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Research into the Effects of an ICALL Program on Teaching Word Classes to Learners of English

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ABSTRACT

This study investigated the effectiveness of an intelligent computer-assisted language learning (ICALL) program on learning word classes to Turkish learners of English. Learning word classes is a common problem for Turkish students, so the main aim of this research is to help students to overcome this problem. Within the scope of this research, an ICALL application with a word class analyzer was developed and used on Foundation English School Students to measure its effects on students' achievement in the mastery of word classes and also their attitudes toward such an ICALL environment. The study employed a pre-test—post-test control group design. The sample consisted of 38 B1 level students who were divided into experimental and control groups. The *t* test was used to investigate the differences between the experimental and control groups. Learners' achievements in the knowledge of word classes were measured. The results showed that the reading activities with this system had positive effects on students' word classes learning and their attitudes toward the intelligent computer-assisted language learning tool. According to the statistical results obtained from the study, there is a significant difference between the groups in favor of the experimental group.

Keywords: parts of speech learning, word classes analyzer, ICALL, *reading*

INTRODUCTION

It is a fact that technology is in every part of our lives. 20 years ago, teachers who teach language skills by using computer technology were accepted as innovative, today the ones who don't adapt the technology to the classroom are considered as out-of-date (Chapelle, 2008). It has been proven that using computer in language learning has several important advantages such as multimedia-based learning, simulation-based learning, self-paced learning and immediate feedback which cannot be done by traditional methods (Bax, 2011; Butler-Pascoe & Wiburg, 2003; Butler-Pascoe, 2011; Choi, 1991; Dudeney, 2007; Lamy & Hampel, 2007; Levy, 1997). There are some terms related to the computer in education; which are CASLA (Computer Applications in Second Language Aquisition) (Chapelle, 2001), CAI (Computer-Assisted Instruction), CAL (Computer-Assisted Learning), CBI (Computer-Based Instruction), CDI (Computer-Directed Instruction), and CMI (Computer-Managed Instruction). CAL is synonymous with CAI. What is more, CALL is another term which is both a part of CAI and related to language teaching (Yang, 2011). CALL stands for "Computer-Assisted Language Learning" which is used to describe the role of computers in terms of language teaching (Hardisty & Windeatt: 1989). It is also defined as "the search for and study of applications of the computer in language teaching and learning" by Levy (1997). In other words, CALL is based on teaching English by using computers. Lee (2000) suggests 8 reasons to use CALL which are (1) Experimental learning, (2) Motivation, (3) Enhancing student achievements, (4) Authentic materials, (5) Greater interaction, (6) Individualization, (7) Independence from a single source of information and (8) Global understanding. CALL provides more interactive teaching along with a highly individualized instruction. It is a student-centered instruction and even the speed of the lessons can be controlled by the students. Another aspect of CALL is that it can fit learners' level and evaluate learners' responses (Chapelle, 2008). To sum up CALL is flexible, patient and sensitive to a learners' pace, students can set their own speed of work, it gives responses and it can

answer the real needs of the individuals and what is more, it increases motivation (Ahmad et al., 1985:5; Calvo, 1997).

Based on our observations during English lessons, we realized that Turkish ESL students commonly suffer from lack of parts-of-speech knowledge and that causes their failure especially in cloze tests. We brainstormed about it in an attempt to find a solution to it. Finally we came up an idea of using technology to overcome this problem. Teaching parts-of-speech directly is not as effective as we want, so the method we are looking for is based on indirect teaching. For this reason a web based system has been developed to help students to differentiate parts-of-speech. This system is designed as autonomous learning activity because in language teaching "perception" is the key (Derwing & Munro, 2005). Students need to apprehend the parts-of-speech concept on their own for retention learning. It is believed that with the help of this system, students will improve their parts-of-speech knowledge by the end of the study.

LITERATURE REVIEW

Intelligent CALL Programs

Uses of computers in language teaching dated back to the 1960s. During this period CALL can be divided into three main stages which are Behaviorist CALL, Communicative CALL and the Integrative CALL (Lee, 2000). There are also three important time periods in terms of significant developments in CALL: The 1960s and 1970s, the 1980s and the 1990s (Levy, 1997). In 1960s, Computer-assisted language learning was supported by mainframe computers. "Courseware" (Computer-based language learning activities) was developed through programming languages and stored on a mainframe for learners (Chapelle, 2001). The PLATO and TICCIT are the significant projects of the 1960s and 1970s (Levy, 1997). During the early 1980s, with the rising of cheap microcomputers, CALL industry was on the rise. *Storyboard* and *the Athena Language Learning Project* (ALLP) are important works of the 1980s (Levy, 1997). With the involvement of the internet, the most significant improvement has occurred in educational technology. *The International Email Tandem Network, the CAMILLE/France InterActive Project* and the *Oral Language Archive* (OLA) are the prominent projects of the 1990s (Levy, 1997). According to Murphy (2000), 20th century CALL technology is based on behaviouristic and communicative CALL and the 21st century CALL technology will depend on Technology Enhanced Language Learning (TELL). With TELL, the role of technology changes and education adapts a constructivist, student-centered approach.

There are eight CALL applications that can be used or developed for projects. These are (1) Word processing, an application for spelling, (2) Games such as hangman, (3) Literature, for reading skills, (4) Corpus Linguistics, in terms of real world samples, (5) Computer-mediated communication (CMC), For instance e-mail, chat, (6) WWW resources, (7) Adapting other materials for CALL and (8) Personal Digital Assistants (PDAs) & Mobile Phones (Beatty, 2013). Warschauer and Healey (1998) claim that there are three ways to help language learners develop reading skills which are incidental reading, reading comprehension and text manipulation. It has been claimed that ESL learners' reading activities through a CALL program are more effective than the traditional ones. According to several researches, CALL improves reading comprehension (AlKahtani, 1999; Busch, 2003; Gorjian, 2008; McGlinn & Parrish, 2002). Abraham (2008) and Cummins (2008) also examined the effect of computers on reading comprehension and the determined that computer assisted reading activities are highly effective.

Several studies have been done on effectiveness of CALL in grammar teaching. For instance Pirasteh (2014) tested CALL for teaching 15 grammar points. 52 learners were divided into two groups. Experimental group have learned these grammar points through computer and control group through printed paper. Results showed that the experimental group have been more successful in the post test than the control group. Naba'h et al. (2009) used CALL to teach passive voices on 212 students. Experimental group students who have used computer outperformed control group students who have used traditional method. Nutta (1998) has also done a research on effectiveness of CALL in grammar teaching on 53 students and it is determined that teaching grammar structures through CALL is more effective than traditional methods. Finally Nagata (1996) compared CALL and workbook instruction in terms of grammar teaching on 26 students and it is found that CALL is more effective than using workbook.

Word Classes

In all languages in the world, words can be categorized into classes according to their semantic and syntactic functions (Gardenfors, 2014). "Word class" can be used instead of "part-of-speech" (Van Lier & Rijkhoff, 2013). The term word class was introduced by structuralist linguists in the twentieth century. Another equivalent term is "Syntactic category" called by Chomskyan linguists (Haspelmath, 2001).

Word classes are groups of words with similar behaviours (Vulanavic & Miller, 2010). Hockett (1958: 2219) explained parts-of-speech as form class stems that have similar features in inflection, syntax, or both of them. Native speakers unconsciously have a word classification system (Alderson, Clapham, & Steel, 1997). However, second language learners must create a new system. They can start to do that through direct transfer from their first language (Schmidst, 2001).

Word classes dates back to ancient times (Gil, 2000). Aristotle and the Stoicks used to have their own part-of-speech lists. However Throx's set of eight became the basis for all parts-of-speech description of Latin, Greek and most European languages. Those eight parts-of-speech were noun, verb, pronoun, preposition, adverb, conjunction, participle and article (Jurafsky & Martin, 2000). Adjectives have been accepted as a word class since the second half of the 18th century. Latest lists of word classes (or tagsets) had more classes such as 45 for the Penn Treebank tagset (Marcus, Santorini, & Marcinkiewicz, 1993), 87 for the Brown Corpus tagset (Francis, 1980; Francis & Kucera, 1982) and 146 for the C7 tagset (Garside & McEnery, 1997). Nowadays noun, verb, adjective, adverb, pronoun, preposition, conjunction and interjection are "traditional word classes" (Gardenfors, 2014; Van Lier & Rijkhoff, 2013). Auxiliaries are not included in the traditional word classes list. The reason of it is probably the fact that they are not prominent in Latin and Greek grammar (Haspelmath, 2001).

In most languages, word classes are divided into two main categories. These categories are "Content words" and "Function words". Nouns, verbs, adjectives and adverbs are content words. However, prepositions, conjunctions, articles, auxiliaries and particles are function words (Haspelmath, 2001). Jurafsky and Martin (2000), on the other hand, claimed that parts-of-speech are divided into two classes which are "closed class types" and "open class types". Prepositions are a closed class because they are fixed. On the contrary, Nouns and verbs are open classes because they welcome new nouns and verbs continually. Another opinion in terms of classification of words classes is DeCapua's. DeCapua (2008) said that parts-of-speech are divided into as "form and structure classes" in many grammar texts. Form classes are the major parts-of-speech such as nouns, verbs, adjectives and adverbs. However, the structure classes are the minor parts-of-speech which are prepositions, pronouns, conjunctions and others.

Word classes are predictors of better text comprehension (Mikk, 1997). The most important aspect of parts-of-speech (also known as POS, Word classes, Morphological classes or Lexical tags) is the amount of information they provide to a word. Knowing whether a word is a possessive pronoun or a personal pronoun helps students a lot. For instance possessive pronouns are mostly followed by a noun and personal pronouns by a verb (Jurafsky & Martin, 2000). On the other hand, there is a problem which is that some of the classes intersect. In other words one word can be in more than one class. For instance; "there" is a both a pronoun and adverb (Haspelmath, 2001). To sum up, word classes in English do not always rely on word endings or forms. Context and sentence positions in English are key points in terms of clarifying the function of a word, because word order in English is fixed (DeCapua, 2008).

Research Questions

The main research problem is divided into two research questions and two sub-questions which are presented below:

1. Do reading activities with Graffor and traditional reading activities differ in enhancing ESL learners' *grammar knowledge*?

   (a) Do reading activities with Graffor and traditional reading activities differ in enhancing ESL learners' grammar with regard to *the development of parts-of-speech knowledge*?

   (b) Do reading activities with Graffor and traditional reading activities differ in enhancing ESL learners' grammar regarding *how words function in context*?

2. Do reading activities with Graffor affect learners' *attitudes to CALL* compared to traditional reading activities?

   (a) Do reading activities with Graffor affect learners' opinions of *the usefulness of ICALL programs* compared to traditional reading activities?

   (b) Do reading activities with Graffor affect learners' *anxiety about CALL programs* compared to traditional reading activities?

METHOD

Research Design

This study applies quantitative and qualitative methods together to analyze the collected data. Fraenkel and his colleagues state that "quantitative researchers seek to establish relationship between variables and look for and sometimes explain the causes of such relationship" (Fraenkel, Norman, & Hyun, 2012: 11). This study attempts to find the effectiveness of a CALL program on word classes learning. Therefore, we use a quantitative data analysis procedure in order to find out the relationship between the variables. This method will enable us to generalize our results to the same setting. We also use a qualitative data analysis procedure in order to find out students' attitudes toward the CALL program.

Participants

Thirty-eight university students who studied intermediate level (B1) English at Foundation English School of Girne American University (GAU) participated in the research. Students whose ages range from seventeen to twenty had been divided into groups at the beginning of the semester by the administration. Volunteer students (22 male – 16 female) from the groups named as B1.7 and B1.8 were the participants of the research. B1.7 (Control Group) contained 19 students. B1.8 (Experimental Group) had 19 students as well. Both groups, after taking the pre-test, followed the same reading texts in two different ways. Experimental group have studied word classes through computer and control group have studied them through printed texts. The aim of the lessons was to teach word classes and the function of the words in context. After the one month of training, both groups took the post test.

Measurement Tools

For this study, two tests were designed by the researcher. A pilot study has been done. The reliability of the tests was measured by using Cronbach's alpha. The values are satisfactory: the value of test 1 is 0.84 and the value of test 2 is 0.61. The content validity was determined through the opinions of three experts who are professors in ELT department at Cyprus International University. Learners' attitudes toward Graffor were gathered through a focus group. Six volunteers were selected randomly from among the experimental group students and focus group interviews were done with them.

The System

Graffor is a CALL program with a word classes analyzer. It consists of 11 short stories of Oscar Wilde. According to Inn-Chull (2016) using short stories in grammar learning (in our case, more specifically parts-of-speech learning) takes learners' attention and help them to focus on grammatical concepts without dealing with contextual comprehension of the short stories. Therefore, the aim of our system is to facilitate reading skills of Turkish students who are learners of English and improve their parts of speech knowledge while reading in English. The system has a module which can:

1. show word classes of every word in the system
2. provide an explanation why the word belongs to that particular class

Pedagogic Design

The Graffor system has been designed to help learners to learn word classes in context and increase their language awareness. It is an out-of-class online learning tool which can be used whenever and wherever learners want to use. This not only facilitates a student-centered learning environment but also increases learners' contact time with the foreign language. Students can easily connect to the system by using their e-mails and a password given by the researcher, through the following website link: "www.graffor.com" (See **Figure 1**). The system based on a reading activity that consists of eleven B1 level short stories. Students can choose any story they want to read (See **Figure 2**). The best part of the system is that each learner has the opportunity to choose any story he or she wants to read and click on any word that seems unfamiliar to him or her while reading. As soon as the word is clicked, the word classes analyzer is automatically activated and the word class of the word displayed in the "parts of speech" window on the right along with its explanation in the "Rules" window under the "parts of speech" window (see **Figure 3**).
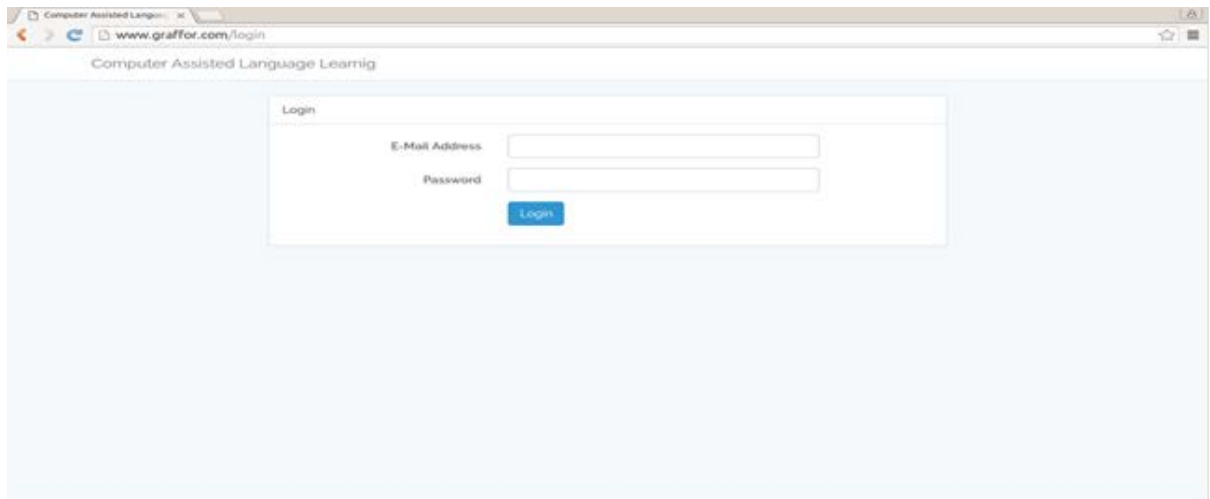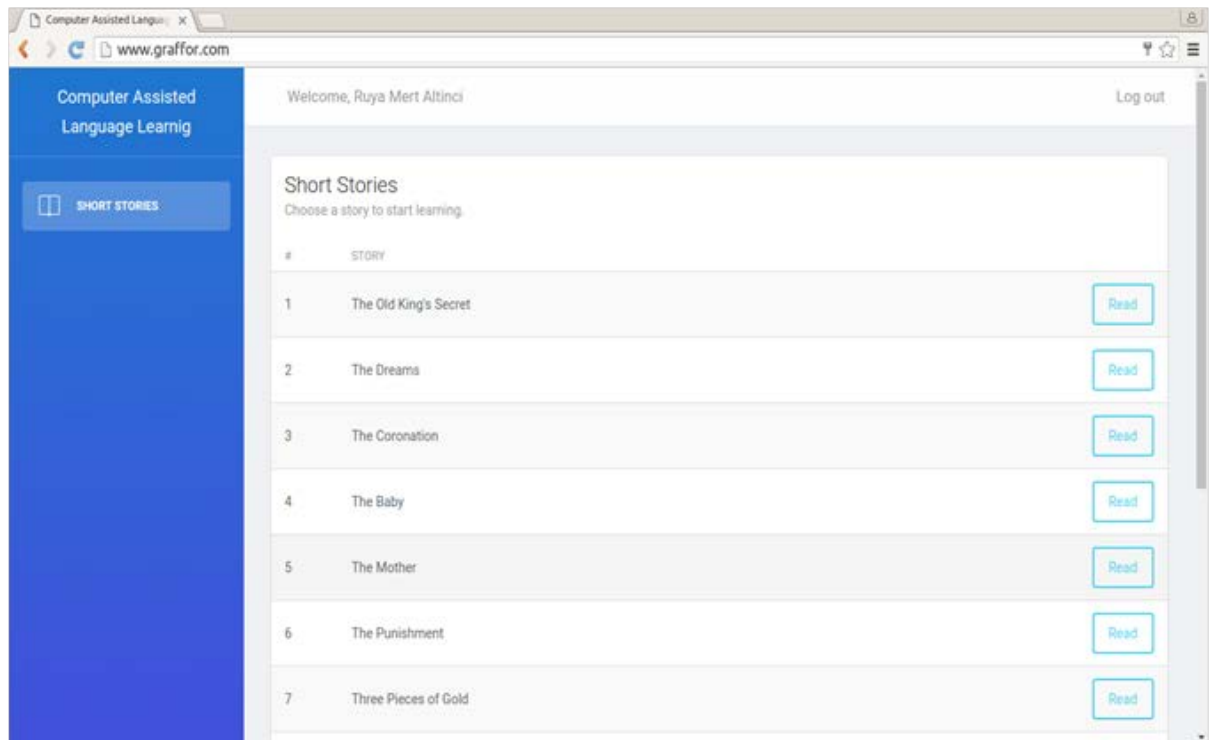
Figure 1. www.graffor.com
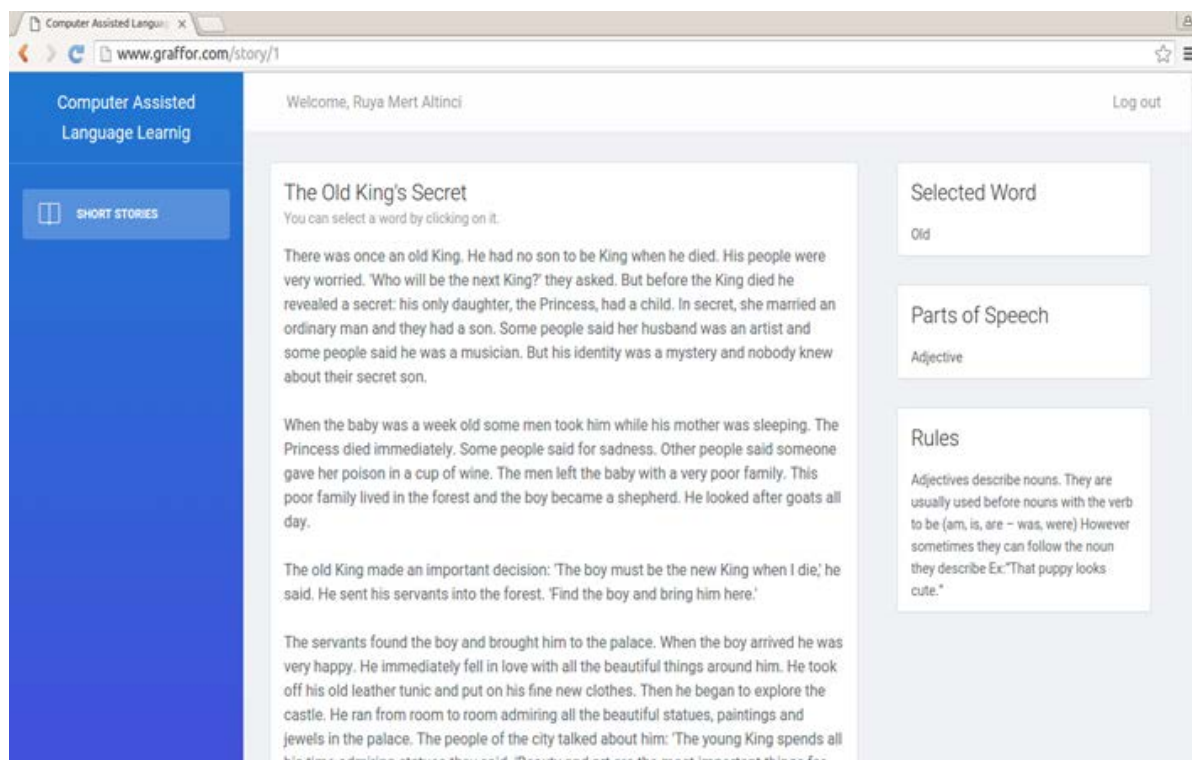

Figure 2. Short Stories

Figure 3. The Graffor user interface

Performance Analysis

The Graffor system consists of 11 short stories and total 6377 words. There are 891 unique words and all eight parts-of-speech in the system which helps students to be aware of different types of parts-of-speech. In order to test functional performance of the system, all words were checked by the researcher and the accuracy of the words in terms of part-of-speech and their rules were also analyzed. During the test three problems were encountered:

(1) Flexible Words: Some words in the system have two meanings. Such as "well" which is both a noun and an adjective according to the context. In these cases, the rules section has both rules of nouns and adjectives so learners are supposed to read the rules and decide on whether the "well" is a noun or an adjective according to the context. For instance; according to the rules section if it is a noun, there must be an article (a, an, the) before the singular nouns, so if in the context, it says "there is a well" the "well" here is a noun. This problem is a challenging one, because learners will be able to practice what they have learned.

(2) Phrasal verbs: The system fails to analyze phrasal verbs it analyzes them as single words. For instance "look after" is considered as "look-verb" and "after-preposition". It is not a big problem, because it is known that phrasal verbs are combination of verbs and prepositions. Also our aim is to teach parts-of-speech, this way is much easier for beginners.

(3) Prepositions: Another problem the system had created is preposition problem. Analyzing the one-word prepositions such as, "in, on, at, between, behind…" is fine. However prepositions more than one word have problems. The system doesn't analyze them together. It does it separately. For instance "in front of" is analyzed as "in-preposition" "front-noun" "of-preposition". Still it is not a big problem in terms of parts-of-speech learning at all.

Underlying Technology

There are four issues to take into consideration in order to develop a system with a part-of-speech analyzer:

1. Creating an online website
2. Building a corpus story module
3. Determinig parts-of-speech of the words
4. Creating rules for each part-of-speech

The main function of Graffor is to help Turkish students to be aware of parts-of-speech. It has two basic components which are (1) story module and (2) parts-of-speech and their rules segments. It doesn't show definition of the words or their morphemes. However it does show hints to guess parts-of-speech of the words without even knowing meaning of the words.

Graffor is a web based application and it is written with Hypertext Preprocessor (Php) language which is a server-side scripting language, designed for web development. Php is backed with a relational database management system (RDBMS) called MySQL to store and fetch all the stories, rules and parts-of-speech of the words in the system. The system provides an open access through the web for everyone that has a valid username and password that is in the database. Graffor system has 3 components: story corpus module, parts-of-speech (POS) module, and the rules module. Story corpus module consists of the short stories of Oscar Wilde in the system. POS module is a key value dictionary where "key" is the word and value is the part of speech of the word. Parts of speech of the words in the stories have been determined and classified before and then stored in the database for fast and reliable access for the students. The system supports word flexibility as well. To make it clear, if a word belongs to more than one word classes, the system shows all of them. The rules module consists of the information related to all word classes. Each word class has its own rules, key hints and examples in the system which can be seen by clicking on the related words.

Procedure and the Analysis of Data

The research employed a pre-test – post-test design. The control group learned parts-of-speech and read Oscar Wilde's short stories (2003) from the book. While reading, they also analyzed the word classes through traditional ways such as the use of dictionary. However, the experimental group learned parts-of-speech and read Oscar Wilde's short stories through Graffor. Both groups did the research as out-of-class activity. In short, both groups read exactly the same stories, but the experimental group used only the electronic version of it. The research consisted of two tests (test 1 with 17 questions and test 2 with 15 questions). Tests which were used as both pre-test and post-test, developed by the researcher. The researcher selected two or three sentences from each short story and by omitting one word from each sentence, in other words by turning sentences into cloze test, she prepared the word classes tests for the control and the experimental group students. The research took one month and experimental group students' online activities were tracked by the researcher. After the one-month of intensive study period, both control and experimental group students took the post-test.

RESULTS

The results of Test 1 which are shown in **Table 1** and **2** indicate that there is a significant difference between the mean scores of experimental and control groups. Especially experimental group's post test results are highly significant. In other words, the experimental group has a statistically significantly higher mean score (10.94) than the control group (1.21). In the light of pre and post test results, it can be said that students who used "Graffor" improved themselves more, in terms of parts-of-speech knowledge.

Table 1. (M and SD of Test 1)

Scale type	Group type	N	M	SD	Standard Error Mean
Pre-test	Experimental	19	5.63	4.63	1.06
	Control	19	2	1.68	0.38
Post-test	Experimental	19	10.94	4.04	0.92
	Control	19	1.21	1.00	0.23

Table 2. (t-test results of Test 1)

Scale type	t	p	Mean difference
Pre-test	3.212	0.002	3.631
Post-test	10.190	0.0001	9.736

The results of Test 2 are shown in **Table 3** and **4**. According to the tables, mean scores of the experimental group are statistically significant (pre- 6.94 – post: 11.84) comparing to mean scores of the control group (pre: 4.15 – post: 3.84). While pre-test results do not have statistically significant difference between two groups (experimental: 6.94 control: 4.15), post test results do have. This difference can be interpreted as the students who used traditional methods for parts-of-speech knowledge did not improve themselves as much as the students who used the CALL program "Graffor".

Table 3. (M and SD of Test 2)

Scale type	Group type	N	M	SD	Standard Error Mean
Pre-test	Experimental	19	6.94	3.25	0.74
	Control	19	4.15	2.15	0.49
Post-test	Experimental	19	11.84	2.58	0.59
	Control	19	3.84	2.83	0.65

Table 4. (t test results of Test 2)

Scale type	t	p	Mean difference
Pre-test	3.120	0.003	2.79
Post-test	9.105	0.0001	8

With regard to research question 1 (Do reading activities with Graffor and traditional reading activities differ in enhancing ESL learners' *grammar knowledge*?) students in the experimental group enhanced their grammar knowledge more than the ones in the control group. It can be seen from the mean scores above. After one-month, students took the post tests. The purpose of the delayed posttest was to check learners' retention in terms of parts-of-speech knowledge. Students in the experimental group got higher marks compared to the control group students. All students in the experimental group had more correct questions in their posttests compared to their pretests so this means there is an obvious improvement in their parts-of-speech knowledge. On the other hand students in the control group had almost the same results both in pre and posttests. Some of them even got the lower marks. Therefore, it can be said that experimental group's retention success is higher than the control group. In other words, there is a significant difference in the retention of the parts-of-speech by the control and experimental group students' tests. The tests were in cloze test format because cloze tests are language teaching tools which help students to check their knowledge about lexical items. Cloze tests help students to predict the missing word and by doing this, students learn information about the grammar and vocabulary of a language (Mohammedzadeh, 2015). According to Simpson (1997) cloze test are designed on the purpose of increasing learners' knowledge about choosing the appropriate lexical items for related grammatical contexts. To conclude, it can be deduced that reading activities with Graffor is more effective than traditional methods in terms of development of both parts-of-speech knowledge and function of the words.

With regard to research question 2 (Do reading activities with Graffor affect learners' *attitudes to CALL* compared to traditional reading activities?) students' attitudes toward the CALL program were positive. Students in the experimental group were enthusiastic about the study and they were eager to use the system at home. They considered it as a game. On the other hand students in control group were not happy to get extra papers to read at home. They considered it as homework. According to the CALL focus group, all students who used the tool, found the system useful.

The followings are the students' responses in the focus group: *Question 1: What do you think about the usefulness of Graffor compared to traditional reading activities?*

Low achiever participant: I think this program is useful. It is easy to use. It is not boring like using dictionaries. Although I couldn't use it much because of work, I think it is better than traditional methods.

Moderate achiever participant 1: I think it is really useful. I have started to understand how words function in a sentence. The rules section in the system really helped me. I prefer to use this system instead of traditional methods.

Moderate achiever participant 2: I can say that this new system is really enjoyable. It is also very useful. It is faster than using a dictionary for sure. I believe that I improved myself.

High achiever participant 1: I love the system. It is really functional. I used it with my mobile phone whenever I was free. It is definitely better than traditional methods. Now I can analyze sentences and find the missing parts-of-speech in cloze tests.

High achiever participant 2: Reading activity with Graffor is really useful and fun. I really liked to use technology. It is different. When I use it, time flies so fast. Now, I know word classes and their functions in sentences better than before.

High achiever participant 3: Graffor is quite useful. I have learned lots of new things. Learning word classes through a computer was fun. It was more practical than using traditional methods. I mean, I used it at school, at work, at night. It is easy to use and it doesn't seem like homework. Now parts-of-speech doesn't seem so difficult to me.

Question 2: Did you have any anxiety about the program?

Low achiever participant: No, I didn't.

Moderate achiever participant 1: Yes I did. I thought I couldn't use the tool because I am not good at technology. However I did use it. It was really easy to use.

Moderate achiever participant 2: No, I didn't. I found it innovative and enjoyable.

High achiever participant 1: No, I didn't. I use my mobile phone all the time, so I liked the idea of using my mobile phone and learning parts-of-speech.

High achiever participant 2: No, I didn't. I love technology. My department is computer engineering, so I really liked it.

High achiever participant 3: Yes I did a bit. I was anxious about "if I don't understand something or if I have a question, how will I ask it to a computer?" I mean, teachers are always there for us and this thing is new. However, the system was really simple and easy to use. I didn't have any problem.

DISCUSSION AND CONCLUSION

Just like claims of several researchers, the study shows that CALL application with a parts-of-speech analyzer can help learners to acquire word classes effectively. An ICALL tutoring system with an L2 grammar teaching setting has positive effects on L2 learners and prevents them from incorrect conceptualization of grammatical rules and subsequent fossilization. Therefore, this study eventually leads learners to acquisition of the target grammar (Fotos & Brownne, 2004, pp. 3-14; Matthews, 1993; Stockwell, 2007; Toole & Heift, 2002). The results of the experiment demonstrate that reading activities with Graffor have positive effects on learners' parts-of-speech learning and their attitudes toward the use of CALL program as well.

Studies on SLA have shown that process-oriented language learning where the main aim is the learning process' itself (in our case, computer assisted language learning) is much more effective than product-oriented language learning where the main aim is results (in our case traditional language learning such as learning by answering questions or taking multiple choice tests) (Bolhuis, 2003; Gattegno, 1972; Horowitz, 1986; Richards & Rodgers, 1987; Vermunt & Verschaffel, 2000, pp. 209-225). Both Test 1 and Test 2 results show that posttest mean scores of experimental groups are higher than control groups which proves that "Graffor" system helps students to improve themselves in terms of parts-of-speech/ grammar knowledge. This cooperates with the findings of (Naba'h, Hussain, Al-Omari, & Shdeifat, 2009; Nagata, 1996; Nutta, 1998; Pirasteh, 2014). On the other hand, post test scores of control group are lower. That means students' performance even worse than the pre-test, so according to these data, it can be said that following the traditional methods is not helpful in terms of improvement in parts-of-speech learning.

It is a fact that there are a lot of advantages of computer assisted language learning. However, all of these advantages are up to learners' interest and desire to use it (Hsu, 2016). In this case, ESL learners' acceptance and usage of CALL is quite important. Based on students' opinions about the CALL program, it can be said that Graffor is both useful and enjoyable. All students found it effective even the one who didn't use it much. Some students were anxious about it but they changed their minds as soon as they started to use it. According to students, Graffor was effective, useful, practical, simple, easy to use, innovative and enjoyable. To conclude, students think that with "Graffor" it is fun to learn parts-of-speech. This result also matches up with other results which claim that learners have a positive attitudes toward computer assisted language learning (Al-Juhani, 1991; Askar, Yavuz & Köksal, 1992; Önsoy, 2004).

SUGGESTIONS

Another version of the Graffor can be created for teaching vocabulary, grammar, pronunciation etc. This research has been carried out on Turkish students. Another research may be done on students with other nationalities as well. There were some limitations during the research such as flexible words; the words belong to more than one word class. The researcher solved this problem by adding all word classes it belongs to the parts-of-speech section, so students had to read the rules, analyze the sentence and decide in which class the word belongs to whenever they come across these flexible words. For further improvements, some suggestions are as follows:

- In the research, repeated words have the same rules which created some trouble in terms of flexible words, so there can be a system in which each word has its own rules.
- The system can be redesigned for vocabulary, grammar and even pronunciation teaching.
- There are only 11 short stories in the system, so number of the words is limited too, so the number of the short stories can be increased.
- Compound words accepted as two individual words, so the system can be developed to overcome this problem as well.

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