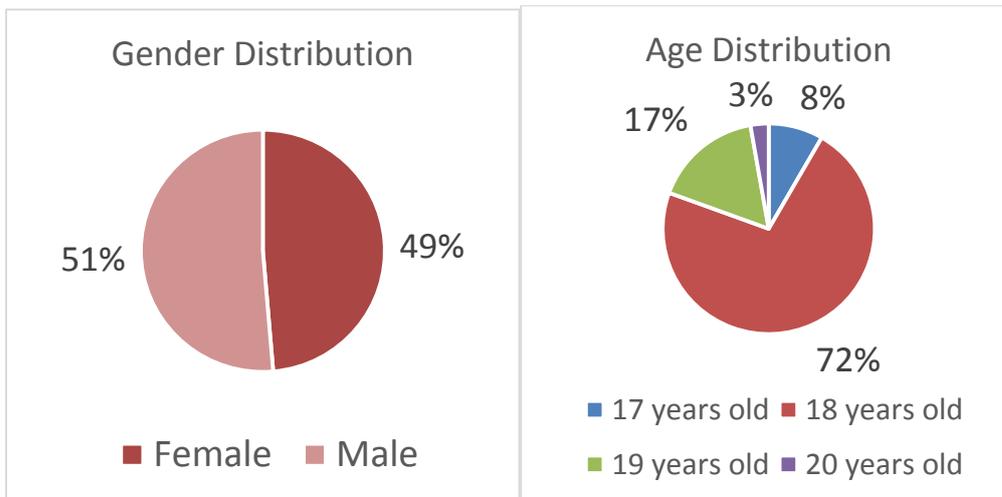


Figure 4.3 Gender and age distributions of the respondents in the main study

Infrastructure

Identifying the infrastructure regarding the mobile phone ownership of the respondents was important since the study required participants to possess mobile devices that are categorized as smart phones or tablet computers with internet connection. All of the respondents had a mobile phone and 94.6% of them categorized their phones as smart phone. Furthermore, 35.1% of the respondents reported to have a tablet PC. In terms

of Internet connectivity, 97.3% of the participants reported that they had access to the Internet via Wi-Fi or 3G. Among them, 67.6% of the respondents reported that they mostly prefer to use 3G whereas 29.7% of the respondents reported that they mostly prefer Wi-Fi for Internet access. Table 4.3 shows the device availability and Internet access among the respondents.

Table 4.3 Device Availability and Internet Access in the Main Study

Infrastructure	%
Mobile Phone Ownership	100
Smart Phone Ownership	94.6
Tablet PC Ownership	35.1
Internet Access (3G)	67.6
Internet Access (Wi-Fi)	29.7
Internet Access (Total)	97.3

The mobile operating system was another important criteria since the selected mobile application (MeWe) to be used for the mobile device supported learning environment was only available for certain operating systems, which are Android and iOS. The majority of the respondents (70.3%) had an Android operating system running on their mobile devices. On the other hand, 21.6% of them had an iOS operating system and the rest of the respondents (8.1%) had other mobile operating systems running on their mobile devices. Figure 4.4 shows the use of mobile operating systems on respondents' mobile devices.

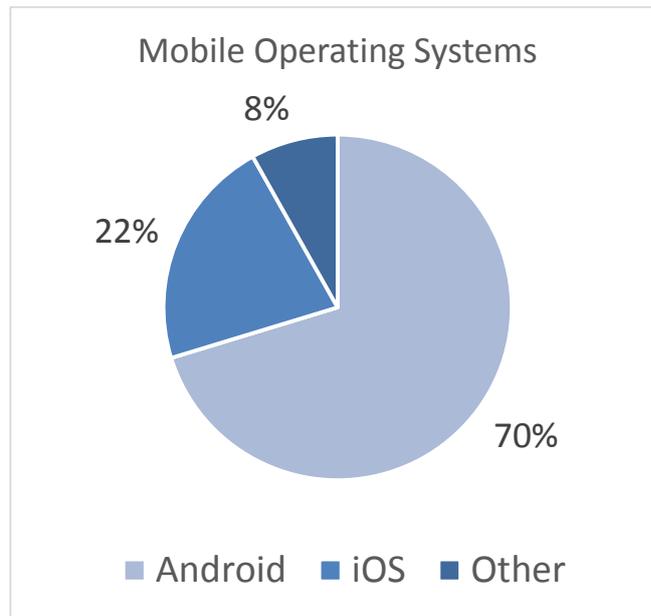


Figure 4.4 The mobile operating systems used on the respondents' mobile devices in the main study

Mobile Phone Activity

The activities that were performed on the mobile phones was also important to identify which activities were performed more frequently and which of them were performed less frequently than other activities by the respondents. In total, 16 type of activities were filled out by the respondents with respect to the frequency of performing those activities. Surfing the Internet (91.9%), making phone calls (86.5%) and listening to music as (83.8%) were the most frequently performed activities by the respondents as they often or always performed these activities on their mobile phones. Furthermore, surfing social networks (64.9%) and taking pictures (62.2%) were the following two activities that were often or always performed by the respondents on their devices. The less frequently performed activity was sending MMS as all of the respondents stated that they never or seldom sent MMS through their mobile phones. In addition, playing online games with others (83.8%) and playing offline games (73%) were the other two activities that were never or seldom performed by the respondents. Table 4.4 shows the overall frequency of activities that were performed by the respondents.

Table 4.4 Mobile Phone Activities Performed by the Respondents of the Main Study

Activity	Never-Seldom (%)	Sometimes (%)	Often-Always (%)
Making phone calls	2.7	10.8	86.5
Sending SMS	21.6	37.8	40.5
Sending MMS	100	-	-
Taking photos	8.1	29.7	62.2
Recording voice	62.2	29.7	8.1
Recording video	27	51.4	21.6
Making video calls	67.6	24.3	8.1
Surfing the Internet	5.4	2.7	91.9
Sending e-mail	13.5	35.1	51.4
Downloading files	18.9	24.3	56.8
Surfing social networks	18.9	16.2	64.9
Sending/receiving files	29.7	24.3	45.9
Playing online games	83.8	5.4	10.8
Playing offline games	73	8.1	18.9
Listening to music	8.1	8.1	83.8

4.2.2 Results of the Vocabulary Achievement Tests

There were two groups (experimental, comparison) of students who took the pre-test prior the study and the post-test after the study. In order to identify the progress of students in these vocabulary achievement tests, gain scores were calculated by finding the difference between the means of the pre-test scores and post-test scores for each group. Finally, all of the scores were converted into a scale of 100 since this scale is mostly used in achievement tests. Each group's means and standard deviations in the pre-tests, post-tests and gain scores are presented in Table 4.5.

Table 4.5 Means and Standard Deviations of the Pre-test, Post-test and Gain Scores

	Pre-test		Post-test		Gain Score*	
	Mean	SD	Mean	SD	Mean	SD
Experimental (n=18)	25.93	12	82.14	12.87	56.22	16.54
Comparison (n=19)	22.06	14.24	66.92	21.68	44.86	11.15

* Mean difference between the post-test and pre-test scores.

The mean pre-test scores of the experimental and comparison group students were close to each other. In order to make sure that there was no difference between the two groups based on their pre-test results, independent samples t-test analysis was conducted. The results of the t-test analysis revealed that the difference of mean pre-test scores between two groups is not significant, $t(35) = .89$, $p = .38$. The mean gain scores were 56.22 and 44.86 for the experimental and comparison groups respectively. These results indicate that the experimental group students performed better than the comparison group students according to the results of the vocabulary achievement tests as shown in Figure 4.5.

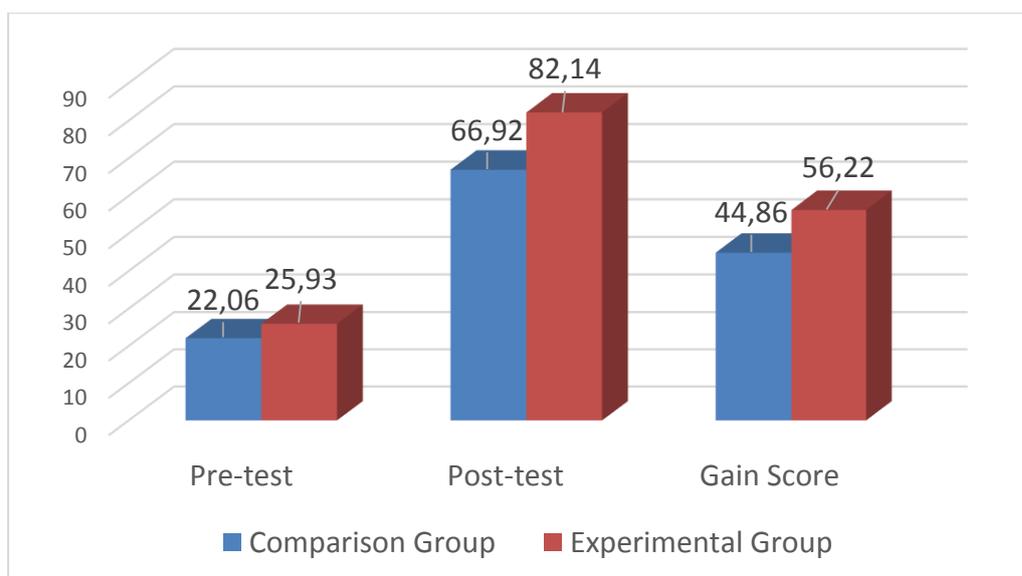


Figure 4.5 Comparison of two groups' mean scores in the vocabulary achievement tests.

In order to understand whether the difference of mean gain scores between the experimental and comparison groups was significant, independent samples t-test analysis was conducted. The independent variable was the learning method (mobile, traditional). The dependent variable was the gain score (the mean difference between the pre-test and post-test). The results of the t-test analysis revealed that the difference of mean gain scores between two groups was significant, $t(35) = 2.46$, $p = .019$ as shown in Table 4.6. The experimental group students acquired statistically more vocabulary items ($M=56.22$, $SD=16.54$) than the comparison group students ($M=44.86$, $SD=11.15$).

Table 4.6 Independent Samples t-test Results of the Vocabulary Achievement Tests

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Mean difference between pre-test and post-test	Equal variances assumed	2.02	.16	2.46	35	.019

4.2.3 Results of the Motivation Survey

After conducting the vocabulary achievement post-test, the motivation survey was distributed to the students in both groups (experimental, comparison) to understand whether the two different study modes (mobile, traditional) had different effects on the motivation of the students to complete the given activities. The motivation survey included items measuring the four dimensions of motivation, which are attention, relevance, confidence and satisfaction. Student scores on each dimension were calculated and compared both separately and as a whole. The motivation scores of each dimension were converted to a scale of 100 to make a more effective comparison. Table 4.7 shows the means and standard deviations of the motivation scores for each

group of students. The results initially revealed that the motivation scores of the experimental group students for each dimension were greater than the scores of the comparison group students as shown in Figure 4.6.

Table 4.7 Means and Standard Deviations of Motivation Scores

	Attention		Relevance		Confidence		Satisfaction		Total	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Experimental (n=18)	76.02	13.60	76.79	13.03	76.05	11.22	72.96	17.67	75.71	12.34
Comparison (n=19)	63.33	17.33	63.74	17.51	68.30	9.88	52.98	20.84	62.95	15.19

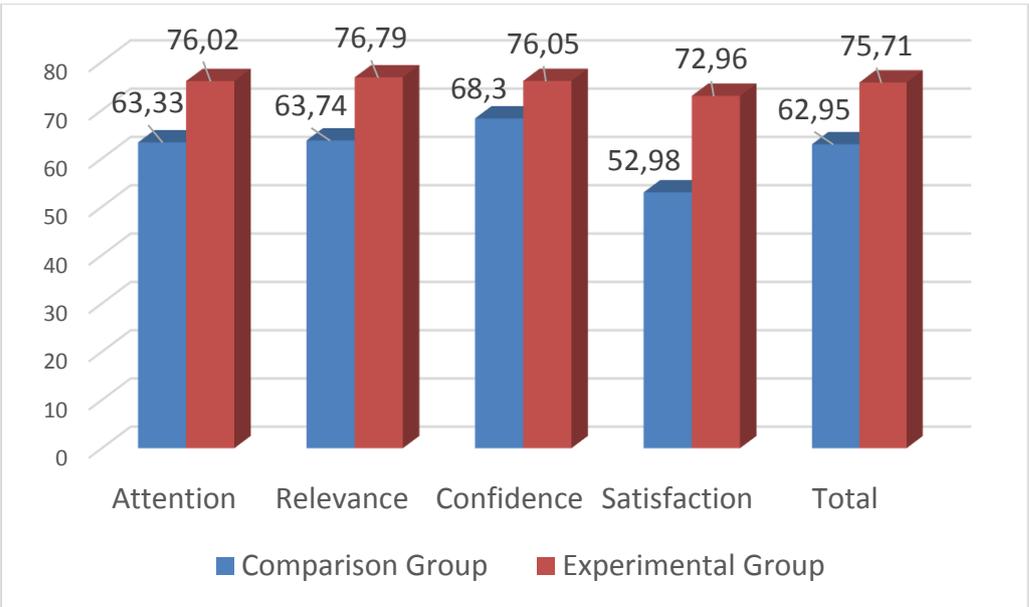


Figure 4.6 Comparison of two groups' mean scores in motivation survey.

In order to understand whether the difference of total mean motivation scores between the experimental and comparison groups was significant, independent samples t-test analysis was conducted. The independent variable was the learning method (mobile, traditional). The dependent variable was the total motivation score. The results of the t-test analysis revealed that the difference of total mean motivation scores between two groups was significant, $t(35) = 2.79, p = .008$ as shown in Table 4.8. The experimental

group students were statistically more motivated (M=75.71, SD=12.34) than the comparison group students (M=62.95, SD=15.19) while completing the given tasks.

Table 4.8 Independent Samples t-test Results on Total Scores of Motivation Survey

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Total mean motivation score	Equal variances assumed	.92	.34	2.79	35	.008

In addition, subsequent independent samples t-test analyses were conducted for each dimension of motivation to understand whether the mean score difference between two groups of students for each dimension was significant. The results of the t-test analyses revealed that the experimental group students' mean motivation scores were significantly greater than the comparison group students' motivation scores for each dimension of motivation as seen in Table 4.9.

Table 4.9 Independent Samples t-test Results on Scores of Motivation Survey for Each Dimension

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Attention dimension	Equal variances assumed	1.02	.32	2.47	35	.019
Relevance dimension	Equal variances assumed	1.60	.22	2.56	35	.015
Confidence dimension	Equal variances assumed	.02	.89	2.23	35	.032
Satisfaction dimension	Equal variances assumed	.33	.57	3.14	35	.003

4.2.4 Results of the Student Focus Group Sessions

The main objective of the focus group questions was to obtain in-depth opinions of the students regarding their overall experience while completing the tasks in the mobile device supported learning environment. Focus group sessions were held by dividing the students in the experimental group into four sub groups and in total 18 students participated in these sessions. The qualitative data collected from the focus group sessions were transcribed and analyzed to gather information about the students' perceptions on the mobile device supported learning environment and to receive the students' feedback on the advantages and disadvantages of the mobile learning system together with suggestions concerning the improvement of the learning environment.

In the interview form there were 11 questions to be answered by the students in each focus group. With the first question, the students were asked to express their general opinions regarding the use of mobile devices for vocabulary learning. All of the students favored the use of mobile devices for learning by talking about different aspects of mobile device supported learning environments. Some of the points emphasized by the students were the constant usage of mobile devices in daily life and their instant availability at anytime and anywhere. On the other hand, some students also talked about some negative aspects of using mobile devices such as the presence of possible distractors while using a mobile device. For example, one student stated,

There are too many distractors while we are using our mobile phones. This is also true for computers. But it could be more effective as well since we have them with us all the time and the Internet connection is faster. It also depends a little on our usage.

[Çeldiriciler çok fazla oluyor mobil kullanırken aynı şekilde bilgisayar kullanırken de öyle. Ama bir yandan da hem sürekli elimizin altında olduğu için hem de İnternet erişimi falan daha hızlı olduğu için daha etkili de olabilir. Biraz bizim kullanmamıza da bağlı.]

Some students stated that they had negative opinions towards the use of mobile devices for vocabulary learning before the study and they changed their attitudes afterwards. For instance, one of the students indicated,

Actually I was, well, a bit opposed to the idea at the beginning, because I used classical methods. I mean, I learned by writing things down. But later, while thinking about pictures for the words, contemplating which photo would be more appropriate for that word, you see that you are learning. I mean, actually it teaches you without you realizing it.

[Ben de aslında buna ilk başlarda biraz şeydim, tepkiliydim, çünkü ben klasik şey yapıyordum. Hani yazarak öğreniyordum. Ama sonra bu hani resimler düşünürken kelimelere, bu kelime için hangi resim çekmek daha uygun diye düşünürken bir bakıyorsunuz öğreniyorsunuz. Yani aslında fark ettirmeden öğretiyor.]

In the second question, the students were asked to talk about their own methods of learning English vocabulary and to make a comparison with the new method. Most of the students (n=13) stated that they memorize the words by writing them down on a paper together with their meanings as seen in Figure 4.7.

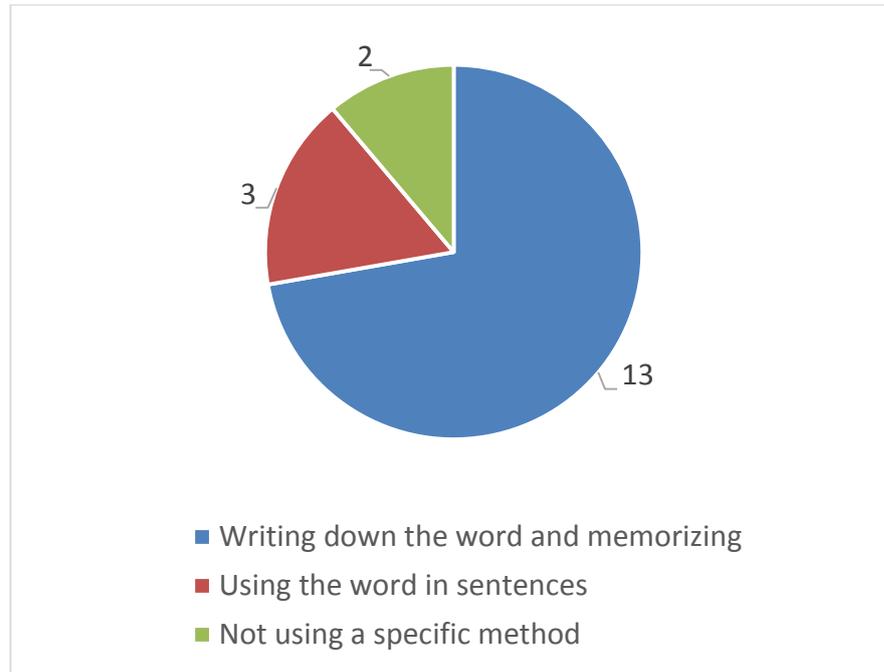


Figure 4.7 Vocabulary learning methods used by the students.

As a follow-up question to the second question, the students were asked to compare their own methods with the new method in terms of their advantages and disadvantages for vocabulary learning. Regarding the advantages of the new method used in the

study, the most frequent responses of the students included that this method provided permanent learning since it required them to form sentences and create associations with real-world objects through use of visuals. For instance, one interviewee stated,

... And also this thing happened, using it in a sentence increased its memorability... There is also the photo shooting thing, which increased its memorability a great deal as we also involved our creativity in it, so the word became really memorable.

[...Hem işte şey oldu, cümlede kullanmak onu daha böyle aklımızda kalıcılığını arttırdı... Bir de fotoğraf çekme kısmı var, o da kalıcılığını çok çok arttırdı çünkü biraz da işin içine yaratıcılığı kattığımız için kelime baya kalıcı oldu.]

Regarding the benefits of creating associations with an object, one student indicated,

It is much better to associate it with something. Even kids learn the color green by looking at that color while learning it as it stays in their memory. Therefore, it was very memorable for us to shoot photos via this method.

[Bir şeylerle bağdaştırmak çok daha iyi oluyor. Çocuklar bile öğrenirken yeşil rengine bakıp sonuçta o hafızasında kaldığı için yeşili öğreniyor. Bu yöntemle de bizim resim çekerek yapmamız baya kalıcı oldu yani.]

Another advantage of the new method according to some students was that it was time saving compared to traditional methods. One of the students made a comparison of this method with traditional methods and stated,

In fact, well, it gradually accelerates your pace of learning. I mean, you save time because it takes too much time when you write them down. But in this one you shoot something quickly and it takes 1-2 seconds.

[Gerçekten şey hani zamanla öğrenme hızını arttırıyor. Yani zamandan tasarruf ediyorsun çünkü yazarak baya bir zaman alıyor. Ama bunda kısaca bir şey çekiyorsun ve fotoğraf çekmem 1-2 saniye sürüyor.]

Besides the advantages of the new method, the students also pointed out some disadvantages of the new method compared to traditional methods. Three students noted that it was sometimes challenging to find an appropriate picture idea because of the limited opportunities around the environment. For instance, one student voiced,

For this, you need to create the circumstances, I mean you need to be able to take that photo. You know, you have to shoot it outdoors but you are indoors, so sometimes you might not work it out.

[Bunda ortamı yaratabilmen lazım, yani fotoğrafı çekebilmen gerek. Hani açık bir ortamda çekmen gerekir, kapalı bir ortamdadır, olmayabilir bazen.]

Two students also stated that using mobile devices for learning was not as serious as classical methods like using paper and pencil since most mobile applications are not aimed for educational purposes in the first place. Regarding this, one student indicated,

To be honest, because it is mobile, I kind of lost my seriousness. You know, it kind of became an ordinary application for me, like the social media apps I had on my mobile phone... I think this is the only disadvantage.

[Ben biraz mobil olduğu için ciddiyeti kaybettim gibi oldu açıkçası... Hani benim için sıradan bir program gibi oldu telefona kurduğum sosyal medya programları gibi... Tek dezavantajı bu diye düşünüyorum ben.]

The frequency of student responses to the advantages and disadvantages of the mobile learning method compared to traditional methods is shown in Table 4.10.

Table 4.10 Student Responses to the Advantages and Disadvantages of the M-Learning Method

Advantages	f	Disadvantages	f
Provides permanent learning	4	Challenge of the environment to take photos	3
Forming sentences	4	Not serious as classical methods	2
Creating associations with pictures	4	Fewer words can be learned	2
Time saving	3	Challenge to relate some words with photos	1
Good for visual memory	2	Tiring to complete	1
Instant feedback of the instructor	2	Writing down is better for spelling	1
Enhances creativity	1		
Seeing friends' sharings	1		

The students were asked to state their suggestions for improvement of the mobile device supported learning environment. The current design of the mobile device supported learning environment was found to be acceptable by the students but there were also some suggestions for future improvements. The most frequent suggestion (n=9) was that there should be more words to be completed in a week. Moreover, three students stated that it would be good to include weekly quizzes to let them test their knowledge of the words that they were responsible for that week. One of the students pointed out the possible motivating effects of weekly quizzes and stated,

And also it is something like that: Let's say I did seven words during the first week. One can be more motivated, I mean, for the coming weeks if s/he sees that s/he has learned six of them. There could be personalized quizzes too.

[Hem ayrıca şöyle bir şey mesela ilk bir hafta içerisinde atıyorum 7 kelime oluyordu. Bir haftada onun 6 tanesini öğrendiğini görünce insanı daha da çok teşvik edebilir, yani bir dahaki haftalar için. Kişiyeye özel quizler de olabilir.]

Some of the words can have several meanings according to their context of use but in this study, only the textual meanings of the words were used in order to measure student knowledge based on these meanings. Three students stated that it would be more beneficial to include other meanings of the words as well. Regarding this issue, one student stated,

Let's say a word has four basic meanings that are really important. Here the instructor usually included the meanings that were found in the reading texts we used, but maybe it could have been better if we had also used that word with a second meaning.

[Mesela bir kelimenin 4 tane temel baya önemli anlamı var. Şimdi burada da genelde hani bizim kullandığımız textlerdeki falan anlamlarına göre yazmıştı hoca ama sanki bir ikinci anlamıyla da kullansaydık belki o da iyi olabilirdi.]

The frequency of the students' suggestions for future improvements of the mobile device supported learning environment is shown in Table 4.11.

Table 4.11 Students' Suggestions for the Future Improvements of the M-Learning Environment.

Sub-themes	f
More words in a week	9
Weekly quizzes	3
Other meanings of the words	3
Turkish meanings of the words	2
Speaking exercise	2
Other forms of the words	1

The students were asked to talk about their perceived success regarding their own progress in learning the vocabulary items throughout the study. All of the students (n=18) indicated that their knowledge of vocabulary items improved in a positive way. They were also asked to elaborate on the indicators and reasons for their success. The most frequent response (n=8) of the students as indicative of this success was the improvement in the results of their tests and quizzes. Some of the students made a comparison between the results of the pre-test and the post-test. For instance, one of them stated,

For example, the test that we took after the completion of the study was the one that we did at the beginning of the study, and when our instructor told this to us, I was much surprised. When I did the second test, I did really well. I mean I got a good result because I hadn't known those words, and I had learned them in one or two months.

[Bu bize çalışma bittikten sonra yapılan sınav bu çalışmanın başında da yapılmış mesela ve hocamız bunu bize söylediğinde ben baya şaşırılmışım. İkinci sınavı yaptığımda baya yaptım yani güzel bir sonuç çıktı. Çünkü onları bilmiyordum ve yani aynı kelimeleri bir iki ay sonra öğrenmiş oldum.]

Another student argued that the used method contributed to the retention of the vocabulary items without noticing and stated,

For instance, when I looked back on the past weeks, I noticed that they had remained in my mind, and I observed this in the quiz as well. I mean although a lot of time had passed since the first weeks, I remembered them in the quiz and I did well. It kind of makes you learn without you realizing it.

[Mesela öyle bir geçen haftalara baktığım zaman aklımda kaldığını fark ettim ki quizde de bunu gördüm. Yani en baştaki haftalar bile üzerinden onca zaman geçmesine rağmen quizde onlar aklıma geldi ve yaptım yani. Biraz da fark ettirmeden öğretiyor.]

Furthermore, three students attributed their success to seeing many different example uses of the vocabulary items from their friends' shared posts in addition to their own tasks. For example, one student voiced,

I mean, when you do it alone, you see one sentence for one word, but when it is done in a shared platform, you see minimum ten different things for one word.

[Yani tek başına yapınca bir kelimededen bir cümle falan görüyorsun ama ortak bir platformda olunca bu sefer bir kelimededen en az 10 farklı şey görüyorsun yani.]

One of the most important dimensions of vocabulary learning is active use vocabulary items that students learnt. The students were asked whether they have used or could use the vocabulary items that they learned throughout the study. Most of the students (n=14) stated that they had the confidence to use these vocabulary items in different ways. Among these students, seven of them expressed that they already used some of the vocabulary items in their writing assignments. The students attributed their success in actively using some vocabulary items in their writings to several reasons. The first reason was spending quality time thinking various alternative representations of the words. The second reason was practicing the use of the words in sentences. Another reason was coming up with a creative idea to visually represent the words. Regarding the benefit of creativity, one student stated,

A specific word occurs to me. I had tried hard to come up with a highly creative photo; I had taken a nice photograph for that one. For example, I use that word a lot when I am writing a paragraph.

[Benim bir kelime geliyor aklıma. Ben ona fotoğrafla baya yaratıcı bir şey yapmaya çalışmışım, güzel bir fotoğraf çekmişim onunla ilgili. Mesela ben o kelimeyi bir writing yazarken çok kullanıyorum.]

Throughout the study, the students needed to follow a certain strategy to complete the given tasks for each vocabulary item. The students took photos and formed explanatory sentences for each vocabulary group in the mobile learning system and they were asked to elaborate on their own strategies while completing these tasks. Most of the students (n=11) indicated that they tried to find a photo idea by exploring their surroundings as the first step and formed the related sentences afterwards. On the other hand, three students stated that they formed sentences first and tried to find a relevant photo idea afterwards. The remaining students expressed that they used different strategies depending on the vocabulary item as it is shown in Figure 4.8.

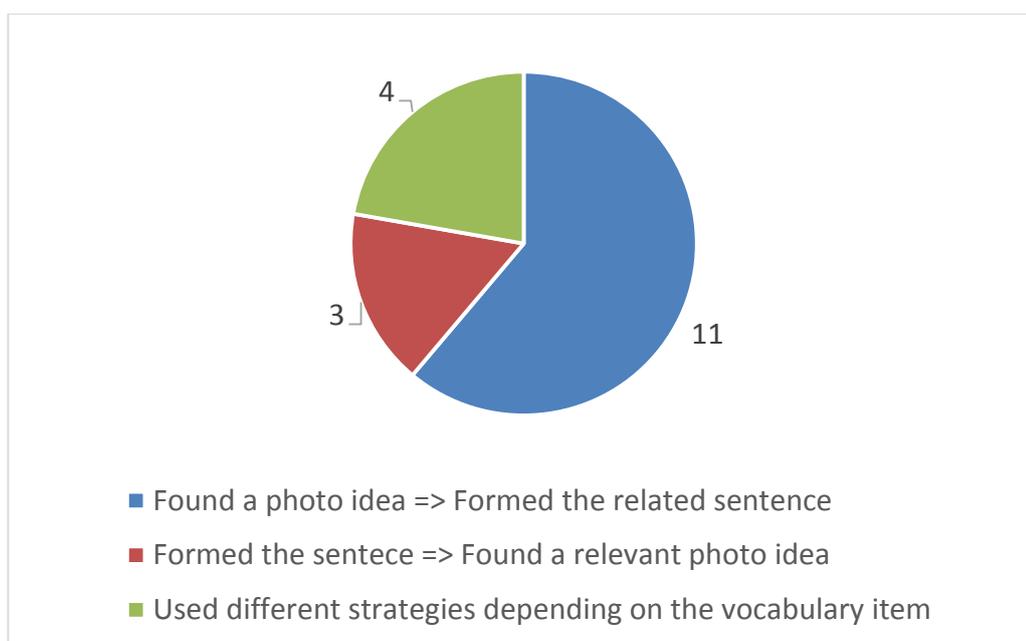


Figure 4.8 Students' strategies while completing the given tasks.

In order to identify the most useful aspects of the mobile device supported learning environment, the students were asked to indicate the most beneficial parts of the study for their own vocabulary learning progress. The most frequent response (n=5) was the thinking process to take a photo while trying to find a relevant idea for the vocabulary items. For instance, one student indicated,

As you try to find a photo related to the word, you think about the word itself. I mean, normally when you just write, you find its meaning and write it next to the word, so you do not really think. But in this one you inevitably think about the word while trying to find a photo idea. Meanwhile, it becomes embedded in your memory.

[Kelimeyle ilgili bir fotoğraf bulmaya çalışırken kelimeyi düşünüyorsun. Hani normalde yazma işleminde anlamını buluyorsun yazıyorsun yanına, fazla bir düşünme işlemi olmuyor. Ama bunda hani fotoğraf bulmaya çalışırken kelimeyi illa ki düşünüyorsun. O arada kelime insanın kafasına yerleşiyor.]

Another frequent response regarding the most beneficial sides of the learning environment was forming sentences (n=4). Students reported that the learning environment allowed them to examine various uses of words in sentences which were shared by the instructor or other participants. Moreover, they emphasized the importance of forming sentences for actively using the words and associating the sentences with photos for permanent learning. Regarding this benefit, one student voiced,

As we form a sentence and relate it with a photograph at the same time, it can remain in our minds for a longer time. Some of us may have a better visual memory. Therefore, it remains in our minds better.

[Cümle kurup aynı zamanda fotoğrafla ilişkilendirdiğimiz için aklımızda daha çok kalabiliyor. Bazılarımızın görsel hafızası daha iyi oluyor. O yüzden aklımızda daha iyi kalıyor.]

The opportunity of the learning environment to provide multiple representations of the vocabulary items was also found to be very beneficial by some students. Some students reported that they could not always be creative during the photo taking process and they completed the tasks by using simple ideas for some words. In these cases, they indicated that other posts shared by their friends served as complementary materials for their understanding of these words. For example, one student stated,

Even if I have shared an ordinary photo, at least one person's photo is interesting, or, you know, there is a funny photo. Even if the word does not remain in my mind through my own photo, it does so thanks to that photo. I guess that was by far the best side of it.

[Ben normalde sıradan bir fotoğraf paylaşmış bile olsam en azından bir kişinin fotoğrafı ilginç oluyor ya da ne bileyim komik bir fotoğraf oluyor. Benimkinden aklımda kalmasa bile o fotoğraftan kalıyor. Bence açık ara en güzel tarafı buydu.]

The student responses included several other benefits of the learning environment, which are listening to the pronunciations of the words, seeing the forms of the words (noun, verb, etc.), examining the instructor's shared posts, receiving the instructor's feedback, using separate vocabulary groups to examine the shared posts, and completing the given tasks on a regular basis. All of these benefits were reported by the students to have an effect on increasing the retention of the words. Table 4.12 shows the students' responses to the most beneficial aspects of the learning environment for vocabulary acquisition.

Table 4.12 Student Responses to the Most Beneficial Aspects of the M-Learning Environment

Sub-themes	f
Photo taking process	5
Forming sentences	4
Seeing friends' shared posts	3
Listening to the pronunciations	2
Seeing the forms of the words	2
Instructor's example post	2
Instructor's feedback	2
Use of separate vocabulary groups	1
Sharing photos regularly	1

In this study, the students were asked to study and complete the given tasks for one word each day and they were responsible for seven words a week. The students were asked to state their opinions on whether the number of words was enough or not. None of the students indicated that the number of words should be decreased. However, there were varying responses about whether studying one word a day was ideal or not. Ten of the students stated that one word a day was not enough and two of them explicitly

indicated that there should be two or three words a day to study. On the other hand, 7 students stated that one word a day was ideal. These responses were based on different viewpoints of the students. Some students believed that they could complete more tasks relying on this method by increasing the number of words per day. Some others believed that one word a day was ideal with this method since they have other tasks to be completed in a day. One student argued that increasing the number of words a day might have negative effects for the retention of the words and stated,

When you think of it as one word per day, it sounds insufficient, but when you think of it in terms of permanence, you learn one word in a day, but it becomes permanent. Actually it kind of becomes unforgettable.

[Günde bir kelime olarak düşününce az geliyor ama kalıcılık bakımından baktığımız zaman günde bir kelime öğreniyorsunuz ama kalıcı oluyor. Biraz da unutamayacağınız bir kelime oluyor açıkçası.]

The students were asked how often and in what cases they checked their peers' posts. The most frequent response was that they checked the posts when they received a notification. One student reported that the notifications aroused curiosity by urging him to check the post and focus on the vocabulary item as well.

You know, I get a notification, and I wonder how the photo is. Meanwhile, I also focus on the word. Then I leave the notification and take a look at the other shared ones on the home page, I mean, honestly it triggers me.

[Yani bildirim geliyor, merak ediyorum açıkçası nasıl fotoğraf paylaştı diye. Sonra o sırada kelimeye de odaklanıyorum. Sonra çıkıyorum ana sayfadan paylaşılanlara bakıyorum, yani beni dürtülüyor açıkçası bu.]

The notifications also indirectly led the students to check the posts as they wanted to get rid of the notification sign. For instance, one student voiced,

When I get a notification, I click on it in order to get rid of the notification. When I click on it, I check the photos as well.

[Bildirim gelince orda bir tek o bildirim sayısı yazıyor ya, gitsin diye açıyorum, açmışken de bakıyorum.]

Moreover, some students reported that when they could not come up with any idea about the photos they were supposed to share, they checked their peers' posts for inspiration. One student stated that it was also useful to compare the ideas that the others used in their own photos in order to come up with an original idea,

Also, if two or three people added photos and I added one after them, I checked them to get an idea from them as well. Like they have used it this way, can I use it differently, or will I come up with the same thing? That kind of things. For this reason, I paid attention to what my friends shared and checked them as well.

[Bir de şöyle bir şey hani iki üç kişi eklediyse ben onlardan sonra eklediysen onlardan da yardım almak için baktım... Hani düşündüm de açıkçası o öyle kullanmış ben farklı kullanabilir miyim yoksa yine aynı anlama mı çıkacak gibisinden. Onun için yani ben arkadaşlarımla paylaştıklarına da önem verdim baktım.]

Throughout the treatment procedure, there was a decrease in the students' performances related to sharing posts. It was observed that the students were sharing their posts on a regular basis at the beginning of the treatment procedure. However, some of the students started to share fewer posts or share posts irregularly through the end of the treatment procedure. The students were asked to talk about possible reasons for this decrease of performance. There were two main issues that were raised frequently by the students. The first reason was related to the students' overall loss of interest in the English preparatory school program. Four students indicated that they were more willing to study at the beginning of the English preparatory school program but they lost their interest in following the lessons and completing their homework assignments in the last weeks. For instance, one student voiced,

It is not particularly related to this study, overall we have lost our interest in our lessons over the past weeks. It could also be due to exhaustion. I mean, it is our own fault; it is not because of the study.

[Bunun sadece özel olarak bu uygulamayla ilgisi yok, genel olarak bizim derse olan ilgimiz de son haftalarda çok fazla düştü. Birazcık yorgunluktan da olabilir... ..biraz uygulamanın değil de bizim kendi suçumuz yani.]

The second reason was related to the students' loss of enthusiasm towards the study itself. Four students stated that they were more eager to participate at the beginning of

the study compared to the last weeks of the study since it was an interesting method for vocabulary learning at first sight. One student made an analogy and stated,

There is this thing; when you get a new mobile phone, you spend a lot of time on it during the first week. After some time, you begin to lose your interest in it. It was something like that.

[Şimdi şöyle bir şey var yeni bir telefon aldığınız zaman ilk hafta onunla çok ilgilenirsiniz. Zaman geçtikçe biraz hevesinizi almış olursunuz bırakırsınız gibi bir şey oldu.]

There were some other responses regarding the decrease of performance. Two students stated that their course load increased as weeks passed and it became more difficult to spare time for this study. Moreover, two students mentioned the negative effects of procrastinating the weekly tasks to the last days of the week.

Finally, the students were asked to state their perceptions regarding the usability of the mobile sharing application (MeWe) that was used throughout the study. There were both positive and negative student responses regarding the perceived usability of the application. Concerning the interface of the application, two students indicated that the interface was similar to other social sharing applications such as “Instagram” and that was the reason why they liked it. On the other hand, two students stated that the interface for accessing the vocabulary groups was a bit complicated and that was the reason why they sometimes mistakenly shared their posts on the homepage. They suggested that the interface could have been simpler. Another student reported that the interface was not complicated but it should have been more intriguing. Two students reported that the use of separate groups for each vocabulary item made it easier to follow the shared posts. Regarding the interactive elements of the application, two students stated that the use of emojis was very useful to express feelings. The students also reported some failures about the functionality of the application. For instance, three students stated that they sometimes experienced some temporary problems with the notification system such as failing to open the related group page via the notification message. In addition, two students reported that uploading videos took too much time although the videos were small in size.

4.2.5 Results of the Instructor Interview Sessions

The aim of the instructor interview questions was to obtain information from the instructors of both groups regarding their opinions on the method used for vocabulary learning. The qualitative data collected from the interview sessions were transcribed and analyzed to gather information about the instructors' perceptions of the benefits and challenges of the used method and students' involvement based on their observations.

In the instructor interview form, there were 10 questions to be answered by the instructors. The first section of the interview form included preliminary questions in order to obtain information about the instructors' educational background and their former experiences in teaching vocabulary. The second section included follow-up questions regarding their opinions on the used method for vocabulary learning throughout the study.

The instructors were asked to talk about their educational background and teaching experience in the first two questions. Both instructors completed their undergraduate studies on English language but their fields of study were different. The mobile group instructor reported that she graduated from the department of English Language and Literature in 2007 and completed a pedagogical formation certificate program afterwards. She had 9 years of teaching experience in higher education in three different universities. On the other hand, the traditional group instructor reported that she graduated from the department of English Language Teaching in 2009 and she had 7 years of teaching experience in higher education in two different universities as shown in Table 4.13.

Table 4.13 Educational Background and Teaching Experience of the Instructors

The Mobile Group Instructor	The Traditional Group Instructor
Hacettepe University	Middle East Technical University
English Language and Literature (BA, 2007)	English Language Teaching (BA, 2009)
9 years of teaching experience in higher education:	7 years of teaching experience in higher education:
<ul style="list-style-type: none"> • Kapadokya Vocational School (1 year) • Mehmet Akif Ersoy University (3 years) • Middle East Technical University (5 years) 	<ul style="list-style-type: none"> • Bilkent University (1 year) • Middle East Technical University (6 years)

The instructors were asked to talk about their former experiences in teaching vocabulary by providing details on the methods they used in class and the factors influencing their choice of method. The mobile group instructor reported that she mostly used the definition of the word and elaborated on it as the first step and then formed several example sentences including the word. She emphasized the importance of using sentences to provide context to the students. She indicated that she made use of pictures if the word was concrete enough to be represented by a picture and she added that use of pictures was mostly time-saving and better to recall vocabulary. Moreover, she also made use of synonyms and antonyms of the word based on the students' prior knowledge to help students create connections between the target word and the words already known. On the other side, the traditional group instructor reported that she generally used the vocabulary teaching methods along with other skills such as reading or listening skills and determined unknown words that needed to be taught before the activities. She indicated that she preferred to ask introductory questions to the students regarding the target word and expected them to infer the

meaning of the word through their own answers. In addition, she stated that she used pictures for simple words and formed additional sentences for abstract words to provide context for students. Furthermore, she reported that she occasionally used the storyline on a video to create a relation with the target word. She also noted that she adjusted the methods based on the students' proficiency level. Table 4.14 shows the factors influencing the instructors' choices of vocabulary teaching methods.

Table 4.14 Factors Influencing the Instructors' Choice of Vocabulary Teaching Method

The Mobile Group Instructor	The Traditional Group Instructor
Concrete/simple words	Concrete/simple words
1. Use of pictures	4. Use of pictures
Abstract/advanced words	Abstract/advanced words
2. Use of example sentences to provide context	5. Use of example sentences to provide context
Prior knowledge of students	Unknown words before a reading/listening activity
3. Use of synonyms/antonyms of known words to provide association	6. Use of introductory questions to let students infer the meaning
	Proficiency level of students
	7. Increasing repetition for low-level students

After obtaining preliminary information about the instructors, they were interviewed on their opinions and experiences regarding the used method for vocabulary learning throughout the study. The instructors were asked to state their opinions regarding the benefits and challenges of the used method by providing reasons. The mobile group instructor reported that the used method was more student-centered and forced the students to produce something on their own. She indicated that the used method provided permanent learning for students since it created a learning environment

where the students could spend time thinking about the words and share something from their own lives. Moreover, she stated that the use of the mobile-supported learning environment let the students produce something anytime they wanted and it was convenient for addressing the habits of students regarding technology use. She voiced,

As I have said, the benefits are that the students give examples from their own lives, own world and that it provides a more permanent learning in this way. Another point is that it is mobile learning. I mean, the students can do something in terms of learning vocabulary anywhere and under any circumstances because today students are intertwined with technology and this study also appeals to their needs.

[Faydaları dediğim gibi öğrencinin tamamen kendi dünyasından kendi hayatından örnekler vermesi ve bu şekilde daha kalıcı öğrenme sağlaması. Diğer bir nokta da mobil öğrenme olması. Yani öğrencinin her an her durumda bir şeyler yapabilmesi kelimeyi öğrenmek adına. Çünkü günümüzde öğrenciler teknoloji ile iç içeler ve bu onların bu ihtiyaçlarına da hitap ediyor.]

She also emphasized the importance of sharing among students since it created an engaging environment where the students commented on each other's photos recurrently. She argued that these actions paved the way for repeated exposure to the vocabulary items and stated,

As the students shared the photos, they could comment on each other. Of course, the fact that they comment on the photos, re-view them and read their friends' comments increases repetition, and vocabulary can be learned through repetition.

[Öğrenciler fotoğrafları paylaştıkça birbirlerine yorum yapabildiler. Tabi ki bu yorum yapmaları ve dönüp tekrar bakıp arkadaşlarının yorumlarını incelemeleri tekrar düzeyini artırıyor ve kelime tekrar yöntemiyle öğrenilebilen bir şey.]

Regarding the benefits of the method, the traditional group instructor stated that it was enjoyable for the students and aroused their interest at first sight. She argued that she believed in the effectiveness of using visual approaches for learning and knowledge retention. For instance, she stated,

I really believe in this when one learns something. It is also true for learning vocabulary. I think I find it important as I attach importance to more visual things. I believe that including visual things in vocabulary learning is a much more effective method for students.

[Ben ona çok inanıyorum bir şey öğrenirken kelime öğrenmede de aynı şey geçerli başka şey öğrenmede de geçerli, ben biraz daha görsel şeylere önem verdiğim için de sanırım bunu önemli buluyorum. Vocab teaching'i görselliğe taşımanın öğrenciler için çok daha etkili bir yöntem olduğunu düşünüyorum.]

The instructors were asked to state their opinions on the challenges of the method for the students. The mobile group instructor indicated that one of the challenges of the method for the students was the difficulty to explain abstract words through photos. She added that contextualization became more important when it came to represent abstract words and it challenged students to form appropriate contexts for some words. Regarding this issue, she indicated,

Of course it is easier when they are explaining a concrete word; they can explain it by shooting a photo of anything in their rooms or houses. However, when it is an abstract word; when the word has an abstract meaning, they have to create a situation for it and they may not express it well in a photograph.

[Tabi ki somut bir şey anlatırken daha rahat, evlerindeki odalarındaki herhangi bir şeyin resmini çekerek anlatabiliyorlar. Ancak durum soyut olduğunda, kelime soyut bir anlama sahip olduğunda bir durum yaratmak zorunda kalıyorlar ve bu durumu fotoğrafta her zaman iyi ifade edemeyebiliyorlar.]

On the other side, the traditional group instructor also mentioned the challenge of drawing for some students. She stated that some of her students did not enjoy drawing or believed that they did not have the talent when they examined their own drawings.

I had some students who could not draw; I remember them say "Madam, I cannot draw well", I remember such things being said for one or two weeks... I mean it was a bit too challenging for those who do not have the ability to draw or rather for those who do not like drawing.

[Resim çizmeyi hiç bilemeyen beceremeyen öğrencilerim vardı, hatırlıyorum yani hocam güzel olmuyor deyip böyle bir iki hafta öyle şeyler dendiğini hatırlıyorum bana... Hani çok resme yeteneği olmayan ya da çok sevmeyen diyeyim yetenekten ziyade öğrenciler için birazcık zorlayıcı oldu sanki.]

The instructors were asked to state their perceptions of the level of student engagement throughout the study. The mobile group instructor stated that using a mobile device supported learning environment for vocabulary learning aroused the students' interest at the beginning of the treatment procedure but their level of interest decreased towards the end. She argued that students are generally prone to getting bored and distracted very easily while doing the same things. Moreover, she indicated that the English preparatory program is very demanding for students in general and they always experience a decrease in motivation for classwork towards the end of the term. Regarding this issue, she stated,

The students kept going until the end, but after some time this began to fail to attract their interest... The students always experience a loss of motivation through the end of the term, so I do not think that it was related to this study. As time passed, the students' interest in this study decreased a little just like their interest in the lessons did.

[Öğrenciler sonuna kadar devam ettiler ama bir süre sonra bu da öğrencilerin ilgisini çekmemeye başladı... Öğrenciler dönemin sonuna doğru her zaman bir motivasyon düşüklüğü yaşıyorlar yani bu çalışmayla ilgili olduğunu düşünmüyorum. Dönem ilerledikçe öğrencilerin genel olarak derslere olan ilgisi gibi bu çalışmaya olan ilgisi de biraz azaldı.]

Based on her observations, she indicated that students were engaged by interacting with other photos that were shared. She stated,

Overall, I believe that they somehow followed each other in the virtual platform as they saw each other's photos, and I think they participated in this way.

[Genel olarak sanal bir ortamda birbirlerinin fotoğraflarını gördükleri için bir şekilde birbirlerini takip ettiklerini düşünüyorum, bu şekilde bir katılım da sağladıklarını düşünüyorum.]

Regarding the level of student engagement, the traditional group instructor stated that almost all of the students participated until the end of the treatment procedure. She

indicated that she occasionally received some questions from the students about whether they have to complete the given tasks. The instructor's response to them was that the vocabulary items were taken from their own books and they are already responsible for these words. She noted that the students were engaged in the activities and they completed their tasks on time knowing that the vocabulary items were relevant to their curriculum. She voiced,

I think they participated and did something because I had told them that it was related to their active vocabulary. Therefore, they did not question it much and object to it. I mean they already knew that continuing the study was on a voluntary basis, and yet I did not hear anything negative about it. They usually did their homework on time.

[Sizin active vocab teachinginizle alakalı dediğim için bence katıldılar bir şeyler yaptılar. O yüzden çok sorgulamadılar böyle karşı çıkmadılar hani isteyen devam edebilir durumunu zaten biliyorlardı ama yine de böyle negatif bir şey duymadım. Genelde yaptılar ödevlerini zamanında.]

She also noted that the students' drawings were more detailed at the beginning of the treatment but the quality got poorer towards the end. She stated,

And actually, I also felt that the quality of the drawings got poorer as I collected their task sheets because they were not taking it seriously enough I guess. I think they got a bit comfortable.

[Bir de ben gittikçe böyle o taskları aldıkça resimlerin kalitesinin düştüğünü hissediyordum açıkçası çünkü çok fazla artık böyle ciddiye almıyorlardı sanki bence birazcık daha rahatladılar.]

Finally, the instructors were asked to describe their role in the study and in what ways they supported the students. The mobile group instructor reported that she had a passive role of monitoring and guiding the learning process through the mobile application. She stated that the using the mobile application was convenient to follow the students and their interactions with each other virtually. She voiced,

Since it was a mobile application, I could see it instantly when the students shared a photo We did not share such things in classes because we were already virtually in contact with each other and everybody could see the others' comments or photos.

[Zaten uygulama mobil olduğu için öğrenciler bir fotoğraf paylaştıklarında ben bunu o anda telefonumda görebiliyordum... ...Sınıf içinde çok fazla bu anlamda bir paylaşım olmadı çünkü zaten sanal bir ortamda birbirimizle haberleştiğimiz için orda herkes birbirinin yorumunu ya da birbirinin fotoğrafını görebiliyordu.]

She also indicated that she used “emoji buttons” to appreciate the students’ posts and she pointed that it was effective for increasing their motivations. She stated,

The students got really more motivated as long as they knew that the instructor was following the photo sharing... ... I observed them reproach like “I uploaded a photo, why didn’t you like mine?” or “why didn’t you let me know that you had seen my photo?”

[Öğrenciler gerçekten öğretmenin fotoğrafı takip ettiğini bildiklerinde daha çok motive oluyorlardı... ...Hocam fotoğrafı yükledim benimkini neden beğenmediniz ya da benimkini gördüğünüze dair bir işaret vermediniz şeklinde bazen serzenişte bulduklarını gördüm.]

Concerning the instructor’s role, the traditional group instructor reported that she did not have an active role in directing students about what to draw and therefore she advised them to use their creativity while completing the tasks. She voiced,

Actually I do not believe that I guided my students a lot, because it depends on the students’ imagination. It was a task which required the students to use their imagination. I mean I told them “draw as you like, use it in a sentence in any way you like”.

[Yani ben aslında çok fazla böyle yönlendirdiğimi düşünmüyorum öğrenciyi, çünkü öğrencilerin hayal dünyasına kalmış bir şey. Öğrencilerin yaratıcılığını kullanacakları bir tasktı. Yani siz nasıl istiyorsanız öyle bir resim çizin, nasıl bir cümlede kullanmak istiyorsanız öyle bir cümlede kullanın dedim.]

Regarding supporting the students, she indicated that she encouraged the students at certain parts of the study depending on the students’ needs. For instance, she reported that sometimes some of the students felt reluctant to complete the given tasks and she encouraged them by reminding these vocabulary items would be tested in their exams.

Occasionally some of them asked “Do we have to do it?”, “Is it obligatory?”; I got feedback like that... Regarding this, I said things like “In the end, the same vocabulary will be included in your exams, you need to do this”.

[Arada şey diyen olmuştu hocam yani bunu yapmamız gerekiyor mu illa yapmalı mıyız şeklinde bana geri dönütler gelmişti... Hani sonuçta sizin sınavlarınızda da bu vocabler çıkacak, yapmanız lazım tarzı böyle bir iletişimimiz oldu bunla alakalı.]

Furthermore, she reported that some students had doubts about their own progress of completing the tasks and she tried to clarify them that the process was more important than the quality of the products.

Those students who could not draw well came to me and asked whether their drawings were good enough. I told them that the point was not the drawing itself, and that they needed to form a correct sentence and draw what they understood from that sentence.

[Resme çok yeteneği olmayan öğrenciler yanıma gelip hocam şu oldu mu bu oldu mu tarzı sorularla geliyorlardı. O öğrencilere karşı şey diyordum, yani burada önemli olan resim çizme kısmı değil senin doğru bir cümle kurup ondan anladığını çizmen gerek şeklinde belirtiyordum.]

She also stated that she encouraged them to continue with their tasks by telling them that they studied vocabulary in a more entertaining way.

I encouraged them by saying that in the end they were practicing English and studying vocabulary in a way that was not so boring, that they were drawing something, and they kept going.

[Yani sonuçta siz pratik yapıyorsunuz kelime çalışıyorsunuz böyle sıkıcı bir şekilde çalışmamış oluyorsunuz bir şeyler çizmiş oluyorsunuz deyip o şekilde yüreklendirdim ve devam ettiler yani zaten.]

4.3 Summary of the Results

The results of the pre-study survey questionnaire revealed that all of the students had a mobile phone and most of them categorized their mobile phones as smart phone. Moreover, most of the students had Android or iOS operating systems running on their mobile devices. In addition, the results of the questionnaire showed that the students frequently use their mobile phones to make phone calls, take pictures, surf the Internet, surf the social networks and listen to music.

The students' improvement in vocabulary knowledge was measured by calculating the mean gain scores between the pre-test and post-test results of both groups. The students in both groups showed substantial improvement based on their gain scores in the vocabulary achievement tests. The results of the independent samples t-test analysis revealed that the students in the experimental group significantly acquired more vocabulary items than the students in the comparison group.

The students' motivation to complete the given tasks was measured by a motivation scale that was adapted from Keller's (1987) instructional materials motivation survey which is based on ARCS model of motivational design. The students' overall mean motivation scores in both groups were compared by conducting independent samples t-test analysis and the results showed that the students in the experimental group were more motivated than the students in the comparison group.

The information on experimental group students' opinions and experiences was gathered by conducting focus group sessions and the results of the interview data revealed that all of the students favored using the mobile device supported learning environment. The major advantages of the learning environment according to the students were its opportunities to create associations with pictures, form sentences and provide permanent learning. Besides the advantages, the major disadvantages of the learning environment that were found by the students were the challenge to come up with a photo idea, the lack of seriousness of learning through mobile devices and the fact that few words could be learned via this learning environment.

The instructors of both groups were interviewed in order to obtain information on their educational backgrounds and overall experiences regarding the method used for English vocabulary learning. The results of the interview data revealed that the educational backgrounds and teaching experiences of the teachers were similar to each other. Both of the teachers favored the used method for vocabulary learning by emphasizing the presence of visuals which added value to the students' learning process. The major challenge of the mobile device supported learning environment was reported to be the difficulty to describe abstract words with photos. The drawing

activity in the traditional learning environment was reported to be challenging for some of the students since they did not enjoy drawing or believed that they did not have the talent for it.

CHAPTER 5

DISCUSSION AND CONCLUSION

In this chapter, the findings of the present study are discussed in the light of relevant literature in order to draw conclusions. There were four research questions in this study and findings related to each research question are discussed and compared to relevant research studies in the literature.

5.1 Purpose of the Study

The primary purpose of this study was to design and implement a mobile device supported learning environment for learners of English in order to enhance their vocabulary knowledge. The proposed system included a vocabulary pool for each week and the students were encouraged to share their real-world experiences regarding the words in the pool. The students were supplied with preliminary information about the vocabulary items (definition, word form and spelling), example uses of the words in sentences and their visual representations through the mobile learning system. Then, the students were asked to create their own visual representations by taking photos and forming sentences that described their photos. Both quantitative and qualitative methods were used in order to investigate the effectiveness of the proposed mobile learning system in the students' English vocabulary learning.

5.2 Discussion of the Effect of the Mobile Device Supported Learning Environment on Students' English Vocabulary Acquisition

The first research question asked whether the use of the mobile device supported learning environment had any effect on the students' English vocabulary acquisition and whether this effect was greater compared to the use of a traditional learning environment. In order to address this question, two study groups (mobile group,

traditional group) were formed and the performances of both groups were analyzed according to the results of vocabulary achievement tests that were administered before (pre-test) and after (post-test) the treatment procedure. In order to compare the effects of two different media on learning, Clark (1983) argues that treatments such as the instructional content and the method must be identical. In this study, therefore, identical learning materials were supplied to the students in both groups and they were asked to complete similar tasks. The tasks were similar but not completely identical since the mobile group students were asked to capture photos with their mobile devices and it was not possible to replicate the same procedure for the traditional group students. Hence, the traditional group students were asked to draw pictures instead of capturing photos. The results of the study showed that the students in both groups remarkably improved their vocabulary knowledge throughout the treatment procedure.

The vocabulary learning approach used in this study was based on several relevant principles found in the literature for effective vocabulary learning. One of the fundamental principles for meaningful vocabulary learning is studying words together with their surrounding contexts (Nagy, 1995). Decontextualizing techniques for vocabulary learning such as dictionary use, flashcards and word-definition pairs are only suggested for initial familiarity with the words (Schmitt, 2008). Contextualizing the actual usage of words is considered essential for in-depth learning of vocabulary (Oxford & Crookall, 1990). In this study, the students in both groups were supplied with example sentences of vocabulary items which provided an initial context for the students. In addition to the example sentences, the students in both groups were also provided with identical pictures representing the words. Usage of visuals such as pictures, illustrations or even videos for vocabulary learning is considered as an effective semi-contextualizing technique called visual imagery (Oxford & Crookall, 1990). The visual imagery technique is based on the dual-coding theory which asserts that information is stored in memory as two different mental representations (verbal, non-verbal) and the number of referential connections between these two representations strengthen the information recall (Clark & Paivio, 1991). The use of visual imagery technique for language learning was found to be highly effective in

several research studies in both traditional settings (Bull & Wittrock, 1973; Smith et al., 1994; Center et al., 1999) and technology-mediated settings (Chun & Plass, 1996; Taki & Khazaei, 2011; Saran, Seferoglu & Cagiltay, 2012). These studies demonstrated that using the visual imagery technique can remarkably improve learners' vocabulary development and the findings of the present study are consistent with them since the students in both groups improved their vocabulary knowledge throughout the study according to their pre-test and post-test results.

Providing readily-prepared vocabulary learning materials to the students is regarded as effective for initial recognition of the words but the literature suggests that students need to personalize the use of words by using the target words actively in a different context than the presented one for in-depth learning (Blachowicz & Fisher, 2000; Nation, 2001). Therefore, the students in both groups were asked to create their own contexts by using the target words in new sentences and creating their own visual representations in the present study. The effect of composing original sentences on vocabulary knowledge of the students was found to be superior compared to studying definitions and readily-provided examples (Coomber, Ramstad & Sheets, 1986). In another study, Hall (1991) experimented the effects of personalization on learning mathematics vocabulary and concluded that the students learned better when they personally created their own contexts rather than merely relying on the contexts provided to them (as cited in Nation, 1993). As creating new contexts requires productivity, it was found that the target vocabulary items were remembered better when they were used in productive tasks with original contexts compared to non-productive tasks (Hulstijn & Trompetter, 1998). Creative/generative usage of the words in new contexts is known to be an important psychological process which leads to effective remembrance of target words (Nation, 2001). Moreover, the effectiveness of the visual imagery technique increases the level of comprehension as students generate their own visual representations in mind (Center et al., 1999). The study conducted by Bull and Witrock (1973) supports this view as they found that the students who used the self-generated imagery technique outperformed the students who used only texts or supplied illustrations for vocabulary learning. The authors

concluded that the achievement in vocabulary learning soars when visual imagery and self-discovery are combined together.

Throughout the treatment procedure, both groups of the students (mobile, traditional) improved their vocabulary knowledge according to their pre-test and post-test results. In order to compare the effectiveness of these learning environments, independent samples t-test analysis was conducted. The result of the independent samples t-test analysis revealed that the mobile group students improved their vocabulary knowledge significantly better than the traditional group students. Similar vocabulary learning approaches were used both in the mobile and traditional settings but the mobile device supported learning environment constituted unique educational affordances that created additional opportunities for learners compared to the traditional learning environment. The term “affordance” was first defined by Gibson (1977) as “a quality or feature of an object, or of an environment, that allows an individual to perform an action.” (as cited in Woodill, 2014, p. 111). It was later adapted to educational contexts with the term “educational affordance”. Educational affordances are defined as “the relationships between the properties of an educational intervention and the characteristics of the learner that enable particular kinds of learning by him/her” (Kirschner, 2002, p. 19). The primary educational affordance of the mobile device supported learning environment is the opportunity that it enables the learners to study without the limitations of time and space. This opportunity is provided by the unique features of mobile devices such as portability, connectivity and immediate access. In the current study, the traditional group students studied vocabulary on printed materials. It required the students to focus on completing the tasks only when they allocated a certain time in a certain place to study without the opportunity to extend their learning processes out of these confinements. On the other hand, the mobile group students had the opportunity to carry their learning processes outside their study areas and continue to be engaged with the learning activities during the remaining times of a day. Moreover, this opportunity allowed the mobile group students to complete the given tasks “on the go”, such as in their leisure times, on the bus or while walking around without any planning beforehand. This leads to a more distributed learning

practice in terms of time and space. Research on cognitive psychology provides empirical evidence on the significant benefits of constant and distributed practice of materials in vocabulary retention compared to massed practice (Dempster, 1987). Bjork (1979) defines this concept as the “spacing effect” and provides empirical evidence that students remarkably improve their long-term retention of learning materials when they distribute their study efforts as small episodes over time instead of massing their efforts at once. In the literature, the effectiveness of the spacing effect on vocabulary acquisition was also experimented in mobile device supported learning environments by delivering content as spaced messages to learners’ mobile phones (Thornton & Houser, 2005; Lu, 2008; Saran, Seferoglu & Cagiltay, 2012). In these studies, spaced delivery of content in mobile device supported learning environments was found to be superior over massed practice of content in traditional learning environments in terms of retention of the vocabulary items. In the current study, the spacing effect was utilized for task completion instead of content delivery. The mobile device supported learning environment included separate groups for each vocabulary item and the students were assigned to complete each vocabulary task in specific days of a week. It allowed the students to focus on a specific vocabulary item that they were responsible for a whole day and they did not need to make plans regarding where and when to complete their tasks as they carried their mobile devices wherever they went.

Another educational affordance of the mobile device supported learning environment is that it provides learning in real-world contexts rather than fictional ones. In the present study, the mobile group students were involved with real-world experiences in relevantly situated contexts whereas the traditional group students relied on fictional contexts while completing their tasks for vocabulary learning. It is closely related to the theories of situated learning and experiential learning. The situated learning theory asserts that knowledge is developed within activities, contexts and cultures and it is not possible to abstract knowledge away from these (Brown et al., 1989). Bransford (2000) states that knowledge needs to be situated and constructed in real-world tasks since learning is highly effected by the context where it takes place. The experiential learning theory emphasizes the importance of personal experience in learning and

defines learning as “the process whereby the knowledge is created through the transformation of experience” (Kolb, 1984, p. 41). In the context of mobile learning, some studies experimented the effects of the pedagogical practices of situated and experiential learning theories and found significant effects on student achievement compared to traditional methods of learning (Lai et al., 2007; Shih et al., 2010). For instance, Shih et al. (2007) designed an inquiry-based mobile exploration activity to investigate its effect on students’ knowledge gains about the history of a temple and they found a significant effect on student achievement.

The opportunity for social interaction and communication outside the classroom is another educational affordance of the mobile device supported learning environment. In her FRAME model for m-learning, Koole (2009) defines it as “interaction learning (LS)”, which is formed by the intersection of the learner aspect (L) and the social aspect (S). The emphasized benefit of social interaction in terms of learning is the consideration of multiple views in the process of collaborative meaning making (Smith & Ragan, 1999). The underlying theoretical view of interaction learning is social constructivism, which asserts that learning is a social process where learners construct their own interpretations about a subject and convey their understandings to other learners through communication (Koole, 2009). As Sharples (2000) argues, the real power of mobile technologies for effective learning is the opportunity they provide for a platform where learners describe their own representations of the world and shape their understandings through social negotiation. In the present study, the mobile group students had the opportunity to share their visual representations of the vocabulary items with all of their peers and received instant comments on their shared posts from them. It created an interactive environment where students could both make contributions and examine various representations of a specific vocabulary item that were submitted by their peers. On the other side, the traditional group students did not have the chance to instantly review their peers’ tasks outside the classroom.

There are two main advantages of social interaction that takes place in the mobile device supported learning environment for effective vocabulary acquisition. The first advantage is the opportunity that is provided to the students for multiple exposures to

the same vocabulary item at different times. In the mobile device supported learning environment, as students made comments about the shared posts, the mobile application sent notifications to the students who shared those posts and the ones who participated in the comments section. This process pushed students to be exposed to the same vocabulary item more than once and the literature suggests that there is a positive correlation between the number of repetitions and the retention of vocabulary items (Nation, 1982; Web, 2007). There are different views on the necessary number of repetitions for a vocabulary item to be retained. Crothers and Suppes (1967) demonstrated that seven repetitions of word pairs are necessary for learners to master all of the given words (as cited in Nation, 1982). On the other hand, Saragi et al. (1978) experimented the effects of different numbers of repetitions and concluded that most learners recognize a vocabulary item after 16 repetitions (as cited in Nation, 1982). Web (2007) experimented the effects of different repetition numbers (1, 3, 7, 10) of vocabulary items in context and provided empirical evidence that gains in vocabulary knowledge improved after each increase of repetitions.

The second advantage of the social interaction is the opportunity that is provided to the students to view vocabulary items in multiple contexts with different representations. As Hirsch (2003) argues, full and flexible knowledge of a vocabulary item requires “exposure to the word in multiple contexts from different perspectives” (p. 19). In the current study, each student in the mobile group took a photograph that visually represented his/her own understanding of a vocabulary item and supplied a personal context with a sentence describing the photograph. Each photograph in a vocabulary group that was shared by a different student created an alternative representation of the vocabulary item that belonged to a unique context. During the focus group sessions, the mobile group students also mentioned that they mostly checked their peers’ posts with the purpose to come up with original ideas while completing their own tasks. Therefore, they had the opportunity to evaluate and compare different representations of the vocabulary items that belonged to different contexts. Nitsch (1978) conducted a study on the effects of multiple contexts to the recognition of vocabulary items and demonstrated that the students who saw the words

in multiple contexts were better at recognizing the words in genuine settings compared to the students who saw the words in a single context (as cited in Stahl, 1991). Furthermore, the memory model proposed by dual-coding theory asserts that the number of referential connections between verbal and non-verbal representations in memory is dependent upon the person's experiences in different contexts (Clark & Paivio, 1991). Regarding the implication of dual-coding theory for vocabulary learning, Sadoski (2005) argues that "encountering and using words in various contexts establishes a rich set of verbal and nonverbal connections" (p. 229). It is known that a high number of referential connections between verbal and non-verbal representations strengthen the information recall (Clark & Paivio, 1991). Therefore, exposure to the vocabulary items in multiple contexts together with a rich set of verbal and non-verbal representations paves the way for recalling the meanings of the learned vocabulary items in different settings.

5.3 Discussion of the Effect of the Mobile Device Supported Learning Environment on Students' Motivations for English Vocabulary Acquisition

The second research question asked whether the use of the mobile device supported learning environment had any effect on students' motivations to learn English vocabulary and whether this effect was greater compared to the motivations of students who participated in the traditional learning environment. In order to address this question, a motivation survey was distributed to both groups (mobile group, traditional group) of students at the end of the treatment procedure. The motivation survey was based on Keller's (1987) ARCS model of motivational design that included items measuring four dimensions of motivation, which are attention, relevance, confidence and satisfaction. The results of the independent samples t-test analysis revealed that the mobile group students' overall mean motivation scores ($M=75.71$) were significantly higher than the overall mean motivation scores of the traditional group students ($M=62.95$). Therefore, these results indicated that the students who received materials and completed their tasks through the mobile learning system were more motivated than the students who received materials and completed their tasks via the printed booklets. Furthermore, the mean motivation scores of the students for each

dimension of motivation (attention, relevance, confidence and satisfaction) were compared between two groups of the students and the results of the t-test analyses revealed that the mobile group students' mean motivation scores for each dimension were significantly higher than the mean motivation scores of the traditional group students.

The first motivational dimension of the ARCS model is "attention" and it refers to the arousal of curiosity and interest of learners and sustaining engagement for the learning task (Keller, 1987). The results of the present study revealed that the mobile group students' mean attention scores were significantly higher than the traditional group students' mean attention scores. This difference of interest may have been due to the type of different activities that the students were involved in. As mentioned in the method chapter, the learning materials were prepared identical for each group of the students but they followed different procedures to complete the given tasks. The traditional group students were asked to draw illustrations on paper whereas the mobile group students were asked to capture photos that visually represent their own understanding of the vocabulary items. The traditional group instructor reported that some of the students did not enjoy drawing and they found it challenging to complete the tasks. On the other hand, none of the students in the mobile group reported any dislike for capturing photos. In addition, the results of the pre-study questionnaire indicated that the students frequently capture photos with their mobile devices in their daily lives. Lai et al. (2007) found similar results in their study that made a comparison between a PDA group (photo taking activity with plug-in camera) and a non-PDA group (sketching activity with paper-pencil) in a natural science class. They found that the students in the non-PDA group (42.9%) were more frustrated than the students in the PDA group (7.4%) while completing the given tasks. They concluded that sketching was a more exhausting activity than capturing photos because of the requirements for certain skills.

"Relevance" is the second motivational dimension of the ARCS model and it refers to the usefulness of the learning task for learners' needs and current and future uses of the gained knowledge (Keller, 1987). The mean relevance scores of the mobile group

students were significantly higher than the traditional group students' mean relevance scores. This result shows that the mobile group students found the learning tasks more relevant to their learning needs than the traditional group students. During the student focus group sessions, some students in the mobile group mentioned that they encountered some of the vocabulary items in their quizzes and remembered their meanings immediately. In addition, they indicated that they could actively use some of the vocabulary items in their writing assignments and believed that they could use them in the future as well. Furthermore, the mobile group instructor also reported that she heard the students talking about the vocabulary items after some quizzes. These results indicate that the mobile device supported learning environment provided opportunities for the students in terms addressing their needs for vocabulary acquisition.

The third motivational component of the ARCS model is “confidence” and it refers to the learners' level of positive expectations from the learning task for their achievement with respect to their own control over their learning process (Keller, 1987). The mean confidence scores of the mobile group and the traditional group were close to each other but the difference between the mean scores was significant in favor of the former. This result suggests that the mobile group students felt more confident to complete the given tasks successfully and had more control over their learning process compared to the traditional group students. In a classroom environment, locus of control for the learning process mostly belongs to the instructor but mobile learning can distribute control among “learners, guides, teachers, technologies and resources” (Sharples, Taylor & Vavoula 2005, p. 5). Having control over learning is closely related to having a range of choices and independence for learners while completing the learning tasks (Gambrell, 1996; Joiner et al., 2006). In the present study, the instructors of both groups did not directed the students in any way regarding how to complete their tasks. The traditional group students drew whatever they wanted and the mobile group students captured photos however they pleased. Mobile technologies have additional opportunities to provide control for the learners by allowing them to “access, aggregate, create, and share information in a variety of media formats across space and

time” (Van't Hooft, 2008, p. 14). Sharing of information between peers can create an environment where successful students can support “less able students” (Sharples, Taylor & Vavoula 2005, p. 3). During the focus group sessions, some students indicated that checking their peers’ posts was very helpful for them to get inspired. Therefore, interacting with the shared information may have supported the students to complete the learning activities in a more confident way.

The last motivational component of the ARCS model is “satisfaction” and it refers to the positive feelings of learners towards completing the learning activities successfully with respect to the intrinsic and extrinsic motivators (Keller, 1987). The difference between the mean satisfaction scores of the mobile group and the traditional group was significant in favor of the former. It suggests that the mobile group students were more satisfied with the learning activities than the traditional group students. There may be several reasons for this difference. Firstly, the students in the mobile group constantly got notifications as the vocabulary groups got updated and this may have intrinsically motivated the students to take action as a response to these stimuli. On the other hand, the traditional group students needed to take action on their own without the presence of external stimuli. Similarly, Saran, Seferoglu and Cagiltay (2012) argue that sending multimedia messages to the students’ mobile phones pushes them to study and they become intrinsically motivated. Another reason for this difference may have been due to the mobile group instructor’s use of emojis for the students’ shared posts. The instructor reported in the interview session that she believes in the motivating effect of using emojis on students’ learning since she witnessed that some students reminded her when she forgot to put emoji to their shared posts.

5.4 Discussion of the Students’ Perceptions Regarding the Use of the Mobile Device Supported Learning Environment for English Vocabulary Acquisition

The third research question addressed the mobile group students’ perceptions concerning the use of mobile device-supported learning environment for vocabulary acquisition. In order to obtain information about the students’ perceptions about mobile learning and overall experiences throughout the six-week long treatment

procedure, semi-structured focus group sessions were conducted. All of the students indicated a positive attitude towards using their mobile devices for vocabulary learning. They mentioned that distinctive features of mobile devices such as portability and instant access added value to their learning since they constantly used their mobile devices wherever they go. On the other hand, some students noted that mobile devices can include distractors such as incoming text messages from friends and notifications from various applications that may interrupt their learning process. They argued that it is important for learners to consider and eliminate possible distractors before using their mobile devices for learning purposes.

Vocabulary learning is an important aspect of language learning but language instructors seldom spare time for vocabulary teaching activities in classrooms and students are expected to improve their vocabulary knowledge on their own (Oxford & Crookall, 1990). The main focus of the language courses is on providing core language skills such as reading, writing, listening and speaking skills and students are mostly expected to develop their own strategies for vocabulary learning along with these core skills (Watts, 1995; Blachowicz & Fisher, 2000). In this respect, the students' own strategies for vocabulary learning were identified in this study. The responses of the students revealed that almost all of the students used memorization strategies for vocabulary learning. The most commonly used strategy among students was writing down the words together with their definitions as word-lists. Use of word-lists belongs to decontextualizing strategies for vocabulary learning and the lack of communicative context prevents learners to comprehend the proper usage and recognition of words in different settings (Oxford & Crookall, 1990). With respect to the students' responses, only a few students were aware that vocabulary learning should incorporate relevant contexts and they mentioned that they tried to use the words in sentences in addition to memorizing them. In the literature, some studies revealed that the students mostly remain incapable of developing effective strategies for vocabulary learning on their own and this situation leads them to go for mere memorization of words (Huang & Eslami, 2013). The findings the current study are consistent with literature in this respect and it shows that the students need to be supported with additional activities

that will help them to go beyond memorization of words and to be involved in meaningful experiences for vocabulary learning. The current study aimed to support the students to this end and it was crucial to obtain their opinions on the advantages and disadvantages of the new method for vocabulary learning compared to their own methods that they used in the past.

The most expressed superiority of the new method over the former methods by the students was its contribution to permanent learning of the vocabulary items. The students mentioned that they mostly tried to memorize a list of words before an exam but they could not remember any of those words afterwards. Being forced to form sentences and try to find creative photo ideas was considered by the students to be the main factor that increased the memorability of the vocabulary items with the new method. Forming original sentences and thinking about photo ideas lead learners to revisit the meanings of the vocabulary items in the process and the literature suggests that the conditions for effective vocabulary learning occur when learners constantly focus on the meanings of the vocabulary items and try to make associations with their existing knowledge (Newton, 2001).

The new method was also found to be time-saving by the students compared to their former methods of writing down the words and memorizing them. Access to the meanings of the vocabulary items and learning materials anytime-anywhere and the opportunity to take a picture on the move were provided by the students as the main reasons for time-efficiency of the mobile device supported learning environment for vocabulary learning. The findings of a research study suggests that learners who are accustomed to use mobile devices and experience no usability issues with them tend to find mobile device supported learning environments time-saving and beneficial compared to the traditional settings (Shih, 2007). Therefore, the usability of devices and interfaces should be an essential concern while designing mobile device supported learning environments. In the current study, the students used their own devices throughout the treatment procedure and therefore they were already accustomed to the functionality of their devices. For learners, familiarity to the built-in functionality of a mobile device is regarded as a source of comfort which drives them to explore the

learning opportunities provided by the device (Kukulska-Hulme, 2007). However, if an application to be used on a mobile device lacks the necessary directions to guide the learners, it decreases the learners' willingness to investigate how these applications can be exploited for learning purposes. (Hackemer & Peterson, 2005). Therefore, it is essential to provide necessary guidance to the learners on how to get involved with the interface of an application that will be used for educational purposes. In the present study, the students were provided with printed manuals that included step-by-step directions on how to complete the given tasks using the mobile sharing application. Furthermore, the mobile sharing application which was used as the learning interface throughout the study was novel to the students but its resemblance to popular social sharing and communication applications, such as "Instagram" and "WhatsApp", was found to be convenient by the students in terms of the familiarity with the use of the interface.

Besides the advantages of the mobile device supported learning environment, the use of mobile phones for learning was perceived as "unserious" by some of the students compared to studying with paper and pencil. Regarding this issue, Kukulska-Hulme (2005) argues that mobile devices are not designed for educational purposes at the first place, and therefore, sometimes students might find it challenging to complete the given tasks on their mobile devices. Stockwell's (2008) study on learners' preparedness to mobile learning revealed that there may be concentration issues for learners while using their mobile devices for learning purposes because of the reason that they "could not get into study mode" with use of these mobile devices (p. 260). In the current study, students mostly suggested to perform weekly quizzes to increase the seriousness of the mobile device supported learning environment. One student argued that including weekly quizzes could be helpful for both maintaining seriousness and motivating learners to see that they could actually learn with this method. Another student argued that quizzes should be on paper in order to make the learning process more serious and formal. In other words, students expect to observe a concrete influence of out-of-class activities to their in-class performances in a constant manner. In the literature, integration of out-of-class mobile learning activities to in-class

activities is also suggested to make the activities more engaging to the students' learning process and add value to it (Naismith & Corlett, 2006; Chen & Li, 2010).

The quantitative results of the study revealed that the students remarkably improved their vocabulary knowledge throughout the treatment procedure but it was crucial to obtain the most beneficial aspects of the mobile device supported learning environment for vocabulary learning from the students' point of view. Thinking process to take a photo was the most expressed benefit of the mobile device supported learning environment by the students for effective vocabulary learning. In addition, forming new sentences was also found to be important by the students for creating associations with the photos they captured. In other words, the expressed benefit of the tasks was not the product itself but the process that forced the students to rehearse the meanings of the vocabulary items elaborately in order to produce alternative representations for those items in their memory. Rehearsal of information is known to increase its strength in working memory and the transfer of information to long-term memory is dependent upon these rehearsals (Atkinson & Shiffrin, 1971). There is a distinction between "maintenance rehearsal" and "elaborative rehearsal" in terms of transferring information to long-term memory (Baddeley, 1997, p. 123). The former refers to repeating information to keep its current representation in memory such as trying to memorize a vocabulary item together with its meaning but it does not lead to long-term learning of the information. On the other hand, elaborative rehearsal refers to "reorganizing the new material to fit in what is already known" (Baddeley, 1997, p. 123). In the current study, the students reported that they spent time thinking about the words to produce ideas and they argued that writing down the meanings of the words would not yield the same effect. Hence, the primary benefit of completing the given tasks in the mobile device supported learning environment was the opportunity provided to the students for elaborative rehearsal of the vocabulary items.

Throughout the treatment procedure, the students completed their tasks individually but the mobile device supported learning environment provided the students with the opportunity for social interaction. The FRAME model suggests that interaction learning can let learners negotiate different perspectives of knowledge among them

and help them realize their potentials (Koole, 2009). Hence, it was crucial to investigate in what cases students interacted with their peers' posts in the vocabulary groups. The most emphasized factor that led the students to view their peers' posts was the presence of notifications. The notifications, which urged them to check new posts, were mainly found to be intriguing by the students. Checking new posts also allowed the students to be exposed to the meanings of the vocabulary items again with a different perspective. Therefore, the notifications regularly pushed the students to return to the vocabulary groups and recall the meanings of the vocabulary items. The "push" aspect of the mobile devices were studied in previous studies in different forms such as using e-mail messages (Thornton & Houser, 2005), text messages (Lu, 2008) and multimedia messages (Saran, Seferoglu & Cagiltay, 2012) in order to notify the learners. As these studies demonstrated, the push aspect of the mobile devices transforms students from a passive state to an active state in a regular fashion and it maximizes exposure to the learning materials. Such an effect is difficult to actualize in traditional learning environments and learners mostly need to pull themselves into the learning materials on their own.

Another emphasized factor that led the students to view their peers' posts was the need for inspiration. The tasks required the students to come up with original ideas to capture photos for the vocabulary items but the students reported that sometimes it was challenging to produce an idea. In such cases, the students indicated that reviewing their peers' posts was helpful for inspiration and to make a comparison between different ideas. Review of different ideas paves the way for mediation among students and helps them to realize their potentials by filling the gap between what they currently do and what they can actually do (Vygotsky, 1982). Furthermore, different perspectives of the students create a rich set of verbal and non-verbal representations of the vocabulary items for each student to form multiple associations in memory that increase the chance of information recall (Paivio, 1971). Hence, the interaction that takes place on the mobile learning platform can engage students for increased retention of knowledge.

5.5 Discussion of the Instructors' Perceptions Regarding the Used Method for English Vocabulary Acquisition

The last research question addressed the perceptions of the instructors regarding the used method in their classes for English vocabulary acquisition. The experimental group and the comparison group had different instructors throughout the treatment procedure and it was important to gather their perspectives of the study. The mobile group instructor guided the procedures of the mobile-device supported learning environment whereas the traditional group instructor guided the procedures of traditional learning environment. In order to learn the instructors' perceptions and overall experiences throughout the six-week long treatment procedure, semi-structured interview sessions were conducted. The first part of the interview sessions aimed to gather background information about the instructors such as their educational backgrounds and former experiences in English language teaching. The results revealed that there were no remarkable differences between the educational backgrounds and teaching experiences of the instructors. Moreover, the instructors used similar approaches for vocabulary teaching in the past.

Regarding the used method throughout the study, both instructors reported that they favored the use of visual approach for English vocabulary learning. The instructors reported different challenges of the used method for the students based on their observations. The main challenge for the traditional group students was the difficulty of drawing. The traditional group instructor reported that some of the students felt unconfident while drawing because of the belief that they did not have the talent for it. On the other hand, the mobile group instructor did not report any dislikes of students for taking photos. This result is consistent with a previous research study in which the majority of the students preferred taking photos over drawing pictures and found it frustrating to draw something since they were not good at it (Lai et al., 2007). However, the mobile group instructor noted that the major challenge for some of the students was finding an appropriate environment to shoot a photo since it is difficult to create a real-world context for abstract words. The same challenge may not be mentioned for the drawing activity since it is more up to the imagination of the

students. Therefore, both of the activity types have their own benefits and challenges for the students.

The engagement levels of the students with the activities in both groups showed similar patterns based on the observations of the instructors. The interest levels of the students towards the activities were higher at the beginning of the treatment procedure but it gradually decreased towards the ends of it. The mobile group instructor mostly attributed this situation to the students' general loss of interest to the preparatory school program and their boredom related to the requirements of the school's demanding curriculum. However, she also added that the treatment itself was much more interesting for the students at the very beginning of the study. The traditional group instructor expressed similar opinions on this subject. She indicated that the students had more fun when they first started drawing but the quality of the drawings decreased at the ends. This overall decrease of performance in both groups might be due to the novelty effect of the treatments. Novelty effect mostly occurs as an increased student performance at the initial phases of introducing something new and exciting to students (Glass, 2010). Since the treatment procedure lasted for six weeks, the students might have been bored doing the same things. Implementing variable activities in a future study would be better to sustain students' attention.

5.6 Implications and Recommendations for Practice

The present study aimed to design and implement a mobile device supported learning environment for learners of English in order to enhance their vocabulary knowledge. The following recommendations can be offered to the instructors and educational researchers based on the findings of this study:

- Students participate in mobile device supported learning environments with either their own devices or supplied devices. If possible, it is suggested to let the students use their own mobile devices due to their familiarity with the built-in functions and the interface of the device. If it is not possible, the necessary information about how to use the new device should be given.

Yet, the students may not carry the supplied devices everywhere along with their own devices and it is not good for the mobility of the learning process.

- The mobile application used throughout the study (MeWe) was mostly steady but some of the students reported that they experienced temporary notification problems. If a custom application is to be developed in the future, it might be useful to test it on different devices of the students to ensure stability.
- The students were assigned to complete the tasks for 7 vocabulary items in a week in this study. It is suggested to assign specific days for the vocabulary items and to provide checklists for the students. It can be useful for the students to create weekly plans in their heads and follow their own completion rates.
- Using mobile devices for learning perceived as “unserious” by some of the students after a period of time during the treatment procedure. Students are accustomed to the conventional settings and consider a classroom environment as a more serious place for learning to take place. Even if the vocabulary items were taken from the curriculum, the present study can be said to be isolated from the classroom instruction. It is suggested to integrate mobile learning activities with classroom instruction and prepare complementary activities.
- The students wanted to follow their weekly progress to see whether they could actually learn the given vocabulary items. It is suggested to perform weekly quizzes in the mobile device supported learning environment or in the class to help students follow their own progress.
- Appreciation of the works of the students by the instructor had motivational effects on the students. Use of emojis for the students’ products is a useful way to show the students that they are doing well.

The following guidelines can be followed by the instructors who want to apply the method used in this study for vocabulary learning:

1. Prior the treatment, the information on mobile phone ownership of the students needs to be collected such as the technical features of the devices, the type of mobile operating systems and the availability of Internet connectivity. This information can be used for providing the students with new devices and deciding on the application to be used for the treatment.
2. The mobile application to be used during the treatment needs to be checked in order to make sure it is compatible with the mobile operating systems that are used on the students' mobile devices. The application used in this study (MeWe) is compatible with Android and iOS operating systems. If there is another common operating system (e.g. Windows) that is used on the students' mobile devices, then it would be better to switch to a similar application that also runs on that operating system. The application needs to incorporate private group feature for sharing posts related to specific vocabulary items in order to prevent confusion among the students.
3. The application used in this study can be downloaded from the "Google Play Store" for Android operating systems and from the "Apple App Store" for iOS operating systems. When the application is downloaded and installed to the devices, the instructor and the students need to be registered to the system by providing a real name and a password. Then, the students need to be instructed to add the instructor to their "Contacts" list by using the "Search" feature of the application and searching for the name of the instructor.
4. The instructor needs to click on the "Start a New Group" button in the "Groups" section to create a new group to be used for a single vocabulary item. The group name should include the name of the vocabulary item. The cover photo of the vocabulary group can be changed by clicking the "photo icon" on the same page. The content of the cover photo needs to include the name of the vocabulary item, its word form and its definition. The photo to be used as

a cover photo can be prepared by a basic photo editor on a desktop computer (e. g. Paint).

5. When the group is created, the instructor needs to send a bulk invitation to the students in his/her “My Contacts” list. When the students join the group, the instructor can share an example picture describing the vocabulary item together with an explanatory sentence. When the post is shared, the students are notified by the notification system. The students need to be instructed to take and share their own photos on the system by providing their own sentences. The students need to be reminded that their examples must be original rather than replicating others’ posts.
6. When the students share their own examples in the groups, the other members of the group are notified. The students need be instructed to respond to each other’s post by making use of the comments and emojis. The instructor also needs to respond to the posts to demonstrate his/her presence.
7. The same procedure of creating private groups needs to be repeated for other vocabulary items. The group chat feature can be used for communicating with the students in case they have any problems.

5.7 Suggestions for Further Research

Mobile technologies offer new opportunities for learners without the confinements of time and space. The present study proposed a mobile device supported learning environment that could make contributions to language learners’ vocabulary development with use of social activities that have real-world relevance. As the literature suggests, the nature of mobile language learning activities need a shift from content-delivery to active knowledge construction and peer-to-peer interaction (Kukulska-Hulme & Shield, 2008). The results of the pre-study questionnaire of this study revealed that the students frequently used the Internet and had access to the social media applications via their mobile devices. Hence, future research studies on mobile vocabulary learning should focus on social needs of the learners and their interactions on these platforms.

The present study focused on learning tasks that enabled the students to personalize vocabulary knowledge through verbal and non-verbal representations. Sharing of information and social interaction took place as a passive collaboration in this study. Future research may explore the effects of active collaboration to vocabulary learning by letting learners co-create content in a mobile device supported learning environment. For instance, learners may shoot a video together that describe their understanding of vocabulary items by making use of the objects in the real-world. It can be useful for practicing speaking skills as well.

The current study incorporated activities for language learning. The design of the current study can be adapted to other subject areas in future studies. For instance, the study can be re-designed for areas of mathematics, physics and chemistry. Learners can share their understanding of scientific terms in specific groups that is created for these terms through the mobile device supported learning environment. Learners can also demonstrate their own problem solving methods to their peers in a real-world setting.

The participants of the current study suggested performing weekly quizzes to follow their learning progress. Future research may include built-in assessment features in the design of the mobile device supported learning environment. Weekly quizzes can be prepared by making use of the shared photos and asking students to match them with the vocabulary items. The quizzes may incorporate gaming features such as challenging students to respond to as many photos as they can in a limited amount of time. In addition, leaderboards and virtual rewards can be incorporated to increase engagement with the activities.

The sample of the current study included elementary level students of the English Preparatory School of METU. The study can be repeated for other proficiency levels. It was a challenge for some of the students to form sentences in the present study since their proficiency level was elementary. Advanced level students may be included in a future study by asking them to write a paragraph with several vocabulary items describing a combination of photos or a video. Future studies may include alternative

samples from different populations such as learners from a private English course or a kindergarten school. The university environment includes a formal curriculum and informal environments may yield different results than the present study.

5.8 Conclusion

Mobile learning has received attention for educational research for more than a decade and the opportunities provided by the mobile device supported learning environments have increased due to the advancements in mobile and communication technologies. The first mobile phones were primitive in nature since they had limited features to display information and to provide user interaction. Yet, many former research studies in the literature of mobile vocabulary learning demonstrated that the use of text messages and multimedia messages in mobile device supported learning environments could yield better learning outcomes compared to the traditional learning environments (Thornton & Houser, 2005; Stockwell, 2007; Lu, 2008; Cavus & Ibrahim, 2009; Basoglu & Akdemir, 2010; Saran, Seferoglu & Cagiltay, 2012). Recent developments in mobile technologies provide more opportunities for learners such as using smart phones with wide touchscreens and communicating with other learners through social networking. The present study showed that educational affordances of the mobile devices such as mobility, immediacy, portability and social interaction can effectively be used for language learners' English vocabulary acquisition.

The rate of mobile device usage among teenagers is increasing and the findings of the current study revealed that all of the participants owned a mobile phone. Device usability is an important issue to consider in mobile device supported learning environments and the possible challenges were overcome by letting the students use their own mobile devices for learning in this study. Furthermore, the mobile application used in this study was found to be similar to other popular social media applications by the students and therefore it was similar to their former experiences. In addition, the most frequent activities performed by the students with their mobile phones included surfing social media sites and taking photos. In this respect, mobile phone usage habits of the students were also addressed with the present study.

Moreover, the study allowed the students to complete the learning tasks with their mobile devices on the move such as while walking around or travelling on the bus. Hence, they did not need to create additional time period for the activities and they saved time by completing the tasks in their leisure times.

The results of this study revealed that the students generally used memorization strategies for learning English vocabulary and it remained inadequate for knowledge retention when vocabulary items are processed in memory apart from their context. In the present study, the students were forced to be involved in real-world contexts and to be productive with respect to their real-world experiences. Previous research studies on mobile vocabulary learning mainly considered mobile devices as content-delivery tools by sending materials to the students' devices at pre-established time-intervals. The present study considered mobile devices as production tools that promoted active content creation and social interaction among the students. The learning tasks encouraged the students' creativity, inspiration and social meaning. The students not only learned from their own experiences but also from their peers' experiences and viewpoints. It allowed them to examine the usage of vocabulary items from multiple perspectives.

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APPENDIX A

PRE-STUDY QUESTIONNAIRE

İngilizce Hazırlık Sınıfı Öğrencilerinin Mobil Öğrenmeye Karşı Hazır Bulunmuşluklarını Belirleme Anketi

Bu anket İngilizce hazırlık öğrencilerinin mobil öğrenmeye karşı hazır bulunuşluklarını belirlemek amacıyla hazırlanmıştır. Bu anket için vereceğiniz cevaplar yalnızca bu araştırma için kullanılacaktır. Bu nedenle lütfen her soruyu dikkatle okuyarak **her soru için** kendinize uygun seçeneği işaretleyiniz. **Lütfen cevapsız soru bırakmayınız.** Katkılarınız için teşekkür ederiz.

Şenol Bakay

Bilgisayar ve Öğr. Tek. Eğitimi Bölümü, ODTÜ

A. Temel Bilgiler

1. Yaşınız?

2. Cinsiyetiniz?

Erkek Kadın

3. Kendinize ait cep telefonunuz var mı? (Cevabınız “Hayır” ise 8. soruya geçiniz)

Evet Hayır

4. Ne kadar zamandır cep telefonu kullanıyorsunuz?

0 – 6 ay 6-12 ay 1-2 yıl 2-4 yıl 4 yıldan fazla

5. Cep telefonunuzun **akıllı** telefon özelliği var mı? (Dokunmatik ekran, uygulama yükleyebilme)

Evet Hayır

6. Cep telefonunuz ile internet erişimini daha çok aşağıdakilerden hangisiyle gerçekleştiriyorsunuz?

2G 3G Wi-Fi İnternet erişimim yok

7. Cep telefonunuzda kullanılan işletim sistemi nedir?

Symbian (Nokia) BlackBerry iOS (iPhone) Android

Window Mobile Bada Diğer _____

8. Kendinize ait tablet bilgisayarınız var mı? (Cevabınız “Hayır” ise sonraki soruyu atlayınız)

Evet Hayır

9. Tablet bilgisayarınızın internet erişimi var mı?

Evet Hayır

B. Cep Telefonu Kullanımı

10. Cep telefonunuzu aşağıda verilen aktiviteleri gerçekleştirmek için ne sıklıkta kullanıyorsunuz?

	Hiçbir Zaman	Nadiren	Bazen	Sıklıkla	Her Zaman
1. Konuşma yapmak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. SMS göndermek	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. MMS göndermek	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Fotoğraf çekmek	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Ses kaydı almak	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Video kaydı almak	[]	[]	[]	[]	[]
7. Görüntülü konuşma yapmak	[]	[]	[]	[]	[]
8. İnternette gezinmek	[]	[]	[]	[]	[]
9. E-posta göndermek/kontrol etmek	[]	[]	[]	[]	[]
10. İnternette dosya indirmek	[]	[]	[]	[]	[]
11. Facebook, Twitter gibi sosyal ağlarda gezinmek	[]	[]	[]	[]	[]
12. Diğer kişilerle dosya alışverişi gerçekleştirmek	[]	[]	[]	[]	[]
13. Diğer kişilerle internet üzerinden oyun oynamak	[]	[]	[]	[]	[]
14. Çevrimdışı oyun oynamak	[]	[]	[]	[]	[]
15. Müzik dinlemek	[]	[]	[]	[]	[]

ANKETE KATILIMINIZ İÇİN TEŞEKKÜRLER ☺

APPENDIX B

VOCABULARY ACHIEVEMENT TEST

Student ID: _____ Class: _____

Read the following statements and fill each gap with an appropriate word from the box. DO NOT change the forms of the words. Use each word only ONCE. There are more words than you need.

remained	original	unsuitable	dumped	discovered
properly	evaporate	vary	burns up	increase

1. The police were looking for the missing person for days. Finally, they _____ his body in a remote area of the town yesterday.
2. The programme's subject matter was quite _____ for children. There was too much violence.
3. You're not _____ dressed for this weather. It is freezing and you are not wearing a coat.
4. The heat coming from the sun dries up water and causes it to _____.
5. The dictator has _____ in power for over 20 years.
6. Rooms _____ in size. Some are big whereas some are small, but all have a television and a telephone.
7. Over 150,000 tons of waste are _____ annually along the coastline and pollute the environment.

sources	solid	exists	effectively	decreases
surface	produce	unlike	provide	actually

8. _____most actors who are generally very talkative and sociable, Johnny Depp is a rather shy man.
9. There is still no evidence that life _____ on other planets.
10. The best _____ of potassium are vegetables and fruit.
11. If you sleep well and exercise regularly, you can work more _____.
12. We saw fish swimming just under the _____ of the water.
13. Most of the metals are _____ at room temperature.
14. Lawyers _____ legal advice and services to their clients.

victims	resistance	regulates	requires	essential
plentiful	maintaining	prevent	harm	disregarding

15. Working with young children _____ a great deal of patience.
16. A/An _____ supply of hot water is a necessity in every house for domestic and hygienic purposes.
17. Sun light is absolutely _____ for the healthy development of plants.
18. Vitamin C helps us build _____ to diseases and microbes.
19. Success in business depends on building and _____ a good relationship with your customers.

20. Regular cleaning in your house may _____ you from getting ill.
21. 500 penguins were the _____ of an oil spill. They were all covered in oil.

tries	regained	rapidly	float	consume
shallow	consequences	relies	rarely	blowed

22. World of technology is changing _____. There is a new device introduced almost every hour.
23. A smaller car will _____ less fuel, so you should prefer smaller cars because they are more economical.
24. He broke the law, and now he must face the _____ of his actions.
25. The museum _____ on voluntary donations, i.e. money given by rich people, to keep open.
26. If you don't know how to swim, then you had better move to the _____ part of the pool.
27. Objects with a lower density than water _____ in the water. In other words, they do not sink in the water.
28. After losing the second set, the boxer _____ his confidence and won the third set.

principle	altered	pioneer	depends	restrict
forward	balanced	based	stretches	bottom

29. If you don't want anyone to see some of your files, you may need to _____ access to them.
30. He _____ his appearance with surgery, and now even his friends cannot recognize him.
31. First examples of computer animation were presented by John Whitney. In other words, he was a _____ of computer animation.
32. The Titanic movie is _____ on a real ship accident which happened in 1912.
33. He leaned _____ to reach for the salt which was at the other end of the table.
34. A _____ diet contains lots of fruit, green vegetables and protein.
35. Choosing the right bike _____ on what you want to use it for. For example, if you want to use it in the city, you will not need a bike with advanced capabilities.

major	approximately	available	absorb	disasters
horizontally	regions	fixed	distributes	thaw

36. Some _____ of Turkey, such as those in the north, have much more green areas than the others.
37. You should _____ frozen meat in its packet and cook it as soon as possible.
38. Age is a/an _____ factor which affect chances of employment. In other words, it is an important factor which employers consider when they hire a person.
39. There are enough data _____ to scientists to make a decision about the new drug.
40. We don't know the exact number, but the world population is _____ 7.3 billion as of July 2015.
41. Apple® _____ its products through various companies all around the world.
42. Dark colors _____ heat. That's why you should wear clothes with a light color such as white on hot summer days.

APPENDIX C

MOTIVATION SURVEY

Sınıf: _____

Yaşınız: _____

Cinsiyetiniz: [] Erkek [] Kadın

ÖĞRETİM MATERYALLERİ DEĞERLENDİRME ANKETİ

İfadelere katılma derecenizi, görüşünüzü en iyi yansıtan seçeneğe karşılık gelen kutucuklardan bir tanesini 'X' ile işaretleyerek belirtiniz. **Aşağıdaki ifadelere ilişkin görüşlerinizi belirtirken dönem boyunca üzerinde çalıştığınız kelime öğrenme etkinliklerini göz önünde bulundurunuz.** İfadelere yönelik yanıtlarınızı tamamen kişisel görüşleriniz doğrultusunda ve doğru ya da yanlış cevap arayışında olmaksızın belirtmeniz önemlidir. Çalışmaya katılım gönüllülük esasına dayalı olup, görüşleriniz yalnızca bu çalışmanın amacı doğrultusunda kullanılacaktır. Katkılarınız için teşekkürler.

Şenol Bakay

Bilgisayar ve Öğr. Tek. Eğitimi Bölümü, ODTÜ

1 = Doğru Değil 2 = Biraz Doğru 3 = Orta Derecede Doğru 4 = Oldukça Doğru 5 = Çok Doğru

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
1. Bu uygulama ile ilk defa karşılaştığımda, benim için kolay olabileceği izlenimini edindim.	[]	[]	[]	[]	[]
2. Bu uygulama ile ilk defa karşılaştığımda ilginç özellikleri dikkatimi çekti.	[]	[]	[]	[]	[]
3. Bu uygulamada sunulan materyallerin anlaşılması, olmasını beklediğimden daha zordu.	[]	[]	[]	[]	[]
4. Uygulama başlamadan önce yapılan bilgilendirmelerden sonra, bu uygulamada neler öğrenmem gerektiğini anladım.	[]	[]	[]	[]	[]

5. Bu uygulamada sorulan soruları tamamlamak bana başarı duygusunun sağladığı doyumunu verdi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Bu uygulamanın içeriği ile daha önce öğrendiklerim arasında ilişki vardı.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Bu uygulamada çok fazla bilgi sunulduğu için önemli noktaları görmek ve hatırlamak zordu.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Bu uygulamada sunulan materyaller dikkat çekici görünüyordu.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Bu uygulamada kullanılan kelime tanımları, telaffuz seslendirmeleri, resimler ve örnek cümleler bana bu uygulamanın İngilizce kelime öğrenimi için ne kadar önemli olabileceğini gösterdi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Bu uygulamayı başarıyla tamamlamak benim için önemliydi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Bu uygulamada kullanılan (kelime tanımlarının, örnek cümlelerin, resimlerin, telaffuz seslendirmelerinin vb.) içeriklerin kalitesi dikkatimi uygulamaya vermeme sağladı.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Bu uygulamada kullanılan içerikler dikkatimi veremeyeceğim kadar soyuttu.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Bu uygulamada sunulan içerikleri çalışırken, kelimeleri öğrenebileceğimden emindim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Bu uygulamadan öyle keyif aldım ki, bu uygulamanın ileride tekrarlanması isterim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Bu uygulama hiç çekici değildi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. Bu uygulamada sunulan materyaller, benim ilgi duyduğum şeylerle ilişkiliydi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. Bu uygulamada bilgilerin düzenlenme biçimi dikkatimi uygulamaya çekmeye yardımcı oldu.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. Bu uygulamada öğretilen kelimelerin nasıl kullanılacağına ilişkin açıklamalar veya örnekler vardı.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

1 = Doğru Değil 2 = Biraz Doğru 3 = Orta Derecede Doğru 4 = Oldukça Doğru 5 = Çok Doğru

	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
19. Bu uygulamada sorulan sorular çok zordu.	[]	[]	[]	[]	[]
20. Bu uygulamada merakımı uyaran anlatımlar, örnekler, resimler ve sesler vardı.	[]	[]	[]	[]	[]
21. Bu uygulamada yer almaktan gerçekten zevk aldım.	[]	[]	[]	[]	[]
22. Bu uygulamadaki tekrarların miktarı bazen sıkılmama neden oldu.	[]	[]	[]	[]	[]
23. Bu uygulamadaki içerikler ve bunların sunuluş biçimini görünce bu uygulamanın benim için önemli olduğunu izlenimini edindim.	[]	[]	[]	[]	[]
24. Bu uygulamadan tahminlerimin ötesinde beklenmedik şeyler öğrendim.	[]	[]	[]	[]	[]
25. Uygulama başladıktan bir süre sonra, uygulamadaki kelimelerin yer aldığı bir testte/sınavda başarılı olabileceğimden emindim.	[]	[]	[]	[]	[]
26. Bu uygulama gereksinimlerime uygun değildi çünkü zaten içeriğinin çoğunu biliyordum.	[]	[]	[]	[]	[]
27. Bu uygulama esnasında aldığım geribildirim, gösterdiğim çabanın ödüllendirildiğini hissetmeme yardım etti.	[]	[]	[]	[]	[]
28. Bu uygulamadaki materyalin çeşitliliği (kelime tanımları, örnek cümleler, resimler, telaffuz seslendirmeleri vb.) dikkatimi derste tutmama yardımcı oldu.	[]	[]	[]	[]	[]

29. Bu uygulama sıkıcıydı.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30. Bu uygulamanın içeriğiyle, derste öğrendiğim bilgiler arasında ilişki kurabildim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31. Bu uygulamada sunulan içeriğin yoğunluğu/çok sayıda kelime içermesi rahatsız ediciydi.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
32. Bu uygulamayı başarıyla tamamlayınca kendimi iyi hissettim.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Bu uygulamanın içeriği benim için yararlı olacak.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Bu uygulamadaki içeriğin bir kısmını gerçekten anlayamadım.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. İçeriğin iyi biçimde yapılandırılmış olması, sunulan İngilizce kelimeleri öğrenebileceğim konusunda kendimi emin hissetmeme yardımcı oldu.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Bu kadar iyi tasarlanmış bir uygulamada yer almak benim için zevkti.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX D

STUDENT INTERVIEW FORM

Odak Grubu Soruları

1. Mobil cihazları kullanarak kelime öğrenme hakkında ne düşünüyorsunuz?
2. Daha önce hangi yöntemleri kullanarak kelime öğrendiniz?
 - a. Daha önce kullandığınız yöntemle bu yöntemi karşılaştırır mısınız?
 - i. İki yöntemin avantajları ve dezavantajları neler?
 - ii. Nedenleriyle açıklayabilir misiniz?
3. Yeni yöntemde ne gibi geliştirmeler yapılabilir?
4. Sizce etkinlik süresince kullanılan yöntem diğer yöntemlerle birlikte kullanılabilir mi?
 - a. Evet: Nasıl kullanılabilir? Hayır: Neden kullanılamaz?
5. Bu etkinlikle yeni kelimeleri öğrenmedeki başarınız konusunda ne düşünüyorsunuz?
 - a. Öğrendiğiniz kelimelerle dönem boyunca tekrar karşılaştınız mı?
 - i. Evet: Hangi durumlarda karşılaştınız?
 - ii. Bu durumlarda kelimenin anlamını ve kullanımını hatırlama konusunda ne yaşadınız?
 - b. Öğrendiğiniz kelimeleri daha sonra kullanabileceğinizi düşünüyor musunuz?
6. Etkinlik süresince arkadaşlarınızın resimlerine ne sıklıkta baktınız? Neden?

7. Etkinlik süresince verilen kelimelerle ilgili resim çekmek için nasıl bir yol izlediniz?
 - a. Kelime başına ortalama ne kadar süre harcadınız?
 - i. Hangi aşamalarda? (Fikir bulma, fotoğraf çekme, sisteme yükleme vs.)
 - b. Bu süreçte kelimeleri öğrenme konusunda en faydalı bulduğunuz 3 şey nedir? Neden?
8. Etkinlikte yer alan haftalık kelime sayısı ile ilgili ne düşünüyorsunuz?
 - a. Yeterli miydi, daha mı az olmalıydı, daha fazla olabilir miydi? Neden?
9. Haftalar geçtikçe etkinliği tamamlama oranında bir düşüş oldu. Sizce bunun sebebi ne olabilir?
10. Etkinlik süresince kullanılan mobil uygulama (MeWe) hakkındaki olumlu/olumsuz düşünceleriniz nelerdir?
 - a. Olumlu: Sistemin hangi yönleri bu süreci kolaylaştırdı?
 - b. Olumsuz: Sistemin hangi yönleri bu süreci zorlaştırdı?
11. Başka eklemek istediğiniz herhangi bir şey var mı?

APPENDIX E

INSTRUCTOR INTERVIEW FORM

Okutman Görüşme Soruları

Temel Sorular:

1. Kaç senedir öğretmenlik yapıyorsunuz?
2. Daha önce hangi sınıflarda ders verdiniz?
3. Geçmişte ne çeşit kelime öğretim teknikleri kullandınız?
4. Bu kelime öğretim tekniklerini seçmenizde rol oynayan faktörler nelerdi?

Çalışmaya Yönelik Sorular:

5. Kelime öğrenme konusunda öğrenciler tarafından görsel oluşturulması yöntemi ile ilgili düşünceleriniz nelerdir?
6. Uygulanan görsel oluşturma yönteminin faydaları ve zorlukları konusunda ne düşünüyorsunuz? Sizce bu çalışma sonucunda öğrenciler kalıcı kelime öğrenimi yaşadı mı?
7. Çalışma süresince öğrenci katılımına yönelik algınızı açıklayabilir misiniz?
8. Sizce uygulanan çalışmada öğretmenin nasıl bir rolü vardı?
9. Öğrencilere hangi noktalarda destek oldunuz?
10. Başka eklemek istediğiniz bir şey var mı?

APPENDIX F

INFORMED CONSENT FORM

Gönüllü Katılım (Bilgilendirilmiş Onay) Formu

Bu çalışma danışmanlığını Orta Doğu Teknik Üniversitesi Bilgisayar ve Öğretim Teknolojileri Eğitimi Bölümü Öğretim Üyesi Doç. Dr. Ömer DELIALİOĞLU, yardımcı danışmanlığını Yabancı Diller Eğitimi Bölümü Öğretim Üyesi Doç. Dr. Perihan SAVAŞ'ın yaptığı doktora öğrencisi Şenol BAKAY tarafından doktora tezi olarak yürütülmektedir. Bu araştırmayla mobil cihaz destekli öğrenme ortamının geleneksel yöntemlere nazaran İngilizce dili öğrencilerinin kelime bilgisi edinimi ve derse bağlılığı üzerindeki etkisi incelenecektir. İngilizce hazırlık bölümünde okuyan öğrenciler bu çalışmanın katılımcıları olarak belirlenmiştir. Katılımcılar deney grubu ve kontrol grubu olarak belirlenip her grupta farklı bir öğretim yöntemi kullanılacaktır. Araştırma 6-8 hafta sürecek olup çalışmanın başında öğrencilerin mobil destekli dil öğrenimine karşı hazırbulunuşluğunu belirlemek amacıyla ön anket uygulanacaktır. Çalışmanın sonunda katılımcıların kelime bilgisi edinimini ölçmek amacıyla bir başarı testi uygulanacak, öğrencilerin derse bağlılığını ölçmek için derse bağlılık ölçeği uygulanacak ve öğrencilerin deneyimleri üzerinden görüşlerini almak için mülakat yapılacaktır. Çalışmanın sonunda dersi yürüten öğretmenlerin görüşlerini almak için de öğretmenlerle mülakat yapılacaktır.

Bu çalışmaya katılım tamamen gönüllü olup katılmamaktan ötürü ya da katılımdan vazgeçme sonunda olumsuz hiçbir sonuç olmayacaktır. Toplanan bilgiler sadece araştırmacı tarafından kullanılacaktır. Katılımcıların isimleri tamamen gizli tutulacaktır. Hiçbir rapor ya da tezde katılımcı isimleri kullanılmayacaktır.

Arařtırmaya ynelik oluřabilecek sorularla ilgili olarak arařtırmacının kendisiyle dođrudan iletiřime geilebilecektir. Ařađıdaki arařtırmacının adresi, telefon numarası ve e-posta adresi verilmiřtir.

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Adı, Soyadı : _____

Tarih: ___/___/_____

İmza : _____

APPENDIX G

APPROVAL OF ETHICAL COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER



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Gönderen : Prof. Dr. Canan Sümer 
IAK Başkan Vekili

İlgi : Etik Onayı

Danışmanlığını yapmış olduğunuz Bilgisayar Eğitimi ve Öğretim Teknolojileri Bölümü doktora öğrencisi Şenol Bakay'ın "**Mobil Destekli Öğrenme Ortamının İngilizce Dili Öğrencilerinin Kelime Bilgisi Edinimine Etkisinin İncelenmesi**" isimli araştırması "İnsan Araştırmaları Komitesi" tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı

Uygundur

13/04/2015


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EDUCATION

Degree	Institution	Year of Graduation
MA (non-thesis)	Bilkent University, CEIT	2010
BA	Bilkent University, CEIT	2009
High School	Özel Balıkesir Fırat Lisesi	2004

WORK EXPERIENCE

Year	Place	Enrollment
2012-Present	METU, CEIT	Research Assistant
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2010-2011	MAKU, CTIS	Research Assistant

FOREIGN LANGUAGES

Advanced English

PUBLICATIONS

Arslantas, T. K., Bakay, S., Bulut, İ. H., & Kilis, S. (2015). Faculty Members' Perception toward Computer Education and Instructional Technology Field in terms of Opportunities and Risks & Future of the Field. In *EdMedia: World Conference on Educational Media and Technology* (pp. 1238-1246). AACE.

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Bakay, S., Bulut, I. H., & Delialioğlu, Ö. (2013). English as a Foreign Language (EFL) Students' Readiness and Perceptions towards Mobile Learning. *EDULEARN13 Proceedings*, (pp. 251-257). IATED.

Bulut, I. H., Bakay, S., & Delialioğlu, Ö. (2013). Third-Person Effect in Violent Video Games. *EDULEARN13 Proceedings*, (pp. 1050-1054). IATED.