

Araştırmanın Önerileri : Çalışma sonunda elde edilen bulgular, daha önce var olan bir ölçüğe yeni kategoriler kattığı için ve alanda bu konu ile ilgili çalışmaların sayısının azlığı açısından önemlidir. Sosyal bulunuşluk konusunda söylem analizi yapmak isteyen araştırmacılara yardımcı olabilecek sonuçlar elde edilmiştir. Eğitimsel ve öğrenciler için ise metne dayalı eş zamanlı iletişimin olduğu bir ortamda gerçekleşen iletişimin özelliklerini ortaya koyması açısından ve onlara yol gösterici bir niteliği olması açısından önemlidir.

Anahtar Sözcükler: Sosyal Bulunuşluk, Söylem Analizi, Bilgisayar Araçlığıyla İletişim, Metne Dayalı Eş Zamanlı İletişim.



Effects of Web-Based Spaced Repetition on Vocabulary Retention of Foreign Language Learners

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Abstract

Problem Statement: Computers are considered to be powerful tools supporting the process of teaching and learning, and it has been declared that ICT has particularly changed the language-learning environment and settings. The studies on technology with language learning have usually been comparative studies on the effectiveness of a new technology with more traditional ways of learning. Thus, there is a need for studies evaluating the instructional methodology of technology-supported language learning and teaching environments so that one can determine the nature of learning through technology and why there is a need for method-based educational software.

Purpose of Study: The aim of this study was to examine the effects of web-based supplementary material on intermediate level English language learners' vocabulary retention by presenting the vocabulary items to them through spaced repetitions. WEBVOCLE, a web-based vocabulary learning system in which the contextual presentation of the words was enriched with audio and visual multimedia resources and the retention of the words was enhanced with 'spaced repetitions', was used as a supplementary vocabulary development material.

Methods: Three modules and their repetitions, consisting of texts and exercises such as multiple choice, gap-filling and cloze tests, were made accessible to learners on the web. The study consisted of 69 participants, and it was implemented during the spring semester of 2006-2007. Participants were given vocabulary retention tests to measure their vocabulary development.

Findings and Results: Based on the results of the study, it could be concluded that WEBVOCLE proved to be effective in increasing the retention of participants' vocabulary through spaced repetitions.

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Conclusions and Recommendations: In the study, media was just a mode for instruction to be delivered, and the applied method and pedagogical principles played prominent roles. It is recommended that future designs of computer-mediated language projects should utilize language teaching and learning strategies, methodologies and principles in their instructional design process with the necessary inquiry and precedence over simple technological learning.

Keywords: Web-based education, spaced repetition, interactive language learning environments, vocabulary retention, multimedia

The rapid increase in the use of computers and the Internet has aroused considerable interest in the field of education, leading to an enthusiasm for e-learning ventures. It is a fact that changes in society, business and technology have limited the impact of traditional learning today, and it appears that this will persist in the future. Unfortunately, as expressed by Zemsky and Massy (2003), the revolution that created a rapid expansion of computers and related computer software at educational settings was so rapid, that most of the products were devoid of the necessary research, distant from e-learning realities and lacking in a dominant design.

The studies on language learning through technology have mostly been of a comparative nature and have focused on the effectiveness of using new technology with more traditional ways of learning. Thus, there is a need for further studies to evaluate the instructional methodology of technology-supported language environments. Herron and Moos (1993) have expressed the same concerns by stating that the major obstacle of foreign language teaching is deciding how to integrate new technology into instruction. As suggested by Clark (1983), research studies should focus on the method rather than the media. In his well-known methodology versus media debate, Clark claims that, where learning benefits are at issue, the method, aptitude and task variables of instruction should be investigated. Therefore, this study focuses on the method rather than the media.

Language learners frequently have difficulty in learning new vocabulary and retaining the newly-learned words. In fact, rehearsals or repetitions have a significant effect on the retention of vocabulary. This has been investigated in many studies (Waring, 2004; Waring & Takaki, 2003; Horst, Cobb & Meara, 1998; Groot, 2000; Webb, 2007; Dobinson, 2006; H. Bahrick, L. Bahrick, A. Bahrick & P. Bahrick, 1993; Fidan, 2003). However, as Wozniak (1995) stated, most of the previous research studies examined the application of equally spaced repetition but not differently spaced repetitions. Moreover, spaced repetitions in periods longer than one week were very scarcely studied (Glenberg, 1980 as cited in Wozniak, 1995). Thus, it is clear that there is a need for further research on spaced repetition procedure measured in longer periods and in unequal repetitions. Moreover, its use in vocabulary learning and retention with varying strategies for the presentation of words and its effect on vocabulary retention in a web-based environment have to be studied as well.

As a conclusion, the purpose of this study was mainly to discover the influence of a spaced repetition design as a supplementary material for English language vocabulary retention on intermediate level university prep class students. Because the applied material was a supplementary retention material, the aim in this study was to elicit the effect of the web-based material on the retention of learnt words. The aim of the material was not to teach the whole content through the online material.

Hatch and Brown (1995) have stated that one sentence context enhances the word-form and meaning association, and use of words by means of meaningful repetition exercises increases the words' retention in one's memory. The lack of context results in difficulty in vocabulary learning and the words taught in isolation are generally not remembered and/or easily forgotten. Moreover, persons learning new vocabulary need a lot of repetition of the same item to store it in their long-term memory. If the word is not truly stored in the long-term memory, one will have trouble in recalling it again.

It is obvious that the lack of a repetitive learning system for the language learner is one of the sources of difficulty for many language courses. The spaced repetition technique originates from the way memory works and is based on the 'dual store theory' which asserts that repeated rehearsals increase the length of stay in short-term memory, which could be encoded into long-term memory (Atkinson & Shiffrin, 1968). This could be further explained with Ebbinghaus's (1885) 'Forgetting Curve'. Most forgetting occurs very soon after the learning takes place. Thus, if a word is not encountered again soon after it is learned, it is more likely to be forgotten. That is, immediately after learning, knowledge decreases rapidly, but after that, it decreases rather slowly. Thus, the time between the first and the second exposition should be relatively short (Waring, 2004).

Regarding spaced repetition, Pimsleur (1967, as cited in Waring, 2004) suggested that when we relearn something, the knowledge gets stronger and it becomes more resistant to decay. Pimsleur's 'Graduated Interval Recall' schedule shows that the gap between the second encounter and the subsequent encounters with the learnt item should progressively widen if there is to be 100% recall. Thus, forgetting slows down as relearning continues. As far as vocabulary teaching goes, this necessitates the fact that the intervals between the revisions of words should increase.

Fidan (2003) compared the effect of repetition provided through the web-based system 'TRAINER' on the vocabulary retention level of preparatory school students in different groups of learners and found that by the end of the 3-week period, students who used 'TRAINER' were able to remember more words than the other group of students who studied words traditionally. There are many studies in the literature indicating that vocabulary gains of the learners increase with 8 or 10 encounters of the target words (Horst et al., 1998; Saragi, Nation & Meister, 1978; Waring & Takaki, 2003). Jenkins, Stein and Wysocki (1984) found that vocabulary gains increase as the revisions of words in context increase. Rott (1999) examined the effects of two, four and six encounters on the incidental gain in knowledge and meaning and found that there was little difference between two and four encounters but there was a significant gain between two and six encounters. Webb's study (2007) supported the earlier findings

and concluded that repetition had a significant effect on vocabulary acquisition. In his study examining the reasons for learners' recall of some words more than others, Dobinson (2006) found that words recalled by 50-74% of learners had a mean of four repetitions and words recalled the least had a mean of one repetition. As Johnson and Heffernan (2006) stated, the results of studies examining the effect of acquisition of a word after a single exposure in a reading context revealed a very low rate of retention.

As Lewis (2000) states, "encountering new vocabulary on several occasions seems to be a necessity and even a sufficient condition for learning to occur" (p. 184). Moreover, establishing similarities and contrasts between the old and the new information and higher involvement with a word increases the chance of retention (Laufer & Hulstijn, 2001). However, studies concerned with the number of encounters necessary for effective vocabulary learning and retention are not consistent in literature, and the exact number of repetitions that would provide perfect retention is still indefinite (Nation & Wang, 1999). As Nation (1990, 2002) stated, to fully acquire words, learners need to be exposed to them 5-16 times, and frequent reencounters with each word are crucial for learners' vocabulary acquisition. In fact, differing results from various studies are related to a number of issues, such as the size of vocabulary, the type of target words (noun, verb etc.), the strategy preferred in the presentation of vocabulary, and meaningfulness of the context (Webb, 2007).

Studies of technology-assisted vocabulary acquisition point out that words could be learned more effectively and in a more enjoyable way with the use of audio-visual devices (Jones, 1999; Labrie, 2000). Many studies confirm that students consider the Internet as a useful tool to learn new vocabulary (Alishairkh, 2004; Johnson & Heffernan, 2006; Ma & Kelly, 2006) and to supplement in-class instruction (Kung & Chuo, 2002). In addition, use of the Internet and multimedia in language teaching was found to be more meaningful and effective and a life-long experience for learners (Pekel, 2002). In literature, there exist various examples of web-based or computer-based language learning environments such as CAVOCA (Groot, 2000), TELL (Yang & Chen, 2006), the Short Readings Project (Johnson & Heffernan, 2006), and The Tutor (Labrie, 2000), all of which serve these purposes.

Today, by using the web's advantage of time and place flexibility, learners can practice vocabulary with pre-designed spaced repetitions. These repetitions might include the context-based presentation of words with comprehension questions, matching, multiple-choice exercises, etc. in a spaced format and with support multimedia. As Al-Seghayer (2001) suggested, exposing learners to multiple modalities of presentation, such as verbal and visual, produces a learning environment which can have a real impact on vocabulary learning. This could be explained with encoding variability which requires "information to be thought of in a number of different ways" (DeWinstanley & Bjork, 2002, p. 22). The design of multimedia-embedded instruction affects the degree to which learners engage in the cognitive processes required for meaningful learning within visual and verbal information processing systems (Mayer, 2001).

Method

This study aims to answer the following research question:

- Does WEBVOCLE have an impact on the learners' English language vocabulary retention?

The Design of the Tool

WEBVOCLE encompassed the following characteristics:

- Spaced repetitions: Learners were provided with spaced repetition of words (graduated interval recall) in which increasing intervals of time were used between subsequent reviews of the vocabulary items. To guarantee their retention in memory, learners made revisions, which became less and less frequent in time.
- Contextual guesswork: Target words were presented to learners in various contexts and they were encouraged to guess the words' meanings.
- Multimedia embedded instruction: Meanings of target vocabulary items were presented through visual aids and an online dictionary which provided synonyms, pronunciations, and meanings of each word. The first text in each module presented the words with hyperlinks, supported with an online dictionary. Thus, the learners would be able to see and learn the word's pronunciation and collocations and to register and use them in sentences.
- Encoding variability: Use of context-based presentation with audio-visual aids constituted elaborative processing and encoding variability.

The design and the presentation of modules within the web-based material corresponded to the units of the main course book used in the course at school. The study was carried out according to the plan in Table 1. The researchers followed the plan closely.

Table 1
Implementation

Weeks	Modules and Dates	Tests and Dates
1. week	Module A (February 20-25*)	Pre-test A* (February 20)
2. week	Module B, A1 (February 27- March 4)	Pre-test B* (February 27)
3. week	Module C, B1 (March 6-11)	Pre-test C* (March 6)
4. week	C1, A2 (March 12-18)	
5. week	B2 (March 19-25)	
6. week	C2 (March 26-April 1)	
7. week	A3 (April 2-8)	
8. week	B3 (April 9-15)	
9. week	C3 (April 16-22)	
10. week	(April 23-29)	
11. week	Post-tests* (A,B,C) (May 7-13)	

Note: *Tests A, B, C: English language vocabulary retention tests.

**The dates indicate the period when the modules and repetitive exercises were open to the learners' access.

Three sets of words were presented in Module A, Module B and Module C within the web-based vocabulary learning system. The words in these modules were taken from the learners' main course book and they were presented in context and followed by a comprehension exercise and vocabulary game in the system (Figure 1, 2 & 3). Vocabulary items in A, B, and C modules differed from each other, and these words had been taught to the learners in class one day before their web-based presentations. By utilizing different sets of words, the researchers were able to measure the effect of revisions on retention with three different applications. Therefore, three different pre-tests concerning the sets of words were implemented. After learners took the pre-tests at school in the morning, they were able to access the system the same day in the evening. The subsequent repetitive exercises covered the following practices in this order:

- A1, B1, C1 Repetitive exercise one:
 - Choose the appropriate word (in combo boxes)
 - Fill in the blanks by writing exercise. (Figure 4)
 - Fill in the blanks exercise (drag and drop)
- A2, B2, C2 Repetitive exercise two:
 - Matching exercise
 - Multiple choice test
- A3, B3, C3 Repetitive exercise three:
 - Puzzle (Figure 5)
 - Cloze test

Before opening the web-based material for learners' access, the researchers provided an explanatory session about how to register, how to login and logout of the system, how to move between the pages, how to use other navigation buttons and pop-up windows, how to adjust screen resolution, etc. As stated by Borne (1993), "motivating students to learn is a difficult task since the dawn of civilization" (p. 388) and when it comes to a programmed environment, it is much more difficult. The researchers experienced the same during the implementation of the study; therefore, they continuously reminded participants to use the system.

As previously stated, Ebbinghaus suggested that most forgetting occurs very soon after the learning (1885, as cited in Waring, 2004); thus, the researchers provided the modules as the first repetition of the pre-learned words within 24 hours after their initial exposure in class. The second repetition was one week after that, the third one was two weeks after the first one and the last one appeared three weeks after the third one. Thus, the time intervals between repetitions gradually increased throughout the semester.

Learners were exposed to three modules that included 10 to 12 target words each. In order to prevent possible confusion, only the basic meaning of the word in that context was given. After a module was studied by the learners, it was closed to learners' access. That is, learners were not allowed to study the previous weeks' or months' vocabulary items because the researchers aimed to see the effects of spaced repetition in such intervals.

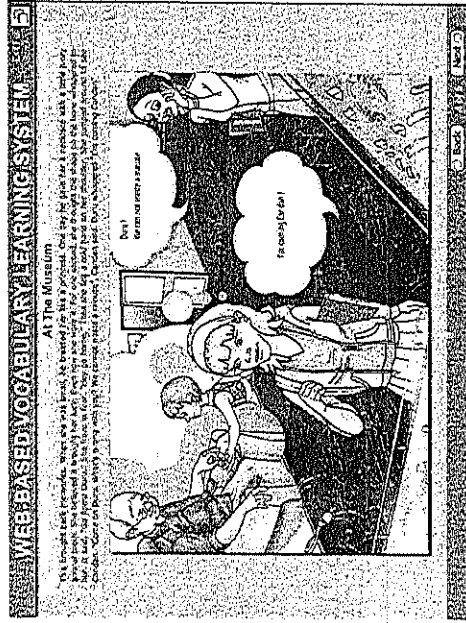


Figure 1. A sample story page

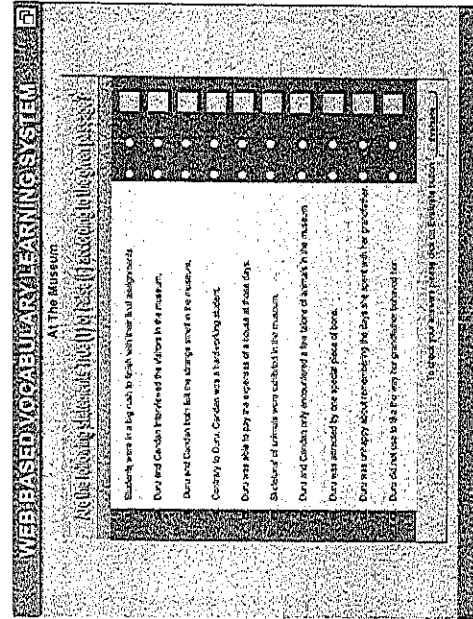


Figure 2. True/False exercise following the story

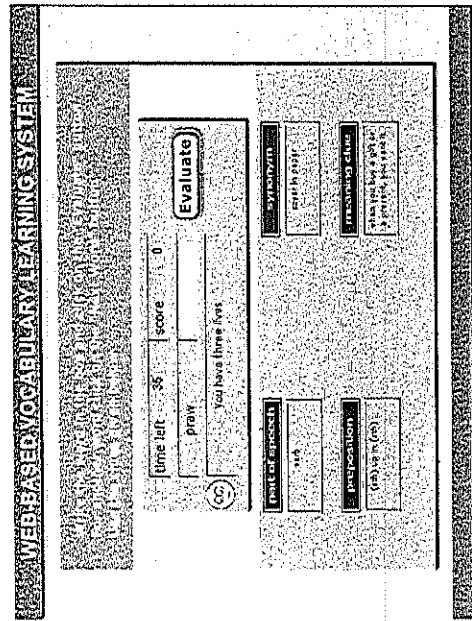


Figure 3. Vocabulary game

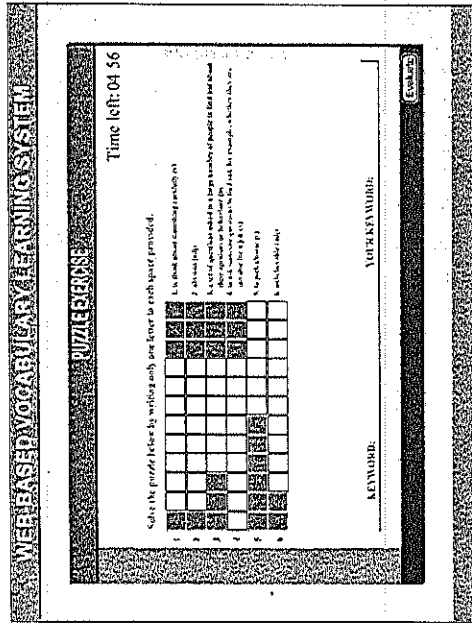


Figure 5. Puzzle

Sampling

The study was carried out with 69 (39 female, 30 male) students in the spring semester of 2006-2007 at Gazi University Preparatory School and lasted one semester. A within-subject design was used in this study with the participants who were exposed to web-based vocabulary again as a supplementary material after class. That is, the material to be used for the present research study enabled the revision of pre-learned vocabulary items. The effect of spaced repetition on vocabulary retention throughout several weeks was investigated. The researchers especially preferred researching prep school students because these students were thought to have a higher rate of access to computers and the Internet on account of their age and the opportunities they were provided through the labs on university campuses, in their residence halls, and at other places such as Internet cafes.

Data Collection Methods and Instruments

Learning evaluation is one of Kirkpatrick's four levels of evaluation (1994) and focuses on learners' development of skills, knowledge or attitudes rather than their satisfaction. In order to gather information about the learners' vocabulary proficiency levels, pre-tests and post-tests were given to learners. The pre-tests were administered after learners' first exposition to target words in class and the post-tests were administered after studying the web-based modules at the end of week 11, as the researchers believed that the results of such a test would better reflect subjects' longer term retention of words after some time passed. The rationale for the application of the pre-test after in-class exposition of words was that the study investigated the effects of vocabulary revision modules on retention. The web-based material provided revision of the pre-learned words. After in-class exposition of words, learners' retention rates of those



Figure 4. Fill in the blanks by writing exercise

words were measured. If the pre-tests had not been applied after in-class exposition and before the implementation of the modules, the researchers would not have investigated the effects of revision on retention. After the implementation, the post-tests were applied and retention rates were measured again. It was hypothesized that with the revisions, the learners would be able to retain the words at the same rate or a slightly higher rate just after their in-class exposition.

Because the study investigated the impact of WEBVOCLE on learners' vocabulary retention, the changes in the level of retained words through the process were measured. For measuring the changes, a one-way ANOVA was used. The factor was the number of participation in each application of Modules A, B and C, and the dependent variable was the vocabulary retention level regarding post- and pre-tests' differences. Learners' participation number for each of the four applications of Module A, B and C were recorded during the study, and this data was computed by giving 1 point for each participation number.

Results

There were three English language vocabulary retention tests in the form of a pre-test and post-test for each module of A(9 items), B(10 items) and C(11 items). Each test was applied prior to and after the implementation of each A, B, and C module. Learners' total gain, or the number of words retained before and after the web-based expositions, are presented in Table 2. As demonstrated, there was an increase in the mean pre- and post-test scores, which meant that the number of words that learners remembered increased with time. In order to see each repetition's effect on learners' vocabulary retention, a more detailed analysis with ANOVA was conducted.

Table 2

	Pre-test A		Post-test A		Pre-test B		Post-test B		Pre-test C		Post-test C	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
N	69	69	69	69	69	69	69	69	69	69	69	69
Minimum	-4.00	-4.00	-3.00	1	1	0	0	0	0	0	0	0
Maximum	7.00	5.00	11.00	9	9	10	10	10	9	9	11	11
Mean	1.9275	.3333	2.6087	4.75	6.68	6.48	6.81	6.81	4.57	4.57	7.17	7.17
Std. Deviation	1.88997	2.03402	2.08790	1.973	2.152	2.343	2.421	2.285	2.285	2.651	2.651	2.651

Results of the pre-test and post-test for Module A. The findings indicated that as learners revised the words within Module A, a moderate increase occurred in the level of their retention of those words (Table 3). Next, in order to investigate learners' means of pre-test and post-test score differences after completing A, A1, A2, and A3, a one-way ANOVA was computed.

Table 3

The Mean Differences between Learners' Pre-test & Post-test Scores after Completing Module A

Revisions of Module A	N	Mean	Std. Deviation
.00	2	-.5000	.70711
1.00	3	.3333	.57735
2.00	13	.9231	2.10006
3.00	14	2.0000	2.28709
4.00	37	2.5135	1.44571
Total	69	1.9275	1.88997

According to the result of ANOVA, there was a statistically significant difference in pre-test and post-test scores of learners, $F(4,64)=3.67$, $p=.009$ ($p<0.05$) (Table 4). In other words, there was a significant difference in the number of words that learners remembered from Module A before and after using WEBVOCLE, taking into account the frequency of revisions of Module A.

Table 4

The Results of ANOVA Analysis of Module A ANOVA Post-test A- Pre-test A

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	45.305	4	11.326	3.673	.009
Within Groups	197.333	64	3.083		
Total	242.638	68			

Because the test was significant, follow-up tests were conducted to evaluate the pairwise differences among the means. In order to determine the reason for the difference in the application numbers, multiple comparisons were carried out. In order to decide on the right post-hoc procedure, the group's homogeneity-of-variance was checked. The significant value was .29, which was greater than .05; therefore, the assumption of homogeneity-of-variance was not violated (Pallant, 2001) (Table 5). Next, post-hoc comparisons (Tukey HSD) were applied.

Post-hoc comparisons (Tukey HSD) showed that there was not a statistically significant difference between 0 and the other groups, between 1 and the other groups, or between 3 and the other groups because p values were greater than .05. However, between the learners with the participation frequencies of 2 and 4, there was a slight significant difference, $p=.05$ ($p<0.05$) (Table 5). This emanated from the learners who had practiced in all 4 revisions. It meant that the learners who had revised the words in all 4 practices of Module A remembered slightly more words than the ones who practiced only twice. This might result from the fact that learners' revision of the same vocabulary four times had a positive effect on the learners' retention. In order to better understand what caused such a revision effect on retention in Module A, other modules were examined in the following sections.

Table 5
The Results of Homogeneity-of-variance Test and Post-hoc Comparisons
Levene's Test of Equality of Error Variances Post-test A- Pre-test A

F	df1	df2	Sig.
1.272	4	64	.290

Multiple Comparisons		95% Confidence Interval				
(I) A	(J) A	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
.00	1.00	-8.3333	1.60295	.985	-5.3329	3.6662
	2.00	-1.42308	1.33373	.823	-5.1670	2.3208
	3.00	-2.50000	1.32737	.337	-6.2260	1.2260
	4.00	-3.01351	1.27475	.139	-6.5918	.5648
1.00	.00	.83333	1.60295	.985	-3.6662	5.3329
	2.00	-.58974	1.12470	.985	-3.7469	2.5674
	3.00	-1.66667	1.11715	.571	-4.8026	1.4692
	4.00	-2.18018	1.05409	.246	-5.1391	.7787
2.00	.00	1.42308	1.33373	.823	-2.3208	5.1670
	1.00	-.58974	1.12470	.985	-2.5674	3.7469
	3.00	-1.07692	.67633	.508	-2.9754	.8216
	4.00	-1.59044(*)	.56614	.050	-3.1796	-.0012
3.00	.00	2.50000	1.32737	.337	-1.2260	6.2260
	1.00	1.66667	1.11715	.571	-1.4692	4.8026
	2.00	1.07692	.67633	.508	-.8216	2.9754
	4.00	-.51351	.55097	.883	-2.0601	1.0331
4.00	.00	3.01351	1.27475	.139	-.5648	6.5918
	1.00	2.18018	1.05409	.246	-.7787	5.1391
	2.00	1.59044(*)	.56614	.050	.0012	3.1796
	3.00	.51351	.55097	.883	-1.0331	2.0601

* The mean difference is significant at the .05 level.

Results of the pre-test and post-test for Module B. According to the result of the analysis, when learners revised the vocabulary items in Module B, there was a slight increase in their vocabulary retention. Table 6 gives the means of the differences between learners' pre-test and post-test results after their participation in Module B. In order to investigate learners' means of pre-test and post-test scores' differences according to their revisions of B, B1, B2, B3, a one-way ANOVA was computed.

Table 6

The Mean Differences between Learners' Pre-test and Post-test Scores with Respect to Their Participation in Module B

Revisions of Module B	N	Mean	Std. Deviation
.00	6	-1.1667	1.72240
1.00	7	-.5714	1.90238
2.00	13	.0000	2.51661
3.00	16	.4375	1.63172
4.00	27	1.0000	1.92154
Total	69	.3333	2.03402

According to the results of ANOVA indicated in Table 7, there was not a statistically significant difference in pre-test and post-test scores of learners, $F(4,64)=2.12$, $p=.089$ ($p>.05$). Therefore, there was not a need to conduct any post-hoc analysis.

Table 7

The Results of ANOVA Analysis of Module B

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32.848	4	8.212	2.115	.089
Within Groups	248.485	64	3.883		
Total	281.333	68			

Results of the pre-test and post-test for Module C. The findings indicated that as learners revised the vocabulary items in Module C, a moderate increase occurred in the level of their retention of those items (Table 8). Next, in order to investigate learners' means of pre-test and post-test score differences according to their revisions of C, C1, C2, C3, a one-way ANOVA was computed.

Table 8

The Mean Differences between Learners' Pre-test and Post-test Scores with Respect to Their Participation in Module C

Revisions in Module C	N	Mean	Std. Deviation
1.00	8	.6250	2.26385
2.00	9	1.6667	1.41421
3.00	21	3.0476	2.31249
4.00	31	3.0968	1.70009
Total	69	2.6087	2.08790

According to the results of ANOVA indicated in Table 9, there was a statistically significant difference in the pre-test and post-test scores of learners, $F(3,65)= 4.49$, $p=.006$ ($p<.05$). In other words, there was a significant difference in the number of words that learners remembered from Module C before and after using WEBVOCLE, taking into account their revision frequencies.

Table 9

The Results of ANOVA Analysis of Module C

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	50.898	3	16.966	4.491	.006
Within Groups	245.537	65	3.777		
Total	296.435	68			

Because the test was significant, follow-up tests were conducted to evaluate the pair wise differences among the means. In order to determine the reason for the difference in the application numbers, multiple comparisons were carried out. In order to decide on the right post-hoc procedure, the group's homogeneity-of-variances was checked. The significant value was .80, which was greater than .05; therefore, the assumption of homogeneity-of-variance was not violated (Table 10). Next, post-hoc comparisons (Tukey HSD) were applied.

Post-hoc comparisons (Tukey HSD) showed that there was not a statistically significant mean difference between 2 and the other groups, but there was a significant difference among the groups with the participation frequencies of 1, 3 and 4 $p=.020$ and $p=.011$ ($p<0.05$) (Table 10). This emanated from the learners who had participated in all 4 revisions. There was a statistically significant difference between the learners who had revised the vocabulary items once and the ones who revised them four times. Similarly, there was a difference between the learners who had revised the words once and the ones who revised three times.

Table 10

The Results of Homogeneity-of-variance Test and Post-hoc Comparisons

Levene's Test of Equality of Error Variances/Post-test C- Pre-test C

Levene Statistic	df1	df2	Sig.
.336	3	65	.800

Multiple Comparisons

Dependent Variable: Post-test C- Pre-test C

(I) C	(J) C	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
Revisions of C	Revisions of C				Lower Bound	Upper Bound
1.00	2.00	-1.04167	.94441	.689	-3.5318	1.4485
	3.00	-2.42262(*)	.80751	.020	-4.5518	-.2934
	4.00	-2.47177(*)	.77074	.011	-4.5040	-.4395
2.00	1.00	1.04167	.94441	.689	-1.4485	3.5318
	3.00	-1.38095	.77434	.291	-3.4227	.6608
	4.00	-1.43011	.73592	.220	-3.3705	-.5103
3.00	1.00	2.42262(*)	.80751	.020	.2934	4.5518
	2.00	1.38095	.77434	.291	-.6608	3.4227
	4.00	-.04916	.54930	1.000	-1.4975	1.3992
4.00	1.00	2.47177(*)	.77074	.011	.4395	4.5040
	2.00	1.43011	.73592	.220	-.5103	3.3705
	3.00	.04916	.54930	1.000	-1.3992	1.4975

* The mean difference is significant at the .05 level.

Discussion of Findings

The results of the study demonstrate that WEBVOCLE proved to be effective for retention of the words that had been previously taught in the classroom. Throughout the study, learners were exposed to three modules that included 10 to 12 target words. Learners' vocabulary retention levels for each of three modules, in regards to their participation frequencies and pre-test and post-test scores' differences, were analyzed by computing ANOVA and post-hoc tests. According to the results, the number of words that learners remembered increased in Modules A and C. The results also indicated that the number of words recalled decreased for the learners who did not make any revisions. The difference in the mean scores was particularly observed with the revision number of practices 2 and 4. That is, the learners' vocabulary retention levels increased when they revised the words in all four practices rather than only two practices. Besides this, the mean score differences between pre-post tests were 1.9 for Module A, 0.3 for Module B, and 2.6 for Module C. Learners' vocabulary retention increased the most in Module C, with approximately 2.5 words, and the least in Module B, with less than a word on average; however, learners were still able to retain almost the same number of words that they had learnt prior to implementation of Module B.

However, the size of target vocabulary, the strategy applied, the types of target words, the length of intervals, the use of multimedia, use of an online dictionary, the meaningfulness of contexts that the words are used in, the accepted increase of learners' English language proficiency levels at school, and learners' independent studying of target words other than WEBVOCLE might have affected learners'

performance in post-vocabulary retention tests positively. Moreover, the quality and the quantity of repetitions, learners' extrinsic motivation that was affected by the fear of getting low oral marks, and the presence of the teacher who continuously observed learners' participation in WEBVOCLE might have affected the results of vocabulary retention tests. These students were thought to be highly extrinsically motivated to improve their English language proficiency for the final proficiency exam; therefore, the research might have a different result with a different sample other than intensive English program students.

As suggested by Lauter and Hulstijn (2001), further research could compare vocabulary retention according to varying task involvement load and the number of exposures to the investigated words. The exact number of encounters that leads to perfect retention might be investigated in further studies by controlling the variables, such as the size of target vocabulary, the preferred strategy, the types of target words, use of multimedia, learners' independent studying of target words, the quality and the quantity of repetitions.

Conclusion and Further Recommendations

Current developments in information technologies with computers and the Internet have correspondingly resulted in rapid advances in the application of technology in the field of education. However, most of the researchers have failed to base their studies on the psychological principles of human learning and have only investigated the learners' achievement differences between web-based and conventional training so far. English language teaching in general and vocabulary teaching and learning would benefit from other studies with respect to the effective use of different methods or strategies through ICT and multimedia. Although the integration of computers and the Internet within educational programs is the trend nowadays, educational settings should not adapt it immediately. Rather, they should examine the methods and strategies currently applied for effective teaching with technology. Prior to designing any web material, a designer should keep in mind that web-based education cannot be a duplicated version of face-to-face learning/teaching.

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Web-Tabanlı Aralık: Tekrarın Yabancı Dil Öğrencilerinin Kelime Hatırda Kalıcılığına Etkisi

(Özet)

Bilgisayar öğrenme ve öğretim sürecini destekleyen en etkin araçlardan birisidir. Bilgisayar ve İnternet destekli dil eğitimi materyalleri günümüzde dil eğitiminde sıklıkla kullanılmaktadır. Bilindiği üzere dil eğitiminde etkileşim çok önemlidir. Günümüzde çoklu ortam destekli dil eğitimi materyalleri öğrencilere hem işitsel ve hem de görsel çalışma yapabilmeye avantajı sunmaktadır. Dahası, hem işitsel hem de görsel kanallardan elde edilen bilginin daha iyi öğrenildiği ve kalıcı olduğuna dair çalışmalar literatürde mevcuttur. Bilgisayarlar öğrenmeyi daha etkili hale getirmek amacıyla çoklu ortam desteğini sunmakla kalmayıp özellikle İnternet teknolojisi öğrencilerin sınıfı öğrendiklerini tekrar yapabilmeleri, ekstra çalışma ve araştırmalar yapabilmeleri ve bireysel olarak çalışarak kendi kendine öğrenmeyi güçleştirebilmesi gibi çağdaş yaklaşımlarla öğretim imkânları da sunmaktadır. Burada söz edilen öğrenme biçimleri klasik öğrenme yaklaşımlardan çok daha farklıdır ve bu tür çağdaş yaklaşımların öğrenme çıktılarının çok daha verimli olduğu eğitim uzmanlarının kabul görmektedir.

Problem Durumu: Daha önce söz edildiği gibi bilgi iletişim teknolojileri farklı ortamlar ve özellikler sunarak dil öğrenmeye katkıda bulunmuştur. Teknoloji destekli dil öğrenmeye yönelik çalışmalar genellikle geleneksel ortam ile yeni teknolojilerin dil öğrenmeye yönelik katkısını araştıran karşılaştırmalı çalışmaları olmuştur. Dolayısıyla, teknoloji destekli dil öğrenme ve öğretim ortamlarında öğretim yöntemlerinin kullanılmasına üzerine çalışmalar yapılmasına ihtiyaç vardır. Bu sayede, öğrenmenin teknoloji desteğiyle nasıl gelişeceği ve gerçek anlamda bir dil eğitimi yazılımının nasıl olması gerektiği ile neden-yöntembilimi üzerine dayanması gerekliliği anlaşılabilir.

Araştırmanın amacı: Bu araştırmanın amacı web-tabanlı çoklu ortam destekli bağlam modelinde aralıklı tekrarlar ile orta düzeyde İngilizce sözcük öğrenen öğrencilerde öğrenilenlerin hatırlanma kalıcılığına etkisini ölçmektir. Sınıfta öğrenilen sözcüklerin tekrarları, Pimsleur'un aralıkların açıklarak tekrar yapılması yaklaşımını temel alarak farklı ve düzenli olarak arttırılan aralıklarla gerçekleştirilmiş, böylelikle tekrarların öğrenilen kelimelerin hafızada kalıcılığına katkı sağlanması beklenmiştir. Web-tabanlı sözcük öğrenme materyalinde (WEBVOCLE) bağlam içerisinde sunulan sözcüklerin takdimi sesli çevrimiçi sözlük, resim ve animasyonlar ile zenginleştirilmiş, hedef sözcükler boşluk doldurma, çoktan seçmeli alıştırmalar, oyunlar, bulmacalar gibi etkileşimli alıştırmalarla öğrencilere tekratlatılmıştır.

Araştırmanın Yöntemi: Bu çalışma 2006-2007 öğretim yılı güz döneminde Gazi Üniversitesi Yabancı Diller Uygulama ve Araştırma Merkezi'nde başlangıç seviyesinde İngilizce eğitimi almakta olan 69 (39 kız, 30 erkek) öğrenci üzerinde uygulanmıştır. Öğrenciler okulda öğrendikleri konulara paralel olarak hazırlanan içeriği web-tabanlı kelime öğretim sistemlerinde 9 hafta boyunca takip etmişlerdir. Öğrenciler haftalık uygulamalara her bir katılımlı için birer puan almışlar ve bu sayıların toplamı tüm uygulamalara katılım sayısı

değişkeni olarak atanarak analizlerde kullanılmıştır. Uygulamaların tümü tamamlandıktan 2 hafta sonra 11. haftanın sonunda ise son-testler uygulanarak kelimelerin hatırla kalıcılığı ölçülmüştür. Araştırmacılar örneklem elverişliliği yöntemini uygulayarak veriyi kolaylıkla ulaşılabildikleri sınıflardan toplamışlardır.

Bu çalışmada sözcük hatırlama testleri ile niteliksel veri toplanmıştır. Testler ön-test ve son-test şeklinde uygulanmıştır. Ön-testler sözcükler sınıfta öğretiltikten sonra uygulanan testlerdir. Son-testler ise tüm uygulamalar tamlandıktan sonra uygulanan testlerdir. Öğrencilerin sözcük hatırlama oranları web-tabanlı uygulama öncesi ve sonrası uygulanan ön-test ve son-testlerin sonuçları arasındaki farklılıklara bakılarak belirlenmiştir. Verilerin analizi SPSS istatistik yazılımı kullanılarak yapılmıştır. Her modül için uygulamaların analizleri ayrı ayrı yapılmış ve öğrencilerin katılım sayılarına göre grup ortalamalarının ikili karşılaştırmalarının testi yapılmıştır.

Araştırmanın Bulguları ve Sonuçları: Öğrencilerden elde edilen veriler göstermiştir ki, öğrenciler hedef sözcüklerin hatırla kalıcılığı açısından ilerleme kaydetmişlerdir. Dahası, ikili karşılaştırma testi sonuçlarına göre öğrencilerin eğitim sistemine katılım sayıları ile hatırladıkları sözcüklerin sayısı arasında ilişki olduğu gözlemlenmiştir. Öğrencilerin sistemdeki haftalık uygulamaları takip sayıları ile hatırladıkları kelime sayısı doğru orantılı olarak yükselmiştir. Araştırmanın sonuçlarına bakılarak, WEBVOCLE sağladığı aralıklı tekrar imkânı ile öğrencilere daha önce sınıfta öğretilmiş sözcüklerin hatırla kalıcılığını sağlamada katkıda bulunmuştur.

Öneriler: Araştırmada, medya sadece eğitimi öğrenciye ulaştırma bir araç olarak değerlendirilmiş, hedef sözcükler bağlam içerisinde kelime öğretimi metodu ile sunulmuş ve özellikle aralıklı tekrarı sözcük öğrenme üzerinde etkisi üzerinde durulmuştur. Dolayısıyla, araştırmada web dil eğitim ve öğretiminde geçerli metot ve pedagojik prensiplere sahip içeriğin hedef kitleye ulaştırılmasını sağlayan ortamdır. Bu araştırmanın sonuçlarına bakılarak, sonraki teknoloji üzerinde odaklanılması yerine metot, dil öğrenme ve öğretim teknolojilerinin üzerinde önemle durulması önerilmektedir. Teknoloji destekli sözcük eğitimi üzerine yapılmış çalışmaların literatürde yer almasının birçok bakımdan faydalı olacağı düşünülmektedir. Dil öğretiminde teknoloji kullanımını yaygınlaştırarak piyasada var olan ürünlerin öğretim ilke ve prensiplerine dayandırılarak hazırlanması, öğretimin verimliliğini artıracaktır. Bu araştırmada geliştirilen web-tabanlı dil eğitimi sistemi dil eğitimcilerine kendi derslerinde benzer çalışmalar yapabilmeleri adına örnek olacağı düşünülmektedir. Aynı zamanda bu konu üzerinde çalışan araştırmacılar da bu ve benzeri sistemlerin verimliliğinin artırılması ya da geliştirilmesi üzerine hem farklı teknolojik araçlar kullanımı hem de farklı eğitim yöntemlerinin uygulanması üzerine araştırmalar yapabilirler. Aralıklı tekrar yöntemi sadece dil öğretimi değil farklı derslerin ya da konuların öğretimi için de kullanılabilir. Önemli olan öğretilen içeriklerin tekrarı aralıklı tekrar yaklaşımında önerilen prensibin uygulanmasıdır. Dolayısıyla, bu araştırmanın sonuçlarının farklı alanlarda öğretim vermekte ya da almakta olanlara da faydalı olacağı düşünülmektedir.

Araştırma Sözcükleri: Web-tabanlı eğitim, aralıklı tekrar, etkileşimli dil öğrenme ortamları, kelimelerin hatırla kalıcılığı, çoklu ortam.

Computer Use in Foreign Language Teaching: A Case Study from North Cyprus

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Abstract

Problem statement: In North Cyprus there is a need for understanding and evaluating the use of technology in general and specifically computers in teaching foreign language with a broader perspective. This study can be used by educators to determine how technology can be incorporated better into the professional and academic lives of foreign language teachers in North Cyprus.

Purpose of study: The purpose of this study is to examine the perceptions of foreign language teachers on the use of computers for administrative and teaching purposes in teaching foreign languages in Eastern Mediterranean University (EMU) and compare their perceptions based on gender, age, experience, and education level.

Methods: This study adopted a survey method to examine the perceptions of preparatory school language teachers. The sample of the study was selected by random sampling. It included 50 teachers from EMU's preparatory school in the 2007-2008 academic years. A questionnaire titled "Administrative and Pedagogical Uses of Computers in Foreign Language Teaching" was adopted. For data analysis, frequency and percentage techniques were used to indicate the level of each item. ANOVA was administered to assess whether there was a significant difference in the perceptions of teachers according to their gender, age, experience, and educational level.

Findings and Results: The study found that teachers use computers more for administrative purposes. Although the importance of computers was emphasized, teachers did not use them very much. Except for the age variable, no significant difference was found in the perceptions of the teachers on computer use according to gender, years of experience, or level of education.

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