EFFECTS OF COMPUTER ASSISTED VOCABULARY INSTRUCTION ON VOCABULARY LEARNING AND VOCABULARY LEARNING STRATEGIES

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DEDICATION

I lovingly dedicate this dissertation to
my beloved wife NURGÜL and daughter GÖKÇE...

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ABBREVIATIONS

AFA: Açımlayıcı Faktör Analizi

AS: Affective Strategy:

CALL: Computer Assisted Language Learning

CAVL: Computer Assisted Vocabulary Learning

CAVI: Computer Assisted Vocabulary Instruction

CnS: Compensation Strategy:

CS: Cognitive Strategy

CFA: Confirmatory Factor Analysis

DFA: Doğrulayıcı Faktör Analizi

DCT: Dual Coding Theory

EFA: Exploratory Factor Analysis

L1: Mother Tongue

LLS: Language Learning Strategies

EFL: English as a foreign language

L2: Target Language

McS: Metacognitive Strategy

MONE: Ministry of National Education

MS: Memory Strategy:

PPP: Presentation, Practice, Production

RQ: Research Question

SS: Social Strategy:

VLS-S: Vocabulary Learning Strategies Scale

ABSTRACT

Effects of Computer Assisted Vocabulary Instruction on

Vocabulary Learning and Vocabulary Learning Strategies

The aim of this study was to investigate the effect of computer assisted vocabulary learning applications on the use of vocabulary learning strategies and vocabulary learning of secondary school grade 6 students. The study utilized a quasi-experimental design that lasted for 10 weeks with 68 secondary school students. An instructional software (Dynamic English Vocabulary Instruction Software- DENIS and Games) DENIS and Instructional Games comprising textual, visual and auditory elements with the purpose of enabling students to learn vocabulary in a computer setting was developed and applied as the treatment in a computer lab for two intervals of 4 weeks. Two instruments were used for data collection. First, a vocabulary learning strategy scale was developed and piloted. The reliability of the scale estimated by Cronbach's alpha was .89. The scale also demonstrated acceptable construct validity examined by both exploratory and confirmatory factor analyses. Confirming the theoretical assumptions of vocabulary learning strategies, the scale showed six underlying constructs including memory, cognitive, compensation, meta-cognitive, affective and social strategies to be valid. The strategy use scale was administered to the participants before and after the applications of the treatment. Second, a vocabulary achievement test was developed and administered to the participants before and after the applications of the treatment.

The data was analysed using paired samples t-test and One-way ANOVA for repeated measures. The findings revealed that the treatments resulted in a significant increase only in the students' level of using Compensation Strategies (t_{67}=-2.021, $p<0.05$). No difference was detected for other strategies. However, both DENIS and the Instructional Games resulted in a statistically significant difference in the students' vocabulary learning ($F_{(1.29,\ 86.61)}$=170.16, $p<0.05$; $F_{(1.73,\ 115.63)}$=175.41, $p<0.05$, respectively). When the combined effect of both DENIS and the instructional games on the students' vocabulary learning achievement scores was examined, a statistically significant difference was found (t_{67}=-16.90, $p<0.05$).

Keywords: Vocabulary learning strategies, computer-assisted vocabulary learning, instructional software, instructional computer games.

KISA ÖZET

Bilgisayar Destekli Kelime Öğretiminin Kelime Öğrenimine ve
Kelime Öğrenme Stratejilerine Etkileri

Bu çalışma bilgisayar destekli kelime öğrenme uygulamalarının İlköğretim 6. Sınıf öğrencilerinin kelime öğrenme stratejilerine ve kelime öğrenimlerine etkisini araştırmayı amaçlamıştır. Araştırma yarı deneysel desen olarak tasarlanmış ve 68 öğrenci ile 10 hafta uygulanmıştır. Dörder haftalık ikişer safhadan oluşan ve bilgisayar laboratuarında gerçekleştirilen uygulama için öğrencilerin bilgisayar ortamında kelime öğrenmelerine yardımcı olacak görsel, işitsel ve metinsel öğelerden oluşan Dinamik İngilizce Öğretim Yazılımı (DENIS) ve kelime oyunları geliştirilmiştir. Veri toplama aracı olarak iki araçtan faydalanmıştır. İlk veri toplama aracı olarak kelime öğrenme stratejileri ölçeği Geliştirilmiş ve pilot çalışması yapılmıştır. Cronbach alfa ile varsayılan ölçek güvenilirliği .89 olarak hesaplanmıştır. Ölçek aynı zamanda hem açımlayıcı hem de doğrulayıcı faktör analizleri ile test edilmiş ve kabul edilebilir yapı geçerliği ortaya koymuştur. Kelime öğrenme stratejilerinin teorik varsayımlarını doğrulayan ölçek, hafıza, bilişsel, tamamlayıcı, üst-bilişsel, duyuşsal ve sosyal alt faktörlerinin geçerliliğini ortaya koymuştur. Strateji kullanma ölçeği hem uygulama öncesinde hem de uygulama sonrasında çalışma grubuna uygulanmıştır.

İkinci olarak, Geliştirilen başarı testi uygulamalardan hem önce hem de sonra çalışma grubuna uygulanmıştır.

Verilerin analizinde ilişkili örneklemler t-testi ve tekrarlı ölçümler için tek yönlü ANOVA kullanılmıştır. Bulgular uygulamaların öğrencilerin tamamlayıcı stratejileri kullanma düzeylerinde anlamlı bir artışa sebep olduğunu ortaya koymuştur. (t_{67}=-2.021, $p<0.05$). Diğer stratejilerin kullanım düzeylerinde ise bir fark bulunmamıştır.

Bunun yanında, hem DENIS hem de eğitsel oyun uygulaması öğrencilerin kelime öğrenme başarılarında istatistiksel olarak anlamlı bir fark yaratmıştır (sırasıyla $F_{(1.29, 86.61)} = 170.16$, $p<0.05$; $F_{(1.73, 115.63)} = 175.41$, $p<0.05$). Her iki uygulamanın öğrencilerin kelime öğrenme başarısı üzerindeki ortak etkisi incelendiğinde de istatistiksel olarak anlamlı bir artış görülmüştür ($t_{67} = -16.90$, $p<0.05$).

Anahtar Kelimeler: Kelime öğrenme stratejileri, bilgisayar destekli kelime öğrenme, eğitsel yazılım, eğitsel oyun yazılımı, kelime öğrenme başarısı.

CHAPTER 1
INTRODUCTION
1.1. Background to the Study

Computer assisted language learning (CALL) has been used effectively in the field of education since 1960s. As teaching methods such as audio-lingual and communicative language teaching started to shape language classroom, new and more interactive programs were designed and developed for educational purposes. With all these advances, learning styles and strategies gained new dimensions. The terms "learning style" and "learning strategy", once thought to be synonymous and used interchangeably, had to be redefined after extensive research on these two concepts. New definitions loaded distinct roles on these concepts; while Vincent and Hah (1996, p.1) stated that "learning *style* covers a broad and generalised approach to learning, and influences the selection and application of learning strategies", Oxford (1990) states that the term *strategy* implies conscious movement towards a goal. "Learning strategies are specific actions taken by the learner to make learning easier, faster, more enjoyable, more self-directed, more effective, and more transferable to new situations" (Oxford, 1990, p. 8)."Language learning strategy is an attempt to develop linguistic and sociolinguistic competence in the target language to incorporate these into one's interlanguage competence" (Tarone, 1983).

Using proper learning strategies directly affects learning a foreign language. Liu (2004)found the existence of relationship between language learning and English proficiency. On the ground of related studies, he claims that language learning strategy and English proficiency are closely related (Liu, 2004). Liu underlines the fact that the more strategies students use, the more proficient they become, which indicates that learners who are not capable of using sufficient number of strategies display low

proficiency. Huyen and Nga (2003) state that students are expected to learn a sufficient number of words aligned with their accurate usage in order to establish good communication in a foreign language.

A large number of researchers consider vocabulary to be the core element of language learning (Coady & Huckin, 1997; Harley, 1996; Nation, 2001; Read, 2000). Krashen (1989) considers the lack of vocabulary as the biggest barrier to conveying meaning, and thus regards vocabulary as the basic asset to the integration of four skills. Similarly, Coady (1997b) and Nation and Newton (1997) define vocabulary learning in a foreign language as a problematic area by emphasizing the importance of motivation, individual and group activities, implicit and explicit ways of vocabulary learning and vocabulary learning strategies. Language learners with adequate vocabulary are found to be more successful than learners with limited vocabulary, which thereby presents a positive relationship between language proficiency level and vocabulary knowledge (Luppescu & Day, 1993).

Vocabulary learning strategies are often viewed as a subcategory of language learning strategies (Carter & McCarthy, 1988; Oxford, 1990; Schmitt, 1997). With regard to strategic vocabulary learning, Ahmed (1989) classifies students as successful and unsuccessful according to their performance in associating newly learned words with the previous ones . To lend support to the issue, Porte (1988) reports that weak learners use only a limited number of strategies. Ellis (1994), likewise, underlines the significance of vocabulary learning strategies which raise students' awareness of new lexical items and activate their conscious learning.

The difference between successful and less successful learners stems also from the amount of strategy awareness and vocabulary use. Unlike less successful L2 learners who

not only use the same strategies repeatedly but also fail to accomplish a language task, successful learners who have a wide range of strategy knowledge make effective use of strategic learning (Anderson, 2005).

Dörnyei (2001) classifies the strategy awareness under four categories. The first category is related to appropriate teacher behaviours which involve a good relationship with students and creating a supportive and interactive atmosphere in the classroom. The second category focuses on student motivation which is related to improving the values related to languagelearning and providing the students with a learner-friendly curriculum. The third category is related to increasing student self-confidence and acknowledging learners about language learning strategies. The fourth category includes encouraging effort more than ability, motivational feedback and learner satisfaction. All these categories emphasize the need for teachers to realize proximal goals in raising awareness of language learning strategies.

When compared to the other fields of studies, vocabulary teaching and learning never occupied a major space in the pedagogy until mid-80s (Richards & Renandya, 2002). Laufer (1997) asserts that vocabulary learning is a vital part of language learning and language use. Researchers view vocabulary as a significant language component upon which effective communication relies (Oxford & Scarella, 1994). In recent years, a number of strategies and techniques for teaching vocabulary gained attention from researchers such as Rott, Williams and Cameron (2002), Min (2008), Boers, Piquer, Piriz, Free, and Eyckmans (2009), Mizumoto and Kansai (2009), Hummel (2010) and Shen (2010).

Especially from the mid-1980s and onwards, vocabulary has become the area of interest for many researchers (Laufer, 1990; Carter, 1988; Nation, 1990; Willis, 1990;

Descamps, 1992; Nattinger & DeCarrico, 1992; Lewis, 1993; Read, 2000). Despite extensive empirical research (Haastrup, 1991; Mondria & Wit- de-Boer, 1991; Wang, Thomas, Inzana & Primicerio, 1993) on vocabulary acquisition, which plays a critical role in language learning, the researchers in the related literature put forward a consensus on the lack of conceptualization of the process and certain strategies that students develop for learning vocabulary.

For students to gain the ability of using these strategies, Laufer (1990) stresses the teacher's role of motivating students and increasing their awareness in vocabulary learning aligned with planning, organizing, monitoring the process and the product as well as correcting student mistakes, while leading, encouraging and rewarding. Not limited to the aforementioned aims, research indicates that language teachers need to base their teaching on diverse techniques and activities that foster individual learning.

Teaching students how to use vocabulary learning strategies contributes to developing their own learning style. As suggested by Graves (1987), students actualise their learning of new words independently, and he inspires them "to adopt personal plans to expand their vocabulary over time" (p. 177). Wenden (1985) (as cited in Griffiths, 2004) associates giving immediate feedback to learners with the metaphor of giving them a fish to eat; however, teaching learners how to use strategies is more like teaching them how to catch a fish.

With the integration of modern teaching techniques, it is now feasible for language teachers to provide an educational setting for their students in which they can actively take part in vocabulary learning practices in cooperation with their peers. In line with Laufer (1990), Dörnyei (2001) articulates that "the teacher's level of enthusiasm and commitment is one of the most important factors that affects the learner's motivation to learn" (p, 158).

In addition to enthusiasm and commitment, teachers of foreign languages should also be capable of practising vocabulary teaching strategies to help their students learn vocabulary in an efficient way(Hatch & Brown, 1995). O'Malley and Chamot (1990) view learning strategies as "the special thoughts or behaviours that individuals use to help them comprehend, learn or retain new information" (p. 203).

CALL can provide an anxiety or risk-free environment where students feel relaxed, motivated and secure (Horwitz, 1995; Huang &Liu, 2000). Such ideal conditions also boost self-confidence (Krashen, 1982) and provides low affective filter in learners mind, which in turn results in language output.

One of the most convenient ways of studying vocabulary through CALL is enabling learners to repeat the same words until they learn. Repetition is one of the influential cognitive strategies under the dimension of practising in vocabulary learning. For instance, studies conducted by researchers revealed that a word can be learned if it is repeated six times or more, (Kachroo, 1962; Crothers & Suppes, 1967). However, Tinkham (1993), like many other researchers, states that learning by means of repetition differs from learner to learner. According to the finding of Saragi, Nation and Meister (1978) 20 percent of learning can be accrued by means of repetition.

To emphasise the effectiveness of CALL, Wood (2001) points out an advantage of game-like activities and claims that these activities are more efficient in the sense of engaging students than workbooks or textbooks because they contribute to the lesson through informative graphics, online awards, and extrinsic stimulus. Games can be effective to make students familiar with the new words by means of multiple exposures and use of their prior schematic knowledge.

Furthermore, as Ang and Zaphiris (2005) stressed, computers have a magic power to raise interest in players. Educators also realized this power and they started to see the ability of games in engaging the language learners. Lutsch (1999) acknowledges the effectiveness of carrying out repeated drills since machines do not get bored with presenting the same material repeatedly and they can provide non-judgemental feedback.

The practical side of games is that people play games without external obligations and rewards. Besides, when games are played for the purpose of learning or practising a subject, they help constructing knowledge rather than transmitting knowledge in line with Piaget's constructivism. That is why a lot of game-based learning projects have been designed on the basis of pedagogical epistemology. Ang and Zaphiris (2005) also point out two major contradictory principals such as ludology and narratology. The proponents of ludology are inclined to see computer games as play and game activities while proponents of narratology focus on computer games as stories.

Another appealing side of the games pointed out by Oblinger (2004) is that they provide students with encouragement; that is to say, "when there is a game to play and to win, students are willing to learn instructions and elements (e.g., mythos or mathematics); under other circumstances, learners can find the same subject matter as boring or monotonous" (p. 13).

Olson and Clough (2001) (as cited in Kazancı & Okan, 2009) underline the fact that learners are keen on effortless learning. They believe that learning does not have to be a struggle and knowledge should be easily accessible and joyful. Such a learner tendency urges both instructors and educational software designers to make use of visual instruments like animations, games, and cards in their classes.

Besides the captivating properties of technological instruments, it is a pure fact that the mission of teachers who are willing to integrate technology into their classes is not only confined to changing instructional materials through replacing pen and paper with websites, instructional computer games, software and CD-ROMs but also selecting proper instructional instruments, scaffolding and guiding their students until they manage to keep on studying by using these tools on their own. In this sense, teachers are expected to be proficient technology users utilizing digital instruments in their classes.

Hence, learners can also learn words successfully with the help of specialised programmes available on CD- ROMs (Pawling, 1999) or through popular computer games (Palmberg, 1988). Computers help learners to practice lexical items with no time restriction and furthermore provide them with immediate feedback. Computers provide different dimensions such as texts, sounds and images for learners to facilitate vocabulary learning (Takač, 2008).

Jones (2001) states that the effectiveness of CALL, to a great extent, depends on teacher's performance in vocabulary learning process. Contrary to the idea that computers may make teachers redundant, their necessity and indispensability increase as facilitators, controllers, and mediators in classes where computers are used as a means of instruction (Donaldson & Haggstrom, 2006).

After examining 16 software products in terms of direct and indirect approaches to vocabulary teaching, Wood (2001) asserted that computers are not able to meet all the requirements of vocabulary learning for students but teachers can. Put simply, teachers can interact with students better than "smart machines" in that they can take the learners' needs into consideration and meet these needs with well-chosen software products through which learners get introduced to words within their interests (p. 185).

1.2. Statement of the Problem

Language learning is a challenging process since current foreign language teaching and learning in most elementary schools in Turkey usually take place in the form of printed course books in teacher-led classroom settings. Bingimlas (2009) states that using technology in those classes is avoided for several reasons; most classes deprive of necessary equipment, or teachers do not have sufficient time or they have not been adequately trained to make use of technology in their classes.

In order to overcome the aforementioned problems, The Turkish Ministry of National Education (MONE) has provided tablet PCs to the secondary school students and teachers as course materials but these tablet PCs lack software through which students can practice vocabulary for their English courses on their own.

It is usually stated by public school teachers that they experience a significant problem related to the quantity of English class hours in the curriculum. The curricula applied at schools allocate insufficient time to teachers of English to spare time for vocabulary instruction. Due to lack of time and opportunities to teach vocabulary, teachers generally prefer giving Turkish equivalents of English words to keep up with the curriculum. Under these circumstances, it seems inevitable to assign students to study and practise vocabulary inside and outside the school environment.

Another important problem in language instruction is that students lack sufficient knowledge about vocabulary learning strategies and fail to adopt strategic behaviour (Garner, 1990). The instructors with limited knowledge of vocabulary learning strategies usually teach their students to use only a few conventional ways of learning vocabulary such as repetition or note taking.

A similar problem stated by Zimmerman (1997) is that vocabulary teaching was a neglected area in EFL contexts since researchers widely focused on syntax although vocabulary learning was an important part of learning a foreign language. Nowadays, learners have quick access to all sorts of materials for language learning but they have difficulty in choosing the right strategy or approach for language learning since they know hardly know which vocabulary learning strategies are the most suitable ones for them.

1.3. Purpose of the Study

The general purpose of the current study is to reveal, if any, the effectiveness of computer assisted vocabulary instruction (CAVI) and highlight the importance of vocabulary learning strategies. The research study aims to find whether the application of computer assisted vocabulary learning has any impact on the learners' preference of vocabulary learning strategies. In addition to the purposes mentioned above, the study was conducted with the aim of raising awareness in language learners to integrate vocabulary learning strategies with technology.

Regarding this aim, the following research questions were put forward:

Research Question 1: Is there any significant difference between students' preferences in VLSs before and after CAVI applications?

Research Question 2: **Does** computer assisted vocabulary teaching make a positive contribution to the achievement scores on vocabulary tests?

2a. Is there a significant effect of DENIS applications on vocabulary achievement scores of the grade 6 students?

2b. Is there a significant effect of Game applications on vocabulary achievement scores of grade 6 students?

2c. Is there a significant effect of combined applications (educational software (DENIS) and computer games) on vocabulary achievement scores of grade 6 students?

2d. Does gender have any significant impact on grade 6 students' strategy use?

1.4. Overview of Methodology

1.4.1. Study Group

The study group consisted of 68 grade 6 students in a state secondary school in Sakarya Province in the academic year 2012-2013. The criterion lying behind this "purposive sampling" is the fact that this school and its students represent the average success level and socio-economic standards of Turkey. The reason for choosing this level was that it was necessary for the students in the study group to have had a previous language learning experience. These students had already had some language learning experience as they had started learning English when they were in grade 4in primary school.

1.4.2. Setting

As the implementation was conducted in a laboratory setting, a secondary school which had a computer laboratory was chosen in a town of Sakarya Province. The school had six grade-6 classes from A to F. Each class had about 35 students. The implementation was carried out in the morning between 09:00 and 12:10.

1.4.3. Data Collection Instruments

Vocabulary learning strategy scale (VLS-S), paper-based vocabulary achievement tests, student reflection papers, and classroom observations were all the data collection

instruments. A pilot study was conducted on 303 grade 6 students to verify the validity of VLS scale developed by the researcher.

1.4.4. Data Analysis

For descriptive statistics, PASW 18 package program was used while conducting descriptive (frequencies, means and standard deviations) and inferential statistics.

Exploratory and confirmatory factor analyses were conducted in the process of developing the vocabulary learning strategy scale. An item difficulty analysis was conducted to develop an achievement test for item discrimination. Paired samples t-test was used to compare the means of significant differences between paired groups. Independent samples t-test results were used to analyse the gender difference in strategy preference. Analysis of repeated measures of ANOVA was used to measure the subjects' scores at the end of each application. Bonferroni test was used as the post hoc analysis in the multiple comparisons. Lisrel 8.71 was used for confirmatory factor analysis. A categorical content analysis was applied to students to find out how they perceived the implementation.

1.5. Contribution of the Study

With the aim of revising and updating present VLS taxonomies, a vocabulary learning scale was developed through including items which integrated vocabulary learning strategies and computer assisted vocabulary learning. Along with the scale development, a new computer assisted vocabulary tool was developed with the aim of adding contribution to the field of vocabulary teaching and learning.

The Strategy Inventory for Language Learning (SILL) developed by Oxford was taken as a model in this study. Almost all vocabulary learning strategies stem from Oxford's taxonomies of language learning strategies. Nation (2001) states that there is no

point in putting vocabulary learning strategies into a different category as they are considered to be a part of language learning strategies. Language and vocabulary learning strategies involve similar items but do not involve items related to computer assisted vocabulary learning. What makes this study different from the previous ones is that items related to computer assisted vocabulary learning were used under the dimension of compensation strategies. The motive for using such items in the compensation strategies was that the study would be conducted by making use of computer applications developed by the researcher. The rationale behind the study is that vocabulary learning cannot be considered apart from recent technological advances as they provide learners with many effective tools to practise vocabulary. Hsiao and Oxford (2002) defined compensation strategies as techniques used by learners to compensate for missing knowledge. The present study was based on computer-assisted vocabulary learning as learners can compensate their missing knowledge by means of computer-mediated sources. Thus, in this study, computer assisted vocabulary learning applications were integrated with vocabulary learning strategies to determine the interaction between these two important components of language learning and teaching.

1.6. Limitations of the Study

Vocabulary learning strategies are often regarded as overlapping and ambiguous in the literature. As the participants in this study were grade 6 students who were not quite aware of the vocabulary learning strategies, the findings should be taken into account with the characteristics of the study group. Thus, finding metacognitive strategies as the most preferred vocabulary learning strategy in this study does not ensure the same finding with

a different group of grade 6 students. Therefore, this restricts the generalizability of the study to a wide area.

1.7. Organization of the Study

The present study comprises five chapters. In the first chapter, a general introduction to the study was given for the background information, the statement of the problem, the purpose of the study, the research questions, the overview of methodology (study group, setting, data collection instruments and data analysis), the contribution and limitations of the study. The second chapter provides a detailed literature review organized under four main headings: theories of learning, taxonomies of vocabulary and language learning strategies, CALL applications, and research studies on vocabulary learning. The third chapter is allocated to the methodology detailing the setting, study group, research design, and data collection instruments along with data analysis. The fourth chapter yields findings in terms of the research questions.. Finally, the fifth chapter concludes and discusses the findings of the study giving implications, limitations and suggestions for further research.

CHAPTER 2
LITERATURE REVIEW

2.1. Introduction

Both second language learners and their teachers have always searched for the most efficient wayof vocabulary learning and teaching. Both sides are quite aware of the fact that learning words is an indispensible but challenging part of learning a second language (Laufer & Hulstijn, 2001). In order to facilitate vocabulary learning, quite a number of researchers in the field of linguistics focus on vocabulary learning strategies to figure out which one is more beneficial for vocabulary learners.

Meschyan and Hernandez (2002) (as cited in Cohen, 2003) underline the importance of learning strategies in order to learn a foreign language appropriately, which plays a significant role for EFL learners in gaining proficiency in English. Nisbet, Tindall and Arroyo, (2005) claim that learners should endeavour to achieve their ultimate goal which leads to genuine proficiency in English. Liu (2004) states that the correlation between English proficiency and language learning strategies displays consistency in several studies and stresses that proficiency can be improved by means of using multiple learning strategies.

In order to bridge the gap between the students with a high level of vocabulary knowledge and the ones with a lower level of vocabulary knowledge, teachers should introduce vocabulary explicitly and create a suitable atmosphere for their students to practice it. The more the students are exposed to the new vocabulary, the better they remember it (Chun & Plass, 1996; Yoshii & Flaitz, 2001; Jones & Plass, 2002). Studies conducted by many researchers indicate that using pictures while teaching vocabulary

makes students more successful in remembering the words (Kamil, 2003; Chapelle &Jamieson, 2008). Walker, Barrow and Rastatter (2002) (as cited in Chang, Lin & Lee, 2005) also state that picture-naming is a widely used assessment type administered on children. In addition to teaching with pictures, flashcards are also important materials for vocabulary instruction. While explaining conditions facilitating vocabulary learning, Nation (2001) states that instead of giving a list of words to the students, teachers should supply them with flashcards which have certain learning advantages. Furthermore, Nakata (2008) supports the idea of using flashcards in teaching and adds that computerized flashcards are better than paper flashcards.

Although effectiveness of VLSs depends on many factors such as language level, learning context and personal features of the learner, VLSs help learners find a simple way to learn new vocabulary. According to Nation (1982) (as cited in Prince, 1996), what we mean by context is not clear; so, this causes a difficulty in finding a standard definition of context. Then, he tries to give a definition of context in a broad sense by stating that context is everything which comes along with stimulus processing that includes the learning environment. Moreover, Röhr (1993) (as cited in Prince, 1996) agrees about the diversity of context, and stresses that pictures are one of the other possible contexts along with L2 synonyms. If a learner knows about VLSs, he can easily employ the best strategy to get the meaning of an unknown word, to retain such words in long-term memory, and to recall and use them while writing or speaking (Ellis, 1994; Gu & Johnson, 1996; Schmitt, 1997; Sökmen, 1997; Nation, 2001; Catalan, 2003; Intaraprasert, 2004)

Learners' individual difference factors constitute one sort of variation in the use of VLSs. These factors include belief, attitude, motivation and language learning experience. There are many other factors which affect the learners' VLS preference. The most

important of these is that each learner has an individually different character. Although there are controversial ideas and research findings on this issue, what the learners believe yields their VLS use (Gu & Johnson, 1996; Wei, 2007; Sixiang & Srikhao, 2009). Learners employ various VLSs depending on whether they believe that vocabulary should be studied and put to use or not. Another important factor influencing the learners' decisions on VLS use is their attitude. If their attitude is positive, they tend to use a variety of VLSs (Wei, 2007; Zhi-liang, 2010).

Gu and Johnson (1996) conducted the vocabulary learning strategies questionnaire on 850 second-year Chinese university students by administering vocabulary size tests and proficiency tests. The questionnaire consisted of 91 vocabulary learning strategies, which were classified into seven sub-categories as in Table 9.

Gu and Johnson also classified learners into five types according to their use of vocabulary learning strategies; *readers* who take initiatives in their vocabulary acquisition and use natural ways; *active strategy users* who use a wide variety of strategies consciously; *encoders* who sometimes use mnemonics to enhance their learning; *non-encoders* who have little motivation; *passive strategy users* who prefer rote learning and study vocabulary attentively. In their classification, Gu and Johnson also defined *readers* as the most successful and *passive strategy users* as the least successful in strategy using.

Studies by Fu (2003) and Marttinen (2008) on learner motivation which is one of the most important factors in the literature have revealed that there is a positive correlation between motivation and VLS use. In addition to these factors, the use of VLSs depends on the extent of the learners' background and awareness. So, teachers should explicitly and repeatedly teach the learners about learning strategies to create awareness so that the learners can choose one of these strategies or use different combinations of them (Macaro

2001). The more the learners are exposed to VLSs in class, the more they tend to use these strategies in their learning process (Porte, 1988; Stoffer, 1995; Siriwan, 2007).

Stoffer (1995),being a pioneerin investigating vocabulary learning strategies as a whole, developed a questionnaire which consisted of 53 items. She conducted this Vocabulary Learning Strategy Inventory (VOLS1) and the SILL on 707 students at the University of Alabama. Stoffer classified 53 items on the VOLSI into nine categories as in Table 8.

Schmitt (1997) investigated the usefulness and level of use of his own taxonomy on 600 Japanese students learning English as a foreign language (EFL) at junior high, senior high, and university students. He adopted social, memory, cognitive, and metacognitive strategies from Oxford's SILL and added a new category "determination" in his studies. There were 58 strategies classified into 5 categories and grouped into two dimensions: "discovery of a new word's meaning" and "consolidating a word once it has been encountered". Discovery of a new word's meaning included determination and social strategies and consolidating a word once it has been encountered included social, memory, cognitive, and metacognitive strategies. Thus, the social strategies were placed into the two dimensions since they can be used for both purposes as in Table 11.

There are many learning strategies and learners may find it difficult to decide on the most efficient one. Therefore, they need to be instructed how to equip them with the ability to use these strategies. The ultimate goal of the instructions given to the learners is to make them able to use these strategies independently. Oxford (1990) emphasizes the importance of self-direction by stating that "self-direction is particularly important for language learners because they will not always have the teacher around to guide them" (p.10). Instructions on VLSs can be given explicitly if the learners' language level is high.

However, learners' acquisition of vocabulary in an implicit way more easily in earlier stages of language learning or by instructions given by the teacher in L1 (learner's mother tongue) (Bastanfar & Hashemi, 2010).

Social and situational positions of learners are other important factors in the use of VLSs. A learner's field of study, type of the course, level of the class (Doczi, 2011; Mongkol, 2008), language learning environment, and gender are all social and situational factors affecting the VLS use. For instance, the findings of the studies revealed that art students clearly differ from science students in VLS use (Gu, 2002; Mingsakoon, 2002; Liao, 2004; Chiang, 2004; Zhang, 2009; Bernardo & Gonzales, 2009) as the students studying their major subjects in English differ from the ones who study a non-English subject (Siriwan, 2007; Al-Shuwairekh, 2001). Gender is another factor which has drawn the widest attention from the researchers but contrary to general assumption (Jones, 2006; Siriwan, 2007; Marttinen, 2008; Seddigh, 2012) that there should be a difference between males and females, the researchers Tsai and Chang (2009), Madani and Azizmohammadi (2009), Khatib, Hassanzadeh and Rezaei (2011) and Arjomand and Sharififar (2011) did not find any significant difference between the VLSs used by male and female students.

The studies in the literature revealed that the most preponderant factor that affects the learners' VLS use is the environment in which they learn the language. This environment consists of formal environment such as the classroom, the teacher, peers in the class and the informal environment such as family and friends. The more these environments encourage the students, the more VLSs they tend to use (Kameli et al. 2012; Asgari & Mustapha, 2011).

In a study conducted by Ehrman and Oxford (1990) (as cited in Cohen, 2003), seventy-nine foreign language learners with different personality types which determine

the learning styles were given the SILL with the purpose of determining the preference of language learning strategies. Ehrman and Oxford grouped foreign language learners according to their personalities and their strategy preferences. They also identified which personality is more inclined to use which strategy more as follows;

- Extroverts are more inclined to use social strategies than introverts.
- Intuitive learners prefer compensation strategies, sensing (concrete) learners are more inclined to use memory strategies,
- Thinkers use metacognitive strategies while feelers use social strategies.
- Perceivers (open learners) use affective strategies, which judgers (closure-oriented learners) reject to use.

Hence, it can be easily deduced that different personalities are inclined to use different strategies, which should remind instructors to take individual differences into consideration.

Oxford (1990) defines language learning strategies as memory strategies for storing and retrieving information, cognitive strategies for understanding and producing the language, compensation strategies for overcoming limitations in language learning, metacognitive strategies for planning and monitoring learning, affective strategies for controlling emotions, motivation, and social strategies for cooperating with others in language learning.

Using research instruments such as classroom observation, oral interviews, think-aloud protocols and written records, Lin (2001) studied the vocabulary learning strategies with seven Taiwanese elementary school students. Although the sample was small, 73 vocabulary learning strategies were identified, which were classified under

three dimensions: Metacognitive, Cognitive, and Socio-affective. Each category had its subcategories as displayed in Table 13.

As distinct from other classifications of vocabulary learning strategies, Nation's (2001) taxonomy does not derive from any research results but is purely based on theory. It is organized around three broad categories, where aspects of vocabulary knowledge have been separated from sources of vocabulary knowledge and learning processes as in Table 12.

2.2. Factors Affecting the Preference of Language Learning Strategies

2.2.1. Age Differences in the Use of Language Learning Strategies

One of the most important factors affecting the way strategies are used is considered to be age by many researchers (Brown, Bransford, Ferrera, & Campione, 1983; Ellis, 1994). According to their findings, adults usually refer to more complicated, flexible and wider strategies than younger learners do. Parallel to these findings, Oxford (1990) also suggests that age plays an important role in strategy preference and the way these strategies are used.

There is much research supporting these viewpoints. One such research was conducted by Chen (2014) to examine language learning strategies used by EFL learners at different educational levels and influence of age on the use of language learning strategies. 1023 students from different levels of education -elementary (250), junior high (245), senior high school(249) and university (279)- took part in this study. The Strategy Inventory for Language Learning (SILL) was applied to determine the frequency of the participants' use of language learning strategies. This instrument was conducted in

Mandarin Chinese, the students' native language, to prevent any misunderstanding on the basis of 5 point Likert scale.

The findings of Chen's study which are in line with the current study reveals that metacognitive strategies are the ones that elementary school students prefer using most (M=2.93) in language learning.

Table 1. Distribution of language learning strategies by educational levels

Strategy	Elementary			JuniorHigh			SeniorHigh			University		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
Memory	250	2.80	1.09	245	2.68	0.81	249	2.57	0.77	279	2.74	0.66
Cognitive	250	2.68	1.04	245	2.67	0.82	249	2.69	0.77	279	2.85	0.68
Compensation	250	2.60	1.04	245	2.96	0.90	249	2.96	0.79	279	3.04	0.70
Metacognitive	250	2.93	1.20	245	2.68	0.87	249	2.79	0.90	279	2.90	0.68
Affective	250	2.69	1.13	245	2.50	0.90	249	2.48	0.89	279	2.75	0.70
Social	250	2.74	1.13	245	2.68	0.93	249	2.70	0.99	279	2.90	0.69

In table 1, Chen's study shows that as students become mature, they use compensation strategies more to help them overcome limitations in language learning. Elementary school students' use of metacognitive strategies was more frequent than high school and university students' which highlights the fact that that younger students at earlier level of education can plan, organise, and monitor their own education.

2.2.2. Personality Types and Language Learning Strategies

In many studies in the literature, there is considerable evidence underpinning the notion that the type of personality influences a learner's language learning strategies preference heavily (Ehrman, 2008; Sharp, 2009). In much of the literature, learner's personality traits were considered to be in relation with learning a language successfully (Ehrman et al., 2003).

Quite a lot of research in the literature supports this view. A good example of these studies was conducted by Liyanage and Bartlett (2013) for the purpose of determining whether personality types affect LLSs preference. Firstly, tests were run to measure personality. They used two types of tests for their research; Myers-Briggs Type Indicator (MBTI) and Eynsenck Personality Questionnaire (EPQ). MBTI is a self-report questionnaire composed of 126 items. It measures four different styles of human functioning (introversion-extroversion, sensing-intuiting, thinking-feeling and judging-perceiving) and it suggests that each person possesses all four styles with one dominating the others and affecting the way that a person perceives the world. EPQ measures three dimensions of one's personality: extroversion, neuroticism and psychoticism. These tests were applied to Sri Lankan learners and participants between the ages of sixteen and eighteen learning English as a second language in public schools. Sri Lanka includes multiple cultures and religions and at the end of the data collection, there were 886 questionnaires for analysis, composed of 302 Sinhala (Buddhists), 285 Tamil (Hindus) and 299 Muslim participants.

According to the results, participants with unstable extrovert and stable extrovert personalitities have significantly better scores for LLSs than those with stable introvert and unstable introvert personalities. The participants with different personality types showed great difference in strategy use. Participants at the extrovert side of the scale had the greatest use while the ones at the introvert side had low use of strategies. To sum up, extroversion was measured as the type of personality that is the most predictive of participants' LLSs preference.

2.2.3. Gender Differences in the Use of Language Learning Strategies

Regarding LLSs, there is much research with controversial findings. Some of the researchers found that gender plays a significant role in strategy use while others claim that gender has no significant affect on strategy use (Hayatzadeh, 2007; Wafa, 2003). The research claiming that gender plays a significant role in strategy use found no similar results, and some of the research claims that females use more strategies (Green & Oxford, 1995; Ehrman, 1990) while some others claim that males are better at using language learning strategies (Wharton, 2000; Tercanlioglu, 2004).

In order to analyse the effect of gender on strategy use, Aslan (2009) conducted research on students at preparatory school of a private university. He conducted Oxford's 50 item SILL on 257 (153 male, 104 female) students. Although the findings did not demonstrate a great difference in the preference of strategy subsets across genders, thefact that results revealed females' superiority over males on all strategies seems to be important. Findings on the relevant research study are as follow;

Females use memory strategies (M=2.97) more often than males (M=2.71), females use cognitive strategies (M=2.78) more often than males (M=2.70), females use compensation strategies (M=3.19) more often than males (M=3.03), females use metacognitive strategies (M=3.63) more often than males (M=3.41), females use affective strategies (M=2.57) more often than males (M=2.52), and females use social strategies (M=3.09) more often than males (M=2.84).

2.3. Current Theories of Vocabulary Learning

In the 21st century, the perspective on teaching vocabulary has changed to some extent. The major change is that vocabulary teaching has been considered to be seen as a separate field. Two contentious approaches were put forth (Ketabi & Shahraki, 2011). The first approach is implicit (incidental) learning which focuses on learning vocabulary through four main skills (reading, speaking, writing, and listening) with the help of using mainly English in the classroom, group working in which learners study vocabulary collaboratively, encouraging students to interact with native speakers, and spending time in an English speaking environment. Whereas the second approach, explicit learning, involves explicit instruction, such as deciding on which words to teach, presenting new words, increasing word knowledge and developing fluency.

Ma and Kelly (2006) also categorize vocabulary learning approaches under two paradigms which are implicit and explicit learning paradigms. Implicit learning can be defined as natural, effortless and meaning focused learning while explicit learning requires more purposive mental effort than indulging in meaning focused activities that establish a link between meaning and form by various means.

2.3.1. Behaviourist Learning Theory

Behaviourist theory explains that habit formation depends on the frequency of the activities. "Learning a language is just like putting language items into the learner's ears and a habit then forms through this." The conditioned reflex to the language is produced by the learner as a result of forming the habit. From this viewpoint, words can be attained if a sufficient number of exposures, verbal or non-verbal, is realised (Lightbown & Spada 1999, p. 9).

2.3.2. Constructivist Learning Theory

Unlike behaviourist learning theory, cognitive theories of learning move away from seeing the learner as a passive recipient. The learner is considered as a mentally active participant in the learning process. According to Pachler (1999) two main schools, information processing and constructivism, are distinguished.

Mehlinger and Powers (2002) state that during the last quarter of the twentieth century, cognitive theories of learning termed as constructivism came to be more dominant than behaviourism among psychologists and began to influence education. Constructivists argued that learners must construct their own understanding of what they were being taught. According to this perspective, the teacher's task is neither transferring knowledge, nor ensuring that students perform consistently according to a predetermined description of knowledge and skills. The teacher's role is to help students arrive at their own interpretations of knowledge while becoming more skilful and practised in directing their own learning and recognize the computer as a potential assistant.

Wilson(1996) defines a constructivist learning environment as a place where "meaningful and authentic activities help the learner construct understandings and develop problem solving skills " (p. 3). He classifies constructivist learning environments into three types: 1. Computer micro worlds 2. Classroom-based learning environments, and 3. Open virtual learning environments.

2.3.3. The Implicit Learning Paradigm

In implicit vocabulary learning, the process involves receptive skills such as reading and listening, and requires repeated exposures to words in different contexts (Hulstijn, 2003). In parallel with this definition, Ellis (1995) expands that unconscious repeated exposure is

necessary for the acquisition of vocabulary and emphasizes that if vocabulary acquisition is implicit and unconscious, the computer carries a limited role in exposing students to the vocabulary.

2.3.4. The Explicit Learning Paradigm

Proponents of the explicit learning paradigm assert that vocabulary can be learned or taught through adequate vocabulary learning strategies. Hence, these strategies should be gained through scaffolding which will help the learners cope with diverse vocabulary contexts. These contexts should be selected according to the learners' level, needs and interests within the framework of incidental learning (Coady, 1997). The explicit learning paradigm named as ''mixed approach'' by Coady (1993) embodies two major approaches including explicit learning and strategy instruction (p.17). Ellis (2005) asserts that explicit vocabulary learning is, to some extent, based on using metacognitive strategies. If so, CALL has an important role in explicit learning. When the issues of noticing unfamiliarity, inferring from context, using imagery and semantic techniques to consolidate understanding are in question, active process information is necessary contrary to implicit learning.

Strategy instruction, as the second approach of the explicit learning paradigm, puts emphasis on making learning more effective by means of teaching particular learning strategies to learners (Cohen, 1998; Cohen, Weaver & Li, 1995; O'Malley et al., 1985; Oxford & Scarcella, 1994). In strategy instruction, context plays a central role in learning vocabulary and strategies which reinforce explicit instruction are word association, mnemonics, word grouping, imagery and semantic mapping (Oxford & Scarcella, 1994)(as cited in Ma & Kelly, 2006). Coady (1993) and Nation (2001) state that direct memorization techniques are indispensable elements of teaching vocabulary explicitly.

They claim that learners should master high frequency words by means of direct teaching, direct and incidental learning, and planned encounters with the words. In this sense, effective integration of explicit vocabulary teaching into EFL/ESL can only be realized if a teacher is aware of diverse constituents of intentional vocabulary learning.

Atkinson and Raugh (1975) underline that strategy instruction is beneficial mostly for low level learners. Low level learners are assumed to make use of mnemonics and imagery strategies which lead to link the form and the meaning in memory. Proponents of explicit learning paradigm do not completely reject implicit learning paradigm since they consider the latter as a complementary part of vocabulary acquisition.

In addition to these two main approaches, there are two theories that many researchers have consensus that learning occurs better when visual aids are used; the first is the dual coding theory and the second is the picture superiority effect.

2.3.5. Dual Coding Theory

As stated in many studies, the more concrete the words are, the better the learners can perceive them because concrete words have authentic representatives in real life so that such words can easily be exploited by our perception and they do not have as heavy cognitive load as abstract words do (Nikova, 2002; Sadoski, 2005; Siribodhi, 1995).

Within the framework of the dual coding theory (DCT), which is defined as a general theory of cognition that refers to both verbal and nonverbal cognition by Paivio (1971, 1986, 1991) and Shen (2010) two methods are compared: verbal encoding and verbal plus imagery encoding. The results of the study demonstrated that the verbal plus imagery encoding method does not demonstrate a greater effect in retention of the sound, shape, and meaning of concrete words, but statistically significant differences are seen in retention of the shape and meaning of abstract words. Therefore, it can be said that her

findings support the dual coding theory and confirm the importance of visual learning in vocabulary acquisition.

DCT, which has been applied to many domains of language including vocabulary, reading, composing and spelling, explains concreteness effects by recourse to modality-specific systems for representation and processing. According to DCT, information is likely be remembered or learned better when it is received in both verbal and visual modes at the same time than when it is delivered through only a verbal mode (Paivio, 1986).

DCT makes an important distinction between the verbal code, which is specialized for representing and processing language in all its forms, including speech and writing, and the nonverbal code, which deals with the representation and processing of nonverbal objects, events, and situations. DCT makes another important distinction between abstract language and concrete language. According to this theory, concrete words have access to information from multiple systems due to the activation of two different systems, verbal and imagistic, processing the concrete words. On the other hand, abstract words, which do not have many referential connections between systems and linguistic representations, are mainly associated with information stored in the linguistic system.

DCT suggests that seeing and using the words in many different contexts such as listening, speaking, reading, and writing can enhance the acquisition and teaching of meaningful vocabulary.

In order to teach vocabulary, DCT principles were applied to using imagery in experimental studies by Bull and Wittrock (1971). The results of this study demonstrated that using imagery has a practical significance for children in learning definitions when it is combined with self-discovery.

2.3.6. Word Cards Theory

One of the most widely used strategies is learning by means of word cards. Nation (2001) defines word cards as small pieces of card which involve words on one side and their meanings in L1 on the other. Learners go through a set of cards which allows them to recall the words and their meanings. This vocabulary learning strategy is a form of decontextualised learning which provides learners with only the written form of the word. This enables learners to associate the form, concept of the word and meaning. Though it is assumed as boring, it is the easiest way of memorizing the meanings of words (p. 297).

2.3.7. Picture Superiority Effect

Explanations for the picture-superiority effect were put forward by several theorists (McBride & Dosher, 2002). As stated in the literature, pictures are remembered better than words (Paivio, 1971; Paivio & Csapo, 1973; Paivio, Rogers & Smythe, 1968; Mintzer & Snodgrass, 1999). Paivio (1969, 1971) associates this advantage to the dual coding account of picture superiority in terms of visual and verbal coding. Stenberg, Radeborg and Hedman (1995) support this view by asserting that memory retention shows diversity and if the information is retained by using two different memory stores, it could be maintained longer.

On the other hand, there are some controversial claims arguing that words are less likely recalled if encoded in both the verbal and image codes according to Paivio's (1971) dual coding theory. Paivio's dual coding theory which suggests that pictures have an advantage over words is amenable to semantic encoding through two different routes. In order to enable extended memory retention of the words, semantic and symbolic associations between the pictures and the words are required. This view is also shared by

other researchers such as Hockley (2008) and Whitehouse et al. (2006)who advocate that picture superiority based on dual coding plays a significant role in the retention of the words if the semantic and symbolic bases are set. Childers and Houston (1984) also mention that a stimulus can be retained in the memory better if semantically coded. Thus, the superiority of the pictures over words can be well observed only if pictures are matched with their written equivalents which will lead to the dual coding theory. Learners should be trained on vocabulary learning strategies for the low frequency words. The strategies which can empower the learners can be listed as dictionary use, memory techniques, contextual guessing, and vocabulary cards. Thus, incidental learning covers contextual guessing and communicative activities as well as planned encounters with the words in graded reading and vocabulary exercises.

2.4. Language learning strategies and taxonomies

Language learning strategies defined earlier as being specific actions, behaviours, tactics or techniques, needless to say, facilitate learning a foreign language. All language teachers try to follow some strategies in their teaching process. However, it does not always end up with success since there are many factors to be taken into consideration. Factors like gender, personality, age, motivation, self-concept, learning style, life-experience, anxiety and excitement directly affect the level of success in this process . As Lessard-Clouston (1997) (as cited in Hişmanoğlu, 2000) points out, there are quite a number of questions to be answered;

- What types of language learning strategies appear to work best with what learners in which contexts?
- Do language learning strategies or language learning strategies training transfer

easily between L2 and FL contexts?

- Whatis the role of language proficiency in language learning strategies use and trainings?
- How long does it take to train specific learners in certain language learning strategies?
- Are certain language learning strategies learned more easily in classroom and non-classroom contexts?
- What language learning strategies should be taught at different proficiency levels?

More recent studies (O'Malley & Chamot, 1990, Wenden, 1998) highlighted the importance of metacognition in learning strategy use while some others (Erhman & Oxford, 1988; Green & Oxford, 1995; Oxford & Nyikos, 1989; Politzer, 1983; Rosen, 1995; Sheorey, 1999) studied the relation between strategy use and gender, concluding that males' and females' cultural backgrounds play a significant role in the final strategy selection. In order to compile the main language and vocabulary strategies, they were displayed in 10 tables four of which belonging to the former and six belonging to the latter.

However, with the purpose of clarifying the issue of selecting the most proper strategy, Schmitt (1997) underlined an important problem explaining that one specific language learning strategy may fit into more than one vocabulary learning strategy, which causes classification to be rather difficult. Schmitt states that "...interacting with native speakers is obviously a social strategy, but if it is a part of an overall language learning plan, it could also be a metacognitive strategy" (p. 9).

2.4.1 Taxonomies of Language Learning Strategies

In the literature, apart from learning strategies, researchers started to focus on language learning as a separate topic in 1970s and developed taxonomies of language learning in

early 1980s. Since then, many researchers have developed many different taxonomies but the topic has still been debated. When it comes to classification of the strategies, there is still not a consensus on the number of strategies and how to categorize them. One of the first researchers dealing with the topic was O'Malley who proposed three strategies and his taxonomy is displayed in Table 2.

Table 2. O'Malley et al.'s taxonomy of LLSs (1985)

O'Malley et al. (1985)	Metacognitive	Planning Monitoring Evaluating Self management Directed attention Selective attention Delayed production.
	Cognitive	Repetition Resourcing Translation Grouping Note taking Deduction Recombination Imagery and auditory representation Key word Contextualization Elaboration Transfer Inferencing
	Socioaffective	Social-mediating Transacting with others Cooperation Questioning for clarification

One of the pioneers in the field was Rubin and starting from early 1980s, he developed the following taxonomy (Table 3) and furthered it in 1981.

But as can be seen in Table 3, the topic was regarded as a part of learning strategies, so he added "communication strategies" which was not included in O'Malley and et al. (1985). Rubin located monitoring under cognitive strategies taxonomy while monitoring took place under metacognitive strategies in the taxonomy of O'Malley and et al. (1985) and Stern (1992).

Table 3. Rubin 's taxonomy of LLSs (1987)

Rubin (1987)	Learning strategies	Cognitive	Clarification Guessing Deductive reasoning Practice Memorization Monitoring
		Metacognitive	Planning Prioritizing Setting goals Self-management
	Communication		Participating in a conversation Getting meaning across Clarifying what the speaker intended
	Social		Exposure to the target language

The taxonomy, regarded as the cornerstone in the literature, was developed by Oxford in 1990. Many of the following taxonomies were based on this taxonomy of language learning strategies. In Oxford's taxonomy, the SILL comprises strategies in two main classes; direct and indirect strategies. Direct and indirect strategies are divided into 6 main subsets and these subsets are divided into 19 more sub-divisions which constitute 62 strategy types.

Table4. Oxford 's taxonomy of LLSs (1990)

Oxford (1990)	Direct Strategies	Memory	Creating mental linkages Applying images and sounds Reviewing well Employing action
		Cognitive	Practicing Receiving and sending messages Analyzing and reasoning Creating structure for input and output
		Compensation	Guessing intelligently Overcoming limitations in speaking and writing
	Indirect Strategies	Metacognitive	Centring your learning Arranging and planning your learning Evaluating your learning
		Affective	Lowering your anxiety Encouraging yourself Taking your emotional temperature
		Social	Asking questions Cooperating with others Empathizing with others

The taxonomy that followed Oxford's was developed by Stern in 1992 with some differences. He added "interpersonal strategies" instead of social strategies in previous taxonomies.

Table 5. Stern 's taxonomy of LLSs (1992)

Stern (1992)	Management and planning strategies	Decide what commitment to make to language learning Set himself reasonable goals Decide on an appropriate methodology, select appropriate resources, and monitor progress, Evaluate his achievement in the light of previously determined goals and expectations (p.263)
	Cognitive strategies	Clarification / Verification Guessing / Inductive Inference Deductive Reasoning Practice Memorization Monitoring (p.263)
	Communicative - Experiential Strategies	circumlocution, gesturing, paraphrasing, asking for repetition and explanation (p.265)
	Interpersonal strategies	Cooperation with others(pp.265-266)
	Affective strategies	Controlling emotions (p.266)

2.4.2. Taxonomies of Vocabulary Learning Strategies

Despite extensive empirical research (Haastrup, 1991; Mondria & Wit- de-Boer, 1991; Wang, Thomas, Inzana, & Primicerio, 1993) on vocabulary acquisition, which plays a critical role in language learning, there is a consensus on the lack of conceptualization of process and certain strategies that students develop for vocabulary learning. Hence, vocabulary learning strategies and language learning strategies are scrutinized and analyzed in terms of classifications. It is clear that taxonomies of language learning strategies share lots of commonalities with the following vocabulary learning taxonomies.

Since this subject was regarded as a part of language learning, at the beginning, researchers did not consider learning vocabulary but remembering the words as Cohen did.

Table 6. Cohen's taxonomy of VLSs (1987)

Cohen (1987; 1990)	Strategies for Remembering Words	Using rote-repetition Using mnemonic associations Semantic strategies Vocabulary learning and practicing strategies

Table 7. Rubin and Thompson's taxonomy of VLSs (1994)

Rubin and Thompson (1994: 79-82)	Direct Approach	Put the words and their definitions on individual cards Say the words aloud or write them over and over again as they study Compose sentences with the words they are studying Tape records the words and their definition, if they prefer to learn through the ear Colour-code words by parts of speech, if they prefer to learn through the eye
	Use Mnemonics	Use rhyming Use alliteration Associate words with the physical world Associate words with their functions Use natural word associations, such as opposites Learn classes of words Learn related words Group words by grammatical class Associate words with context
	Indirect Approach	Read a series of texts on a related topic Guess the meaning of words from context Break up the word into components

Table 8. Stoffer 's taxonomy of VLSs (1995)

Stoffer (1995)	Strategies involving authentic language use Strategies used for self-motivation Strategies used to organize words Strategies used to create mental linkages Memory strategies Strategies involving creative activities Strategies involving physical action Strategies used to overcome anxiety Visual/auditory strategies

Table 9. Gu and Johnson 's taxonomy of VLSs (1996)

Gu and Johnson (1996)	Metacognitive regulation	Selective attention Self-initiation
	Guessing strategies	Using background knowledge/wider context Using linguistic cues/immediate context
	Dictionary strategies	Dictionary strategies for comprehension Extended dictionary strategies Looking-up strategies
	Note-taking strategies	Meaning-oriented note-taking strategies Usage-oriented note-taking strategies
	Memory strategies (rehearsal)	Using word lists Oral repetition Visual repetition
	Memory strategies (encoding)	Association/Elaboration Imagery Visual encoding Auditory encoding Using word-structure Semantic encoding Contextual encoding
	Activation strategies	

Table 10. Lawson and Hogben 's taxonomy of VLSs (1996)

Lawson and Hogben (1996: 118-119)	Repetition	Reading of related word Simple rehearsal Writing a word and its meaning Cumulative rehearsal Testing
	Word Feature Analysis	Spelling Word classification Suffix
	Simple Elaboration	Sentence translation Simple use of context Appearance similarity Sound link
	Complex Elaboration	Complex use of context Paraphrase Mnemonic

Shmitt (1997) adopted social, memory, cognitive, and metacognitive strategies from Oxford's SILL and added a new category "determination" in his studies. There were 58 strategies classified into 5 categories and grouped into two dimensions: "discovery of a new word's meaning" and "consolidating a word once it has been encountered". Discovery of a new word's meaning included determination and social strategies and the consolidating a word once it has been encountered included social, memory, cognitive, and metacognitive strategies. Thus, the social strategies were placed into the two dimensions since they can be used for both purposes as in Table 11.

Table 11. Schmitt 's taxonomy of VLSs (1997)

Dimension	Strategy	What learner does
Discovery	Determination Strategies	Analyse part of speech Analyse affixes and roots Check for L1 cognates Analyse any available pictures or gestures Guess from textual context Bilingual dictionaries Monolingual dictionaries Word lists Flash cards
	Social Strategies	Ask teacher for L1 translation Ask teacher for paraphrase or synonym of new word Ask teacher for a sentence including the new word Ask classmates for meaning Discover new meaning through group work activity
Consolidation	Social Strategies	Study and practice meaning in a group Teacher checks students' flash cards word lists for accuracy Interact with native-speakers
	Memory Strategies	Study word with a pictorial representation of its meaning Image word's meaning Connect word to a personal experience Associate the word with its coordinates Connect the word to its synonyms and antonyms Use semantic maps Use scales for gradable adjectives Peg Method Loci method Group words together to study them Group words together spatially on a page Use new word in sentences Group words together within a storyline Study the spelling of a word Study the sound of a word Say new word aloud when studying

		Image word form Underline initial letter of the word Configuration Use key word method Affixes and roots Parts of speech Paraphrase the word's meaning Use cognates in study Learn the word's idioms together Use physical action when learning a word Use semantic feature grid
	Cognitive Strategies	Verbal repetition Written repetition Word lists Flash cards Take notes in class Use the vocabulary section in your book Listen to tape of word list Put English labels on physical subjects Keep a vocabulary notebook
	Metacognitive Strategies	Use English language media (songs, movies, newscast, etc.) Testing oneself with word tests Use spaced word practice Skip or pass new word Continue to study over time

Table 12. Nation's taxonomy of VLSs (2001)

General Class of Strategies		Types of Strategies
Planning	choosing what to focus on and when to focus on it	Choosing words Choosing the aspects of word knowledge Choosing strategies Planning repetition

Sources	Finding information about words	Analyzing the word Using context Consulting a reference source in L1 and L2 Using parallels in L1 and L2
Processes	Establishing knowledge	Noticing Retrieving Generating

Table 13. Lin's taxonomy of VLSs (2001)

Strategy Categories	Strategies
Metacognitive Strategies	Advanced preparation Selective attention Monitoring Self-management
Cognitive Strategies	Written repetition Verbal repetition Segmentation Phonics application Association Resourcing Predicting Elaborating Recalling Others
Social-affective Strategies	Asking for help Cooperation Others

When the related literature is analysed, more vocabulary learning taxonomies can be found developed by researchers such as Decarrico (2001), Hedge (2000), Weaver and Cohen (1997), Kudo (1999), Pemberton (2003) and Intarapraset (2004). Many

language researchers' attempts to develop vocabulary learning strategy taxonomies are mostly based on LLS taxonomies by Oxford (1990), Cohen (1990), Rubin and Thompson (1994) and Stoffer (1995). For instance, Schmitt developed his VLS taxonomy based on Oxford's SILL. He used four LLS strategies; memory, cognitive, metacognitive, and social strategies from SILL and added determination strategies to establish his VLS taxonomy. When Kudo (1999) attempted to develop his VLS taxonomy, he mostly based it on Schmitt's taxonomy combining memory and cognitive strategies into psycholinguistic strategy, metacognitive and social strategies into metacognitive strategy and removed determination strategies. To sum up, the language researchers developed their VLS taxonomies either adding a new dimension, combining two dimensions in one, dividing one dimension in two different dimensions or removing one dimension.

2.5. Vocabulary Learning through CALL

There is no doubt that technology plays very crucial roles in today's educational settings. Nevertheless, how it can be utilised and adjusted to learning environments in a successful way needs specific answers. It is firmly believed that technology has the power to change the nature of instruction by means of providing motivating, challenging and engaging materials for learners. Learners can go through their own learning experiences and have an understanding of information by themselves (Kazancı & Okan, 2009). Lufer and Hill (2000) state that a number of empirical studies conducted in CALL have also contributed to the understanding of how computers are employed within particular classroom settings.

These studies prove that students benefit from technology in the process of language learning. This engagement with the technology improves learners' basic self-learning skills and motivation (Stepp-Greany, 2002).

Computer-assisted vocabulary learning involves a self-learning process through presenting, applying and assigning vocabulary. According to Mayer and Sims (1994), a multimedia learning atmosphere in learning vocabulary helps learners enrich the visual representation of vocabulary and its verbal form. This sort of atmosphere also helps learners develop vocabulary knowledge and increases the speed of word recognition (Tozcu & Coady, 2004). Intelligent Computer-assisted vocabulary learning (ICALL) offers learners the advantage of monitoring and evaluating themselves as well as using VLSs and developing their lexical competence (Segler, Pain & Sorace, 2002).

While many researchers focused on types of words, their meanings and structures, (Laufer, 1990, 2006; de Groot & Keijzer, 2000; van Hell & Mahn 1997; Nissen & Henriksen, 2006) (as cited in Uzun, 2009), some researchers concentrated on learning new words, teaching techniques, approaches, evaluation and assessment (e.g. Meara, 1992, 1997; Meara & Fitzpatrick, 2000; Hulstijn & Laufer, 2001; McCarthy, 1990; Nation, 2001; Schmitt, 2000) (as cited in Uzun, 2009), and some others specified how technology and numerous sorts of software could support learning vocabulary (Griffiths, 2008; Ranalli, 2008; Yip & Kwan, 2006; Grace, 2000) (as cited in Uzun, 2009).

However, quite a lot of research was conducted on vocabulary learning through games since the studies in the field of CALL and multimedia mostly concentrated on vocabulary acquisition through software (Uzun, 2009).

Research conducted by many linguists to find the most effective material in vocabulary teaching has shed light onto materials which have an impact on learners.

Azar (2012) sought an answer to the following question, "Do games help English Language Learners learn vocabulary effectively?" The study was carried out with 23 students in a language centre in Iran. The researcher was interested in whether or not the learners could improve their existing vocabulary knowledge through games while observing their teachers, interviewing teachers and students. The students, as a result, collaborated actively because they liked the relaxed atmosphere and the competitiveness that enhanced motivation.

The students were also successful because they had the opportunity to work collaboratively by discussing, and having fun while learning. However, despite the positive sides of using games, a problem may occur if the teacher is not successful at explaining the tasks and roles of students clearly before playing a game. This could be considered as a crucial point that needs attention while gaming. Vocabulary learning which is perceived as a boring subject can be made interesting through engaging the students in flexible and communicative games. On the contrary, in traditional method, learners are normally introduced to new words by writing them in their notebooks and are taught the exact form. This may be seen as beneficial to a certain extent. However, according to Decarrico (2001), learners just know how to use the vocabulary in exact form but they do not know how to use it in different meanings in real life communication.

This is where the role of games emerges. In a study conducted by Huyen and Nga (2003), the aim was to identify if games are an effective means for learners to feel comfortable and interested in learning vocabulary, which is believed to be boring in Vietnam. Throughout the research, different types of games were introduced in order to see the reaction of the students and pre and post questionnaires were given. As a result, it was once again shown that the effect of games is undeniable. The students found group

work (collaborative learning) exciting and motivating. This was because they had a chance to use their imagination and creativity through games. With all these positive effects, it was concluded that students need different ways of learning vocabulary that allow them to improve themselves through meaningful learning.

A great number of resources on computer-based language training contain the use of various educational games. It is clear that computer games can bring natural materials to learners. Ellis, Heppell, Kirriemuir, Krotoski and McFarlane, (2006) state that game-based activities allow learners to learn in their own way, enhance motivation by offering both visual and auditory input. They also state that computer games focus on play rather than competition and foster a learning environment in which all learners feel more comfortable and confident. Vocabulary acquisition methods in such modern language acquisition programs are more effective in promoting learners' vocabulary retention. Learners are required to decode unfamiliar vocabulary in a context and through visual aids. Computer-assisted activities support the learning effectively in meaningful contexts, so learners can evolve productively in their own learning (Ybarra & Green, 2003). In addition, computers address the needs of learners with different learning styles (Kang & Dennis, 1995) (as cited in Ybarra &Green, 2003).

Holzinger, Nischelwitzer and Meisenberger (2005) state that teachers should find ways to make the education process more fruitful and let their students make utmost use of technology during this process. Computer games are one of the most important contemporary devices for students to be integrated into the learning process since they enable learners to discover their own abilities and skills. With the help of instructional games, students' imagination and creativity can be enhanced and by playing computer

games, students gain experience, develop a skill which lets them learn by searching and experiencing situational learning.

Merely reciting vocabulary causes language learners to feel frustrated and bored, but this does not have to be the case in language learning. One of the solutions is that teachers can use proper games such as "riddles, brainstorm round a word, jokes, puns, tongue twisters and crosswords" to help students enjoy and learn in their classes (Hu & Deng. 2007, p. 58).

The use of computers in language acquisition provides learners with educational software tools containing all varieties of practices for lexical knowledge, grammar subjects, pronunciation, games…etc (Seljan, Berger & Dovedan, 2004). In selecting software relevant to learners, it is significant that teachers assess software not only with regard to its content but also with regard to how effective it is in stimulating learning. Dyck, Pinelle, Brown and Gutwin (2003) affirm that pedagogic and entertaining computer games both promote and foster learning. Computer games boost learning and provide teachers with constructive tools to reinforce learner involvement in the learning process (Sandford, Ulicsak, Facer & Rudd, 2006).

O'Neil, Wainess and Baker (2005) state that computer games were assumed to offer educational advantages, such as;

- Providing sophisticated and various procedures in the learning process.
- Increasing learner achievement in an interactive environment.
- Being inherently engaging, and boosting motivation in educational settings.
- Referring to learning outcomes not only in the affective but more importantly cognitive domain.

In addition to being a prominent instrument to get learners actively involved in the learning process, computer games have an increased power to improve cognitive skills. Robertson and Howells (2008) state that the pedagogical capacity of computer games is often praised, inasmuch as they offer psychological exercises to stretch learners' brain through a number of activities. The results of the research conducted by J. Vagel, S. Vagel, Bowers, Muse and Wright (2006) demonstrated that computer games designed for pedagogic goals provide more benefits for learners' intellectual skills than traditional methods.

A similar survey by Subrahmanyam, Kraut, Greenfield and Gross (2000) provides a general overview on profound effects of home computers on the lives of children. According to the survey, it is an undeniable fact that computer technology has an enormous impact on children's development in a variety of skills. Furthermore, it highlights that the application of visualization in computer games actually may strengthen a range of cognitive skills.

Whitton (2007) advocates that such games are interactive means of keeping learners motivated and alert in an engaging and amusing way, and that learners can build their own comprehension by encountering real-life situations in an integrated learning atmosphere. The findings in Whitton's study (2007) proved that computer games are regarded as an exciting way of learning even by the learners with different demographics. All interviewees in the study stated that they were of the opinion of a game as a medium of learning in spite of the fact that they considered themselves as non-game players.

In recent years, computer technologies have been utilized to both support and enhance vocabulary and language learning. In a review of studies that focused on the

effect of technology on language acquisition, Zhao (2005) observed various ways of improving technology for a powerful learning environment. He claimed that technology can be applied to acquire language effectively in four basic ways such as increasing language input and output, providing exercise and feedback, providing and sustaining motivation and authentic communication.

Most research on various applications of technologies in promoting language acquisition uncovered a favourable attitude with regard to the value of computer-assisted instruction. A survey on advantages of such an instruction demonstrated how much impact the use of computers has on learner motivation for communicating and writing in language acquisition. The study suggests that computer applications in language education influence all learners' behaviours positively whether or not they have the ability or knowledge necessary for computer programs. Furthermore, the survey questions brought out three simple components of learner motivation; intrinsically motivated reinforcement learning, computer-aided communication, and the sense of accomplishment. This implies that teachers can utilise computers in their teaching in order to increase the learners' power of motivation (Warschauer, 1996).

In the early 21st century, an investigation was designed to examine the impact of computer-aided language acquisition on Iranian EFL learners' vocabulary acquisition, in comparison to learners practicing vocabulary through traditional teaching methods. Two groups of learners were randomly selected by the researchers and named as the computer-aided language acquisition group and the traditional group. Both groups were exposed to pre-test and post-test. The outcome of the paired t-test with pre-test and post-test data demonstrated that CALL ended up with a rapid improvement in vocabulary skills (Naraghizadeh & Barimani, 2013).

As a new medium of knowledge, computer software has been put into practice in a variety of fields of education since the early 90s. Since then, the potential of computer-based learning has been viewed as remarkable. Additionally, an increasing number of educators have recognized the educational value of computers over the last several decades. These advancements in education result largely from effectiveness and availability of graphic images by modern computers (Kirriemuir, 2002).

A relaxing learning environment can be of great help to some shy learners and it is possible to create a more comfortable learning atmosphere with the help of CALL programs where learners can have a chance of one to one interaction. Another reason for the learners to feel more relaxed while using CALL programs is that they have a non-human interlocutor. The learners tend to take more risks and gain more self-confidence while using CALL programs (Krashen, 1982; Brett, 1997; Lee, 2000; Egbert, Paulus & Nakamichi, 2002).

Bloom and Hanych (2002) state that it is inevitable for education to find ways to adapt digital materials into classrooms since we are in a digital era. Teachers can use computer games and educational software to enhance learning and motivate their students. Technology is also beneficial for the teachers because digital learning materials are preponderant over conventional printed materials.

For the past two or more decades, a good many studies examined how effective CALL programs are on language learning and they all proved out that teachers can enrich and stimulate the learning process by integrating CALL programs into their classrooms (Brett, 1997; Nagata, 1998; Chapelle, 2001).

Vocabulary improvement is a crucial foundation for learners in language acquisition because a word is an instrument to conceive of the message it conveys (Dewey, 1910). In that case, learners need to increase their exposure to new vocabulary by favour of appropriate techniques according to their interests and levels. It is a fact that vocabulary is the thorniest component in language acquisition. To alleviate challenges associated with vocabulary, educators put a variety of techniques in vocabulary acquisition into use. There is little doubt that computer software can provide learners with a wider range of vocabulary activities. Additionally, most researchers highlight the possibility that computer-aided vocabulary acquisition software is a striking instrument to improve learners' vocabulary retention.

In their research, Kılıçkaya and Krajka (2010) confirmed the effectiveness of computer software named "WordChamp" over standard teaching techniques designed for vocabulary acquisition in reading comprehension. Besides assisting vocabulary enhancement, vocabulary software was viewed as an impressive factor in creating independent learners. The research also indicated that such educational software programs offered a variety of procedures for language learners. These views are in line with the results of the survey by Tamjid and Moghadam (2012). In their survey, the participants in the experimental and the control group were required to acquire new words via computer-aided vocabulary software entitled "Narsis" and the course book which consists of the same words. The findings of the survey verified that computer-based learning provides more opportunities for learners to enhance vocabulary effectively in a shorter time, when compared to standard paper-based vocabulary teaching techniques. Furthermore, in the study carried out by Huang and Liou (2007), it is argued that adult L2 learners are usually required to learn new vocabulary items via

various reading passages to support their language competence. However, designing appropriate reading passages is a problem teachers face as the selected passages should involve known words for particular groups of learners. In order to support vocabulary development in a context, the study consisted of an on-line English reading software with sixteen essays from an on-line Chinese-English journal. The findings indicated that the designed software is educationally supportive to develop learners' vocabulary skills.

In addition, impressive construction of such computer-aided vocabulary acquisition software, which plays a significant role in introducing, exercising, and evaluating vocabulary in an independent approach, has been the centre of interest among investigators (Kılıçkaya & Krajka, 2010). Groot (2000) refers to the value of designing computer-aided vocabulary software products in terms of broadly approved strategies in vocabulary acquisition. He also emphasizes the improvement of computer-aided vocabulary software that involves different features of vocabulary items such as phonology, collocations, syntax, antonyms, synonyms…etc. Furthermore, Ma and Kelly (2006) state that computer-aided vocabulary programs must provide learners with the opportunity to acquire new words implicitly and explicitly, and coach learners to be successful language trainees through practical vocabulary acquisition activities.

Wood (2001) draws attention to the unique role of teachers in computer-aided learning environments. According to him, computers are not the only device that teachers should depend on to promote vocabulary acquisition. That is, teachers are required to assist learners as a mediator in the learning process via various computer software. This implies that learners need to become responsible for improving their own methods of acquiring vocabulary effectively. This view has been extended by Qingzhao (2011) who highlights that learners may be investigators and find new opportunities to

acquire vocabulary, and hence develop their competencies in English through computer-based software. That is, computer games in education can encourage learners to participate in learning and create a more comfortable environment for effective learning.

Such software designed for instructional purposes has a variety of advantages in vocabulary acquisition. It is a fact that learners need to master lexical knowledge through various materials. Instructional computer software can provide opportunities for learners to practice vocabulary in a rich learning environment, and offer an extraordinary approach to traditional language instruction. Additionally, the application of computer-mediated vocabulary software enables learners to become autonomous. It is perfectly clear that self-determination allows learners to acquire new words in a lifelong learning environment. In that case, the responsibility of educators is first to realize their role in improving and conveying learner independence as an instructional method and then to assist their learners to achieve self-determination in the learning process.

CHAPTER 3
METHODOLOGY

3.1. Introduction

This chapter includes information about methodology, setting, study group, data collection instruments, and research questions. This part also attempts to provide the approach to answer the following research questions:

Research Question 1: Is there any significant difference between students' preferences in VLSs before and after CAVI applications?

Research question 2: Does computer assisted vocabulary teaching make a positive contribution to the achievement scores on vocabulary tests?

2a. Is there a significant effect of DENIS applications on vocabulary achievement scores of grade 6 students?

2b. Is there a significant effect of Game applications on vocabulary achievement scores of the grade 6 students?

2c. Is there a significant effect of combined applications (educational software (DENIS) and computer game settings) on vocabulary achievement scores of grade 6 students?

2d. Does gender have any significant impact on grade 6 students' strategy use?

3.2. Setting

The study was implemented in a purposively selected secondary school with a computer lab in Sakarya Province in the academic year 2012-2013 . The school had six grade six classes from A to F. Each class had about 35 students. The education was held in the morning between 09:00 and 12:10.

3.3. Study Group

The study group consisted of 68 grade 6 students studying at a public school in the province of Sakarya in the academic year 2012-2013. The number of female participants was 40 and the number of males was 28. The purpose of choosing grade 6 students as the study group was because the students had not studied the book *Spring 7* which was the source of vocabulary studied in the research. The book was published by MONE. The school had six grade 6 classes from A to F. Students are generally enrolled in their classes according to their last years' grades in order to have levelled classes. Classes C and D were suggested for the study by the principle of the school since the students of these classes were reported to show almost no difference in terms of success rates. The following table (Table 14) provides demographics related to the study group. The other reason for choosing the study group was that grade 6 students feel more carefree and mentally comfortable than grade 7 and 8 students who are to take an important test - high school entrance exams. Based on his experiences, the researcher was aware of the fact that the students who were to sit such nationwide tests like High School Entrance Exam (LGS) usually had problems in focusing on English classes.

Table 14. Demographic Information on the Study Group

Item Number	Dimensions	Female		Male		Total	
		f	**%**	**f**	**%**	**f**	**%**
1	Gender	40	59	28	41	68	100
	Distribution of Personal Information						
		Yes		No		Total	
		f	**%**	**f**	**%**	**f**	**%**
2	Having Computer	45	66.2	23	33.8	68	100
3	Having the Internet Access	37	54.4	31	45.6	68	100
4	Language Course Taken	9	13.2	59	86.8	68	100
5	Private Lesson Taken	5	7.4	63	92.6	68	100
	Distribution of Social Media Use						
6	Facebook	44	64.7	24	35.3	68	100
7	Twitter	15	22.1	53	77.9	68	100
8	Instagram	2	2.9	66	97.1	68	100
9	Ask Fm	3	4.4	65	95.6	68	100
10	Others	11	16.2	57	83.8	68	100
	Distribution of the Internet Use						
11	Doing Homework	62	91.2	6	8.8	68	100
12	Studying	53	77.9	15	22.1	68	100
13	Watching Movies	34	50.0	34	50	68	100
14	Chatting	28	41.2	40	58.8	68	100
15	Playing Games	53	77.9	15	22.1	68	100
16	Others	7	10.3	61	89.7	68	100

When the demographic features of the study group in Table 14 were examined, it was found that more than half of the students had computer and the Internet access in their homes. According to the demographic information, they use technology mainly for social media or educational purposes such as doing homework (91.2 %), studying (77.9 %) or establishing communication with their friends on Facebook (64.7 %) or Twitter

(22.1 %). Playing computer games (77.9 %) was found to be the second most frequently practised activity by the vast majority of the study group.

3.4. Method

A quasi-experimental design with repeated measurements or observations over time (Fraenkel & Wallen, 2006) was carried out before, during and after the treatment. The study was conducted with a nonrandomized experimental group. It was one study group with two different teaching methods; Software-based (DENIS) and Game-based applications. In the framework of repeated measurement design, vocabulary tests were given at regular time intervals in order to collect data and analyse differences among successive applications. The design of the study is presented in Table 15.

Table 15. The Design of the Study

First Administration	Treatment	Second Administration	Treatment	Third Administration
Part A (1st 25 Qs) Part B (2nd 25 Qs)	DENIS	Part A (1st 25 Qs) Part B (2nd 25 Qs)	Games	Part A (1st 25 Qs) Part B (2nd 25 Qs)

As seen in Table 15, Part A consisting of the vocabulary from the first four units of the course book and Part B with vocabulary from the second four units of the course book were used in all three administrations. In order to measure the effect of DENIS, the test results of Part A were taken into consideration because the application of DENIS was based on the words selected from the first four units of the course book. Meanwhile, to measure the effect of Games, the test results of Part B were taken into consideration because the application of Games was based on the words selected from the second four units of the course book. The third administration of Part A after the application of

Games was to observe to what extent the students retained the vocabulary knowledge they had obtained during the application of DENIS.

The first administration of Part B was applied to measure the participants' prior vocabulary knowledge. The second administration of Part B was applied to observe whether any change occurred in the prior vocabulary knowledge after the application of DENIS which did not include any vocabulary from Part B. The third administration of Part B was applied to observe the effect of Games consisting of the vocabulary in Part B. Additionally, in order to observe the combined effects of the applications DENIS and Games, the items in the first administration and the third administration of Part A and Part B (50 items) were applied.

3.5. Data Collection Instruments

Three main tools were used to collect data in this study; the vocabulary learning strategies scale (VLS-S), CAVI tests, and students' reflections. The implementation of the instructional software (DENIS) and Games was applied via computer and the Internet. Pencil-and-Paper tests were administered in a classroom setting. An open-ended question was asked to the study group to understand their perceptions of the implementation, and categorical content analysis was performed on the students' views. Detailed descriptions of the tools are given in this chapter.

3.5.1. Vocabulary Learning Strategies Scale

After analysing various language and vocabulary learning strategy scales in the literature, a 56-item VLS-S was developed for secondary school students to investigate the types of learning strategies followed. It was developed on the basis of The Strategy

Inventory for Language Learning (SILL) by Oxford (1990). The SILL comprises strategies on two main classes; Direct and Indirect Strategies. Direct and indirect strategies are divided into 6 main subsets and these subsets are divided into 19 more subdivisions which constitute 62 strategy types (See Appendices II, JJ, KK, LL, MM, and NN).

Direct Strategies include memory strategies for storing and retrieving information, cognitive strategies for understanding and producing the language, compensation strategies for overcoming limitations in language learning. Indirect Strategies include metacognitive strategies for planning and monitoring learning, affective strategies for controlling emotions and motivation, and social strategies for cooperating with others in language learning.

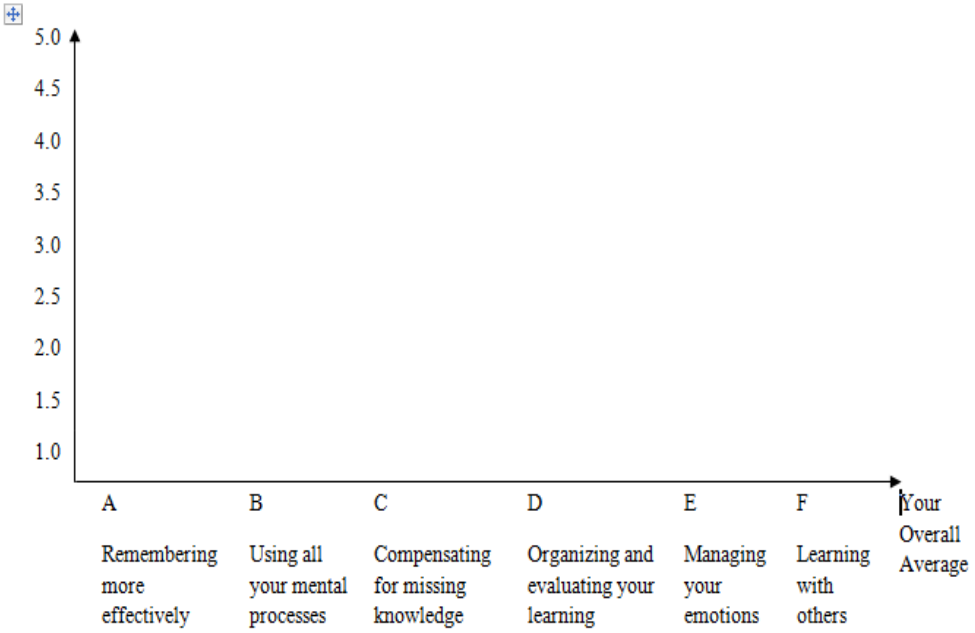
Oxford's SILL was specially chosen for the scale development because it included compensation strategies which were essential for the study since one part of the study aimed to measure the impact of computer assisted vocabulary learning. In the process of itemizing the scale, the aforementioned six main subset strategies that can also be used in vocabulary learning were used as a reference in the present study. Thus, as the title of the study refers, computers are perceived as assisting tools in language and vocabulary teaching and learning. So, some technology related items were placed in the present VLS-S under the category of compensation strategies. A five-point scale was used in order to indicate the frequency of the preferred vocabulary learning strategies. The rating system of the 5-point Likert scale was set as "always (5), often (4), sometimes (3), rarely (2), never (1)" which indicates how often the strategies are used.

Oxford used the key which depicts the ranges from 1.0 to 5.0 in Table 16 to measure learners' averages in strategy use. In order to determine how often a strategy is

used, Oxford applied results to the graph in Figure 1. Oxford suggests learners use the key and the graph to decide their frequency of strategy use, and if learners display a very low average on one or more parts of the SILL, they are advised to consult an expert to determine if there are new strategies available.

Table 16. Key to Understanding Learner Averages

High	Always or almost always used	4.5 to 5.0
	Usually used	3.5 to 4.4
Medium	Sometimes used	2.5 to 3.4
Low	Generally not used	1.5 to 2.4
	Never or almost never used	1.0 to 1.4



(Oxford, 1990, p.300)

For the content validity studies, the 56-item scale was submitted to five experts in the departments of Psychological Counselling and Guidance, Assessment and Evaluation, English Language Education, Turkish Language Education, and Computer and

Instructional Technologies. According to the expert views, the scale was revised and four items were eliminated from the scale and the 52-item scale was piloted on 303 secondary school students in a state secondary school so as to pre-empt unanticipated problems and test its psychometric properties along with applicability. As the students seemed to have difficulties in understanding two of the items, these two items were removed from the scale and the validity and reliability studies were performed on the remaining 50 items (see App. PP and QQ)

The revised version of 50-item scale was given to 923 secondary school students to measure the validity and reliability of the scale. First, Exploratory Factor Analysis (EFA) was performed on the results of the scale for the construct validity. The Eigenvalue-greater-than-one rule which is known as the K1 method proposed by Kaiser (1960) was used in the EFA case (as cited in Fabrigar et. al, 1999). The item loadings on the scale were at least .30 and the minimum difference of .10 between factors was taken into consideration when one item took place in more than one factor. Then, the items obtained from EFA were tested with Confirmatory Factor Analysis (CFA) to ensure the model fit. The reliability of the scale was confirmed by checking the internal consistency co-efficient. PASW 18 package program was used in order to determine the EFA and internal consistency co-efficients and Lisrel 8.71 package programme was used for CFA to test model data fit in the study. All verification studies met acceptable levels.

3.5.1.1. Validity Studies

Exploratory Factor Analysis

Exploratory Factor Analysis was conducted in order to analyse the construct validity of the scale and the correlation matrix was studied in order to determine if there were meaningful correlations between the items. The result showed that there were enough meaningful correlations for the factor analysis to be performed. Then, sampling adequacy with a KMO test and Bartlett's Sphericity tests were carried out. As a result of the test, the The Kaiser-Meyer-Olkin (KMO) value was calculated as .946 (.946> .60). The KMO is an index that compares the size of the observed correlation parameters with partial correlation parameters. The KMO rate being greater than .60 shows the suitability of the data set for the principal components analysis (2004).

Due to the fact that the *p* value from the Bartlett's test is smaller than .01, a high correlation exists between the variables. Therefore, as the results show, the KMO value is high (.946) and Bartlett's test is meaningful, ($p < .01$), the data are suitable for the principal components analysis. The validity study was performed with the data collected from the 923 students. The data's suitability for the principal components analysis was examined via KMO Parameter and Bartlett's sphericity test.

The factor loadings displayed the correlation between the items and the structure that is to be tested. Therefore, the factor loadings and the related proportions that were the outcome of the Principal components analysis were examined. Fifteen items were removed from the scale due to the fact that they did not fit into the category which was supposed to measure a certain feature. Another 3 items were removed from the scale because their factor loadings were low (<.30). In the case of cross-loading items in the

same dimensions with differences fewer than .10, the items which contributed to the content validity were retained (Büyüköztürk, 2004).

Schmitt (1997) stated that it is rather difficult to classify strategies as a strategy can take place under more than one dimension and a strategy may be closely related to one other strategy. In line with Schmitt's assertion, some items (3, 18, 40, 42, 43 and 44) had very close loadings in more than one dimensions and some other items (7, 8, 13, 14, 16, 29, 41 and 50) with lower factor loading were kept in theoretically suitable dimension although they had higher factor loading in some other dimensions.

After these processes, the 50-item VLS-S was finalised as 32 items. The scale was translated into Turkish by two experts and translated back into English by another two in order to ensure the language equivalence(see App. NN and OO).

The rotated components matrix obtained from the factor analysis after a varimax rotation is shown in Table 17 along with Scree plot in Figure 2. Varimax rotation, one of the orthogonal rotation models, was used to maximize the values of factor variances with a limited number of variables. According to the Principal components analysis results, seven items are related to the *Memory Strategies* and the factor loadings of these items vary between .329 and .628, and also explain 23.78% of the total variance. In the second factor, five items are related to the *Cognitive Strategies* and the factor loadings of these items vary between .318 and .744, while explaining 5.17% of the total variance. Four items are related to the *Compensation Strategies* and the factor loadings of these items vary between .454 and .688 and also explain 4.07% of the total variance. In the fourth sub-dimension, four items are related to the *Metacognitive Strategies* and the factor loadings of these items vary between .306 and .631 while explaining 2.95% of the total variance. In the fifth factor, six items are related to the *Affective Strategies* and the factor

loadings of these items vary between .330 and .508, while explaining 2.58% of the total variance. In the sixth sub-dimension, six items are related to the *Social Strategies* and the factor loadings of these items vary between .313 and .616 and also explains 2.47% of the total variance. As a result, the total amount of variance explained by these six factors is: 41.02%. The analysis results of the data collected from the 923 students in the secondary schools are displayed in Table 17.

Table 17. Principal Components Analysis Results for VLS-S.

Dimensions	Item No	Items	Factor Loadings
Memory Strategies	1	When I forget an English word, I try to remember its synonym.	.628
	2	I associate the English words I have learned before with the new ones.	.606
	3	In order to remember an English word, I visualise its picture in my mind.	.329
	4	I associate the pronunciation of an English word I have recently learned with the pronunciation of an English word I know	.535
	7	In order not to forget the English words I have recently learned, I always repeat them	.390
	8	I try to remember the meaning of an English word by visualizing it in my mind.	.367

	9	While learning English words, I try to learn them according to their lexical classes (noun, adjective, verb)	.467	
Cognitive Strategies	10	I try to learn English words by writing them on flashcards and carrying them in my pocket.	.672	
	11	In order to remember English words, I stick the words to the places where I can see them.	.744	
	13	While learning English words, I keep a vocabulary journal.	.396	
	14	I study the English words I want to learn by writing them down.	.409	
	16	I learn English words together with their synonyms and/or antonyms.	.318	
Compensation Strategies	12	I learn the pronunciation of an English word by listening to it several times with the help of technology.		.454
	20	I prefer to learn English words required for my classes with the help of technological programs.		.673
	21	I prefer to learn English words required for my classes with the help of videos.		.688

	22	I prefer to learn the necessary English words for my classes with the help of technological games.	.649	
Metacognitive Strategies	18	While learning English words, I do various English vocabulary tests.	.393	
	26	While learning English words, I try to learn the pronunciation of the words along with the meaning	.631	
	28	I try to find the most suitable method while learning English words.	.506	
	29	While learning English words, I stick to a plan.	.306	
Affective Strategies	36	While learning English words, listening to music in the background helps me relax.		.508
	38	When I learn English words, I reward myself.		.350
	40	I feel happy when I learn English words.		.406
	41	I feel much more comfortable in class when I improve my English vocabulary knowledge.		.346
	42	Our teacher encourages us to learn English words outside the classroom as well.		.330

	43	It attracts my attention when the words I know are used in a video or in a movie.					.437	
Social Strategies	44	I ask my friends whether I correctly pronounce the English words I have recently learned.						.384
	45	I ask my friends to correct me when I mispronounce the English words that I have recently learned.						.460
	46	While trying to learn English words, I prefer working in a group.						.616
	47	While learning English words, I need the assistance of my teacher						.565
	49	While learning English words, I prefer working with the class to individual work						.391
	50	I learn English words better by competing with my friends						.313
Eigenvalue (Total = 20.05)			11.89	2.58	2.04	1.47	1.29	1.23
Total % variance explained = 41.02			23.78	5.17	4.07	2.95	2.58	2.47

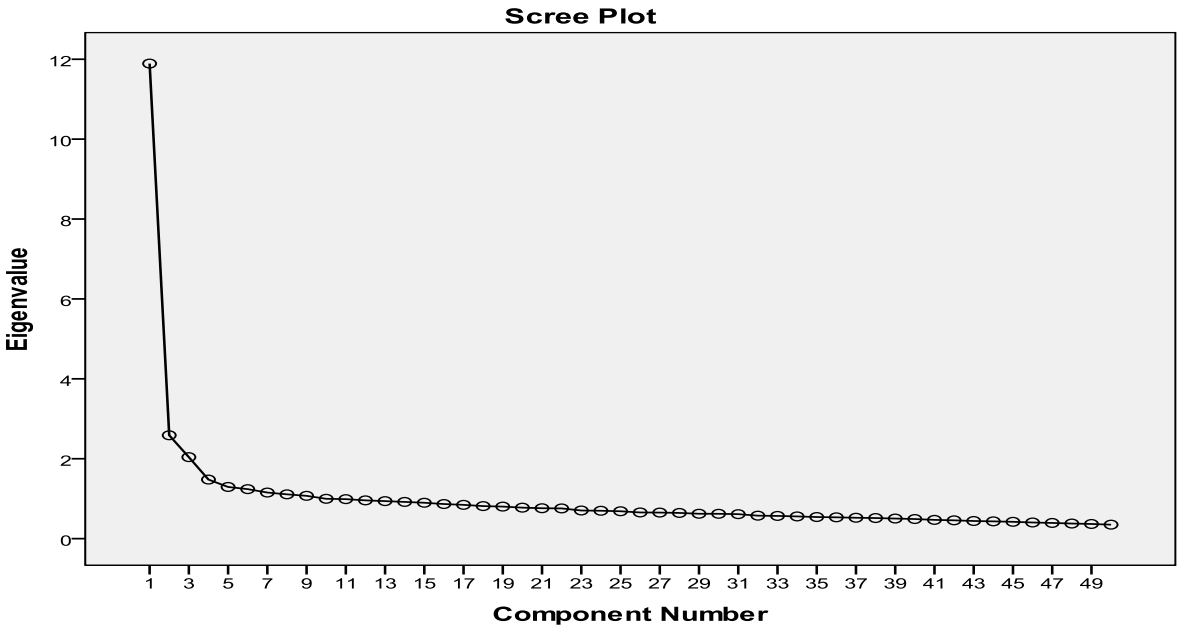


Figure 2. Scree plot of factor structure

Confirmatory Factor Analysis

In order to test the model which was obtained through EFA, a Confirmatory Factor Analysis was conducted on 500 randomly selected cases from 923 participants by using the VLS-S consisting of 32 items. The findings achieved by analysing the constituted model via confirmatory factor analysis are given below. Chi-square (χ^2)/degrees of freedom (df) value was (1054.95/447= 2.36) and the CFA results indicated a good fit [GFI=.88, AGFI=.86, RMSEA=.052, CFI=.96, NFI=.93, RFI=.92, IFI=.96, NNFI=.96, SRMS=.054]. Standard values for the indices were: GFI and AGFI values between 0 and 1.

Although there is an agreement in the literature concerning these values, if the value was over 0.85 and 0.90, it indicates a good fit (Anderson & Gerbing, 1984; Cole, 1987; Marsh, Balla & McDonald, 1988; Schumacker & Lomax, 1996). RMSEA values also vary between 0 and 1. If these values are closer to 0, they indicate a good fit. The χ^2/df ratio indicates a good fit and if it is lower than 2, it indicates an excellent fit

(Jöreskog & Sörbom, 1993; Kline, 2005). Thus, all standardized fit indices indicate that the model factor structure was confirmed. The recommended range of fit indices for CFA is displayed in Table 18.

Table 18. Recommendations for Model Evaluation: Some Rules of Thumb

Fit Measure	Good Fit	Acceptable Fit	Scale
χ^2	$0 \leq \chi^2 \leq 2\,df$	$2df < \chi^2 \leq 3df$	1054.95
p value	$.05 < p \leq 1.00$	$.01 \leq p \leq .05$	.18
χ^2/df	$0 \leq \chi^2/df \leq 2$	$2 < \chi^2/df \leq 3$	2.36
RMSEA	$0 \leq RMSEA \leq .05$	$.05 < RMSEA \leq .08$	.052
p value for test of	$.10 < p \leq 1.00$	$.05 \leq p \leq .10$	.18
NFI	$.95 \leq NFI \leq 1.00$[a]	$.90 \leq NFI < .95$	.93
NNFI	$.97 \leq NNFI \leq 1.00$[b]	$.95 \leq NNFI < .97$°	.96
CFI	$.97 \leq CFI \leq 1.00$	$.95 \leq CFI < .97$°	.96
AGFI	$.90 \leq AGFI \leq 1.00$,	$.85 \leq$ AGFI $< .90$,	.86

(Schermelleh-Engel, Moosbrugger & Müller, 2003, p.52)

Note. AGFI = Adjusted Goodness-of-Fit-Index, *AIC* = Akaike Information Criterion, *CAIC* = Consistent *AIC*, *CFI* = Comparative Fit Index, *ECVI* = Expected Cross Validation Index, *GFI* = Goodness-of-Fit Index, *NFI* = Normed Fit Index, *NNFI* = Nonnormed Fit Index, *RMSEA* = Root Mean Square Error of Approximation, *SRMR* = Standardized Root Mean Square Residual

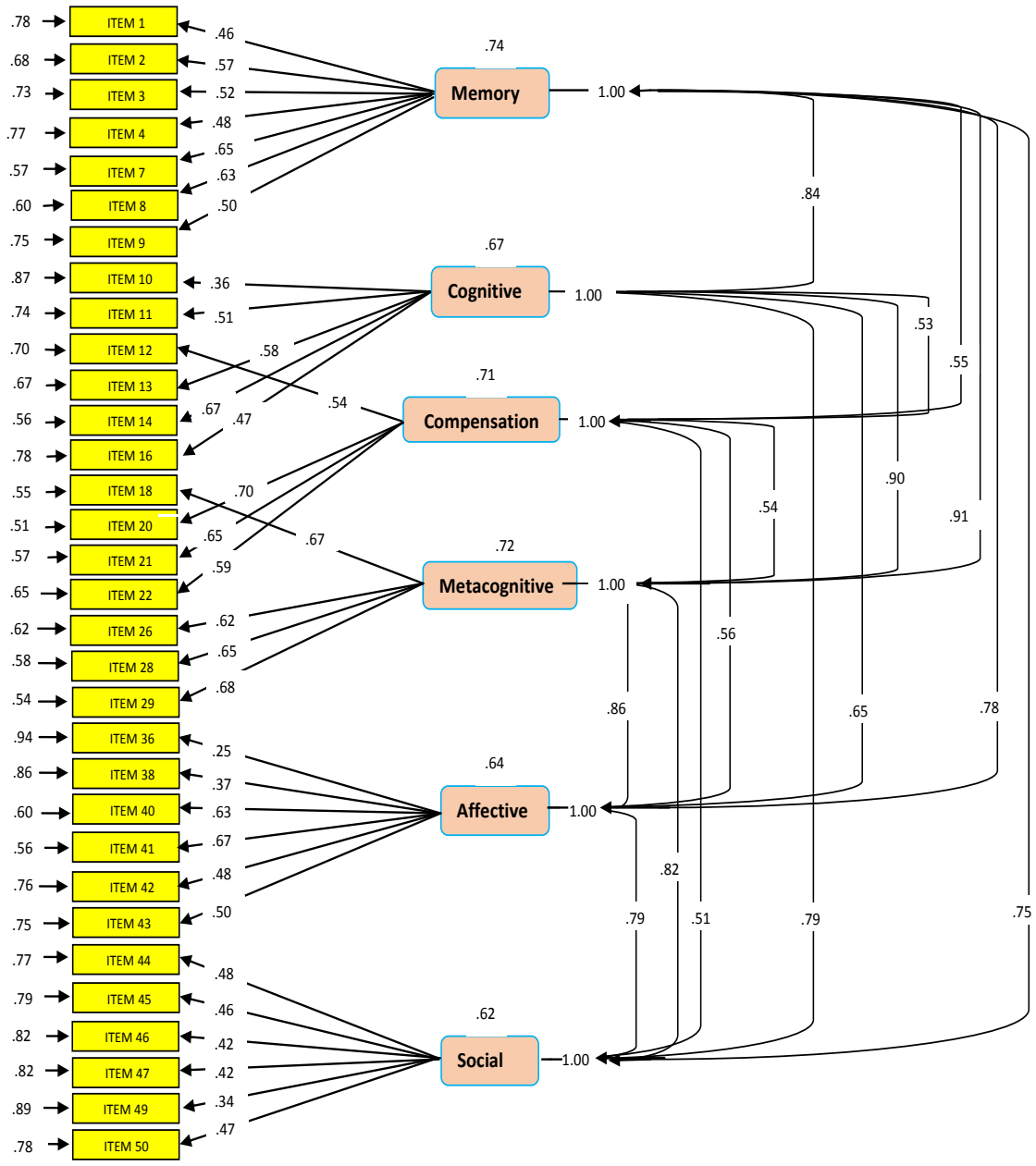


Figure 3. Path diagram of confirmatory factor analysis

3.5.1.2. Reliability Study

In order to determine the scale's internal consistency, Cronbach's α reliability coefficient was calculated. Table 19 displays that the Cronbach's α reliability parameter for the scale applied to 923 students was found as .89. This value shows that the scale is highly reliable

(Nunnally, 1978) (as cited in Gadermann, Guhn, & Zumbo, 2012). The reliability coefficients for the sub scales are given below. The reason why Cronbach´s coefficient values are lower than the scale total score can be justified by the fact that the number of items in the sub scales is insufficient.

Table 19. The Reliability Parameter Values for the Scale

Sub Factors/Scales	Cronbach's α
Memory Strategies	.74
Cognitive Strategies	.67
Compensation Strategies	.71
Metacognitive Strategies	.72
Affective Strategies	.64
Social Strategies	.62
Scale Total	.89

Table 20. The t Values for the 27% Lower-Upper Group Differences forthe Corrected Item-Total Correlation of the Scale.

Item No	Correlation Item-Total	t (Lower27%-Upper27%)	Item No	Correlation Item-Total	t (Lower27%-Upper27%)
1	.40	13.921*	22	.26	13.993*
2	.47	16.730*	26	.55	16.240*
3	.47	16.550*	28	.42	20.425*
4	.46	15.433*	29	.48	22.875*
7	.54	21.425*	36	.57	9.640*
8	.51	18.927*	38	.28	14.395*
9	.42	15.981*	40	.47	17.304*
10	.39	12.125*	41	.41	17.242*
11	.53	16.535*	42	.52	16.795*
12	.53	17.277*	43	.45	13.998*
13	.34	14.410*	44	.54	16.690*
14	.34	19.574*	45	.44	14.312*
16	.56	17.493*	46	.48	12.606*
18	.37	22.247*	47	.35	10.998*
20	.52	17.838*	49	.32	10.802*
21	.45	12.747*	50	.34	15.079*

*p<.01

Table 20 displays that the corrected item-total correlations of the scale were between .26 and .57, the difference of t (sd=162) values calculated for the 27% upper and lower groups' item points specified for the total points were 9.64 (p<.01) and 22.87 (p<.01).

Table 21. The Correlation Values between the Factors of the Scale

Dimensions	Symbol	[1]	[2]	[3]	[4]	[5]	[6]	Mean	SD
Memory Str.	[1]	1						3.17	5.44
Cognitive Str.	[2]	.55*	1					2.87	4.39
Compensatory Str.	[3]	.53*	.55*	1				2.87	3.66
Metacognitive Str.	[4]	.61*	.52*	.57*	1			3.48	3.48
Affective Str.	[5]	.54*	.48*	.50*	.61*	1		3.42	4.92
Social Str.	[6]	.48*	.44*	.43*	.50*	.50*	1	3.20	4.81
Scale total			.76*	.75*	.80*	.79*	.73*	3.15	.65

* $p < .01$

The Pearson product-moment correlation co-efficient was calculated to observe the correlation between the *VLS-S* and its factors and are displayed in Table 21. The table indicates that the correlations between the factors are statistically significant ($p < .01$) and vary between .43 and .81. These findings indicate a high degree of coherence and correlation between the factors of the scale.

In this study, the *VLS-S* was developed to determine vocabulary learning strategy preferencesof the students at secondary school level. A six factor structure was achieved for the VLS-S by applying EFA. The structure obtained by the EFA was tested by using the CFA to ensure a model fit. As a result of the Exploratory and Confirmatory factor analysis, the scale consisting of 32 items under six factors was found to be suitable both theoretically and statistically. These results also prove the construct validity of the scale. Within the framework of reliability studies, the internal consistency co-efficients were examined and they confirmed that the scale can be used reliably.

The *VLS-S* developed within the scope of this research is a reliable scale to be used to determine the vocabulary learning strategies the students at secondary school level prefer to learn English vocabulary. The distribution of the items in the scale according to the sub-dimensions are: the items 1, 2, 3, 4, 7, 8 and 9 comprise the "*Memory Strategies*", the items 10, 11, 13, 14 and 16 comprise the "*Cognitive Strategies*", the items 12, 20, 21 and 22 comprise the "*Compensation Strategies*", the items 18, 26, 28 and 29 comprise the "*Metacognitive Strategies*", the items 36, 38, 40, 41, 42 and 43 comprise the "*Affective Strategies*", and the items 44, 45, 46, 47, 49 and 50 comprise the "*Social Strategies*" for learning Vocabulary in English. The lowest possible score for the scale is 32 while the highest possible score is 160. The current scale, which underwent validity and reliability processes, can be used to determine strategy preferences of secondary school level students in learning English vocabulary.

3.5.2. CAVI Achievement Tests

The course book followed at grade 7 was analyzed in detail and any abstract vocabulary was eliminated due to difficulty of illustration. Thirty words in an equal proportion of lexical types (noun, verb, adjective) were selected from each chapter of the first 8 units from the 16-chapter course book *Spring 7* which was published by MONE. Thus, a vocabulary pool of 240 words was created. A paper based vocabulary test comprising 50 picture-based multiple choice questions (See Appendix HH) was created from 240 words to give to the participants before and after each treatment to observe the impact of the applications. The 50 item test consists of 2 parts (part A and part B). Part A included 25 items selected from the first 4 units of the course book. Part B included 25 items selected from the second four units of the course book.

Expert views on the usability of the pictures in the 50-item test for the secondary school level students were taken from 2 academics at the Faculty of Education. Then, an item analysis of the test was performed through a package program called "Iteman" to measure the item difficulty. The discrimination indices of the first test consisting of 25 multiple choice questions (Part A) ranged from .36 to .86 and the discrimination indices of the second test consisting of 25 multiple choice questions (Part B) ranged from .20 to 1.0. The item difficulty of the first test consisted of 25 multiple choice questions (Part A) ranged from .25 to .97 and the item difficulty of the second test consisting of 25 multiple choice questions (Part B) ranged from .51 to .95. The KR-20 value for the first test consisting of 25 multiple-choice questions (Part A) was computed as .84 and for the second test consisting of 25 multiple-choice questions (Part B) was computed as .87. Both values represent high level of test acceptability.

3.5.3. Students' Reflections

In order to support the researcher's understanding of the students' perceptions, an open-ended question was asked to the study group of 62 students. The question was "What do you think about the advantages and disadvantages of the computer assisted vocabulary learning applications?" Before asking for students' views, researcher referred to 2 experts to ensure that whether the open-ended question was qualified enough to measure the advantages and disadvantages of CAVI applications. The feedback from the experts proved that the question was applicable.

3.6. CAVI Materials

3.6.1. Development of DENIS for Vocabulary Teaching

The present software (DENIS) was designed by using DELPHI: Embarcadero ® RAD Studio XE programming languages. The software was designed to provide students with an opportunity to practice vocabulary in three formats (auditory, visual and textual).

The software was designed in the framework of PPP (Presentation, Practice and Production) model, the name of which suggests that teaching and learning process are divided into three stages. These stages move from rigid teacher control towards learner freedom. Therefore, the role of the teacher is to guide learners and monitor the learning process(Criado, 2013).

In the presentation stage, the vocabulary was*presented* in textual, visual and auditory forms by means of the software-DENIS and Games. The aim of the presentation stage was to give the students all the necessary components they were going to practice in the later stages. Learners studied 30 words per week going through PPP stages. The process lasted for 4 weeks and 120 words were covered in total.

In the presentation stage, the visual and textual forms of the words were randomly displayed on the screen and the audios of the words were played synchronously (See Appendix G).

The practice stage was divided into two different activities. In the first activity, the pronunciation of the vocabulary was *practised* with the help of textual and visual aids(See Appendix H). In the second activity, the spelling of the vocabulary was *practised* with the help of auditory and visual aids (See Appendix I). In the practice stage, the objective is accuracy rather than fluency. The students are anticipated to learn the pronunciations and spellings of the words correctly.

In the production stage, students *produced* the meanings and the pronunciation of the words with the help of visual aids. (See Appendix J). The production stage focused on fluency. Students are expected to produce whatever they learned in the practice stage accurately and fluently.

The students were expected to learn vocabulary by being exposed to visual contexts. When the application ended, it directed the learner back to the start page (See Appendix K)

Repetition of different forms of the words was assumed to consolidate the user's vocabulary. Users were able to make use of the volume control box to turn on or off the sounds of the words. (See Appendices D and E) When the software was used with instructions provided by the teacher, vocabulary was practised aligned with certain strategies. The program can also be used for self-study. Students, by developing their own learning strategies, can use the program with different combinations of the words, with or without audio or text. The program's dynamics stem from the fact that it can be used for different languages with different data. Future applications for the program include it being used for different languages by loading the desired auditory, visual or textual forms of the words in that language.

CDs of the educational software (DENIS) were duplicated and delivered to the participants to enable them to study in and outside the classroom. The participants were also provided with a portable dictionary that could be installed and utilised during the process of vocabulary learning. Prior to the study, the participants had two class hours of vocabulary instruction through computer assisted instruments-vocabulary teaching software (DENIS) during a period of four weeks, and educational vocabulary games for the successive four weeks.

McKeown, Beck, Omanson and Pople (1985) stated that learners have to spend adequate time for the retention of each word, which is approximately 15 minutes. In addition to this suggestion, Nation (1990) proposes 5-16 exposures to internalize a word. As DENIS consisted of a set of a 120-picture vocabulary (comprising nouns, verbs and adjectives), students were expected to learn 30 words each week during the study period which lasted four weeks.

All these activities were performed in a computer laboratory setting. Students' performances were observed and recorded. The software (DENIS) was uploaded on the website of the researcher week by week, www.orhankocaman.net and the participants were authorized to access to the software at the beginning of the implementation. While designing the program, it was realized that the distribution of the lexical types were not equal which seemed to be a weak point of the book. The content features of the first four chapters of the course book to be used with software are explained below.

Unit 1: Interesting Beliefs
Nouns: horoscope, palm, liar, groom, bride, student, leaf, ladder, mirror, horseshoe, contest, evil-eye -bead, medium-height
Verbs: break, catch, see, walk
Adjectives: angry, beautiful, fat, generous, helpful, jealous, kind, lazy, lucky, selfish, shy, thin, ugly

Unit 2: Tourist Attractions
Nouns: airport, skateboarding, diving, flight, bell, hiking, windsurfing, ice-hockey, train station, region, luggage, clock tower, lake, ice skating, ferry, tent, bungee-jumping, stamp
Verbs: arrive, borrow, carry, cross, go over the bridge, go through, turn left, turn right, walk along the street, walk past the cinema
Adjectives: easy, expensive

Unit 3: Our Natural Heritage
Nouns: climate, village, percent, generation, monument, balance, equator, danger, desert, fog, factory, smoke, bin, season, rubbish, forest, earth
Verbs: change, cut, cut down, grow, plant, take care, turn off, turn on
Adjectives: boring, chemical, historical, industrial, natural

Unit 4: Computers
Nouns: hardware, gift, poem, screen, audio, mobile phone, processor, fun, devices, printer, keyboard, speaker, parents, homepage
Verbs: communicate, give, look up, produce, search, send, spend, take
Adjectives: careful, careless, complicated, correct, crowded, noisy, wide, narrow

3.6.2. Development of Educational Games for Vocabulary Teaching

The second stage of the application consisted of four different games. Each game involves 120 words from the second four chapters of the course book but students are anticipated to practice words unit by unit starting from the fifth unit to the eighth unit. Each unit is covered by students in a week and consists of 30 words. of these games were played individually by the students in the computer laboratory under the supervision of a teacher and a researcher for two class hours per week. During the application, students were given guidance only if they had technical problems and needed procedural instructions.

Likewise the application of DENIS, the PPP model was applied in the games prepared for the study. Card Matching game was prepared to *present* the vocabulary and was utilised as an instructional activity with textual, visual and auditory aids. Card matching game was played in the first 20 minutes of the class hour to enable students to see the visuals, read the texts and heard the auditory forms of the words. In the second 20 minutes of the class, students were instructed to play hangman to *practice* the spelling and pronunciation of the words they were presented in the card matching game. The same words were also *practised* by the matching game following hangman for another 20 minutes and students gained the ability of matching the visuals and the written forms of the words. In the following 20 minutes, students were instructed to do crosswords in which they were supposed to *produce* the words by typing them in the grids.

Card Matching: Card Matching, one of the most frequently used memory games for teaching vocabulary, was prepared through Adobe Flash CS6 Software. In this game, the screen tiled with 30 cards, 15 labelled pictures and 15 their written forms, are presented in two subsequent pages. Each time 15 words are practised. When student clicks on a card either with a picture or written form, s/he hears the recording of the pronunciation of the word and sees either the picture or the written form of the word. The aim of the game is to match the picture cards to the cards with written forms. Students hear the same recording either clicking on a picture card or a word card. When a card is matched correctly with its written form, the pair disappears from the screen(See Appendices L, M, N, O and P).

Hangman: Hangman, a very well-known paper-pen game played by young children in the past was adapted into computer through Adobe Flash CC software. Hangman is a game that can be fruitful especially for spelling exercises in teaching and learning vocabulary. On the main page of the game, students are given a picture and a scaffold next to the picture. Students are also given the chance of listening to the recording of the word's pronunciation when they click on the sound symbol. By using the keyboard, students are required to fill in the given spaces above the picture for every single letter to find the word. The aim of the game is to find the word with less than eight wrong trials, because for each wrong answer one part of a man on the scaffold is added and the picture of the man is completed with the eighth mistake student makes. If the picture of the man is completed, students are given a chance of listening to the recording automatically on the speaker symbol a warning 'try again'. If student finds the answer, a smiley and the word "congratulations" are displayed on the screen as a source of

motivation together with the written form of the word down the picture (See Appendices Q, R, S, T and U).

Matching: This game comprises three different activities developed with The Hot Potatoes 6 Software. In the first activity, students are given five pictures with combos next to each. Students are asked to choose the correct word for the picture from these combos. When students complete answering, they click on the "check" button and the software gives a percentage score as feedback to the students. If they find all the answers, the program congratulates the student as a motivation. When students are not able to find all the correct answers, the software game evaluates the students' answers and puts a smiley next to the correct answers but a cross next to the wrong ones. By giving the feedback, the software game removes the wrong answers and directs the students to do the exercise again (See Appendices X, Y and Z).

The second game is a drag and drop activity. The students are expected to drag the correct written word next to its correct picture match. If there is a mismatch, the program blackens it, and shows the student his mistake and warns him to try again (See Appendices AA and BB).

The third game is a flipping card activity. Students are given a picture and asked to know the meaning. After they name the word, they are given the meaning of the word. Students move from the picture to the meaning with the help of 'next' button
(See Appendices CC and DD).

Crosswords: This game was developed through The Hot Potatoes 6 Software. Students are asked to complete the grid of crosswords. They are given a grid with about ten words and supposed to click on the numbers in the grid to have the visual clue for the

word in the grid. Next to the picture, they are given a space to type the word and click on "enter" button so that the grid is completed. Next to the picture, the students are also given a "hint" button. By clicking on the "hint" button, students can borrow a letter of the word but they lose one point from the overall score. When the student completes the grid, s/he simply clicks on the "check" button to see the overall score (See Appendices EE, FF and GG).

The vocabulary content of second four chapters of the course book to be used within the games is as follows;

Unit 5: Fashion
Nouns: battery, memory, chess, river, briefcase, calculator, button, vehicle, cord, cooker, ruler, rose, mountain, bicycle
Verbs: download, insert, push, recommend, repair, store, and watch
Adjectives: absent, comfortable, exciting, healthy, hot, large, rechargeable, smart, useful

Unit 6: TV Programmes
Nouns: devil, worm, snowdrop, magic, fairy, lily, adventure, pearl, star
Verbs: attract, come across, exhibit, look for, prefer, solve, win, mess, adult, fantasy
Adjectives: dangerous, enjoyable, fashionable, interesting, monotonous, mysterious, precious, real, sensitive, trendy, western

Unit 7: Old Days
Nouns: ancient place, ground floor, classroom, countryside, cookie, family, calendar, space, traveller, moustache, housewife, president, prediction
Verbs: cook, do shopping, draw, go around, play, read, write
Adjectives: alone, cute, famous, friendly, neat, old-fashioned, sad, strict, terrible, tired

Unit 8: Inventors and Explorers
Nouns: history, soldier, colleague, flag, masterpiece, radio, instrument, mosque, architect, dynamite, continent, invention, moon, horror, heartbeat, recycle
Verbs: blastoff, cost, develop, discover, go out, introduce, invent, land on, put up, sit, takeoff
Adjectives: portable, wireless, sunny

3.7. Implementation

The researcher established the length of the implementation, selected the course book and selection of vocabulary before the implementation was initiated. Thus, the course book for 7 graders *Spring 7* was chosen as the source of material. An aggregate of 240 concrete words was selected from the first 8 chapters from the 16-chapter course book. For the study, 30 words were picturised, labelled and voiced. Pictures were cut, resized and labelled by means of a program called "Photoscape" (See Appendix B). The pictures were voiced by a native English speaker (See Appendix C). Text documents of the vocabulary lists were prepared and all of these materials were included in the instructional design.

Table 22. Process of the Implementation

Process of the Implementation		
Schedule	Researcher responsibilities	What the participants did
1st week	• Pre-scale • First administration of the achievement test (50 items; Part A: first 25 items, Part B: second 25 items.) • Installation of DENIS in the lab. • DENIS uploaded to www.orhankocaman.net. • Distribution of the CDs of DENIS • Guidelines given to the participants on how to download the program (DENIS) at home	Pre-scale Part A and Part B Download DENIS
2nd week	• Monitor the participants	Study 30 words in unit 1 1st stage: visual, textual, auditory. 2nd stage: visual, textual. 3rd stage: visual, auditory 4th stage: visual

3rd week	• Monitor the participants	Study 30 words in unit 2 1st stage: visual**,** textual, auditory. 2nd stage: visual, textual. 3rd stage: visual, auditory 4th stage: visual
4th week	• Monitor the participants	Study 30 words in unit 3 1st stage: visual**,** textual, auditory. 2nd stage: visual, textual. 3rd stage: visual, auditory 4th stage: visual
5th week	• Monitor the participants	Study 30 words in unit 4 1st stage: visual**,** textual, auditory. 2nd stage: visual, textual. 3rd stage: visual, auditory 4th stage: visual
	• Second administration of the achievement test	Part A and Part B
6th week	• Distribution of the CDs of educational games • Games uploaded to www.orhankocaman.net.	Download the games Study 30 words in unit 5 Card Matching, Hangman, Matching, Crosswords
7th week	• Monitor the participants	Study 30 words in unit 6 Card Matching, Hangman, Matching, Crosswords
8th week	• Monitor the participants	Study 30 words in unit 7 Card Matching, Hangman, Matching, Crosswords
9th week	• Monitor the participants	Study 30 words in unit 8 Card Matching, Hangman, Matching, Crosswords
10th week	• Third administration of the achievement test • Post Scale	Part A and Part B Post-scale

3.8. Data Analysis

All statistical analyses were performed by PASW Statistics 18.0 (SPSS, 2009). Frequencies, means and standard deviations were used for descriptive statistics. Paired samples t-test was used to compare the means of significant differences between paired groups. A one-way ANOVA was used to ascertain the interactional effect of instructional designs (DENIS and Game).

In the process of the scale development, Exploratory Factors Analysis was used for constructing validity through PASW Statistics 18.0 (SPSS, 2009). Lisrel 8.71 (Jöreskog & Sörbom, 2004) was used for confirmatory factor analysis to corroborate the factor structure of the scale. An item difficulty analysis was conducted to develop an achievement test for item discrimination.

Independent samples t-test results were used to analyse the gender difference in strategy preference. Analysis of repeated measures of ANOVA was used to measure the subjects' scores at the end of each application. Bonferroni test was used as the post hoc analysis in the multiple comparisons.

All pre-testing of the instruments determined their reliability and validity for use in the intended study.

In order to support the results obtained from the quantitative analyses, the data obtained from the students' reviews were analysed by means of content analysis. The literature review also supported the need and applicability of this study. The following chapter presents the results of the study.

CHAPTER 4
RESULTS

4.1. Introduction

In this study, quantitative statistics were used. In quantitative statistics both descriptive and inferential statistics were referred. Descriptive analyses were conducted for the purpose of determining the frequencies of preferences in vocabulary learning strategies by comparing pre-scale and post-scale results.

In SPSS statistics, when comparing the scores of two paired groups, the value was found to be greater than .05, which means that the variability in two conditions (DENIS vs Games) is about the same and that the scores in one condition do not vary significantly from those in the second condition. Scientifically, it means that the variability in the two conditions is not significantly different. In this example, the Sig. value is greater than .05.

In the SPSS statistics, it was assumed that the variances are equal after the level for the Levene's Test is greater than .05, and hence not statistically significant. We can conclude, therefore, that the scores variances of the two groups do not differ significantly.

For the research question 2.1, results regarding DENIS applications were provided . first, assumptions of parametric test (repeated measures of ANOVA) were displayed and results of that test were presented.

For the research question 2.2, results regarding game applications were provided . first, assumptions of parametric test (repeated measures of ANOVA) were displayed and results of that test were presented. For the research question 2.3, paired samples t test results regarding combined applications (DENIS and Games) were provided.

For the research question 2.4, Independent samples t test results which display the strategy preferences according to gender were provided. In order to support the findings through inferential statistics, an open ended question was asked to the study group to find out the perceptions of the participants towards the implementation.

4.2. Statistical Analyses of Research Questions

4.2.1. R.Q. 1: Is there any significant difference between students' preferences in VLSs before and after CAVI applications?

Table 23. Vocabulary Learning Strategies before CAVI

VLSs Before CAVI	N	Total Scores	sd	Mean	sd	Level
Memory	68	23.7	6.3	3.4	.9	Medium
Cognitive	68	14.6	4.7	3.0	.9	Medium
Compensation	68	11.4	4.4	2.9	1.1	Medium
Metacognitive	68	14.4	3.5	3.6	.9	High
Affective	68	21.0	4.5	3.5	.7	High
Social	68	19.6	5.3	3.3	.9	Medium
Total	68	104.6	23.7	3.3	.7	Medium

Profile of Results on the Strategy Inventory for Language Learning developed by Oxford (1989) ranges as Low Level: Never or rarely (1.0 to 2.4); Medium Level: sometimes (2.5 to 3.4); High Level: often or always (3.5 to 5.0) (Oxford, 1990 p.300).

According to the profile developed by Oxford, Metacognitive and Affective strategies were preferred most by the study group with the means of (M= 3.6) and (M=3.5) as depicted in Table 23.

Table 24. Vocabulary Learning Strategies After CAVI

VLSs After CAVI	N	Total Scores	sd	Mean	sd	Level
Memory	68	22.8	5.6	3.3	.8	Medium
Cognitive	68	13.9	4.1	2.8	.8	Medium
Compensation	68	12.6	4.5	3.1	1.1	Medium
Metacognitive	68	15.0	3.4	3.7	.8	High
Affective	68	20.7	5.0	3.4	.8	Medium
Social	68	19.3	5.0	3.2	.8	Medium
Total	68	104.4	20.6	3.3	.6	Medium

Low Level-Never or rarely (1.0 to 2.4); Medium Level sometimes (2.5 to 3.4);
High Level often or always (3.5 to 5.0) (Oxford, 1990 p.300)

Table 24 shows that metacognitive strategies were found as the most preferred strategy type (M=3.7) while the other five strategies were preferred at the medium level.

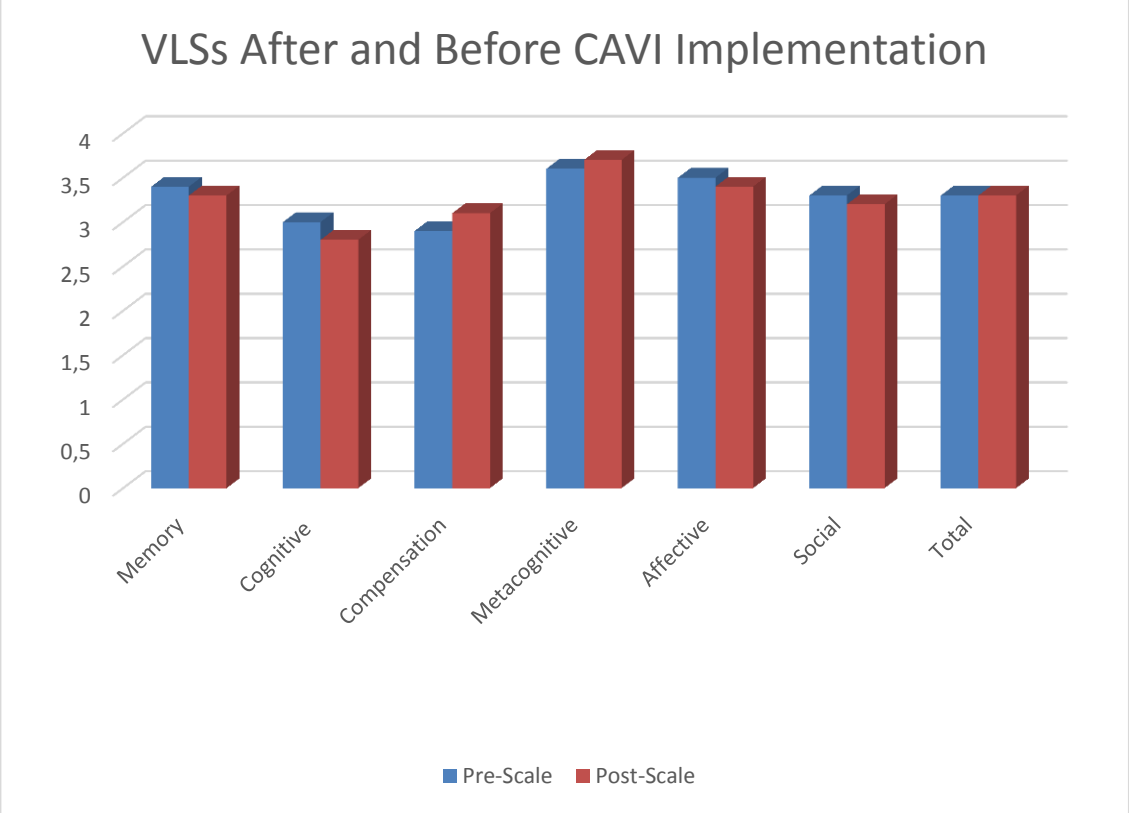


Figure 4. VLSs after and before CAVI implementation

Table 25. Paired Samples T-test Results of the Vocabulary Learning Strategies

	N	M	Sd	df	t	p
Memory Pre-scale	68	23.66	6.264	67	1.262	.211
Memory Post-scale	68	22.84	5.571			
Cognitive Pre-scale	68	14.56	4.666	67	1.141	.258
Cognitive Post-scale	68	13.91	4.138			
Compensation Pre-scale	68	11.43	4.399	67	-2.021	.047
Compensation Post-scale	68	12.60	4.512			
Metacognitive Pre-scale	68	14.41	3.452	67	-1.402	.165
Metacognitive Post-scale	68	15.03	3.372			
Affective Pre-scale	68	20.96	4.497	67	.423	.673
Affective Post-scale	68	20.71	5.014			
Social Pre-scale	68	19.62	5.328	67	.429	.669
Social Post-scale	68	19.31	5.026			
Total Pre-scale	68	104.63	23.746	67	.097	.923
Total Post-scale	68	104.40	20.565			

According to the results illustrated in Table 25, there is a statistically significant difference between the mean scores of the pre and post- scale of compensation strategies. The results revealed that learners incrementally preferred learning vocabulary by means of computer assisted tools ($t(67)= -2.021$, $p = .047$). Paired samples t-test indicated that participants in the current study preferred metacognitive strategies to the other strategies of vocabulary learning. The results in Table 25 displayed that there are no significant differences between mean scores of pre-scale and post-scale of the other strategies in Table 25. Although there are no significant differences between pre-scale mean scores and post-scale mean scores of MS,CS,AS and SS, post-scale mean scores are lower than pre-scale mean scores while post-scale mean scores of McS and CnS are higher than pre-scale mean scores in the study. The mean scores of pre and post-scale are given in app. QQ and RR item by item to display a more clear statistical results.

4.2.2. R.Q. 2: Does the computer assisted vocabulary teaching make a positive contribution to the achievement scores of vocabulary tests?

As presented in Table 26, Normality test was used to determine if the data set was well-modelled by a normal distribution before analyzing research question 2.

Table 26. Values of Skewness, Kurtosis and Kolmogorov-Smirnov

Measures	Skewness	Kurtosis	Kolmogorov-Smirnov Z	p
DENIS_First Adm.	-.451	-.410	.936	.345
GAMES_ First Adm.	.265	-.430	.778	.58
DENIS_Second Adm.	.067	-.899	.766	.6
GAMES_ Second Adm.	-.205	.011	.77	.594
DENIS_Third Adm.	-.043	-.735	.648	.795
GAMES_Third Adm.	-.739	-.161	.984	.287
DENIS+GAMES First Adm.	-.249	-.518	.894	.401
DENIS+GAMES Second Adm.	.008	-.465	.719	.68
DENIS+GAMES Third Adm.	-.372	-.502	.65	.792

Table 26 displays that distributions of the scores obtained at the different levels of measurements are within the normal range.

4.2.2.1. Is there a significant effect of DENIS applications on the vocabulary achievement scores of grade 6 students?

One way ANOVA for repeated measures was applied to determine whether there is a significant difference between the tests applied in the 1^{st}, 5^{th} and 10^{th} weeks in the process of implementation. The analysis was performed on the basis of scores obtained from the first 25 items which consisted of vocabulary in DENIS. Table 27 displays descriptive statistics of the DENIS application achievement test. The ANOVA test results are presented in Table 28.

Table 27. Descriptive Statistics of DENIS Application Achievement Test

Measures	M	SD
First administration of Part A	8.15	3.11
Second administration of Part A	15.82	5.12
Third administration of Part A	15.59	5.15

Table 28. Test Results for Repeated Measures of ANOVA for DENIS

Source	Sum of squares	df	Mean square	F	p	Partial eta-square
Between subjects	3162.26	67	47.20			
Measures	2592.04	1.29	2005.11	170.16	0.000	0.717
Error	1020.63	86.61	11.78			
Total	6774,93	154,9				

When examined, the Mauchly's test conducted to test the sphericity assumption of the analysis (W (2) = .453, p <.05), indicate that the assumption was violated. Greenhouse-Geisser correction for the violation of sphericity was used to ensure assumptions. The ANOVA results indicate that there are significant differences between the measurements. Bonferroni multiple comparison test was conducted to figure out which measurements significantly differed from each other. The results are displayed in Table 29. These results revealed that there was a significant difference between measurements 1 and 2. There was no significant difference between measurements 2 and 3. These results suggest that there is a significant increase in the success of the students after the application of DENIS. The availability of significant difference between the 1st and 3rd measurements indicates that the success did not change in time after the application of DENIS.

Table 29. Bonferroni Test Results for Multiple Comparisons for DENIS

(I) Measure 1	(J) Measure 2	Mean Difference (I-J)	SE	Sig.
First	Second	-7,676*	,549	,000
	Third	-7,441*	,559	,000
Second	First	7,676*	,549	,000
	Third	,235	,242	1,000
Third	First	7,441*	,559	,000
	Second	-,235	,242	1,000

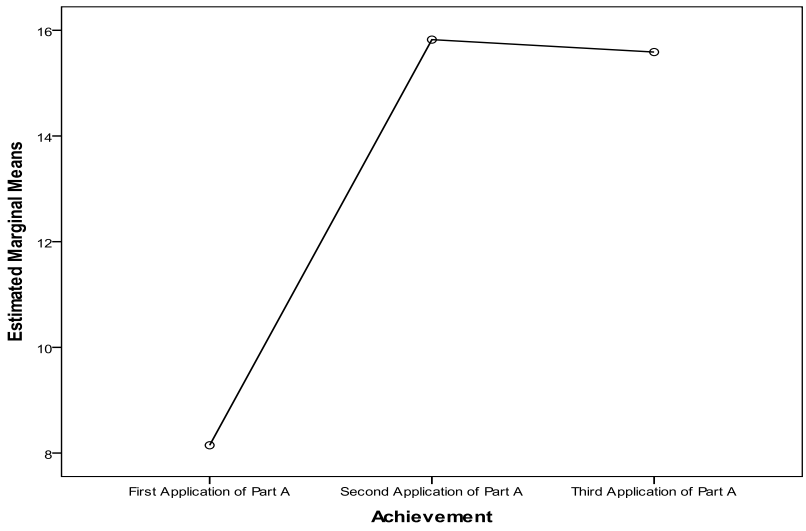


Figure 5. Estimated marginal means of the achievement scores of each measure

4.2.2.2. Is there a significant effect of Game applications on vocabulary achievement scores of grade 6 students?

A one way ANOVA for repeated measures was applied to determine whether there was a significant difference between the tests applied in the 1st, 5th and 10th weeks in the process of implementation. The analysis was performed on the basis of scores obtained from the second 25 items which consisted of the vocabulary in Games. Table 30 displays the descriptive statistics of the Games application achievement test. The ANOVA test results are presented in Table 31.

Table 30. Descriptive Statistics of Games Application Achievement Test

Measures	M	sd
First administration of Part B	10.66	3.79
Second administration of Part B	11.59	4.75
Third administration of Part B	18.37	5.37

Table 31. Test Results for Repeated Measures of ANOVA for Games

Source	Sum of squares	df	Mean square	F	p	Partial eta-square
Between subjects	3488.02	67	52.06			
Measures	2407.19	1.73	1394.85	175.41	0.000	0.724
Error	919.48	115.63	7.95			
Total	6814.69	184.36				

When examined, the Mauchly's test conducted to test the sphericity assumption of the analysis (W (2) = .453, p <.05), indicates that the assumption was violated. Greenhouse-Geisser correction for the violation of sphericity was used to ensure assumptions. The ANOVA results indicated that there are significant differences between the achievements of students as measured at different times. A Bonferroni multiple comparison test was conducted to determine which measurements were different from each other. The results in Table 32 revealed that there was no significant differences between measurements 1 and 2, while significant differences were found between measurements 1 and 3. These results suggest that there is a significant increase in the success of the students who are learning in the Game environment. The unavailability of the difference between the 1st and 2nd measurements supports the finding that the students' learning was actualized through game application.

Table 32. Bonferroni Test Results for Multiple Comparisons for Games

(I) Measure 1	(J) Measure 2	Mean Difference (I-J)	SE	Sig.
First	Second	-.926	.385	.056
	Third	-7.706*	.530	.000
Second	First	.926	.385	.056
	Third	-6.779*	.421	.000
Third	First	7.706*	.530	.000
	Second	6.779*	.421	.000

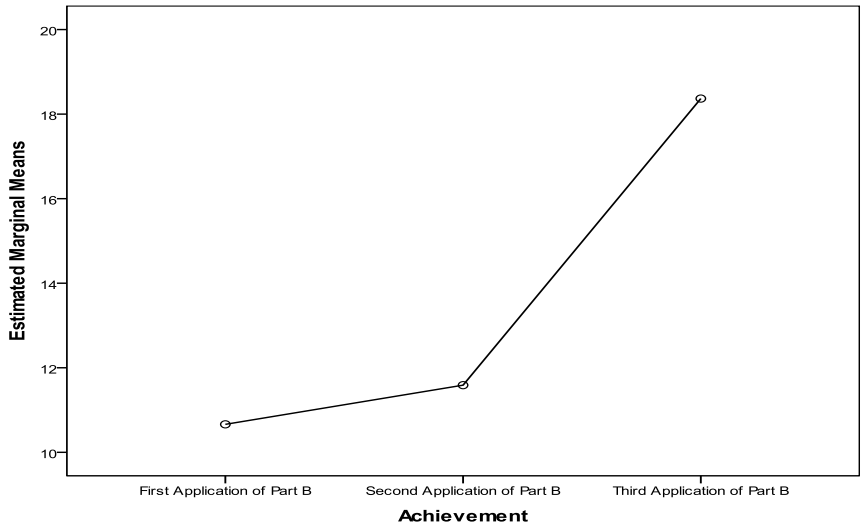


Figure 6. Estimated marginal means of achievement scores of each measure

4.2.2.3. Is there a significant effect of combined applications (educational software (DENIS) and Games) on vocabulary achievement scores of grade 6 students?

In order to investigate whether the combined applications (DENIS and Games) have an effect on students' achievement scores, a paired samples t-test was applied to see the united effect of applications in this analysis The paired samples t-test results for the achievement test are displayed in Table 33.

Table 33. Paired Samples T-Test Results

	N	M	sd	df	t	p
First administration (Part A + Part B)	68	18.81	6.03	67	-16.90	0.000
Third administration (Part A + Part B)	68	33.96	9.82			

The results in Table 33 revealed that significant differences between the first and third administration indicate that the applications (DENIS and Games) significantly increased students' achievement scores.

4.2.2.4. Does gender have any significant impact on grade 6 students' strategy use?

Table 34. Independent Samples T-Test Results for VLS-S According to Gender

Pre-scale							
	Gender	N	Mean	sd	df	t	p
Memory	Female	40	3.21	6.437	66	-1.861	.067
	Male	28	3.62	5.716			
Cognitive	Female	40	2.00	4.306	66	-1.238	.220
	Male	28	2.20	5.101			
Compensation	Female	40	2.63	4.374	66	-2.130	.037**
	Male	28	3.19	4.160			
Metacognitive	Female	40	3.52	3.555	66	-.961	.340
	Male	28	3.72	3.304			
Affective	Female	40	3.39	4.693	66	-1.336	.186
	Male	28	3.64	4.128			
Social	Female	40	4.76	4.790	66	-1.098	.276
	Male	28	5.12	6.003			
Total	Female	40	3.14	23.145	66	-1.774	.081
	Male	28	3.46	23.702			

			Post-scale				
	Gender	N	Mean	sd	df	t	p
Memory	Female	40	3.14	5.600	66	-1.543	.128
	Male	28	3.44	5.388			
Cognitive	Female	40	2.01	4.455	66	.327	.745
	Male	28	1.96	3.710			
Compensation	Female	40	3.09	4.990	66	-.550	.584
	Male	28	3.24	3.786			
Metacognitive	Female	40	3.75	3.545	66	-.085	.932
	Male	28	3.77	3.173			
Affective	Female	40	3.48	5.497	66	.330	.742
	Male	28	3.41	4.316			
Social	Female	40	4.75	5.337	66	-.652	.517
	Male	28	4.95	4.598			
Total	Female	40	3.23	22.594	66	-.559	.578
	Male	28	3.31	17.524			

* p< .01. ** p< .05

Independent samples t-test was carried out to determine whether vocabulary learning strategies changed according to gender.

The results in Table 34 revealed that the male students (M= 3.19) used compensation strategies more often than the female students (M= 2.63) before the implementation (t (66) = -2130., P <.05). A significant difference was not found in other strategies and post-test results in terms of gender.

Findings from the content analysis of students' reflections revealed parallel results with the experimental study. Although there were a few negative views, the students' reflections on the implementations revealed that they found CAVI beneficial and affective in vocabulary learning. The results from the categorical content analysis are given in Table

35, 36, 37 and 38 along with the negative views in Table 39. A few examples of students' point of views are displayed in the appendices UU, VV, WW and XX.

In order to support the researcher's understanding of the students' perceptions, an open-ended question -What do you think about the advantages and disadvantages of the computer assisted vocabulary learning applications?- was asked to the study group of 62 students. The feedback provided by the participants was analysed through categorical content analysis and the results were listed below.

Table 35. Students' Perceptions on Activities

Themes	Codes	Sub-codes	f	Students
Positive view 1	Perceptions of students on activities [Total f : 75]	Good	24	S9, S11, S13, S14, S15, S17, S19, S21, S23, S24, S25, S28, S29, S30, S32S34, S36, S39, S40, S45, S53, S54, S55, S57
		Helpful Beneficial	19	S5, S6, S10, S12, S13, S19, S20, S21, S35, S36, S37, S39, S40, S49, S50, S57, S59, S61, S62
		Fun/enjoyable	10	S2, S19, S24, S29, S46, S54, S56, S57, S60, S61
		Facilitating	10	S1, S15, S17, S18, S22, S23, S39, S50, S51, S57
		Different	3	S1, S36, S44
		Informative	3	S9, S38, S61
		Important	3	S23, S27, S61
		Effective	2	S25, S38
		Creative	1	S61

As understood from the analysis of Table 35, most of the students (f=24) found the application "good" (f=24) and "helpful and beneficial" (f=19). And it is concluded that students need more "fun and enjoyment" in their lesson so that they found using the applications "fun and enjoyable" (f=10). Following extracts are taken from student reviews;

S40. "... a nice experience because it helped us a lot."
S24. ".... The lesson was so funny. There was no negative thing for this lesson."
S55. ".... The computer assisted English program was very good."

Table 36. Students' Emotions about the Process

Them	Codes	Sub-codes	f	Students
Positive view 2	Students' emotions About the process [Total f : 18]	Like	10	S3, S17, S18, S19, S20, S21, S23, S32, S38, S60
		Happy	6	S4, S6, S20, S40, S48, S2
		Grateful	2	S9, S38

When Table 36 was examined, the study group revealed that they "liked" the applications (f=10) and they felt "happy" using the applications (f=6).

S18. " ..... it was a nice lesson. I was so happy and I worked hard for English lesson."
S36. "..... It was very beneficial for me. I liked the study so much. I wish it would never end."

Table 37. Students' Views on the Outcomes of the Implementation

Themes	Codes	Sub-codes	f	Students
Positive view 3	Outcomes of application [Total f : 51]	More/new vocabulary	22	S5, S7, S8, S9, S11, S15, S16, S18, S21, S26, S31, S33, S34, S35, S37,S38, S39, S40, S43, S46, S53, S59
		Improve English	13	S4, S10, S11, S14, S20, S27, S29, S42, S45, S48, S57, S58, S62
		Success in grades	13	S4, S5, S7, S9, S18, S27, S36, S44, S50, S51, S57, S58, S62
		Speaking	2	S9, S10
		Make use of vocabulary	1	S48

In Table 37, the study group's answers to the question showed that they benefited from using the applications by saying that they learned "more vocabulary" (f=22) and the

applications helped them "improve their English" (f=13) and also they became "more successful" (f=13).

> S4. ".... I have improved my knowledge of English words. My success in English lesson has increased."
> S9. ".... thanks to this study, we became successful in English lesson."

Table 38. Students' Views on Additional Effects

Them	Codes	Sub-codes	f	Students
Other Positive views	Additional effects [Total f : 13]	Usage of computer	5	S8,S41,S19, S55, S61,
		Views on researcher [Total f : 5]	5	S26, S37, S47, S48, S55
		Replication of the implementation [Total f : 3]	3	S9, S35, S36

In Table 38, the study group took it very seriously and answered the question in so many details that their answers could not be evaluated in three topics. Other positive views they expressed showed that they were interested in using technology for educational purposes (f=5).

> S35 ".... I would like to attend if it is implemented again. I thank all the teachers that helped us. They taught us so many words."

Table 39. Sources of Students' Negative Views about the Process

	Codes	f	Students
Negative Views	Boring	5	S37, S48, S50, S53, S62
	Participation	3	S47, S55, S56
	Too long	2	S45, S46
	Dislike of English	2	S54, S60
	Tiring	1	S48
	Usability of the program	1	S52
	Exposure to radiation	1	S53
	Preference of blackboard	1	S53
	Consumption of electricity	1	S55
	Too many repetitions	1	S44

As seen in Table 39, although most of the study group's reviews were positive, there were some negative reviews, too. Because of their attitude against language learning or computer use, they found the applications "boring" (f=5). Some members of the study group expressed viewpoints not related to education or the research applications such as "electricity consumption" or "exposure to radiation".

> S54. ".... but I do not like English so much and I did not enjoy so much."
> S37. ".... but sometimes it was boring because we repeated the words again and again."

CHAPTER 5

DISCUSSION AND CONCLUSION

5.1. Introduction

Computer assisted language learning is currently the most innovative medium for practicing foreign or second language teaching and learning. The results of this study support this belief. From an educational point of view, the role of computers and the Internet in promoting a student-centred way of learning seems to have been regarded as crucial by stakeholders in education (Hu and Deng, 2007)

Integrating a diversity of language learning strategies into classes is proven to enhance learners' opportunities for developing their skills in language acquisition. The results of this study support the implementation of strategies where learners are empowered to practice their language skills. After continuous practice and having a repository of learning strategies, learners are to be able to use the most appropriate strategy to resolve their problems in their language learning environment (Naimie, Abuzaid, Siraj, Shagholi and Hejaili, 2010).

Being one of the subdivisions of language learning strategies, vocabulary learning strategies cannot be excluded from this crucial repository of strategies. Learners should have a basic knowledge of these strategies, some of which will benefit them in their vocabulary learning. Hence, the current study determined which vocabulary learning strategies language learners prefer, how frequently they use these strategies and to what extent computer assisted applications affect vocabulary learning.

In order to actualise these learning objectives, a vocabulary learning strategy scale and computer assisted vocabulary teaching instruments were developed by the researcher.

Therefore, the study included a design, an implementation, and data analysis processes. The vocabulary learning strategy scale was used to determine the learners' strategy preferences for vocabulary learning.

Vocabulary learning strategies pre and post-scale conducted on 68 participants revealed that they preferred metacognitive strategies most. It can be deduced from the statistical results that metacognitive strategies were preferred more while cognitive and compensation strategies were less favoured by 68 participants. When the contribution of the software and game-based applications to the vocabulary learning was evaluated, a significant increase was observed in achievement scores.

The current study with 68 participants revealed that there was no statistically significant difference between the mean scores of pre-scale and post-scale of memory, cognitive, metacognitive, affective, and social strategies while a significant difference was found between the mean scores of pre-scale and post-scale of compensation strategies.

The feedback from the learners about the benefits of the Game and software applications showed results parallel to the statistical outcomes. The student feedback indicated learners found the implementation through CAVI instruments satisfactory and beneficial. The role of the teachers cannot be ignored in scaffolding the learners as the participants had a very limited knowledge of using computers. Some participants worked on a computer for the first time. However, almost all the participants spoke of the value of using images in memorising concrete words by articulating that the use of visual imagery to support the process of learning unfamiliar vocabulary.

Teachers use different ways of teaching such as deep processing technique and rote learning. The advantages and disadvantages of these techniques should be discussed by the language teachers and a collaborative atmosphere forteachers should be created at

schools. It is recommended that through teacher training courses on this crucial issue, language or vocabulary learning can be enhanced in schools.

Teachers should have diverse competences in order to teach a foreign language in language classes such as using technological devices to make their lessons more attractive and enjoyable (Fotos & Browne, 2004). One of the teachers interviewed stated that she was against the use of technology outside school asserting that technology causes laziness in students. Some teachers are inclined to follow a teacher centered way of instruction which is regarded as boring by the learners (Nguyen & Khuat, 2003). On the other hand, one of the teachers seemed to be very keen on using technology in his classes. He expressed how he made use of technological aids such as getting the students to listen to lyrics, making Power Point presentations, and watching videos related to the content of the course book. It was observed during the implementation that participants were willing to study by means of computers and they were lining up in front of the computer laboratory before the English classes conducted by the researcher.

Another observation during the implementation was that students both competed with each other in learning the words faster and supported each other in the vocabulary learning process. This observation demonstrated that learners make use of social strategies even in a lab setting. Peer feedback and peer monitoring were the most common learning styles the participants demonstrated during the implementation process. Some participants desired to stay in the class even during the breaks to go on studying. These observations related to the CAVI applications ensured a positive impact on the participants in accordance with the previous research

The study conducted by Sarıçoban and Sarıcaoğlu (2008) for the purpose of identifying the strategies used by the students and the teachers in the School of Foreign

Languages at Erciyes University revealed that metacognitive and compensation strategies were the most favoured but affective strategies were the least favoured by the students.

An experimental study conducted by Hong-Nam and Leavell (2006) revealed that females employed learning strategies more frequently than males, who tended to use metacognitive and compensation strategies most, but affective strategies the least. In their studies, Chun-huan (2010) (as cited in Korkmaz, 2013) and Sarıçoban and Sarıcaoğlu (2008) found the same results that the learners were high frequency users of the compensation strategies and less frequency users of affective strategies. Oxford (1990) in agreement with the findings above states that compensation strategies are referred when the elimination of learning barriers to four skills is needed.

Female participants are reported using social and metacognitive strategies most and memory strategies the least. The results showing the male tendency of selecting strategies in this study are in line with the results that emerged in the current study.

The studies conducted by Demirel (2012), Chi-Him Tam (2013), Chang, Liu and Lee (2007), Alexandros (2012), Cohen (2011) on language learning strategies revealed that compensation strategies were most widely used by the participants. Saeb and Zamani (2013), Peacock and Ho (2003), Abu Radwan (2008), Yamini and Dehghan (2005) conducted studies on language learning strategies with different groups and found consistency in the statistical results and confirmed that more proficient learners use cognitive strategies followed by metacognitive and memory strategies.

Computer Assisted Vocabulary instruction has been regarded as one of the most widely used applications of CALL. Vocabulary learning and teaching have been a prior concern in Computer assisted language learning applications. Some studies (Tozcu & Coady, 2004; Eşit, 2007; Nakata, 2008; Kılıçkaya and Krajka, 2010; Lin, Chan & Hsiao.,

2011; Kayaoğlu, Akbaş &Öztürk 2011; Gorjian et al., 2011; Fehr et al., 2012) were conducted using measuring an instructional program while some others (Koçak, 1997; Özdemir, 2001; Tokaç, 2005; Cellat, 2008) (as cited in Başöz & Çubukcu, 2013) were based on comparing teacher-led instruction with computer assisted instruction.

As for conclusion, the results obtained from statistical findings were that software and games are useful tools for boosting a student's motivation for learning vocabulary. It is clear that learning can be more fun with the help of sound, picture and video, and these materials have a stimulating power on learners. CALL gives learners a chance of individual learning and motivates them to learn a foreign language. Interaction with a computer supports independent learning and learners are not judged in the event of mistakes. Teachers also have important roles in teaching learners how to make use of multimedia instrumentseffectively. One key aim of language teachers is make their students aware of the advantages of computer-assisted vocabulary learning.

The students' reflections supported the results of the experimental study which indicated that CAVI applications had a positive impact on their vocabulary learning. The students revealed that these applications were very informative and helpful for their success in English. The results gained from this content analysis proved that CAVI is an important part of language learning.

The observations in the current study proved that secondary school students may not be aware of technical terminology but they used many CALL integrated vocabulary learning strategies such as;

In the framework of *memory strategies* which is a sub-dimension of direct strategies, learners did a lot of reviewing, representing sounds in their memory, using imagery, and tried to remember the meaning of an unknown word.

In the framework of *cognitive strategies*, another sub-dimension of direct strategies, they kept vocabulary journals, did repetitions, practiced unknown words, used resources, translated, took notes, and wrote the unknown words down.

In the framework of other sub-dimension of direct strategies, *compensation strategies*, they practised the pronunciation of words by means of software, referred to electronic glossary, played vocabulary games, received help from their peers or classmates, used mime and gestures, switched to their mother tongue, and used other linguistic clues.

In the framework of indirect strategies, *metacognitive strategies,* learners evaluated their progresses, monitored themselves, set goals and objectives, paid attention to materials.

The second indirect strategy dealing with the emotions of the learners, *affective strategies*, involved lowering their anxiety since there was no intervention unless they needed help, rewarding themselves and taking risks wisely.

They cooperated with their classmates, asked questions to their classmates or teacher, asked for verification, clarification and correction, and competed with their classmates as a part of *social strategies*.

5.2. Implications

The current study proposes that developing word recognition or naming words in a multimedia environment is vital as traditional systems proved their uselessness in comparative studies. Thus, the main implication of this study is that vocabulary items can be taught effectively and efficiently with the help of well-designed educational software and educational games.

Underestimating the role of technology in educational systems is insensible. A number of developing countries try to integrate technology into their lives due to the fear of falling behind other countries. Another implication is to raise awareness for integrating computer assisted language learning with vocabulary learning strategies.In this study, it is asserted that CALL enables students to learn without time or place dependency. Software or game based learning provides privacy and a self regulated atmosphere for introverted and challenged learners. CALL and the Internet seem to be the best solution for learners who do not prefer competitive settings to actualise their learning.

5.3. Limitations

There are still limitations on the use of multimedia tools in vocabulary learning such as a shortage of qualified software, course books and language teachers who are capable of using technology in their classes.. For the researchers, investigating an issue which should be conducted in a laboratory is rather difficult since the MONE removed computer laboratories from schools and the existing computers in laboratories in many schools are not functional. As for the limitations of using strategies, Cohen, (1998) and Tseng, Dörnyei and Schmitt, N. (2006) underlined that strategy use cannot be easily observed since they are mental processes and depend on learner reports. Unfortunately, most of these reports have to be based on the reported preferences of young learners which may not reflect their actual use of strategies. The last limitation mentioned in the first chapter is regarding generalizability of the results. The nature of the study is limited for generalizability as it is based on vocabulary learning strategies, which give different results in different settings.

5.4. Recommendations for Further Studies

This study was conducted with a small group of secondary school students so research on bigger groups may reveal different or supportive results. A similar study can be replicated with a different group using more sophisticated vocabulary. It was difficult to train students on strategies but this kind of study can be conducted with a longer preparation period before implementation. Educational games and software can be supported by educational videos which cover the parallel vocabulary. The implementation was conducted for 2 class hours a week. However, applications longer than 2 class hours might be more fruitful and useful for the learners.

As mentioned in the limitations, language teachers who believe in the use of technology in their classes or laboratories should be given formal training on how to cope with minor software-based errors (Newhouse, 2002)(as cited in Bingimlas, 2009), This kind of training should be integrated into the curriculum since teachers in public schools are already overloaded and may not be willing to participate in such training sessions out of school time. Another concern voiced by the teachers in the study is that they are supposed to keep up with the curriculum so they feel obliged to stick to the course book. It is recommended that the MONE should revise class hours for English courses and increase the number of hours because students should be taught through not only one approach but through multiple channels.

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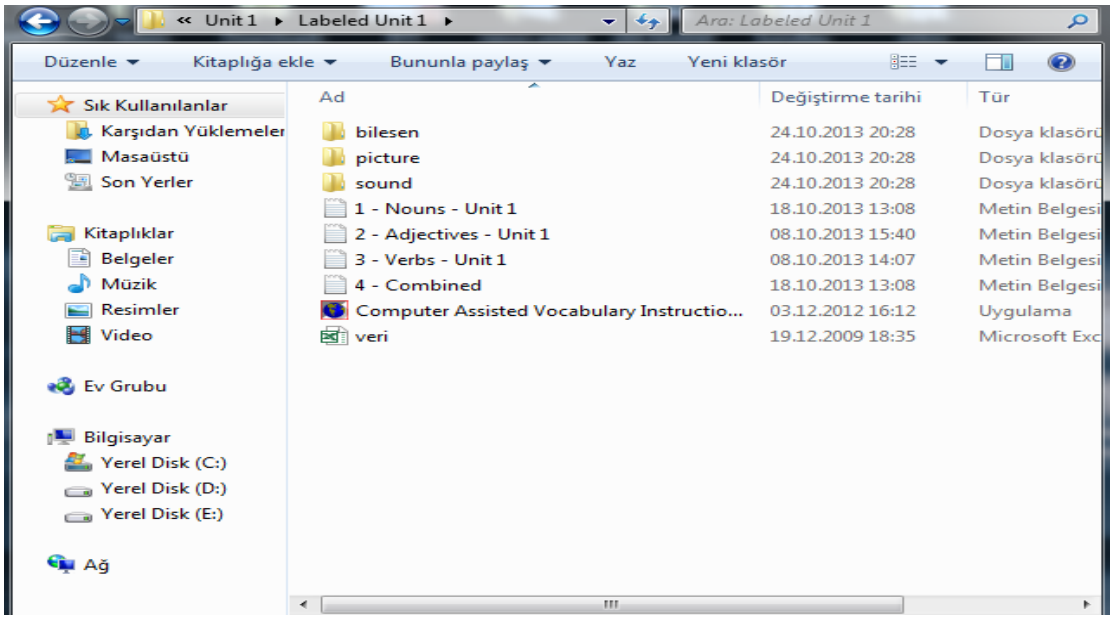
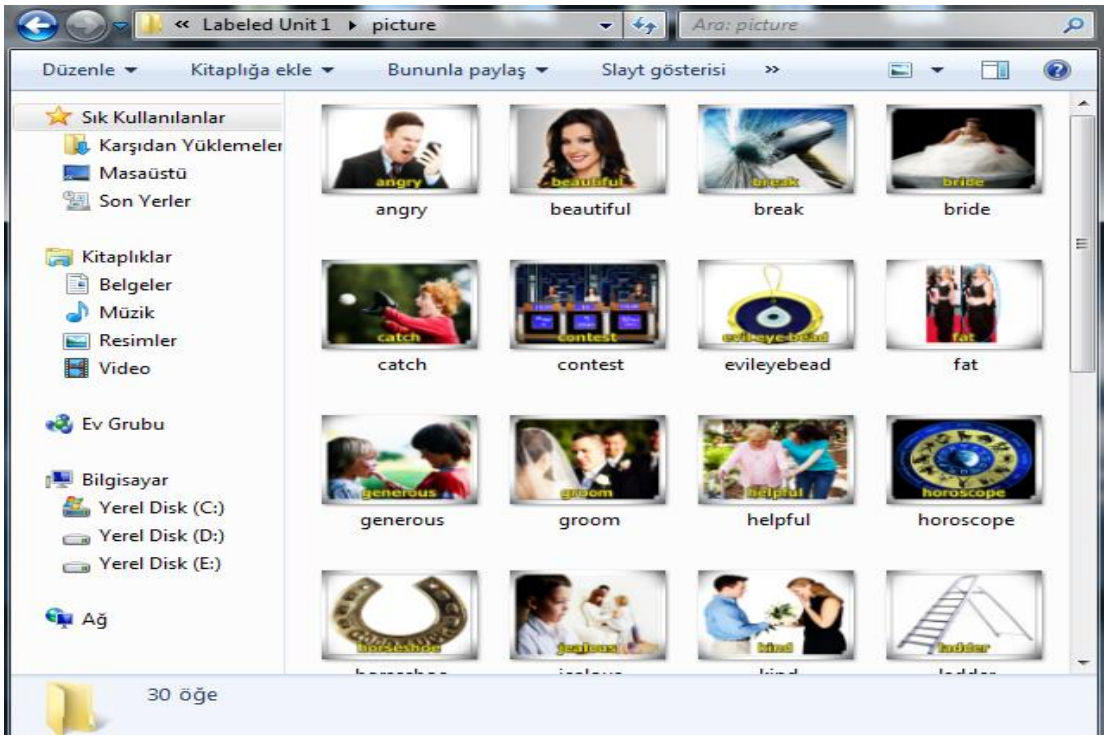
APPENDICES

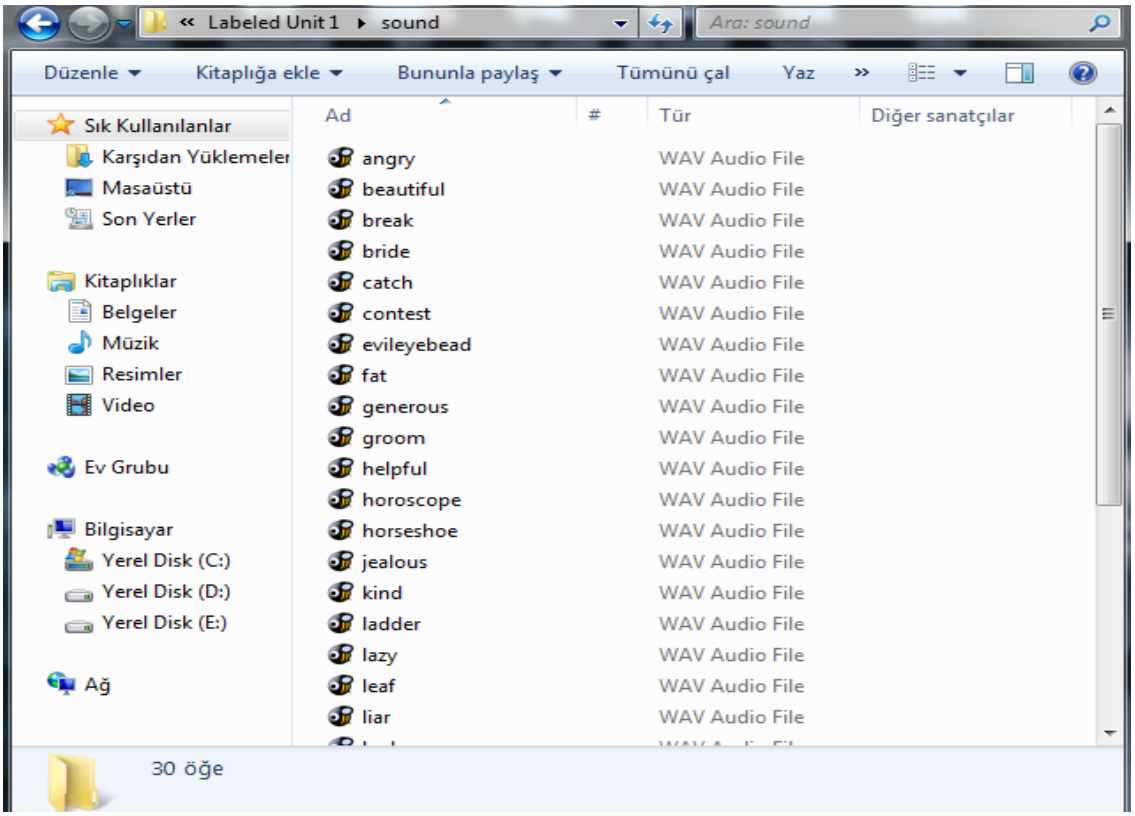
Appendix A. The Interface of the Software DENIS



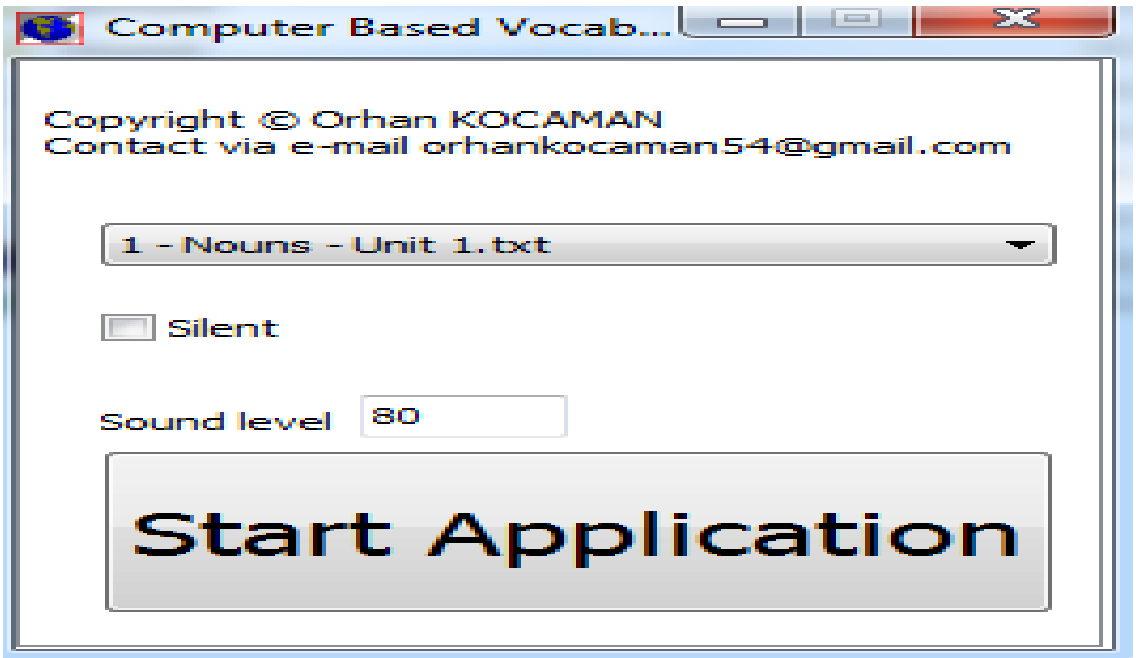
Appendix B. The Interface of the Software DENIS



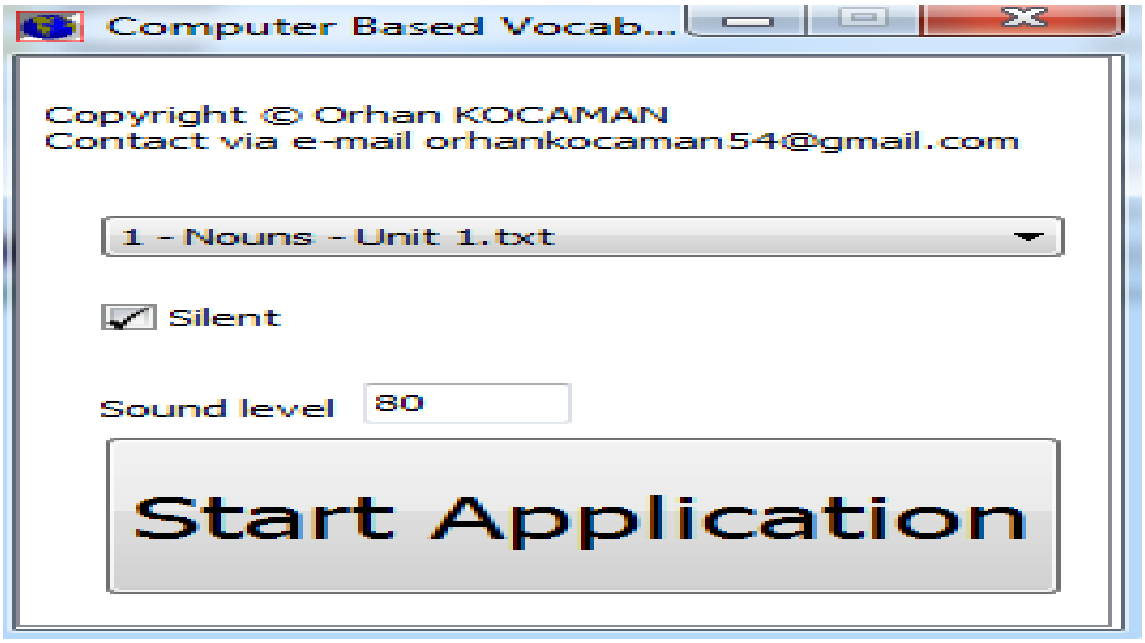
The Auditory Forms of the Vocabulary



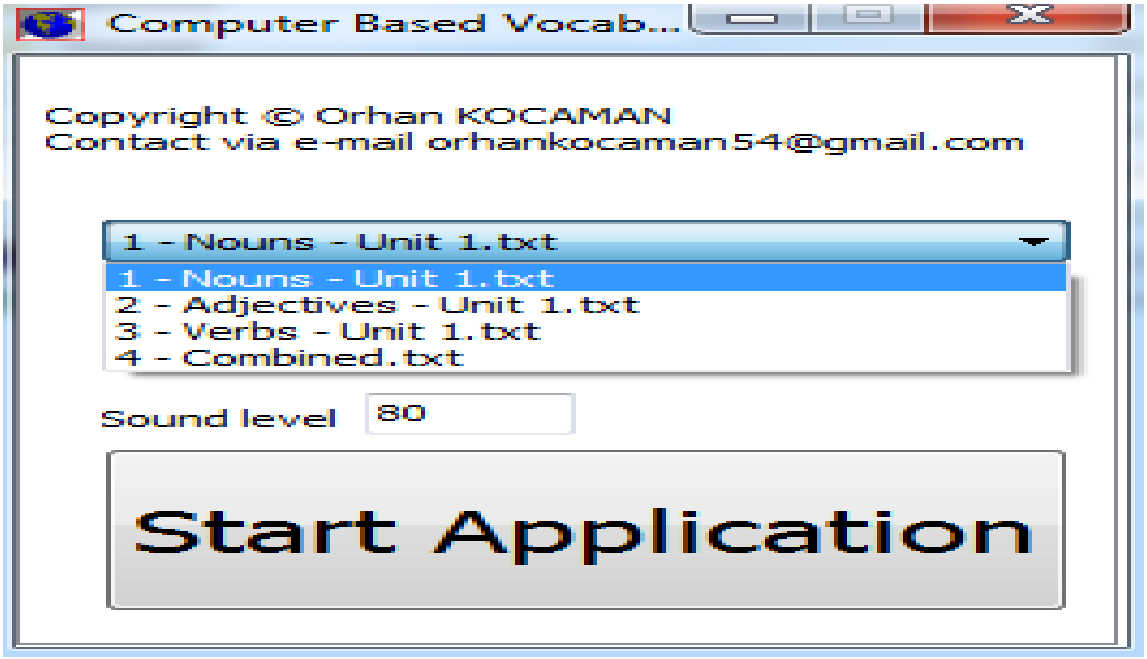
Appendix C. The Voiced Form of the Software DENIS



Appendix D. The Unvoiced Form of the Software DENIS



Appendix E. The Interface Related to Unit and Lexical Type Selection



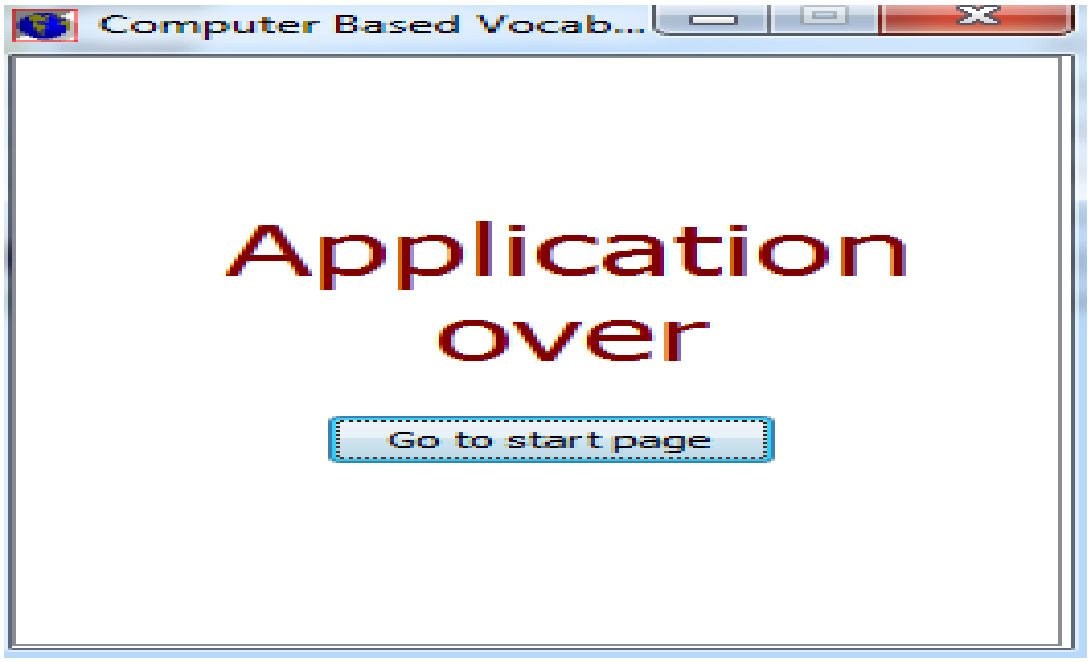
Appendix F. The Lexical Types in the Visual, Textual and Auditory Form

Appendix G. The Lexical Types in the Visual and Textual Form

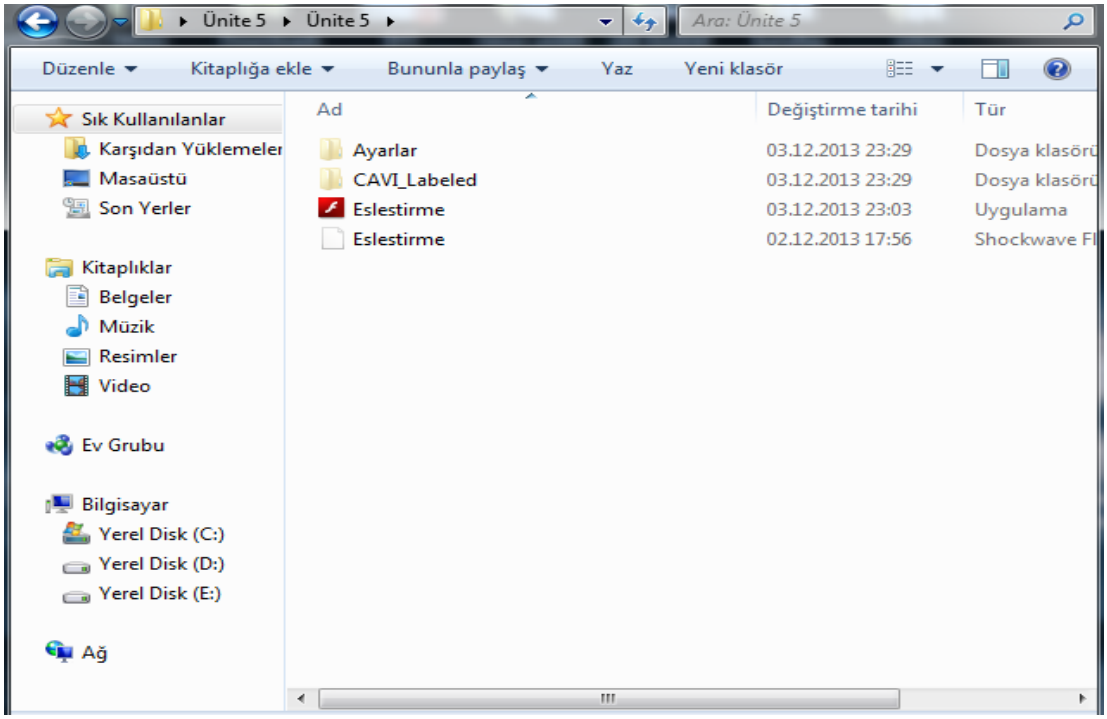
Appendix I. The Lexical Types in the Visual and Auditory Form

Appendix J. The Lexical Types in the Visual Form

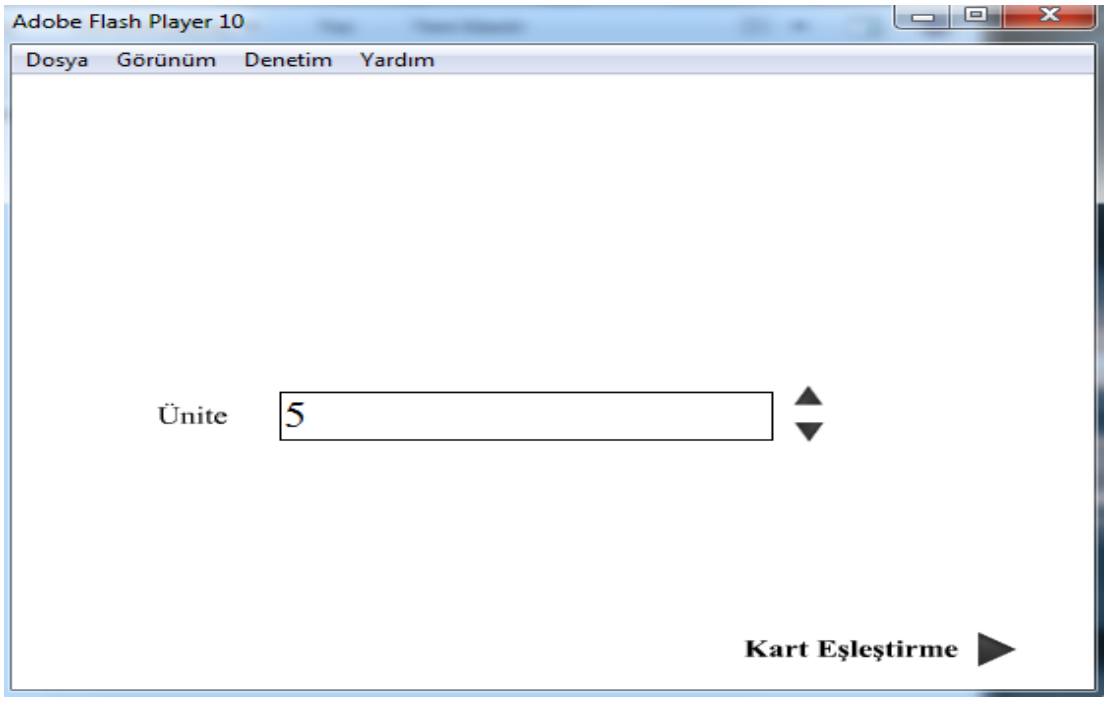
Appendix K. The Interface Showing the End of the Application



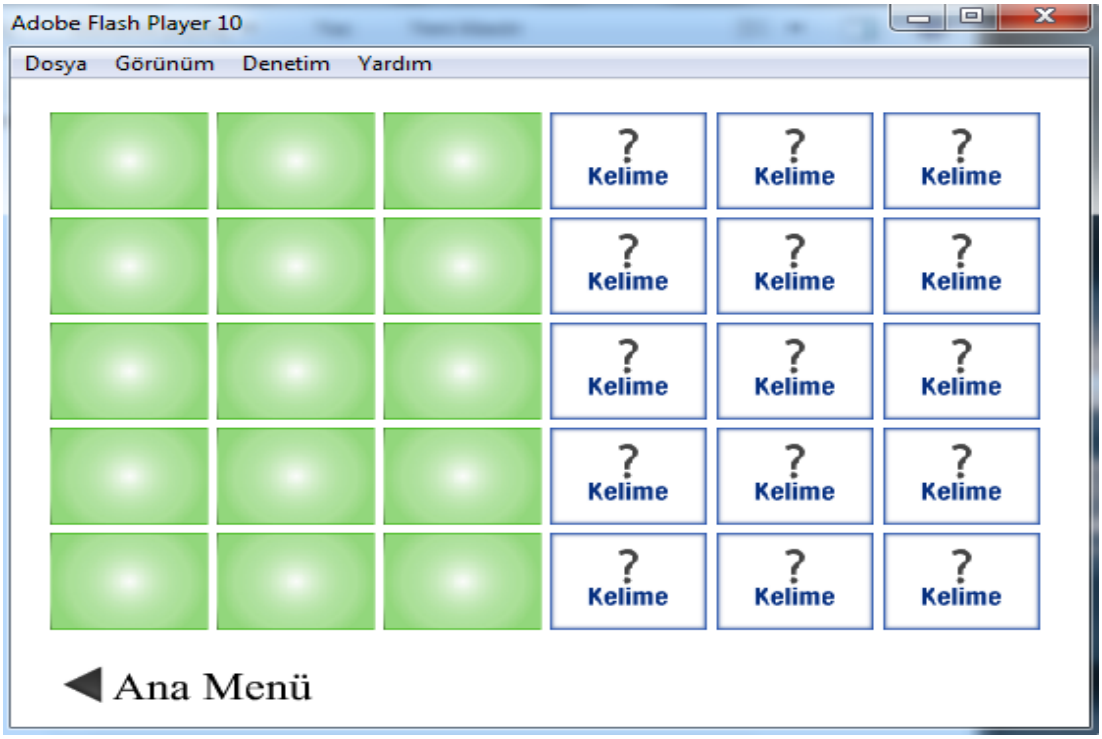
Appendix L. The Interface of the Flash CC Card Matching Game



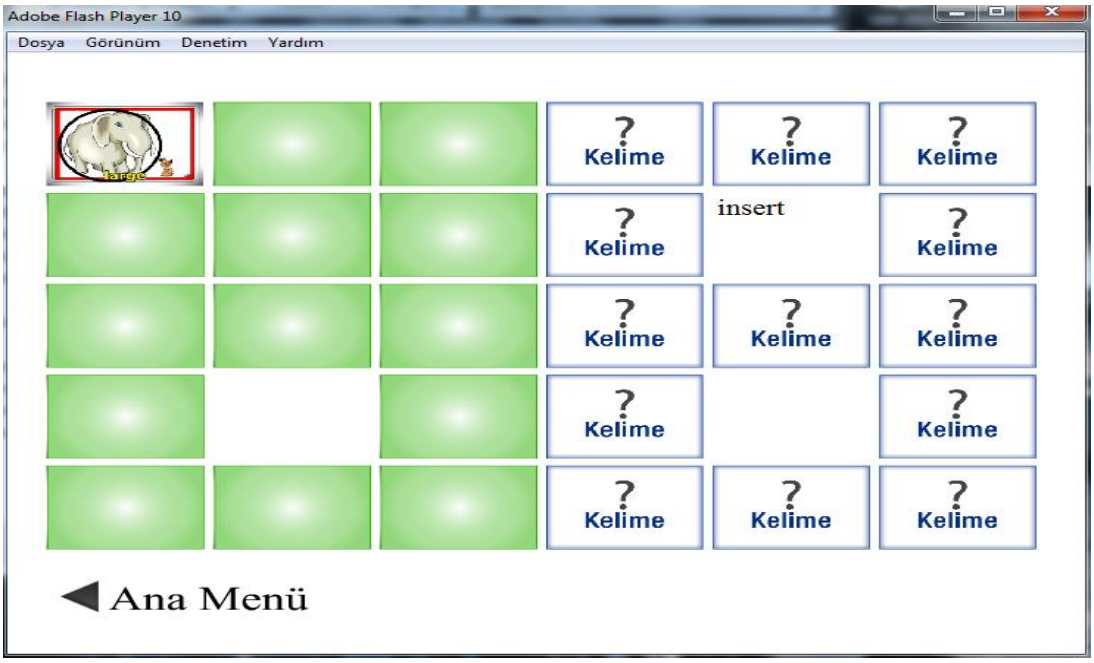
Appendix M. The Interface of the Flash CC Card Matching Game



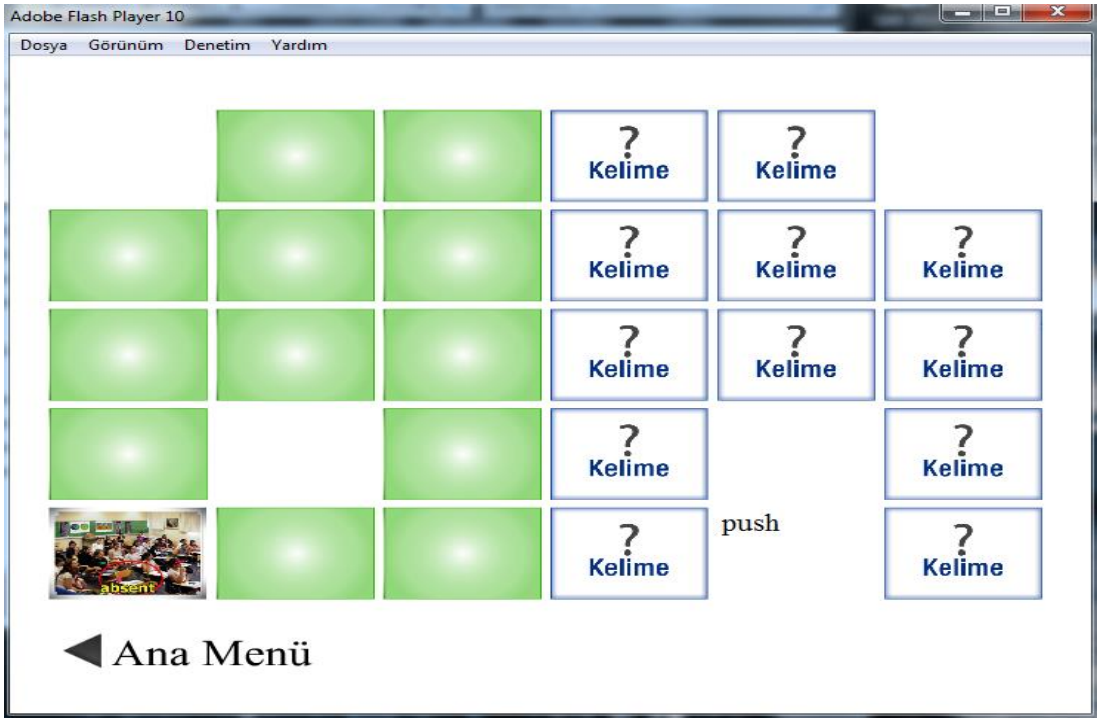
Appendix N. The Interface of the Flash CC Card Matching Game



Appendix O. The Interface of the Flash CC Card Matching Game



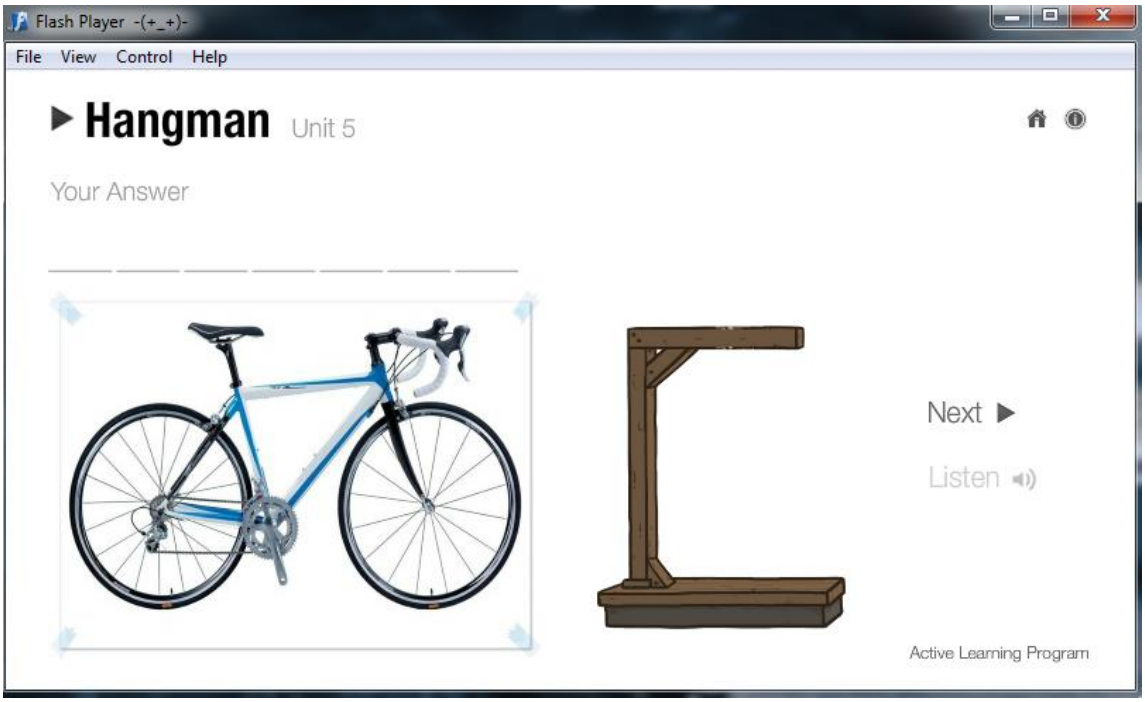
Appendix P. The Interface of the Flash CC Card Matching Game



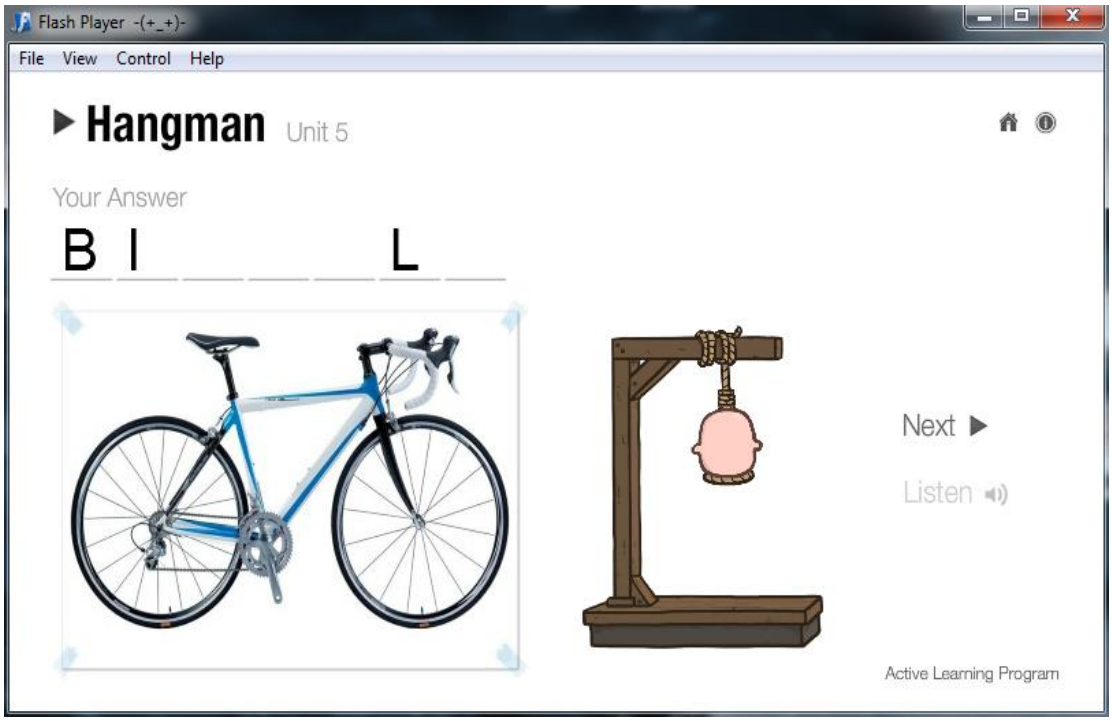
Appendix Q. The Interface of the Flash Hangman Game

Appendix R. The Interface of the Flash Hangman Game

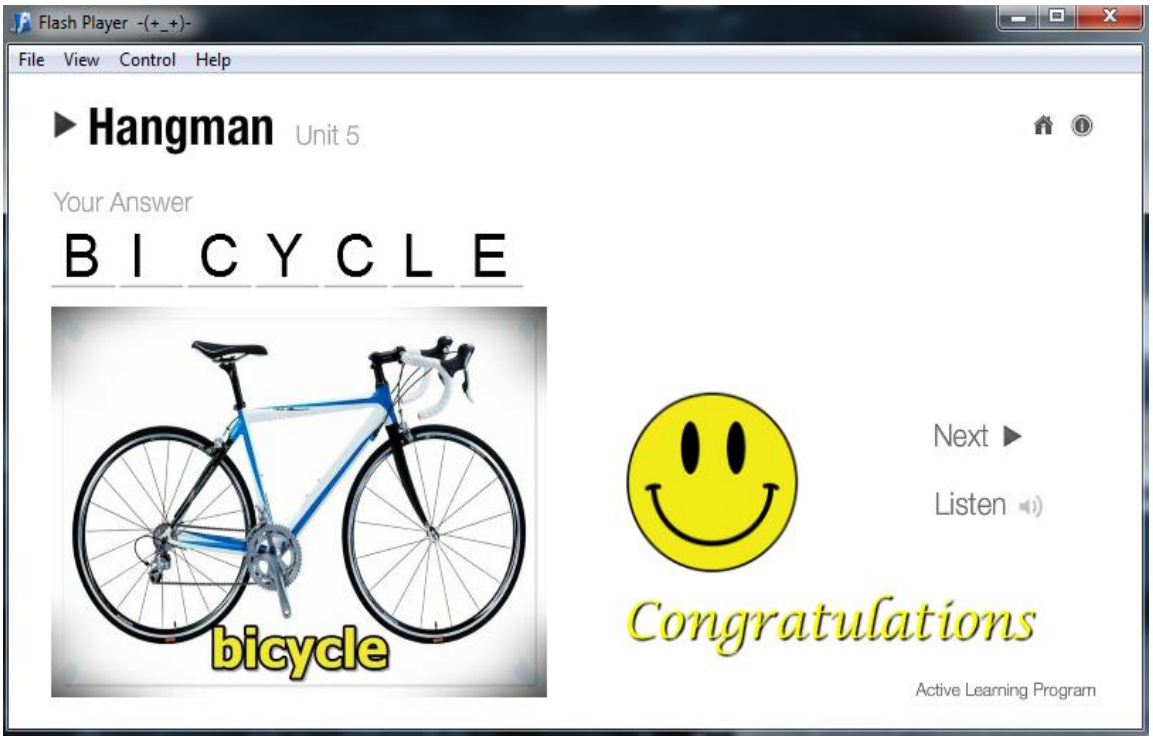
Appendix S. The Interface of the Flash Hangman Game



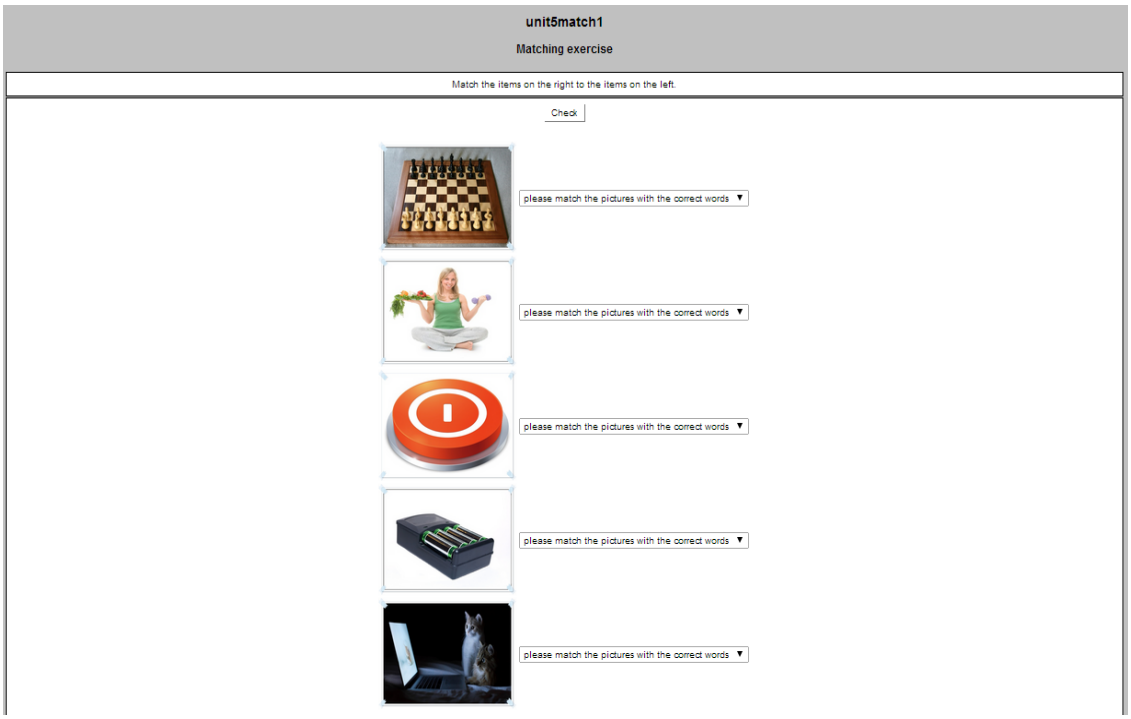
Appendix T. The Interface of the Flash Hangman Game



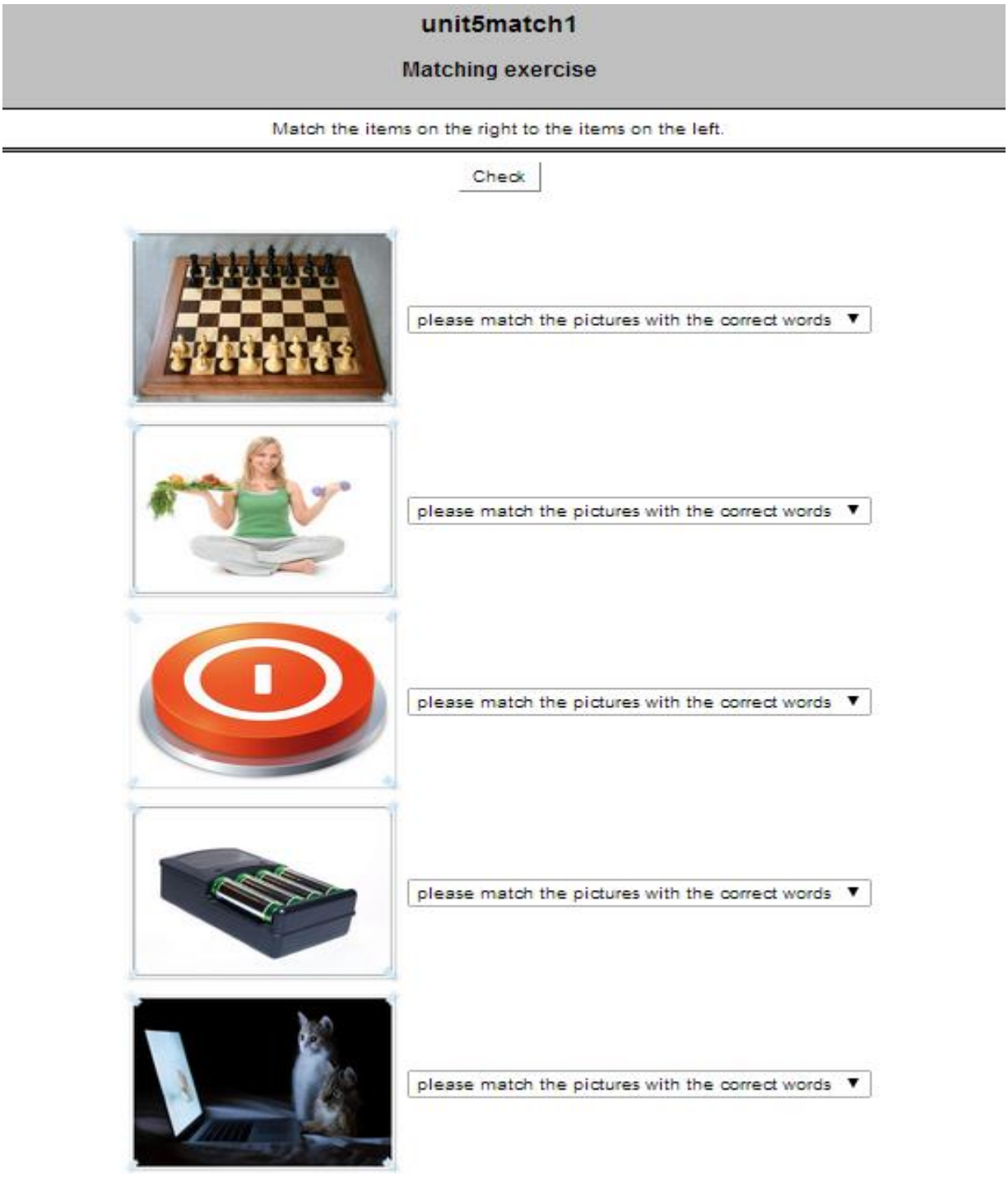
Appendix U. The Interface of the Flash Hangman Game



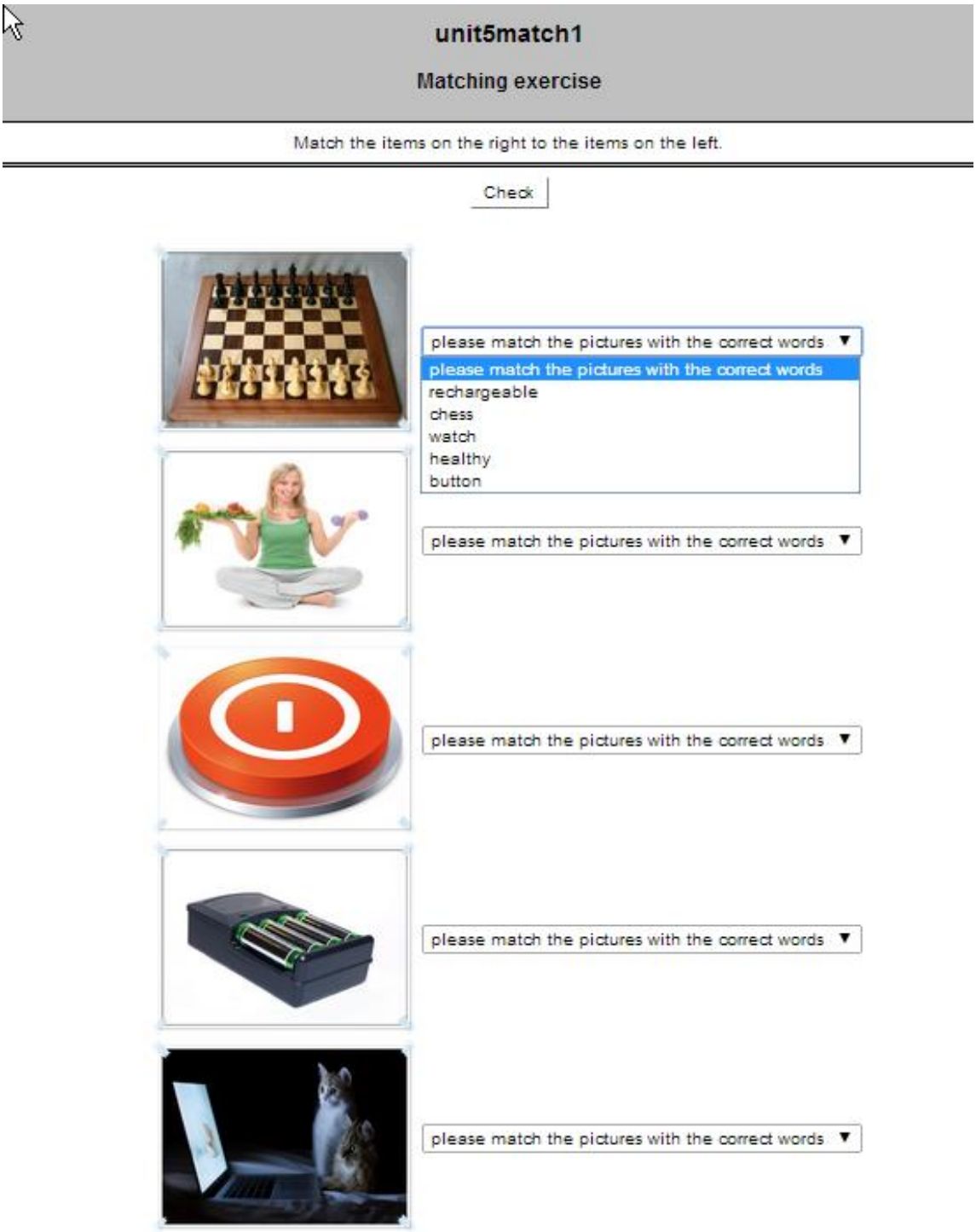
Appendix V. The Interface of the Hot Potatoes Matching Game



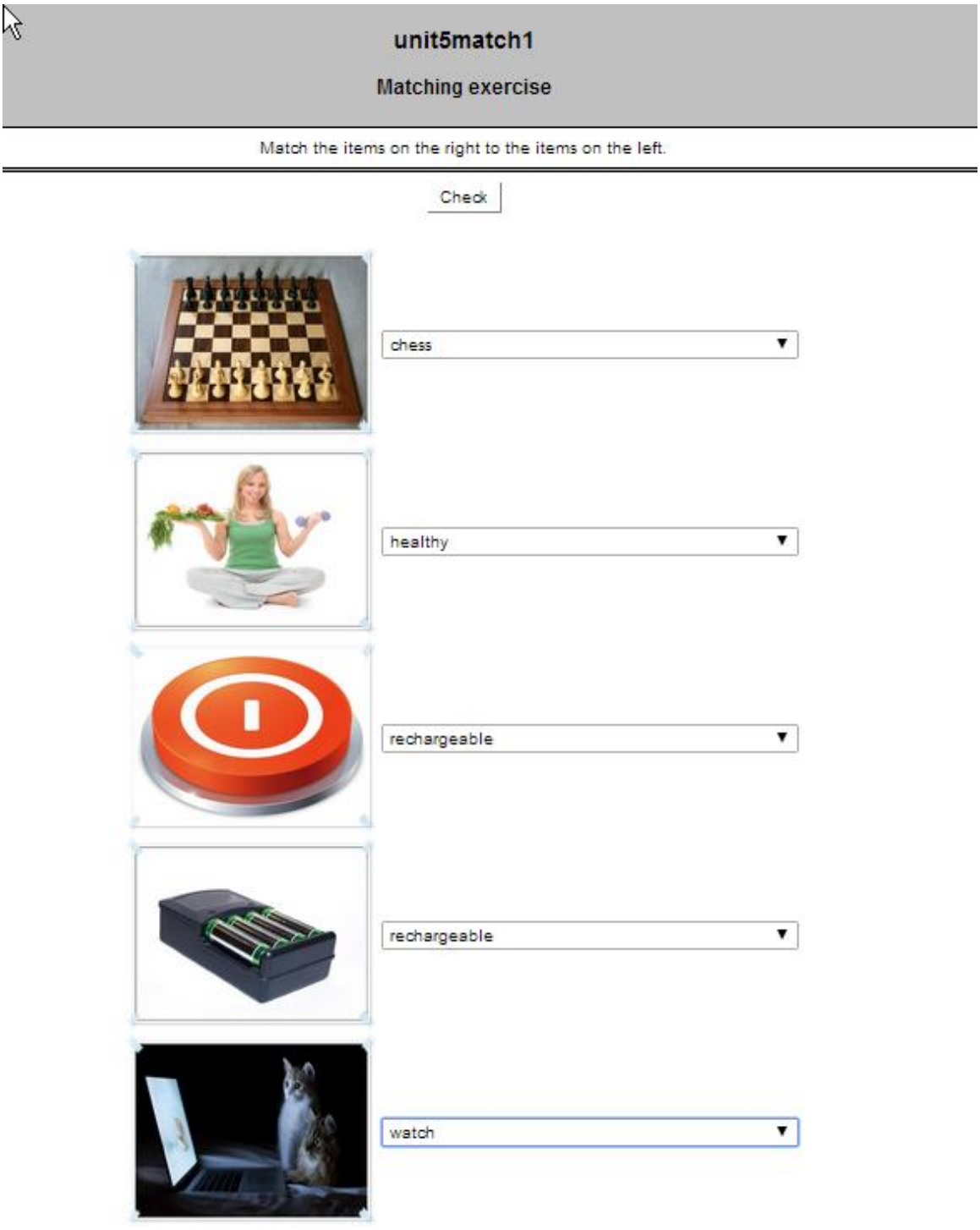
Appendix W.The Interface of the Hot Potatoes Matching Game



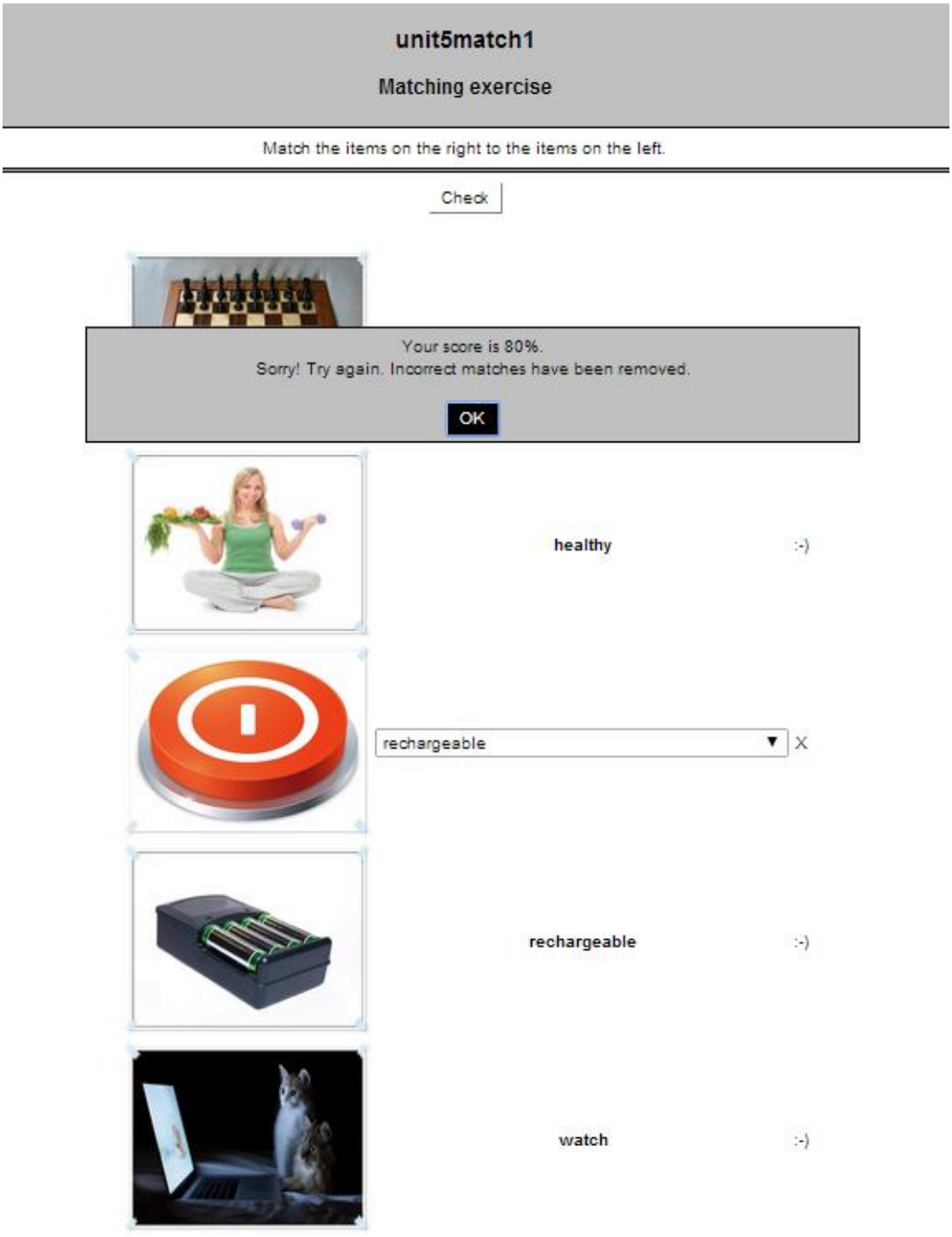
Appendix X. The Interface of the Hot Potatoes Matching Game With Choices



Appendix Y. The Interface of the Hot Potatoes Matching Game with answers

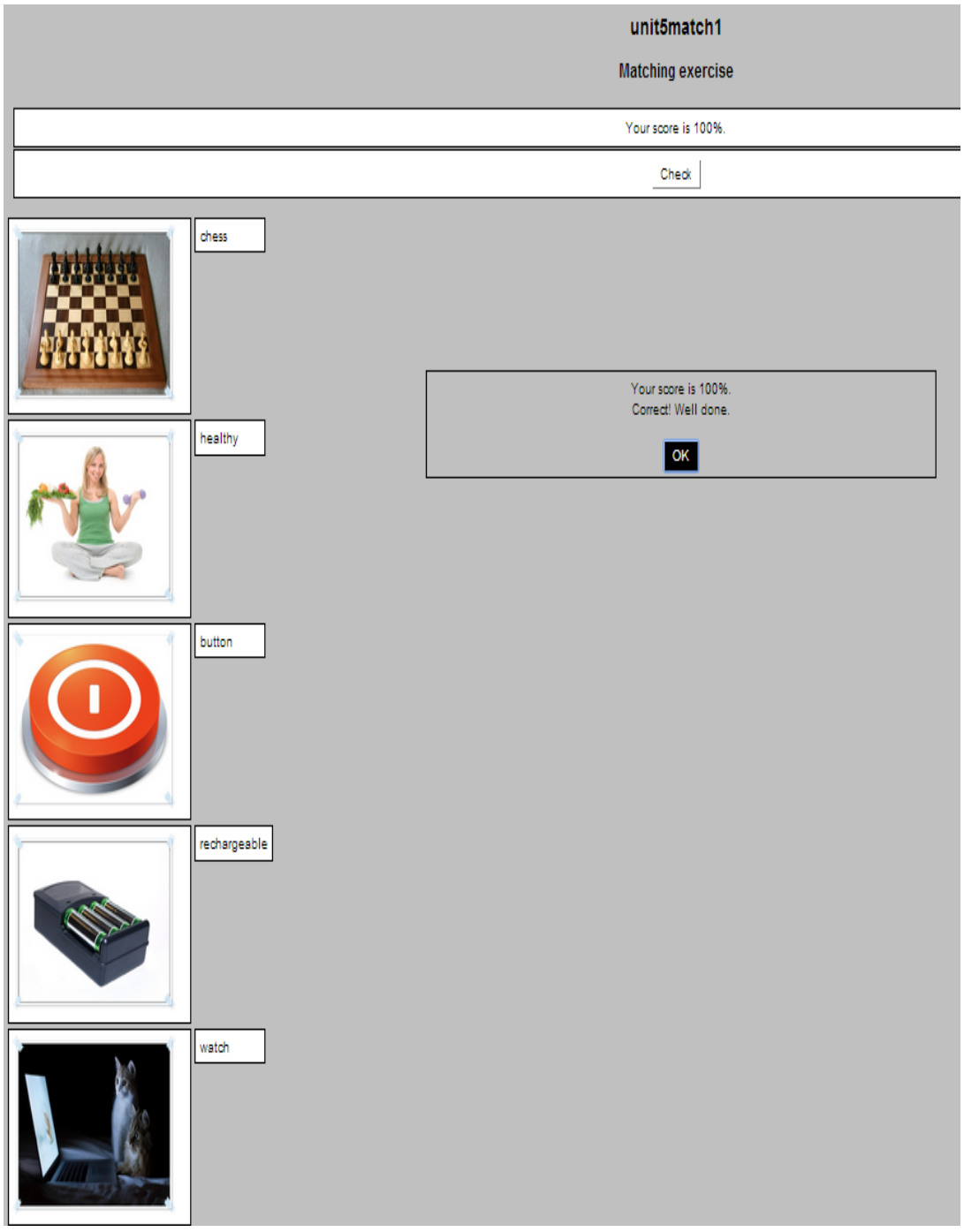


Appendix Z. The Interface of the Hot Potatoes Matching Game Checking Score



Appendix AA.The Interface of the Hot Potatoes Matching Game Drag and Drop

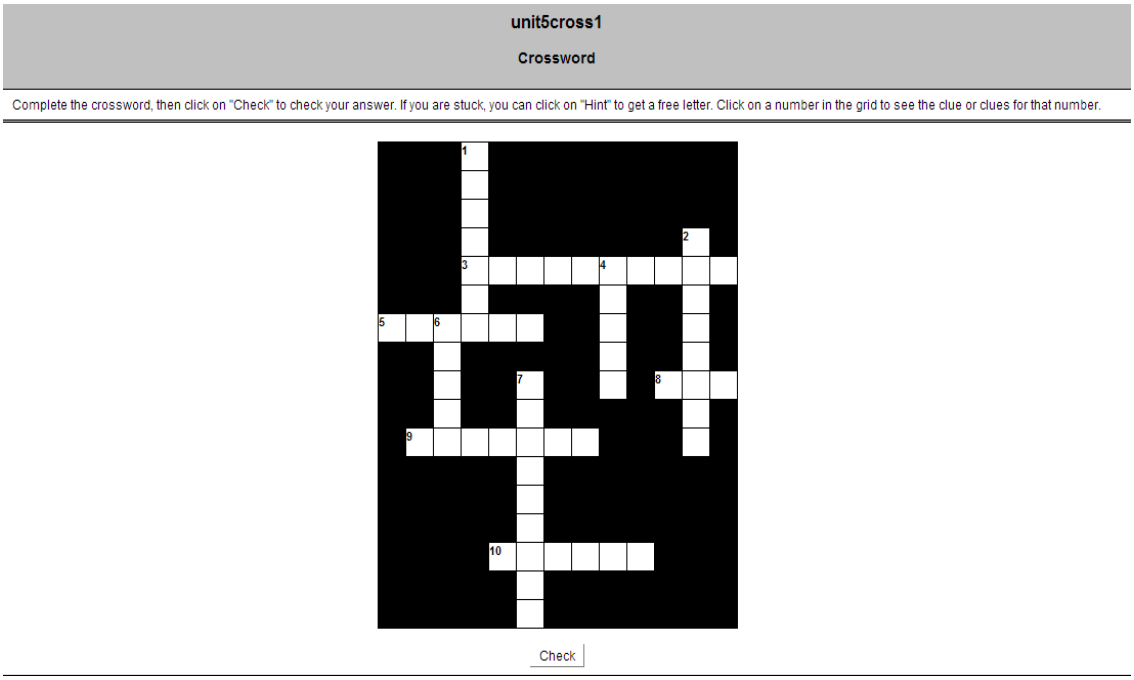
Appendix BB.The Interface of the Hot Potatoes Matching Game Drag and Drop with scoring.



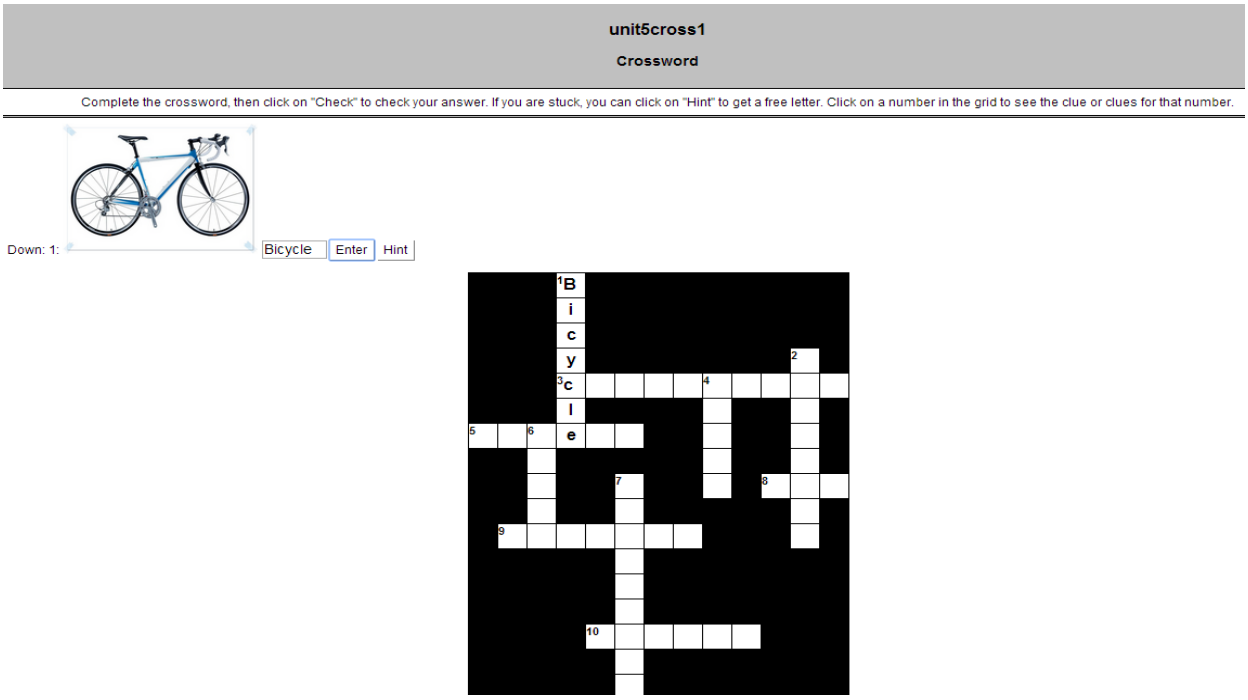
Appendix CC. The Interface of the Hot Potatoes Matching Game Flipping Cards

Appendix DD. The Interface of the Hot Potatoes Matching Game Flipping Cards

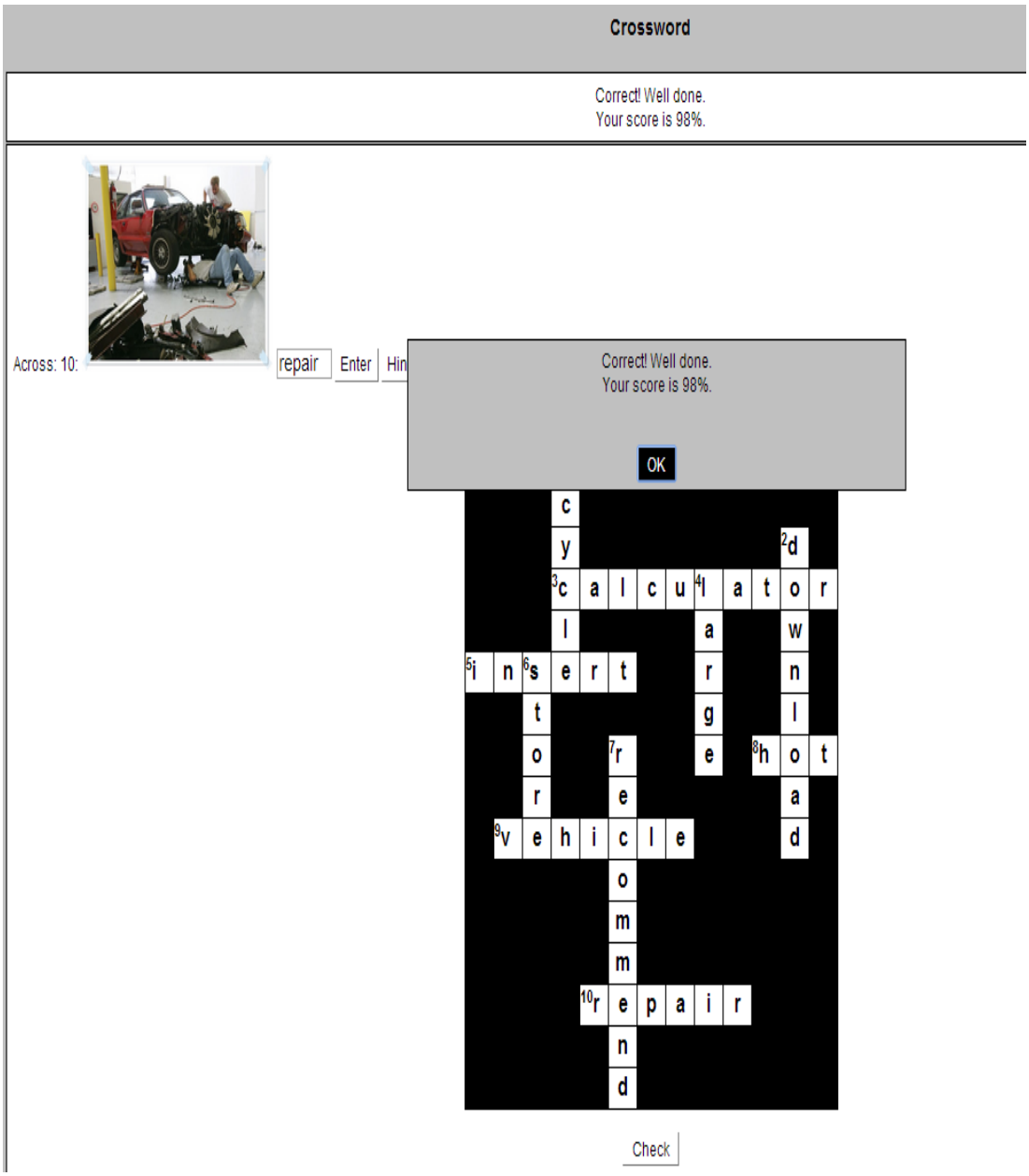
Appendix EE. The Interface of the Hot Potatoes Crosswords



Appendix FF. The Interface of the Hot Potatoes Crosswords



Appendix GG. The Interface of the Hot Potatoes Solved Crosswords



Appendix HH Achievement Test

1. Resim için doğru kelime aşağıdakilerden hangisidir?

a) living beings b) nature c) leaf d) deep

2. Resim için doğru kelime aşağıdakilerden hangisidir?

a) bead b) ladder c) supersitious d) horseshoe

3. Resim için doğru kelime aşağıdakilerden hangisidir?

a) lucky b)fortuneteller c) mirror d) optimistic

4. Resim için doğru kelime aşağıdakilerden hangisidir?

a) look up b) give c) turn on d) catch

5. Resim için doğru kelime aşağıdakilerden hangisidir?

a) break b) search c) turn off d) change

6. Resim için doğru kelime aşağıdakilerden hangisidir?

a) noisy b) lazy c) careless d) boring

7. Resim için doğru kelime aşağıdakilerden hangisidir?

a) expensiveb) hardworking c) selfish d) careful

8. Resim için doğru kelime aşağıdakilerden hangisidir?

a) train station b) flight c) airport d) car

9. Resim için doğru kelime aşağıdakilerden hangisidir?

a) hiking b) diving c) ice hockey d)bungee-jumping

10. Resim için doğru kelime aşağıdakilerden hangisidir?

a) monument b) clock tower c) industrial d) factory

11. Resim için doğru kelime aşağıdakilerden hangisidir?

a) quiet b) expensive c) noisy d) short

12. Resim için doğru kelime aşağıdakilerden hangisidir?

a)thin b) hardworking c) wet d) easy

13. Resim için doğru kelime aşağıdakilerden hangisidir?

a) carry b) take care c) seed) cook

14. Resim için doğru kelime aşağıdakilerden hangisidir?

a) cut down b) draw c) give d) cross

15. Resim için doğru kelime aşağıdakilerden hangisidir?

a) noisy b) percent c) generation d) crowded

16. Resim için doğru kelime aşağıdakilerden hangisidir?

a) colleague b) alone c) pearl d) parents

17. Resim için doğru kelime aşağıdakilerden hangisidir?

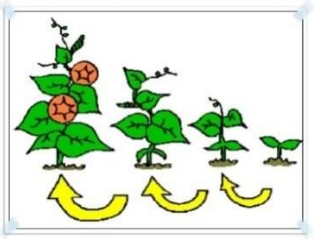
a) monument b) historic c) industrial d) screen

18. Resim için doğru kelime aşağıdakilerden hangisidir?

a) natural b) sea c) tent d) species

19. Resim için doğru kelime aşağıdakilerden hangisidir?

a) forest b) grow c) lake d) nature



20. Resim için doğru kelime aşağıdakilerden hangisidir?

a) change b) go through c) play d) telling the way

21. Resim için doğru kelime aşağıdakilerden hangisidir?

a) communicate b) screen c) monitor d) keyboard

22. Resim için doğru kelime aşağıdakilerden hangisidir?

a) devices b) mobile phone c) screen d) software

23. Resim için doğru kelime aşağıdakilerden hangisidir?

a) wasteb) past c) stamp d) crowded

24. Resim için doğru kelime aşağıdakilerden hangisidir?

a) quiet b) noisy c) tall d) beautiful

25. Resim için doğru kelime aşağıdakilerden hangisidir?

a) break b) read c) produce d) borrow

26. Resim için doğru kelime aşağıdakilerden hangisidir?

a) push b) give c) take d) break

27. Resim için doğru kelime aşağıdakilerden hangisidir?

a) moon b) briefcase c) flight d) audio

28. Resim için doğru kelime aşağıdakilerden hangisidir?

a) ruler b) table c) star d) ladder

29. Resim için doğru kelime aşağıdakilerden hangisidir?

a) rose b) mouse c) bride d) absent

30. Resim için doğru kelime aşağıdakilerden hangisidir?

a) healthy b) dangerous c) married d) careless

31. Resim için doğru kelime aşağıdakilerden hangisidir?

a) change b) go through c) push d) telling the way

32. Resim için doğru kelime aşağıdakilerden hangisidir?

a) turn leftb) do shopping c) play d) repair

33. Resim için doğru kelime aşağıdakilerden hangisidir?

a) equator b) star c) play d) nature

34. Resim için doğru kelime aşağıdakilerden hangisidir?

a) mess b) colleague c) lawyer d) telling the way

35. Resim için doğru kelime aşağıdakilerden hangisidir?

a) alone b) stingy c) large d) dangerous

36. Resim için doğru kelime aşağıdakilerden hangisidir?

a) expensiveb) luckyc) real d) lazy

37. Resim için doğru kelime aşağıdakilerden hangisidir?

a) grow b) come across c) play d) turn right

38. Resim için doğru kelime aşağıdakilerden hangisidir?

a) take off b) go through c) win d) arrive

39. Resim için doğru kelime aşağıdakilerden hangisidir?

a) pageb) clover c) bin d) moustache

40. Resim için doğru kelime aşağıdakilerden hangisidir?

a) devilb) cooker c) play d) cookie

41. Resim için doğru kelime aşağıdakilerden hangisidir?

a) cheapb) friendly c) large d) smart

42. Resim için doğru kelime aşağıdakilerden hangisidir?

a) strictb) thin c) tired d) fast

43. Resim için doğru kelime aşağıdakilerden hangisidir?

a) draw b) spend c) insert d) prefer

44. Resim için doğru kelime aşağıdakilerden hangisidir?

a) changeb) search c) develop d) write

45. Resim için doğru kelime aşağıdakilerden hangisidir?

a) flightb) architect c) beautiful d) calculator

46. Resim için doğru kelime aşağıdakilerden hangisidir?

a) stamp b) fog c) flag d) monument

47. Resim için doğru kelime aşağıdakilerden hangisidir?

a) colleagueb) cool c) warm d) printer

48. Resim için doğru kelime aşağıdakilerden hangisidir?

a) luckyb) complicated c) play d) wireless

49. Resim için doğru kelime aşağıdakilerden hangisidir?

a) carryb) introduce c) build d) discover

50. Resim için doğru kelime aşağıdakilerden hangisidir?

a) take off b) catch c) play d) produce

Appendix II. Memory Strategies for Language Learning

Memory Strategies	Creating mental linkages	Grouping
		Associating/elaborating
		Placing new words into a context
	Applying images and sounds	Using imagery
		Semantic mapping
		Using keyboards
		Representing sounds in memory
	Reviewing well	Structured reviewing
	Employing action	Using Physical response or sensation
		Using mechanical techniques

Appendix JJ. Cognitive Strategies for Language Learning

Cognitive Strategies	Practicing	Repeating
		Formally practicing with sounds and writing systems
		Recognizing and using formulas and patterns
		Recombining
		Practicing naturalistically
	Receiving and sending messages	Getting the idea quickly
		Using resources for receiving and sending messages
	Analyzing and reasoning	Reasoning deductively
		Analyzing expressions
		Analyzing contrastively (across languages)
		Translating
		Transferring
	Creating structure for input and output	Taking notes
		Summarizing
		Highlighting

Appendix KK. Compensation Strategies for Language Learning

Compensation Strategies	Guessing intelligently	Using linguistic clues
		Using other clues
	Overcoming limitations in speaking and writing	Switching to the mother tongue
		Getting help
		Using mime or gesture
		Avoiding communication partially or totally
		Selecting the topic
		Adjusting or approximating the message
		Coining words
		Using circumlocution or synonym

Appendix LL.Metacognitive Strategies for Language Learning

Metacognitive Strategies	Centering your learning	Overviewing and linking with already known material
		Paying attention
		Delaying speech production to focus on listening
	Arranging and planning your learning	Finding out about language learning
		Organizing
		Setting goals and objectives
		Identifying the purpose of a language task (purposeful listening/ reading/ speaking/ writing)
		Planning for a language task
		Seeking practice opportunities
	Evaluating your learning	Self-monitoring
		Self-evaluating

Appendix MM. Affective Strategies for Language Learning

Affective Strategies	Lowering your anxiety	Using progressive relaxation, deep breathing, or meditation
		Using music
		Using laughter
	Encouraging yourself	Making positive statements
		Taking risks wisely
		Rewarding yourself
	Taking your emotional temperature	Listening to your body
		Using checklist
		Writing a language learning diary
		Discussing your feelings with someone else

Appendix NN. Social Strategies for Language Learning

Social Strategies	Asking questions	Asking for clarification or verification
		Asking for correction
	Cooperating with others	Cooperating with peers
		Cooperating with proficient users of the new language
	Empathizing with others Asking questions	Developing cultural understanding
		Becoming aware of others' thoughts and feelings

Appendix OO. Means of Paired Samples Comparing Pre and Post Scales.

Item No	Items		M	n	SD	t	p
1	When I forget an English word, I try to remember its synonym.	Pre	3,18	68	1,158	1,138	,259
		Post	2,97	68	1,338		
2	I associate the English words I have learned before with the new ones.	Pre	3,03	68	1,393	-,587	,559
		Post	3,13	68	1,208		
3	In order to remember an English word, I visualise its picture in my mind.	Pre	3,66	68	1,217	-1,790	,078
		Post	3,99	68	1,252		
4	I associate the pronunciation of an English word I have recently learned with the pronunciation of an English word I know.	Pre	2,78	68	1,524	-,198	,844
		Post	2,82	68	1,445		
5	In order not to forget the English words I have recently learned, I always repeat them.	Pre	3,85	68	1,200	-1,043	,301
		Post	3,71	68	1,185		
6	I try to remember the meaning of an English word by visualizing it in my mind.	Pre	3,84	68	1,031	2,522	,014
		Post	3,38	68	1,339		
7	While learning English words, I try to learn them according to their lexical classes (noun, adjective, verb).	Pre	3,32	68	1,429	2,204	,031
		Post	2,84	68	1,512		
8	I try to learn English words by writing them on flashcards and carrying them in my pocket.	Pre	1,97	68	1,257	-,683	,497
		Post	2,09	68	1,401		
9	In order to remember English words, I stick the words to the places where I can see them.	Pre	2,29	68	1,497	,825	,412
		Post	2,13	68	1,303		
10	I prefer to learn the pronunciation of an English word by listening to it several times with the help of technology.	Pre	3,75	68	1,460	,414	,681
		Post	3,65	68	1,524		
11	While learning English words, I keep a vocabulary journal.	Pre	3,91	68	1,218	2,773	,007
		Post	3,40	68	1,426		
12	I study the English words I want to learn by writing them down.	Pre	2,63	68	1,434	-,076	,939
		Post	2,65	68	1,347		
13	I learn English words together with their synonyms or antonyms.	Pre	2,85	68	1,558	-1,081	,284
		Post	3,04	68	1,398		
14	While learning English words, I do various English vocabulary tests.	Pre	2,90	68	1,488	,200	,842
		Post	2,85	68	1,499		
15	I prefer to learn English words required for my classes with the help of technological programs.	Pre	2,43	68	1,418	-3,065	,003
		Post	3,18	68	1,486		
16	I prefer to learn English words required for my classes with the help of videos.	Pre	3,25	68	1,408	-1,250	,216
		Post	3,53	68	1,355		
17	I prefer to learn necessary English words for my classes with the help of technological games.	Pre	2,93	68	1,596	-3,335	,001
		Post	3,63	68	1,208		
18	While learning English words, I try to learn the pronunciation of the words along with the meanings.	Pre	4,22	68	1,063	,856	,395
		Post	4,07	68	1,213		
19	I try to find the most suitable method while learning English words.	Pre	3,69	68	1,225	-1,195	,236
		Post	3,88	68	1,228		
20	While learning English words, I stick to a plan.	Pre	3,57	68	1,226	,707	,482

		Post	3,44	68	1,309		
21	While learning English words, listening to music in the background helps me relax.	Pre	2,60	68	1,604	-1,687	,096
		Post	3,00	68	1,657		
22	When I learn English words, I reward myself.	Pre	3,01	68	1,430	,397	,693
		Post	2,94	68	1,423		
23	I feel happy when I learn English words.	Pre	4,19	68	1,175	2,014	,048
		Post	3,82	68	1,516		
24	I feel much more comfortable in class when I improve my English vocabulary knowledge.	Pre	4,01	68	1,203	,288	,774
		Post	3,97	68	1,079		
25	Our teacher encourages us to learn English words outside the classroom as well.	Pre	3,56	68	1,164	,971	,335
		Post	3,37	68	1,445		
26	While watching a video a movie, it attracts my attention when the words I know are used.	Pre	3,57	68	1,479	-,152	,879
		Post	3,60	68	1,488		
27	I ask my friends whether I correctly pronounce the English words I have recently learned.	Pre	3,38	68	1,316	,930	,356
		Post	3,19	68	1,448		
28	I ask my friends to correct me when I mispronounce the English words that I have recently learned.	Pre	3,31	68	1,319	,462	,646
		Post	3,21	68	1,451		
29	While trying to learn English words, I prefer working in a group.	Pre	2,81	68	1,458	,307	,760
		Post	2,75	68	1,520		
30	While learning English words, I need the assistance of my teacher.	Pre	3,63	68	1,118	1,488	,142
		Post	3,34	68	1,367		
31	While learning English words, I prefer working with the class to working individually.	Pre	3,00	68	1,466	-1,911	,060
		Post	3,44	68	1,408		
32	I learn English words better by competing with my friends.	Pre	3,49	68	1,560	,479	633
		Post	3,38	68	1,425		

Appendix PP. Means of Paired Samples Comparing Pre and Post Scales.

Item No	Items		M	n	SD	t	p
1	İngilizce bir kelimeyi unuttuğumda, eş anlamlısını hatırlamaya çalışırım.	Pre	3,18	68	1,158	1,138	,259
		Post	2,97	68	1,338		
2	Daha önce öğrenmiş olduğum İngilizce kelimeleri, yeni öğrendiğim kelimelerle ilişkilendiririm.	Pre	3,03	68	1,393	-,587	,559
		Post	3,13	68	1,208		
3	İngilizce bir kelimeyi hatırlamak için, o kelimenin resmini zihnimde canlandırırım.	Pre	3,66	68	1,217	-1,790	,078
		Post	3,99	68	1,252		
4	Yeni öğrendiğim İngilizce bir kelimenin söylenişini, bildiğim bir İngilizce kelimenin söylenişiyle eşleştiririm.	Pre	2,78	68	1,524	-,198	,844
		Post	2,82	68	1,445		
5	Öğrendiğim İngilizce kelimeleri unutmamak için sürekli tekrar ederim.	Pre	3,85	68	1,200	-1,043	,301
		Post	3,71	68	1,185		
6	İngilizce bir kelimenin anlamını, kelimeyi zihnimde canlandırarak hatırlamaya çalışırım.	Pre	3,84	68	1,031	2,522	,014
		Post	3,38	68	1,339		
7	İngilizce kelimeleri öğrenirken, türlerine (isim, sıfat, fiil) göre öğrenmeye çalışırım.	Pre	3,32	68	1,429	2,204	,031
		Post	2,84	68	1,512		
8	İngilizce kelimeleri kartlara yazıp, cebimde taşıyarak öğrenmeye çalışırım.	Pre	1,97	68	1,257	-,683	,497
		Post	2,09	68	1,401		
9	İngilizce kelimeleri hatırlamak için kelime kartlarını görebileceğim yerlere yapıştırırım.	Pre	2,29	68	1,497	,825	,412
		Post	2,13	68	1,303		
10	İngilizce bir kelimenin söylenişini teknoloji yardımıyla birkaç kez dinleyerek öğrenirim.	Pre	3,75	68	1,460	,414	,681
		Post	3,65	68	1,524		
11	İngilizce kelime öğrenirken kelime defteri tutarım.	Pre	3,91	68	1,218	2,773	,007
		Post	3,40	68	1,426		
12	Öğrenmek istediğim İngilizce kelimeleri not alarak çalışırım.	Pre	2,63	68	1,434	-,076	,939
		Post	2,65	68	1,347		
13	İngilizce kelimeleri eş veya zıt anlamlılarıyla birlikte öğrenirim	Pre	2,85	68	1,558	-1,081	,284
		Post	3,04	68	1,398		
14	İngilizce kelime öğrenirken, çeşitli İngilizce kelime testleri çözerim.	Pre	2,90	68	1,488	,200	,842
		Post	2,85	68	1,499		
15	Dersim için gerekli İngilizce kelimeleri teknolojik programlar yardımıyla öğrenmeyi tercih ederim.	Pre	2,43	68	1,418	-3,065	,003
		Post	3,18	68	1,486		
16	Dersim için gerekli İngilizce kelimeleri videolar yardımıyla öğrenmeyi tercih ederim.	Pre	3,25	68	1,408	-1,250	,216
		Post	3,53	68	1,355		
17	Dersim için gerekli İngilizce kelimeleri teknolojik oyunlar yardımıyla öğrenmeyi tercih ederim.	Pre	2,93	68	1,596	-3,335	,001
		Post	3,63	68	1,208		
18	İngilizce kelime öğrenirken, anlamlarıyla birlikte söylenişlerini de öğrenmeye	Pre	4,22	68	1,063	,856	,395
		Post	4,07	68	1,213		

	çalışırım.						
19	İngilizce kelime öğrenirken, en uygun yöntemi bulmaya çalışırım.	Pre	3,69	68	1,225	-1,195	,236
		Post	3,88	68	1,228		
20	İngilizce kelime öğrenirken, planlı bir şekilde çalışırım.	Pre	3,57	68	1,226	,707	,482
		Post	3,44	68	1,309		
21	İngilizce kelime öğrenirken arka planda müzik dinlemek beni rahatlatır.	Pre	2,60	68	1,604	-1,687	,096
		Post	3,00	68	1,657		
22	İngilizce kelimeler öğrendiğimde kendimi ödüllendiririm.	Pre	3,01	68	1,430	,397	,693
		Post	2,94	68	1,423		
23	İngilizce kelimeler öğrendiğimde mutlu hissederim.	Pre	4,19	68	1,175	2,014	,048
		Post	3,82	68	1,516		
24	İngilizce kelime bilgimi artırdığımda, derste kendimi daha rahat hissederim.	Pre	4,01	68	1,203	,288	,774
		Post	3,97	68	1,079		
25	Öğretmenimiz ders dışında da İngilizce kelime öğrenmemiz için bizi heveslendirir.	Pre	3,56	68	1,164	,971	,335
		Post	3,37	68	1,445		
26	İngilizce bir video veya film izlerken bildiğim İngilizce kelimelerin kullanılması dikkatimi çeker.	Pre	3,57	68	1,479	-,152	,879
		Post	3,60	68	1,488		
27	Öğrendiğim İngilizce kelimeleri doğru söyleyip söylemediğimi arkadaşlarıma sorarım.	Pre	3,38	68	1,316	,930	,356
		Post	3,19	68	1,448		
28	Öğrendiğim İngilizce kelimeleri yanlış söylediğimde, arkadaşlarımdan düzeltmelerini isterim.	Pre	3,31	68	1,319	,462	,646
		Post	3,21	68	1,451		
29	İngilizce kelimeler öğrenmeye çalışırken grup çalışmasını tercih ederim.	Pre	2,81	68	1,458	,307	,760
		Post	2,75	68	1,520		
30	İngilizce kelime öğrenirken, öğretmenimin yardımına ihtiyaç duyarım.	Pre	3,63	68	1,118	1,488	,142
		Post	3,34	68	1,367		
31	İngilizce kelime öğrenirken, sınıfla çalışmayı bireysel çalışmalara tercih ederim	Pre	3,00	68	1,466	-1,911	,060
		Post	3,44	68	1,408		
32	İngilizce kelimeleri arkadaşlarımla yarışarak daha iyi öğrenirim.	Pre	3,49	68	1,560	,479	633
		Post	3,38	68	1,425		

Appendix QQ. English Vocabulary Learning Strategy Scale (In English)

English Vocabulary Learning Strategy Scale						
Name / Surname:						
Gender: [ ] Female [ ] Male						
Do you have a computer at home? [ ] Yes [ ] No						
Do you have the Internet access at home? [ ] Yes [ ] No						
Have you ever been tutored in English [ ] Yes [ ] No						
Have you ever taken a private English course? [ ] Yes [ ] No						
Which social media tool(s) do you use?						
Facebook [ ]						
Twitter [ ]						
Instagram [ ]						
Ask.Fm [ ]						
Other …….						
What is your purpose for using the Internet?						
Doing homework [ ]						
Studying [ ]						
Watching movies [ ]						
Chatting [ ]						
Playing games [ ]						
Other						
School: Gender: [ ] Female [ ] Male		Never	Rarely	Sometimes	Often	Always
1	When I forget an English word, I try to remember its synonym.					
2	I associate the English words I have learned before with the new ones.					
3	In order to remember an English word, I visualise its picture in my mind.					

4	I associate the pronunciation of an English word I have recently learned with the pronunciation of an English word I know.					
5	In order not to forget the English words I have recently learned, I always repeat them.					
6	I try to remember the meaning of an English word by visualizing it in my mind.					
7	While learning English words, I try to learn them according to their lexical classes (noun, adjective, verb).					
8	I try to learn English words by writing them on flashcards and carrying them in my pocket.					
9	In order to remember English words, I stick the words to the places where I can see them.					
10	I prefer to learn the pronunciation of an English word by listening to it several times with the help of technology.					
11	While learning English words, I keep a vocabulary journal.					
12	I study the English words I want to learn by writing them down.					
13	I learn English words together with their synonyms or antonyms.					
14	While learning English words, I do various English vocabulary tests.					
15	I prefer to learn English words required for my classes with the help of technological programs.					
16	I prefer to learn English words required for my classes with the help of videos.					
17	I prefer to learn necessary English words for my classes with the help of technological games.					
18	While learning English words, I try to learn the pronunciation of the words along with the meanings.					
19	I try to find the most suitable method while learning English words.					
20	While learning English words, I stick to a plan.					
21	While learning English words, listening to music in the background helps me relax.					

22	When I learn English words, I reward myself.					
23	I feel happy when I learn English words.					
24	I feel much more comfortable in class when I improve my English vocabulary knowledge.					
25	Our teacher encourages us to learn English words outside the classroom as well.					
26	While watching a video a movie, it attracts my attention when the words I know are used.					
27	I ask my friends whether I pronounce the English words I have recently learned correctly.					
28	I ask my friends to correct me when I mispronounce the English words that I have recently learned.					
29	While trying to learn English words, I prefer working in a group.					
30	While learning English words, I need the assistance of my teacher.					
31	While learning English words, I prefer working with the class to working individually.					
32	I learn English words better by competing with my friends.					

Appendix RR. English Vocabulary Learning Strategy Scale (In Turkish)

İngilizce Kelime Öğrenme Stratejileri Ölçeği						
Ad/Soyad:						
Cinsiyet: [ ] Kız [ ] Erkek						
Evinizde bilgisayar var mı? [ ] Evet [ ] Hayır						
Evinizde internet var mı? [ ] Evet [ ] Hayır						
Herhangi bir dil kursuna katıldınız mı? [ ] Evet [ ] Hayır						
İngilizce özel ders aldınız mı? [ ] Evet [ ] Hayır						
Sosyal Medya araçlarından hangilerini kullanırsınız?						
Facebook [ ]						
Tweeter [ ]						
Instagram [ ]						
Ask Fm [ ]						
Diğer …….						
İnterneti hangi amaçlarla kullanırsınız?						
Ödev yapma [ ]						
Ders çalışma [ ]						
Film seyretme [ ]						
Sohbet etme [ ]						
Oyun oynama [ ]						
Diğer						
Okulun Adı: Cinsiyet: [ ] Erkek [ ] Kız		Hiçbir zaman	Nadiren	Ara sıra	Çoğu zaman	Her zaman
1	İngilizce bir kelimeyi unuttuğumda, eş anlamlısını hatırlamaya çalışırım.					
2	Daha önce öğrenmiş olduğum İngilizce kelimeleri, yeni öğrendiğim kelimelerle ilişkilendiririm.					

3	İngilizce bir kelimeyi hatırlamak için, o kelimenin resmini zihnimde canlandırırım.					
4	Yeni öğrendiğim İngilizce bir kelimenin söylenişini, bildiğim bir İngilizce kelimenin söylenişiyle eşleştiririm.					
5	Öğrendiğim İngilizce kelimeleri unutmamak için sürekli tekrar ederim.					
6	İngilizce bir kelimenin anlamını, kelimeyi zihnimde canlandırarak hatırlamaya çalışırım.					
7	İngilizce kelimeleri öğrenirken, türlerine (isim, sıfat, fiil) göre öğrenmeye çalışırım.					
8	İngilizce kelimeleri kartlara yazıp, cebimde taşıyarak öğrenmeye çalışırım.					
9	İngilizce kelimeleri hatırlamak için kelime kartlarını görebileceğim yerlere yapıştırırım.					
10	İngilizce bir kelimenin söylenişini teknoloji yardımıyla birkaç kez dinleyerek öğrenirim.					
11	İngilizce kelime öğrenirken kelime defteri tutarım.					
12	Öğrenmek istediğim İngilizce kelimeleri not alarak çalışırım.					
13	İngilizce kelimeleri eş veya zıt anlamlılarıyla birlikte öğrenirim.					
14	İngilizce kelime öğrenirken, çeşitli İngilizce kelime testleri çözerim.					
15	Dersim için gerekli İngilizce kelimeleri teknolojik programlar yardımıyla öğrenmeyi tercih ederim.					
16	Dersim için gerekli İngilizce kelimeleri videolar yardımıyla öğrenmeyi tercih ederim.					
17	Dersim için gerekli İngilizce kelimeleri teknolojik oyunlar yardımıyla öğrenmeyi tercih ederim.					
18	İngilizce kelime öğrenirken, anlamlarıyla birlikte söylenişlerini de öğrenmeye çalışırım.					
19	İngilizce kelime öğrenirken, en uygun yöntemi bulmaya çalışırım.					
20	İngilizce kelime öğrenirken, planlı bir şekilde çalışırım.					

21	İngilizce kelime öğrenirken arka planda müzik dinlemek beni rahatlatır.					
22	İngilizce kelimeler öğrendiğimde kendimi ödüllendiririm.					
23	İngilizce kelimeler öğrendiğimde mutlu hissederim.					
24	İngilizce kelime bilgimi artırdığımda, derste kendimi daha rahat hissederim.					
25	Öğretmenimiz ders dışında da İngilizce kelime öğrenmemiz için bizi heveslendirir.					
26	İngilizce bir video veya film izlerken bildiğim İngilizce kelimelerin kullanılması dikkatimi çeker.					
27	Öğrendiğim İngilizce kelimeleri doğru söyleyip söylemediğimi arkadaşlarıma sorarım.					
28	Öğrendiğim İngilizce kelimeleri yanlış söylediğimde, arkadaşlarımdan düzeltmelerini isterim.					
29	İngilizce kelimeler öğrenmeye çalışırken grup çalışmasını tercih ederim.					
30	İngilizce kelime öğrenirken, öğretmenimin yardımına ihtiyaç duyarım.					
31	İngilizce kelime öğrenirken, sınıfla çalışmayı bireysel çalışmalara tercih ederim					
32	İngilizce kelimeleri arkadaşlarımla yarışarak daha iyi öğrenirim.					

Appendix SS. 52-Item Vocabulary Learning Strategies Scale (In English) (Modifications)

Developed scale number	52 item scale number	School: Gender: [ ] Female [ ] Male	Never	Rarely	Sometimes	Often	Always
1	**1**	When I forget an English word, I try to remember its synonym.					
2	**2**	I associate the English words I have learned before with the new ones.					
3	**3**	In order to remember an English word, I visualise its picture in my mind.					
4	**4**	I associate the pronunciation of an English word I have recently learned with the pronunciation of an English word I know.					
8	**5**	I try to learn English words by writing them on flashcards and carrying them in my pocket.					
5	**6**	In order not to forget the English words, I always repeat them.					
6	**7**	I try to remember the meaning of an English word by visualizing it in my mind.					
9	**8**	In order to remember English words, I stick the words to the places where I can see them.					
10	**9**	I prefer to learn the pronunciation of an English word by listening to it several times with the help of technology.					
	10	I learn an English word with its meaning in my mother tongue.	Removed after EFA				
11	**11**	While learning English words, I keep a vocabulary journal.					
	12	I learn an English word by comparing its pronunciation to the pronunciation of a word in my mother tongue.	Removed after EFA				
12	**13**	I study the English words I want to learn by writing them down.					

	14	I learn Turkish meanings of English words I do not know in a text by underlining them.	Removed after EFA				
13	**15**	I learn English words together with their synonyms and/or antonyms.					
	16	I learn an English word easier by studying with illustrated dictionary.	Removed after EFA				
14	**17**	While learning English words, I do various English vocabulary tests.					
	18	While learning English vocabulary, I do not limit it with my assignments.	Removed after piloting study				
7	**19**	While learning English words, I try to learn them according to their lexical classes (noun, adjective, verb).					
	20	I ask someone the meaning of an English word I do not know when I need.	Removed after EFA				
	21	I try to learn the meaning of a word outside class that I could not learn in class.	Removed after EFA				
	22	I try to guess the meaning of an English word the spelling of which resembles a word in my mother tongue.	Removed after EFA				
	23	I find activities that I can study individually in order to learn new words in English.	Removed after EFA				
15	**24**	I prefer to learn English words required for my classes with the help of technological software.					
16	**25**	I prefer to learn English words required for my classes with the help of videos.					
17	**26**	I prefer to learn the necessary English words for my classes with the help of technologicalgames.					
18	**27**	While learning English words, I try to learn the pronunciation of the words along with the meanings					
	28	I set daily or weekly goals for myself while learning words in English.	Removed after EFA				
19	**29**	I try to find the most suitable method while learning English words.					
20	**30**	While learning English words, I stick to a plan.					
	31	In daily life, I try to create situations where I can practise English words that I have just learned.	Removed after EFA				

	32	I observe my learning process while learning new English words.	Removed after EFA				
	33	I evaluate my level of learning at certain intervals while trying to learn new English words.	Removed after EFA				
	34	Before attending my English class, I try to learn the meanings of the words I need to know.	Removed after EFA				
	35	I listen to English songs to learn new words.	Removed after EFA				
	36	I prefer learning new English words by the help of technology to other teaching methods.	Removed after CFA				
21	**37**	While learning English words, listening to music in the background helps me relax.					
	38	I motivate myself to learn new English words.	Removed after EFA				
22	**39**	When I learn English words, I reward myself.					
	40	Inappropriate environments prevent me from learning new English words.	Removed after EFA				
23	**41**	I feel happy when I learn English words.					
	42	I care how my friends feel about learning new words in English.	Removed after piloting study				
24	**43**	I feel much more comfortable in class when I improve my English vocabulary knowledge.					
25	**44**	Our teacher encourages us to learn English words outside the classroom as well.					
26	**45**	It attracts my attention when the words I know are used in a video or in a movie.					
27	**46**	I ask my friends whether I pronounce the English words I have recently learned correctly.					
28	**47**	I ask my friends to correct me when I mispronounce the English words that I have recently learned.					
29	**48**	While trying to learn English words, I prefer working in a group					
30	**49**	While learning English words, I need the assistance of my teacher					

	50	While learning new words in English, I prefer studying individually	Removed after EFA				
31	**51**	While learning English words, I prefer working with the class to working individually.					
32	**52**	I learn English words better by competing with my friends.					

Appendix TT. 52-Item Vocabulary Learning Strategies Scale (In Turkish) (Modifications)

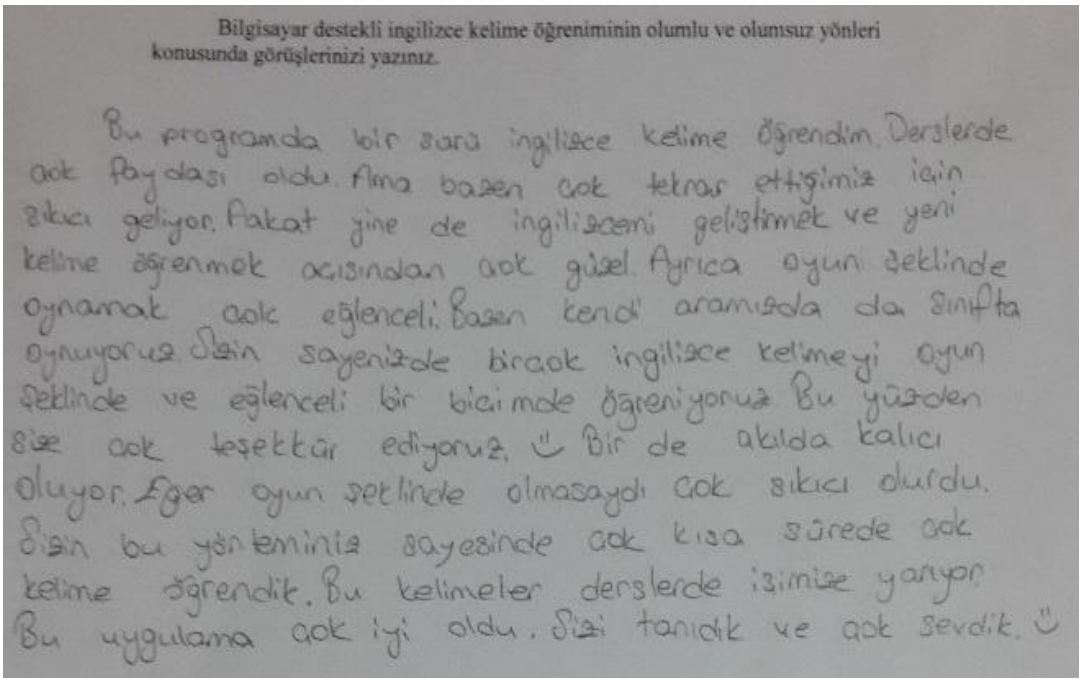
Geliştirilen Ölçek Numarası	52 maddelik Ölçek Numarası	Okul: Cinsiyet: [ ] Kız [ ] Erkek	Hiçbir zaman	Nadiren	Bazen	Sıklıkla	Daima
1	**1**	İngilizce bir kelimeyi unuttuğumda, eş anlamlısını aklıma getirerek hatırlamaya çalışırım.					
2	**2**	Daha önce öğrenmiş olduğum İngilizce kelimeleri, yeni öğrendiğim kelimelerle ilişkilendiririm.					
3	**3**	İngilizce bir kelimeyi hatırlamak için o kelimenin resmini zihnimde canlandırırım.					
4	**4**	Yeni öğrendiğim İngilizce bir kelimenin söylenişini bildiğim bir İngilizce kelimenin söylenişiyle eşleştiririm.					
6	**5**	İngilizce kelimeleri kartlara yazıp, cebimde taşıyarak öğrenmeye çalışırım.					
5	**6**	Yeni öğrendiğim İngilizce kelimeleri unutmamak için sürekli tekrar ederim.					
8	**7**	İngilizce bir kelimenin anlamını, kelimeyi zihnimde canlandırarak hatırlamaya çalışırım.					
9	**8**	İngilizce kelimeleri hatırlamak için kelime kartlarını görebileceğim yerlere yapıştırırım.					
13	**9**	İngilizce bir kelimenin söylenişini teknoloji yardımıyla birkaç kez dinleyerek öğrenirim.					
	10	İngilizce bir kelimeyi anadilimdeki (Türkçe) karşılığıyla birlikte öğrenirim.	AFA dan sonra çıkarıldı				
10	**11**	İngilizce kelime öğrenirken kelime defteri tutarım.					
	12	İngilizce bir kelimeyi anadilimdeki bir kelimenin söylenişini karşılaştırarak öğrenirim.	AFA dan sonra çıkarıldı				

11	**13**	Öğrenmek istediğim İngilizce kelimeleri not alarak çalışırım.					
	14	İngilizce bir metin içindeki bilmediğim kelimelerin altını çizerek, kelimelerin anadilimdeki karşılıklarını öğrenirim.	AFA dan sonra çıkarıldı				
12	**15**	İngilizce kelimeleri eş veya zıt anlamlılarıyla birlikte öğrenirim.					
	16	İngilizce bir kelimeyi resimli sözlükle çalışarak daha kolay öğrenirim.	AFA dan sonar çıkarıldı				
17	**17**	İngilizce kelime öğrenirken çeşitli İngilizce kelime testleri çözerim.					
	18	İngilizce kelime öğrenirken ödevlerimle sınırlı kalmam.	Pilot çalışmasından sonra çıkarıldı				
7	**19**	İngilizce kelimeleri öğrenirken, türlerine (isim, sıfat, fiil) göre öğrenmeye çalışırım.					
	20	Bilmediğim İngilizce bir kelimeyi, ihtiyaç duyduğumda birine sorarım.	AFA dan sonra çıkarıldı				
	21	Derste anlamını öğrenemediğim bir kelimeyi ders dışında öğrenmeye çalışırım.	AFA dan sonra çıkarıldı				
	22	Yazılışı ana dilimdeki bir kelimeye benzeyen, İngilizce bir kelimenin anlamını tahmin etmeye çalışırım. (television - televizyon)	AFA dan sonra çıkarıldı				
	23	İngilizce yeni kelimeler öğrenebilmek için, bireysel olarak çalışabileceğim aktiviteler bulurum.(Bulmaca vs.)	AFA dan sonra çıkarıldı				
14	**24**	Dersim için gerekli İngilizce kelimeleri teknolojik programlar yardımıyla öğrenmeyi tercih ederim.					
15	**25**	Dersim için gerekli İngilizce kelimeleri videolar yardımıyla öğrenmeyi tercih ederim.					
16	**26**	Dersim için gerekli İngilizce kelimeleri teknolojik oyunlar yardımıyla öğrenmeyi tercih ederim.					
18	**27**	İngilizce yeni kelimeleri öğrenirken anlamlarıyla birlikte söylenişlerini de öğrenmeye çalışırım.					
	28	İngilizce kelime öğrenirken kendime günlük ya da haftalık hedefler belirlerim.	AFA dan sonar çıkarıldı				
19	**29**	İngilizce yeni kelimeler öğrenirken en uygun yöntemi bulmaya çalışırım.					
20	**30**	İngilizce yeni kelimeler öğrenirken planlı bir şekilde çalışırım.					

	31	Yeni öğrendiğim İngilizce kelimeleri günlük hayatta kullanabileceğim ortamlar oluşturmaya çalışırım.	AFA dan sonra çıkarıldı				
	32	İngilizce yeni kelimeler öğrenirken öğrenme sürecimi gözlemlerim.	AFA dan sonra çıkarıldı				
	33	İngilizce yeni kelimeler öğrenmeye çalışırken belirli aralıklarla öğrenme düzeyimi değerlendiririm.	AFA dan sonra çıkarıldı				
	34	İngilizce dersinde bilmem gereken kelimelerin anlamlarını derse gitmeden önce öğrenmeye çalışırım.	AFA dan sonra çıkarıldı				
	35	İngilizce yeni kelimeler öğrenmek için o dilde şarkılar dinlerim.	AFA dan sonra çıkarıldı				
	36	Teknoloji yardımıyla İngilizce kelime öğrenmeyi, diğer öğretim yöntemlerine tercih ederim.	DFA dan sonra çıkarıldı				
21	**37**	İngilizce yeni kelimeler öğrenirken arka planda müzik dinlemek beni rahatlatır.					
	38	İngilizce yeni kelimeler öğrenmek için kendimi motive ederim.	AFA dan sonra çıkarıldı				
22	**39**	İngilizce yeni kelimeler öğrendiğimde kendimi ödüllendiririm.					
	40	Uygun olmayan ortamlar, İngilizce yeni kelimeler öğrenmemi engeller.	AFA dan sonra çıkarıldı				
23	**41**	İngilizce yeni kelimeler öğrendiğimde mutlu hissederim.					
	42	İngilizce yeni kelimeler öğrenme konusunda arkadaşlarımın ne hissettiğini önemserim.	Pilot çalışmasından sonra çıkarıldı				
24	**43**	İngilizce kelime bilgimi artırdığımda, derste kendimi daha rahat hissederim.					
25	**44**	Öğretmenimiz ders dışında da İngilizce kelime öğrenmemiz için bizi motive eder.					
26	**45**	İngilizce bir video veya film izlerken bildiğim İngilizce kelimelerin kullanılması dikkatimi çeker.					
27	**46**	Öğrendiğim İngilizce yeni kelimeleri doğru söyleyip söylemediğimi arkadaşlarıma sorarım.					
28	**47**	Öğrendiğim İngilizce yeni kelimeleri yanlış söylediğimde, arkadaşlarımdan düzeltmelerini isterim.					
29	**48**	İngilizce yeni kelimeler öğrenmeye çalışırken grup çalışmasını tercih ederim.					

30	**49**	İngilizce yeni kelimeler öğrenirken, öğretmenimin yardımına ihtiyaç duyarım.					
	50	İngilizce yeni kelimeler öğrenirken tek başıma çalışmayı tercih ederim.	AFA dan sonra çıkarıldı				
31	**51**	İngilizce kelime öğrenirken sınıf içi çalışmalarda, bireysel çalışmalardan daha iyi öğrenirim.					
32	**52**	İngilizce yeni kelimeleri rekabet ortamında daha iyi öğrenirim.					

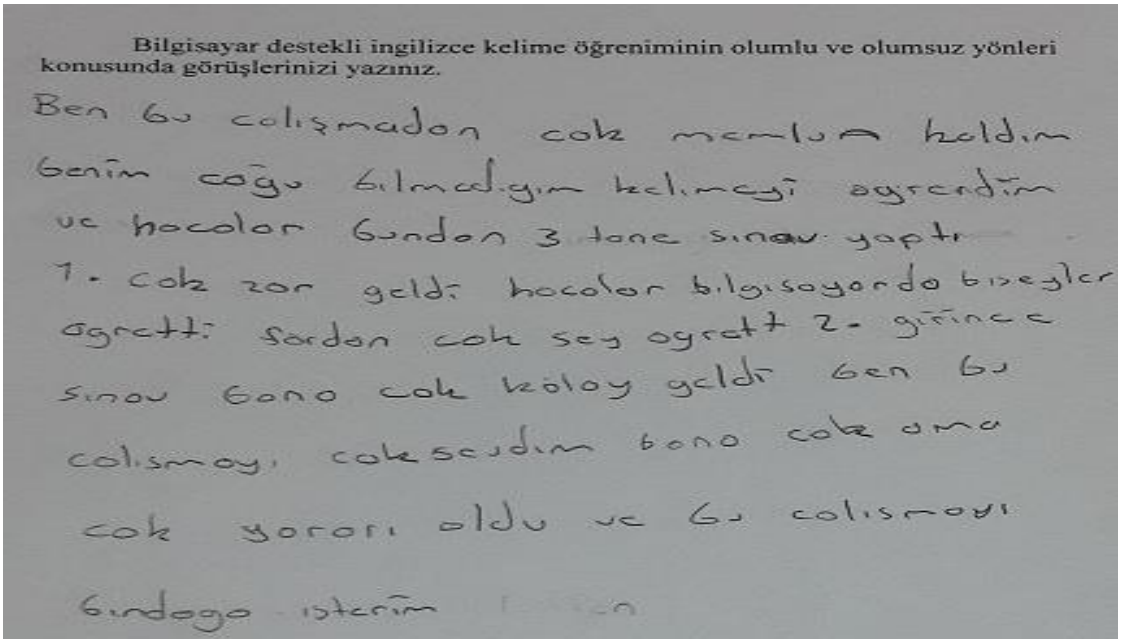
Appendix UU. Student view 1



Bilgisayar destekli ingilizce kelime öğreniminin olumlu ve olumsuz yönleri konusunda görüşlerinizi yazınız.

Bu programda bir sürü ingilizce kelime öğrendim. Derslerde çok faydası oldu. Ama bazen çok tekrar ettiğimiz için sıkıcı geliyor. Fakat yine de ingilizceni geliştirmek ve yeni kelime öğrenmek açısından çok güzel. Ayrıca oyun şeklinde oynamak çok eğlenceli. Bazen kendi aramızda da sınıfta oynuyoruz. Sizin sayenizde birçok ingilizce kelimeyi oyun şeklinde ve eğlenceli bir biçimde öğreniyoruz. Bu yüzden size çok teşekkür ediyoruz. ☺ Bir de akılda kalıcı oluyor. Eğer oyun şeklinde olmasaydı çok sıkıcı olurdu. Sizin bu yönteminiz sayesinde çok kısa sürede çok kelime öğrendik. Bu kelimeler derslerde işimize yarıyor. Bu uygulama çok iyi oldu. Sizi tanıdık ve çok sevdik. ☺

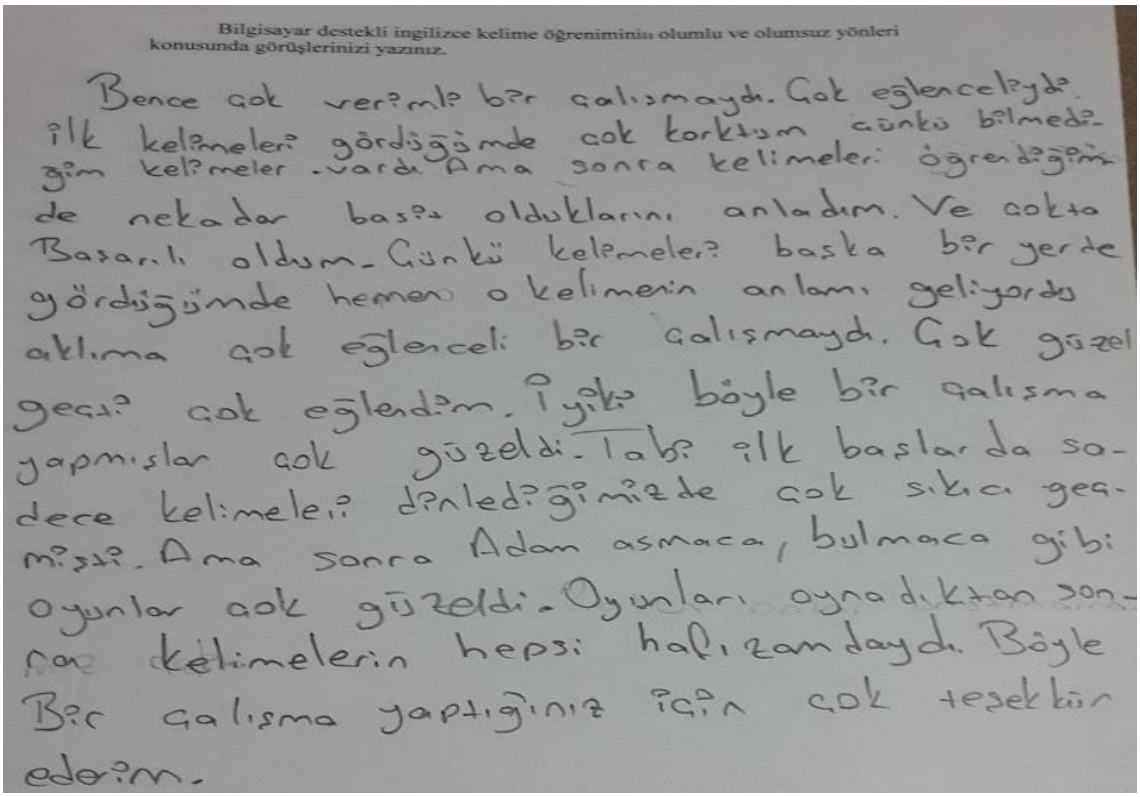
Appendix VV. Student view 2



Bilgisayar destekli ingilizce kelime öğreniminin olumlu ve olumsuz yönleri konusunda görüşlerinizi yazınız.

Ben bu çalışmadan çok memnun kaldım benim çoğu bilmediğim kelimeyi öğrendim ve hocalar bundan 3 tane sınav yaptı 1. çok zor geldi hocalar bilgisayarda bişeyler öğretti sordan çok şey öğrettı 2. girince sınav bono çok keloy geldi ben bu çalışmayı çok sevdim bono çok ama çok yorucu oldu ve bu çalışmayı bindoğa isterim

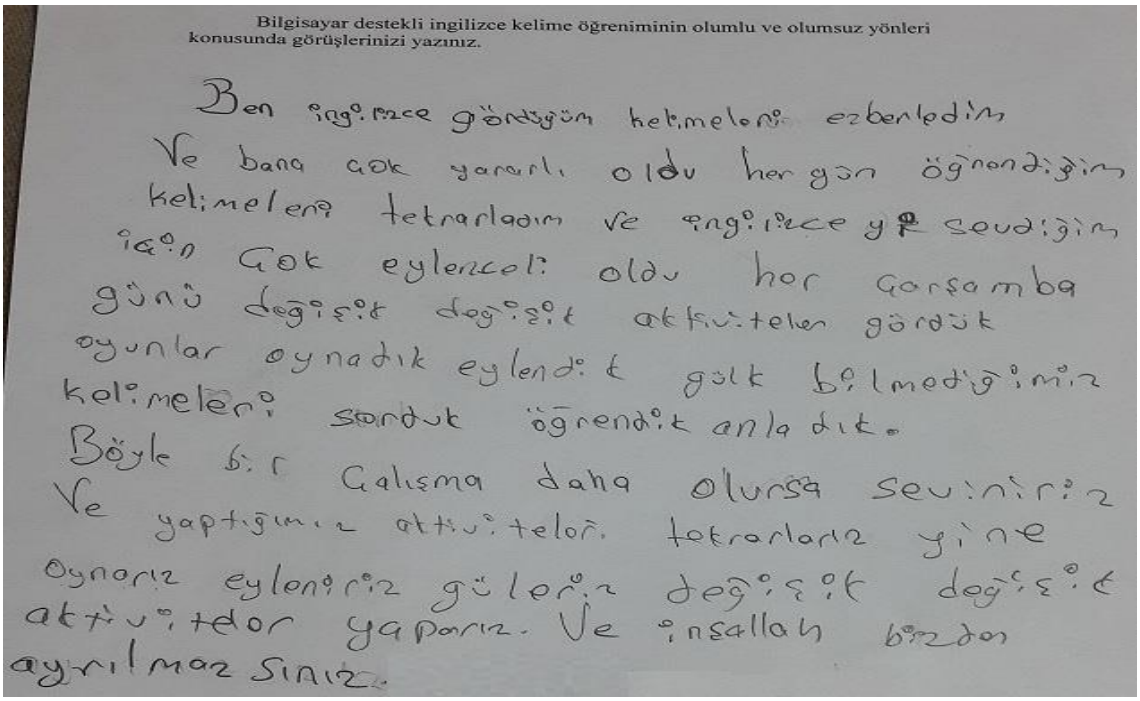
Appendix WW. Student view 3



Bilgisayar destekli ingilizce kelime öğreniminin olumlu ve olumsuz yönleri konusunda görüşlerinizi yazınız.

Bence çok verimli bir çalışmaydı. Çok eğlenceliydi. İlk kelimeleri gördüğümde çok korktum çünkü bilmediğim kelimeler vardı Ama sonra kelimeleri öğrendiğimde ne kadar basit olduklarını anladım. Ve çokta Başarılı oldum. Çünkü kelimeleri başka bir yerde gördüğümde hemen o kelimenin anlamı geliyordu aklıma çok eğlenceli bir çalışmaydı. Çok güzel geçti çok eğlendim. İyiki böyle bir çalışma yapmışlar çok güzeldi. Tabi ilk başlarda sadece kelimeleri dinlediğimizde çok sıkıcı geçmişti. Ama sonra Adam asmaca, bulmaca gibi oyunlar çok güzeldi. Oyunları oynadıktan sonra kelimelerin hepsi hafızamdaydı. Böyle Bir çalışma yaptığınız için çok teşekkür ederim.

Appendix YY. Student view 4



Bilgisayar destekli ingilizce kelime öğreniminin olumlu ve olumsuz yönleri konusunda görüşlerinizi yazınız.

Ben ingilizce gördüğüm kelimeleri ezberledim Ve bana çok yararlı oldu her gün öğrendiğim kelimeleri tekrarladım ve ingilizce yazdığım için Çok eylenceli oldu her çarşamba günü değişik değişik aktivitelen gördük oyunlar oynadık eylendik gülk bilmediğimiz kelimeleri sordut öğrendik anladık. Böyle bir çalışma daha olursa seviniriz Ve yaptığımız aktivitelori tekrarlarız yine oynarız eylenirız güleriz değişik değişik aktivitelor yaparız. Ve inşallah bizden ayrılmaz sınız.