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The Effect of Using Word Clouds on EFL Students' Long-Term Vocabulary Retention

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Abstract

Vocabulary is an important component in all four skills of language. Issue of vocabulary retention has great importance to EFL teachers in instructional contexts because they always observe students forget the words which are taught to them after a short period of time. The current study investigates whether the use of an interactive web-based tool referred to as 'Wordsift' can result in a significant improvement in long-term vocabulary retention of EFL students. 60 participants were selected to take part in the study.The participants' age ranged from 17 to 24. They were taught 100 words in six contextualized texts. The main experiment consisted of twelve sessions, which were followed by an additional meeting designed to check the treatment effect on the long-term vocabulary retention. The results of T-test and ANOVA analyses indicated that word cloud (Wordsift) does have positive significant effect on EFL learners' long-term vocabulary retention.

Keywords: Concept Map, Long- term Retention, Vocabulary, Word Clouds, Wordsift

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Introduction

The term vocabulary refers to "a list or set of words for a particular language or a list or set of words that individual speakers of a language might use" (Hatch & Brown, 1995). In importance of vocabulary Wilkins argued that ‘‘without grammar very little can be conveyed, without vocabulary nothing can be conveyed’’ (1972, p. 111). According to Mehrpour and Rahimi (2010) it has been consistently demonstrated that reading comprehension is strongly related to vocabulary knowledge. Any experienced teacher knows that even after students have more or less mastered grammar, they still face masses of unknown words as they continue to study (Laufer, 1986). According to Cohen & weaver (2005)vocabulary learning is a skill-related strategy that cuts across all four skills.

Because students forget the words after a short period of time, vocabulary retention is of crucial importance to EFL teachers. Then, there is the responsibility of helping learners to effectively store and retrieve words in the target language (Sökmen, 1997), and this necessitates the use of effective pedagogical methods in teaching vocabulary. Therefore, finding and providing new strategies in teaching for enhancing long-term vocabulary retention can be of great help.

Considering the close relationship between EFL learners’ vocabulary command and their ability to understand English readings, researchers have been searching for ways to effectively enhance students' acquisition and retention of learned vocabulary knowledge (Min & Min, 2008). As more and more L2 learners are reading electronic texts from software or over the Internet, there is a need to guide the development of new ways of word presentation. If the interaction between different types of media such as audio, text, picture, and animation presented to the learners is thought to be a considerable help in memorizing words (Dubois & Vial, 2000), then it becomes important to examine if interactive web-based tools such as Wordsift would improve students’ vocabulary learning. Wordsift creates a word cloud through converting the texts into visualized art, in which the learners can see the text in a new way. In addition since this tool is equipped with thesaurus, by offering a concept map containing synonyms and antonyms it will let the students relate their old

knowledge to new ones. Also this tool by searching the Google images for words will help to create a multimedia environment to address all learning styles. In addition, working with this instructional tool is very easy and students and teachers can learn to use it quickly. With all these options which Wordsift provides to users, it is important to see whether it can be an effective tool in enhancing long-term vocabulary retention?

The importance of this study is that, itsfindings will be helpful to teachers who are looking for appropriate ways to help students increase the size of their vocabulary knowledge and facilitate vocabulary retention for future use.

Review of the Related Literature: Theoretical Background

Considering the role of vocabulary in learning a new language, here is a short representation of the status of the vocabulary teaching in different approaches. In 'Grammar Translation Method' the study of vocabulary was advocated through the memorization of lists of target language words and their native language equivalents which were selected from the reading texts (Richards & Rodgers, 2003). 'The Direct Method' emphasized oral skills over written skills. It was supposed that vocabulary can be acquired naturally through interactions during the lesson; therefore, vocabulary was presented in context and was graded from simple to complex. In this approach, vocabulary was emphasized over grammar (Larsen-Freeman, 2000). In 'Reading Approach' the vocabulary used in the reading passages was controlled at the beginning levels and was chosen according to their frequency and usefulness. The acquisition of vocabulary was considered to be more important than grammatical skills and was expanded as fast as possible through intensive and extensive reading (Richards & Rodgers, 2003). In 'The Audio-Lingual Method' the main emphasis was placed on the grammar of a language which should be over learned. The new grammatical points and vocabulary were presented through dialogues; thus, vocabulary learning was kept to a minimum (especially in the initial stages) and new words were introduced and selected according to their simplicity and familiarity to make the grammar practice possible (Zimmerman, 1997). In

'Communicative Approach' with its emphasis on fluency over accuracy, and a focus on encouraging learners to communicate their messages and intentions, vocabulary has not been a primary concern and was given secondary status, taught mainly as a support for functional language use (Decarrico, 2001). 'Lexical Approach' reflects a belief in the centrality of the lexicon in learning a language and how knowledge of lexicon is formatted, coded, and organized (Richards & Rodgers, 2003). In 'Natural Approach', vocabulary is emphasized over grammar "suggesting that a language is essentially its lexicon and only inconsequently the grammar that determines how the lexicon is exploited to produce messages" (Richards & Rodgers, 2003 p. 180).

Types of Vocabulary Learning: Intentional or Incidental?

Hulstijn (1992) distinguished between two types of vocabulary learning:intentional and incidental. The type of learning is determined based on the learners' responsibility for the learning task, which is specified in advance of the task. Therefore, participants who are told in advance that they would have a reading comprehension test after reading the text are treated as incidental vocabulary learning subjects. Those participants who are told in advance that they would have vocabulary tests and reading comprehension are treated as intentional vocabulary learning subjects. Despite the discrepancy among researchers on operationalizing the two terms, it is generally agreed that intentional vocabulary learning, in which student attention is directly focused on vocabulary, offers a greater chance for vocabulary learning (Nation, 2001). Results of some experimental studies also prove that words are more easily acquired intentionally than incidentally (Konopak et al., 1987). However, it is a common belief in both L1 and L2 research that vocabulary is mostly learned incidentally through reading (Krashen, 1989; Nation, 2001).

Explicit vs. Implicit vocabulary instruction

Nagy and Herman (1987) point out that explicit vocabulary instruction may be effective for a specific reading lesson, but it cannot result in any substantial increase in overall vocabulary size. Major progress toward the goals of vocabulary development can be attained

more easily by increasing incidental vocabulary learning (Nagy & Herman, 1987). Vocabulary instruction has usually placed a great deal of emphasis on using context to figure out word meanings. Context clues do support incidental word learning, but it's important to recognize the limitations of contextual analysis. The odds of accurately predicting a word's meaning from written context is very low, ranging from 5 to 15% for both native English speakers and EFL / ESL learners (Beck et al., 2002). Learning vocabulary from context must be evaluated in terms of its long-term effectiveness. Since vocabulary instruction can supply multiple, repeated encounters for only a small number of words, students must have additional opportunities to learn large number of words. Only frequent and regular reading can make this kind of exposure to words possible (Nagy & Herman, 1987).

What is a Word cloud (Wordsift)?

A word cloud is a visual representation for text data which is usually used to depict and visualize keyword metadata (tags) on websites free form text. Tags are usually single words, and the importance of each tag is shown with font size color, or other visual techniques (Halvey& Keane, 2007). Wordsift is a free website which provides the users with the opportunity to use word clouds to analyze texts. It attempts to address one of the greatest challenges facing educators of English Language Learners: how to grow and enrich the academic vocabulary of their students across the grade levels, and especially through academic content instruction Hakuta (2011).

Newly Web-based visualization technology designed by Hakuta and Greg Wientjes is great for helping teachers and their students focus on the academic language that reaches across content areas (Farkas, 2009). There are other visual tools that have served as predecessors, including TagCrowd, Wordle, and vocabGrabber, but this is the only site that integrates web-based images (Hakuta, 2011).

The following tools are part of the Wordsift website:

1. Tag Cloud. A Tag Cloud of the 50 most frequent words in the text, excluding functionwords(such as is, of, at, the). Certain word lists can be highlighted from the most frequentwords,such as the Academic Word List.

2. The most frequent word is entered into the Visual Thesaurus and the result is displayed asa word web. It displays the word, plus related words including antonyms and synonyms TheVisual Thesaurus display is interactive: the definition of each word on the displaypopsup when the cursor is scrolled over it.

3. Google Image Search. The results of Google searches are also displayed.

4. Google Video Search. The videos can be displayed by clicking on Video.

5. Sample Sentences. All relevant examples from the input text are listed.

According to Hakuta (2011)Wordsiftcan be used in the classroom as the following ways:

1- Lesson preparation:

- Identifies the challenging words or concepts prior to a lesson.
- Can help find pictures and videos to illustrate and pre-teach vocabulary

2- Previewing text:

- Can help students better understand the concept of skimming.
- Helps identify the key content words in a passage.
- The word cloud can be used to help students to identify main ideas, themes, goals of thepassage, intended audience, or to develop questions they believe should be answered bythepassage.
- By "sifting" the course description, it can help students preview a course.

3- Class learning activities:

- Students are given a Visual Thesaurus display and students need to discuss how the wordsare related. This reinforces the concepts of antonym and synonym.
- Students could be assigned weekly reading or listening logs where they would find theirownpassage and enter it into Wordsift. They could be responsible for sharing 5 words inan onlineforum with the class.
- Students can look at how the words are used in context throughout the passage and discuss ifthe word was used in the same way in every instance.

- Students could create their own online dictionaries via a blog with the Googlepictures/illustrations. They could also discuss whether or not the pictures that Google cameupwith represent the word well or not.

4- Literacy support:

- Individual students can use WordSift as they read text, or as they write a response orsummary.

- Can help students identify key academic vocabulary in a given passage.

- Is especially helpful for students in need of English for Special Purposes vocabulary when enrolled in a general English course.

5- Assessment:

- Whole-class vocabulary assessment can be done on-the-fly by showing the images fromselected words, having them identify unfamiliar words, and having students talk about whichpicture is the best representation of a given word.

- Teachers can also tailor their own assessments by copying and pasting the images, words,andsentences identified byWordSift into a separate file such as in Word or Power point.

Previous Research Findings

Long-term retention has received wide attention as one of the greatest problems in learning new words (Leeke& Shaw, 2000). With regard to vocabulary retention, Levine and Reves (1990) in a study showed that within the visual presentations, the contextualized presentation was less effective than the decontextualized one. This suggests that context may be helpful when the task is comprehension or deducing word meaning from context; it may, however, turn into an obstacle when the task is retention. Nam (2010) in a study regarding vocabulary learning and teaching concluded that first; the use of visual representations such as pictures and drawings can promote vocabulary retention. And also higher involvement in vocabulary production processing, for example, a composition task or retelling a text, can contribute to vocabulary retention. Higher vocabulary ability has been associated with better recall performance. The decomposition of the word recall performance in the research conducted by Krueger and Salthouse (2010) indicated that higher vocabulary was primarily

associated with an advantage in retention of information, such that higher-vocabulary individuals lost fewer items across trials. Kasahara (2010) examined the possibility of known-and-unknown word combinations on retention and retrieval of meaning in contrast to learning a single word. The results showed that known-and-unknown word combinations allowed better retention of meaning than single words. The study proved that grouping a familiar word with a word to be remembered was an effective way of learning vocabulary. In another study Plass, Chun, Mayer, and Leutner (1998) stated that students remembered unknown words better when provided with both pictorial and written annotations than when provided with only one kind or no annotation.

Research Questions

In the current study theoretically the EFL subjects' long-term vocabulary retention which is considered as the dependent variable was assessed. According to Richards and Schmidt (2003) retention refers to the ability to recall or remember things after an interval of time (p. 457). Operationally long-term retention is defined as the scores which students obtained in a vocabulary test after two weeks of last intervention. Teaching by Wordsift was independent variable of this study. The research questions were:

1.Does using Wordsift have any significant effects on adult EFL learners' long-term vocabulary retention?

2.Is there significant difference among the performance of the male and female subjects of the control and experimental groups on the long-term vocabulary retention?

Methodology

Participants

The participants of this study were 60 intermediate male and female students studying English at two English language teaching institutes in Hamedan, Iran. They were selected out of 120 EFL learners who took a Standardized English Proficiency Test(i.e. Nelson test) based on the results of their performance (See Appendix A). The learners whose scores fell one SD above and below the mean on the

Nelson proficiency test were selected to take part in the study. This ensured that all the participants were homogeneous regarding their English proficiency and at the intermediate level (Shahivand&Pazhakh, 2012). Most of the participants had previously passed in starter, elementary and pre- intermediate classes. All the participants were either high school or university students in different fields. The participants' age ranged from 17 to 24. Then, the participants were randomly divided into two groups. Members of both groups consisted of both male and female subjects.

Instruments

The instruments used in this study consisted of a Nelson English proficiency test (Appendix A) and two parallel vocabulary tests: one of them as the pre-testand the other as the post-test (Appendix B). These tests and their validation procedure are explained below:

Proficiency Test (Nelson)

Nelson 350 A test (Flower & Coe, 1976) was used for homogenizing the subjects regarding their proficiency level. This test consists of 50 multiple choice items. Before starting the treatment, Nelson test was administered to the experimental and control groups to ensure their homogeneity regarding their proficiency level. The validity and reliability of the Nelson testhave been estimated several times before by other researchers and it is considered as highly valid and reliable test of English proficiency(Shahivand&Pazhakh, 2012, p. 18).

Vocabulary Tests

The researcher chose 100 vocabularies from six texts from "Active Skills for Reading 3" by Anderson (2008) as the content of the instruction. But before starting the treatment, it was necessary for the researcher to know how many of the words were known to the students to check the effectiveness of the Wordsift on the long- term vocabulary retention. Therefore, the researcher gave the list of words to the students and asked them to write the meaning of the words either in English or Persian. This list served as the pre-test.

The same vocabulary items were used as the post test in the same way. The only difference was in the order of the items.

Validation Procedure

To estimate validity of the pre-test and post-test, which were developed by the researchers, concurrent validity which is a kind of criterion- related validity was used.To do so, these tests and the Nelson test were 30 EFL learners and then correlation between scores obtained on the vocabulary test and the vocabulary section of the Nelson proficiency test were computed. The result turned out to be 0.794 which indicated that the vocabulary tests were highly valid.

Material

The materials used included 100 vocabularies. The vocabularies were not taught as separate words but instead they were contextualized in six different texts chosen from the book titled "Active Skills for Reading 3" by Anderson (2008). The logic for choosing this book was that all the instructors believed that it was suitable to the students' proficiency level. The experimental group did not have access to the text papers. In the experimental group the participants were instructed using interactive web browser 'Wordsift' which provided the subjects with different options including word clouds, concept maps, definitions and pictures for presenting the words.

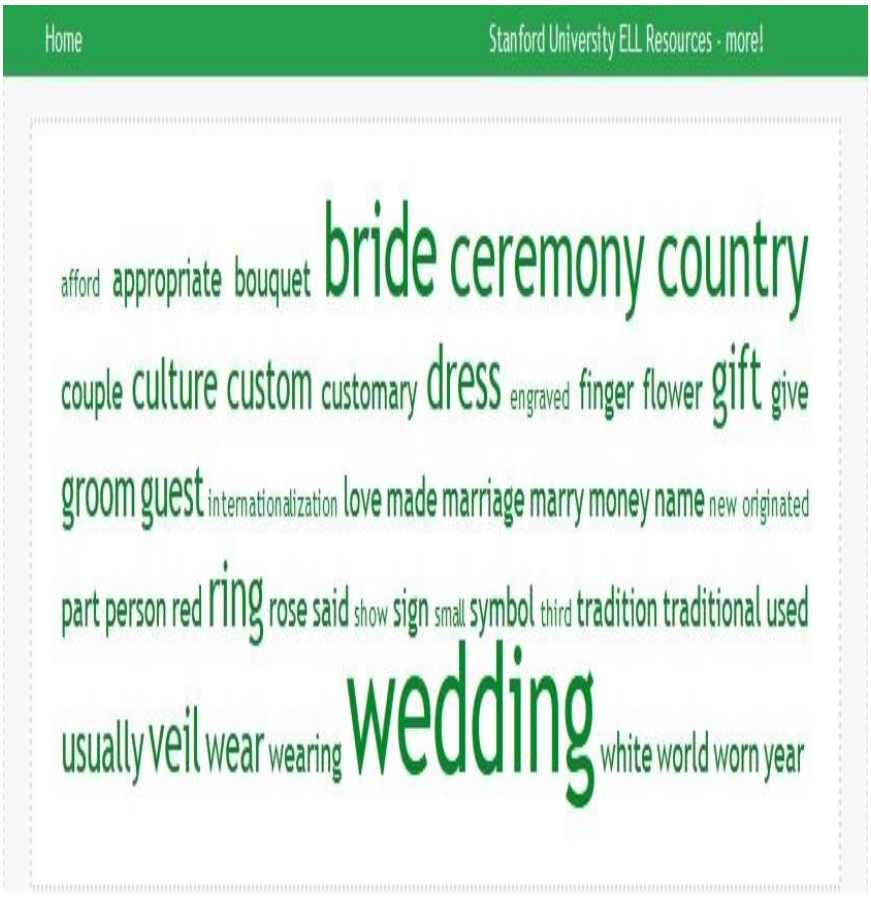

Figure 1.*Word Cloud Orovided by Wordsift*

A word cloud is a visual representation for text data, typically used to depict key word metadata on websites, or to visualize free from the text.

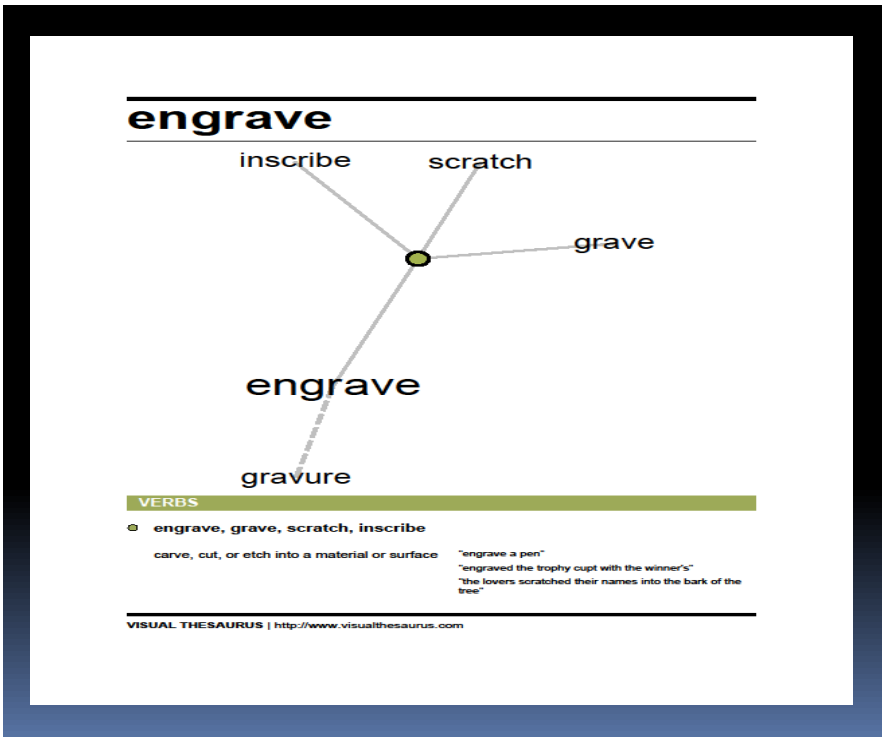

Figure 2. *Concept Map Provided by Visual Thesaurus of the Wordsift*

Wordsift presents the visual thesaurus for each vocabulary in which the students can see the synonyms, antonyms, different parts of speech and the meaning of the words.

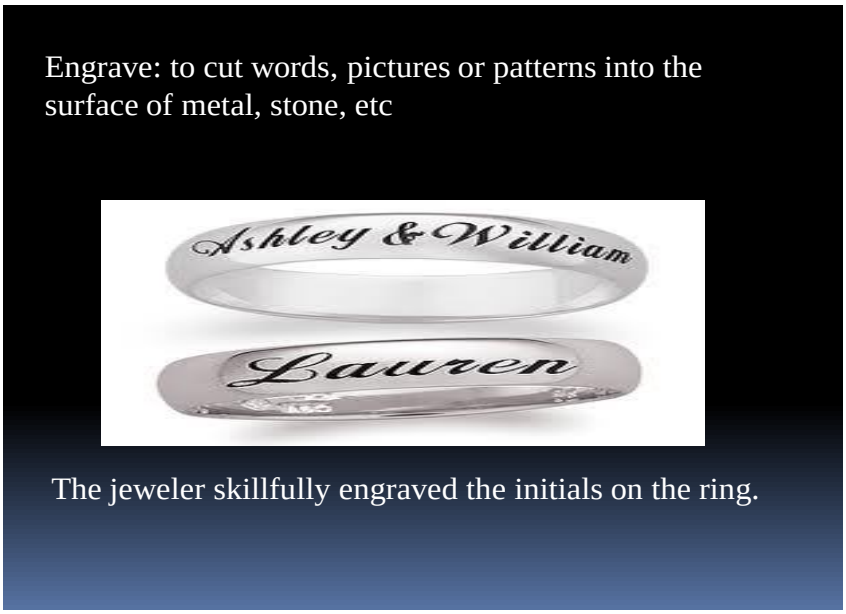

Figure 3. *Definitions, Pictures, and Examples Provided by the Wordsift*

Wordsift also provides the students with the picture of the vocabularies and learners can also listen to the pronunciation of the words through this web browser.

Data Collection procedure

The current study was done in different English language teaching institutes in Hamedan in 2012. At first, the Nelson English proficiency test was administered to the available subjects. Then, participants whose scores fell one SD above and below the mean were selected to take part in this study. Then, the participants were randomly divided into two groups. Members of both groups consisted of both male and female subjects. There were thirty subjects in every group.

In order to investigate the effect of Wordsift on the long-term vocabulary retention of the participants, the vocabulary pre-test was administered to both groups to examine whether or not there was any

statistically significant difference between their vocabulary knowledgeat the beginning of the study. The researcher also investigated the effect of using Wordsift on the different genders' long-term vocabulary retention. Then, a list of 100 vocabularies was taught to both groups during a period of 12 sessions which were held twice a week. The subjects received 15 minutes of instruction every session using any of the presentation methods. The experimental group received their instruction using interactive web browser "Wordsift" while the control group was instructed through the traditional way of teaching in which teachers used only text papers and dictionaries. Each target word received two sessions of instruction. In the first session the target words were introduced to the learners and their meanings were taught to them. In the second session the words were taught in the contextualized texts. After 12 sessions of instruction and two weeks of interval from the last intervention, a post-test, which was parallel to the pre-test and had 100 words, was administered to the students. The scores obtained on the post-test by the students were considered as the indication of their long-term vocabulary retention.

Data Analysis

The data obtained on the Nelson test were analyzed using the T-test formula for independent groups to ensure the homogeneity of the control and the experimental groups regarding their English proficiency level before the inception of the treatment. Furthermore, to ensure that subgroups (male and female groups)of the control and experimental groups were also homogenous, one-way ANOVA was run on the data obtained on the Nelson by the subjects of the four groups.

T-test and one-way ANOVA analyses were also used to see if there was any significant difference between experimental and control groups on the one hand and among subgroups on the other with regard to the subjects' performance on the vocabulary pre-test. In addition, the data collected from the post-test administration to the participants after two weeks of intervention was also analyzed by the T-test and one-way ANOVA formula to examine the effectiveness of the treatment and also to identify the changes that took place as an

outcome of instruction given to the groups as well as the differences in the long-term vocabulary retention among them.

Results

Tables 1 and 2 show the results of the T-test for the Nelson proficiency testwhich was used to see whether there was any significant difference between participants' test scores in the experimental and control groups.

Table 1. *Sample Statistics for the Nelson Proficiency Test*

	T-test for Nelson	N	Mean	Std. Deviation	Std. Error Mean
score	Control	30	25.9000	1.66816	.30456
	experimental	30	25.3333	1.82574	.33333

As the table 1shows the mean score for the experimental group in the Nelson proficiency test was 25.90 and for the control group was 25.33 andthe standard deviations were 1.66 and 1.82 respectively.

Table 2.*Independent Samples T-test for Nelson Proficiency Test*

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.351	.556	1.255	58	.215	.56667	.45152	-.33715	1.47048
Equal variances not assumed			1.255	57.534	.215	.56667	.45152	-.33730	1.47064

As the results of T-test for Nelson proficiency test in table 2 represents the *t* value for equal variances is 1.255, which with 58 degree of freedom has an exact two-tailed significance level of 0.215. The results indicate that the groups were homogenous on the proficiency level before starting the treatment.

One-Way ANOVA was run to ensure that subgroups,male and female subgroups, were homogenous with regard to their proficiency level before starting the treatment.

Table 3.*ANOVA for Nelson Proficiency Test*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	10.450	3	3.483	1.136	.343
Within Groups	171.733	56	3.067		
Total	182.183	59			

As the table 3 indicates, F equals 1.136 with degree of freedom 3 and significance level of 0.343 and based on the critical value of F (Fcr= 2.41), that is greater than obtained F (F= 1.136), we can conclude that there was no significant difference among these four subgroups.

Researchers checked vocabulary background knowledge to see how many of the words are known to the participants of both groups. Results indicate that mean score of the experimental group on the pre-test was 14.30 and for the control group was 14.36 and the standard deviations were 5.95 and 5.90 respectively (Table 4).

Table 4.*Sample Statistics for the Pre-test*

T-test V1	N	Mean	Std. Deviation	Std. Error Mean
Experimental	30	14.3000	5.95471	1.08718
Control	30	14.3667	5.90431	1.07798

Table 5.*Independent Samples T- test for the Pre-test*

	Levene's Test for Equality of Variances		t-test for Equality of Means						
								95% Confidence Interval of the Difference	
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Equal variances assumed	.032	.859	-.044	58	.965	-.06667	1.53101	-3.13131	2.99798
Equal variances not assumed			-.044	57.996	.965	-.06667	1.53101	-3.13132	2.99798

Calculation of observed P-value between the experimental and control group (sig= 0.96) and comparing it with the critical value of P= 0.05, shows that the observed difference is not meaningful and the

participants of the two groups were homogeneous and at the same level of vocabulary knowledge before starting the treatment (Table 5).

Table 6.*ANOVA for the Pre-test Among Subgroups of Groups A and B*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	1.733	3	.578	.016	.997
Within Groups	2037.600	56	36.386		
Total	2039.333	59			

As table 6 shows F= .016 with DF= 3 and obtained P- value of more than 0.05, the researchers concluded that there was no significant difference among pre-test scores of control and experimental subgroups regarding their performance on the pre-test.

After the treatment the same statistical procedures were used and as table 7shows the mean score for the experimental group for the post-test was 29.00 with standard deviation of 9.57 and for the control group was 23 with SD=9.88.

Table 7. *Sample Statistics for the Post-test in Groups A and B*

Groups	N	Mean	Std. Deviation	Std. Error Mean
Experimental	30	29.0000	9.57367	1.74791
Control	30	23.0000	9.88206	1.80421

Table8. *T-test on the Post-test Scores*

	Levene's Test for Equality of Variances		t-test for Equality of Means				
	F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference
Equal variances assumed	.040	.842	2.388	58	.020	6.00000	2.51204
Equal variances not assumed			2.388	57.942	.020	6.00000	2.51204

Levene's test for equality of variances shows that the variances are equal and there is no significant differences between them but, test of equality of means indicates t= 2.38 by degree of freedom of 58 and significant level of (sig= 0.020) the reported P-value is lower than the critical P-value which means there is a significant difference between the performances of the participants in the experimental group comparing it to the control group. Therefore, based on the results obtained from T-test the first Null hypothesis was rejected. So with the 95% confidence the researcher can conclude that using Wordsift results in better long-term retention.

The results of one way ANOVA which was run on the data obtained on the posttest show that F= 2.154 and obtained P- value is more than critical p-value. Therefore, the second null hypothesis was not rejected. In the other word, using Wordsift does not have significant effect on the long-term vocabulary retention of the different genders(Table 9).

Table 9.*ANOVA for Post-test Among the Subgroups of Groups A and B*

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	623.867	3	207.956	2.154	.104
Within Groups	5406.133	56	96.538		
Total	6030.000	59			

Discussion

This study investigated two hypotheses: 1. Using Wordsift has significant effects on adult EFL learners' long-term vocabulary retention. The findings of this study approved this hypothesis. Comparing the scores obtained by the experimental and control

groups; the researchers found that there was significant difference between the long-term vocabulary retention of the experimental and the control groups. Therefore, it can be claimed that the subjects who were instructed with "Wordsift" seemed to have retained the meaning of more words than those in the control group. The findings of this study are in line with the findings of a research conducted by Nam (2010) regarding vocabulary learning and teaching. He concluded that the use of visual representations such as pictures and drawings can promote vocabulary retention. Levine and Reves (1990) also showed that presentation of words with the help of computers, i.e. providing more various exposures to the word via combining definitional, analogous and contextual information, would facilitate learning and improve vocabulary retention.

One possible reason for better long-term retention in the experimental group is that, EFL textual information was not as easily processed as that of picture and text information, and, as a result, the picture supplemented or strengthened the learning and retaining of the words.

Another possible reason is that, brain has separate processing systems. Verbal information is stored in the left hemisphere of the brain and visual-spatial information in the right (Chastain, 1988). Visual aids have long been assumed to be beneficial to second language learning. In reviewing the techniques used in learning L2 vocabulary, Oxford and Crookall (1990) acknowledged the effectiveness of visual imagery and maintained that, "most learners are capable of associating new information to concepts in memory by means of meaningful visual images, and that visual images make learning more efficient" (p. 17) and "the pictorial verbal combination involves many parts of the brain, thus providing greater cognitive power" (p. 17). In this study, pictures provided by Wordsift have been used to clarify the meaning of those unknown words learners encounter in reading which resulted in better retention of words.

According to dual coding theory, the way learners comprehend pictures differs greatly from that of comprehending textual information (Paivio, 1971). In other words, text is processed by the verbal cognitive subsystem, while a picture is processed by the non-verbal cognitive subsystem. It is apparent that Wordsift utilizes both systems

efficiently since the Wordsift has a strong element of both visual information and verbal information. Information to be learnt enters the brain via two channels. In this study the control group in which vocabularies was presented in the form of written texts, learners probably used only their verbal cognitive subsystem but, learners in the experimental group in which vocabularies were presented by texts and pictures via Wordsift used both their verbal and non-verbal subsystems to process the information which result in better retention.

The results of this study are also consistent with the cognitive theory of multimedia learning proposed by Mayer (2003), which claims that meaningful learning engages learners in both verbal and visual cognitive processing systems. His model posited that human learning was "a function of the abstract and distinctive, concrete associations which the learner generates between his prior experience, as it is stored in long-term memory, and the stimuli" (p. 89). In other words, this model emphasizes the active integration of new ideas with the learner's existing schemata. In this study Wordsift, particularly by providing concept maps including synonymous and antonymous and different parts of speeches of a word facilitates integrating students' prior knowledge to new stimuli which leads to better learning and long term retention.

According to Mayer (2001) presenting information in two sensory modalities (visual and auditory) increases the available working memory resources. In fact Wordsift by presenting words both visually through text and pictures and auditory by giving the pronunciation of the words just by one click, activated both processing channels for learning in the experimental group. On the other hand, using computer-based instructional material consisting of diagrams and text, it was assumed that because a learner has a limited working memory capacity, any increase in cognitive resources required to process split-attention materials decreases resources available for learning.

The second hypothesis stated: There is a significant difference among the performance of the male and female subjects of control and experimental groups on the long-term vocabulary retention. Considering the results of one-way ANOVA run on the scores obtained on the post-test, this hypothesis was not approved. The long-term vocabulary retention of the male and female subjects did not

differ significantly from each other. This finding was consistent with the findings of the study conducted by Grace (2000) in which the subjects were given bilingual multiple-choice tests. The statistical analyses did not show any significant difference between the scores of male and female subjects on the short-term or long-term retention test scores. But, in a study conducted by Hakuta (2011), gender significantly mediated the treatment effect in using Wordsift, resulting in a significant negative treatment effect for female participants and a slightly positive (though not significant) treatment effect for males.

Conclusion

The problem of this study was how to improve long-term vocabulary retention and the question was whether using interactive web browser Wordsift affects long-term vocabulary retention or not.

Regarding the results of the study, it can be concluded that using Wordsift affects long-term vocabulary retention positively and it can help both teachers, in presenting the materials, and learners, to improve their long-term vocabulary retention. The limited evidence of this study has showed that using Wordsift makes vocabularies more retainable.

It has also showed that there is no marked difference between genders on the long term vocabulary retention. Usefulness of Wordsift has to be left open since one research project is not sufficient to provide even tentative answers. One issue that is only loosely related to this research is the effectiveness of current teaching methodology.

Implications of the Study

Most teachers do not pay enough attention to the vocabulary learning and complain on short class time they have to teach all components of the language. As the result vocabulary instruction is ignored in most English classes.

The findings of this study revealed that when illustrating terms, pictorial representations may benefit from the inclusion of both negative and positive examples and the use of dynamic cues.

This study found that Wordsift by all its facilities are more effective in supporting long- term retention and are rated higher than text-based presentation. Instructional designers should consider

embedding new technologies in most learning resources. This is especially true when designing educational resources in foreign languages where the learners must understand many concrete terms and the underling meanings to successfully learn new languages in carrying out their educational responsibilities.

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Appendixes

Appendix A: Nelson proficiency test (350A)

Choose the correct answer. Only one answer is correct.

I had been sitting … I ... in my usual compartment ... 2 ... at least ten minutes , waiting ...3 … The trains from little bury never seemed to start … 4 ... and I often thought that I could have ... 5 … in bed a little longer or had …6 … cup of tea before … 7 … suddenly I heard someone shouting …8 … the platform outside . A young girl was running towards the train. The man …9 …put out his hand to stop her but she ran past him and opened the door of my compartment. Then the whistle blew and the train started.

I nearly missed it, …10 … ?" the girl said " How long does it take to … 11 … London? "

It depends on the … 12 …" I said. " Some days it's .. 13 ..others."

"I'll have to ..14 .. , .. 15 .. late again tomorrow ," she said ." Its my first day.. 16.. with a new firm today and they told me that the man .. 17 ..is very strict . I ..18 ..him yet so I don't know .. 19 ..but he sounds a bit frightening ."

She talked about her new job ..20 ..the way to London and before long, I realized that she was going to work for my firm. My ..21 ..secretary had just left so I must be her new boss. .. 22 ..only fair to tell her .

" oh, dear, "she said". .. 23 ..mistake ! I wish I ..24 .. "

" never mind" , I said."At least you'll know when your train's late that ..25 .. "

1. A. for myself
   B. only myself
   C. by myself
   D. in my own

2. A. for
   B. during
   C. since
   D. mean while

3. A. the train to start
   B. for the train to start
   C. the train's start
   D. for the train to start

4. A. on their hour
   B. on time
   C. at their hour
   D. at time

5. A. lain
   B. laid
   C. lied
   D. lay

6. A. other
   B. some other
   C. another
   D. one other

7. A. I had left the home
   B. leave from home
   C. leaving home
   D. to leave home

8. A. at
   B. by
   C. in
   D. on

9. A. at place
   B. on duty
   C. for control
   D. in post

10. A. haven't I
    B. don't I
    C. wasn't I
    D. didn't I

11. A. get to
    B. arrive to
    C. reach to
    D. make to

12. A. driver to the engine
    B. driver engine
    C. engine's driver
    D. engine driver

13. A. far slower that
    B. much slower that
    C. a lot more slower that
    D. a great deal more slower that

14. A. mend me the watch
    B. mend me my watch
    C. have my watch mended
    D. have mended my watch

15. A. in order not be
B. so as not to be
C. for not being
D. so that it's not

16. A. at jab
B. in jab
C. in work
D. at work

17. A. I'm going to work for
B. what I'm going to work for
C. for which I'm going to work
D. which I'm going to work for

18. A. didn't meet
B. haven't met
C. didn't know
D. haven't know

19. A. what he is like
B. what is he like
C. how he is
D. how is he

20. A. through
B. by
C. on
D. in

21. A. proper
B. own
C. same
D. self

22. A. there was
B. that was
C. It was
D. was

23. A. what a terrible
B. what terrible
C. how terrible
D. So terrible a

24. A. A had known
B. have known
C. known
D. would have known

25. A. A so the mine be
B. the mine will be, too
C. so will mine
D. mine will be, too

Choose the correct answer. Only one answer is correct

A telephone Call

Hello , Mary . .26. . you before now but I . . 27 . . so hard at the office that I didn't have time . My boos . . 28 . . on holiday tomorrow and he . . 29 . . arrange everything before he . . 30 . . If he had given me sensible instructions I could have done the work next week. But you. . 31 . . the same problems with your boss. Anyway, . . 32 . . two tickets for the new play at the Grand on Saturday . . .33 . . and see it together?

26. A. should have rung
B. must have rung
C. had to ring
D. ought to ring

27. A. must work
B. must have worked
C. have had to work
D. ought to ring

28. A. will go
B. is going
C. shall go
D. shall be going

29. A. wants that I
B. would that I
C. would like that I
D. wants me to

30. A. leaves
B. shall leave
C. will leave
D. is leaving

31. A. have to have
B. can have
C. ought to have
D. must have

32. A. they have been given to me
B.I have been given
C. I am given
D. they are given to me

33. A. May we go
B. do you like to go
C. shall we go
D. will we go

Choose the correct answer. Only one answer is correct.

34. The lift is out of . . . . . so we'll have to walk
A. function B. order C. running D. work

35. Dinner will be ready ……. but we have time for a drink before then.
A. currently B. lately C. presently D. suddenly

36. what do you ….. to do about the problem now that this solution has failed?
A. attempt B. think C. pretend D. intend

37. We have ..... for a new secretary but we haven't had any replies yet.
A. advertised B. advised C. announced D. noticed

38. I've . . . . . for the job and I hope I get it.
A. appointed B. applied C. presented D. succeeded

39. He threw the box out of the window and it fell to the …….outside.
A. flat B. floor C. plain D. ground

40. 100 competitors had . . . . . the race.
A. put their names for B. entered for
C. put themselves for D. taken part

41. I'm very . . . . . to you for your help.
A. grateful B. agreeable C. pleased D. thanks

42. He's so mean that he wouldn't give a beggar a . . . . . Of bread.
A. peel B. shell C. crust D. skin

43. Will you be able to come to the party? I . . . . .
A. believe yes B. am afraid not
C. don't hope so D. don't expect

44. I never expected you to turn . . . . . at the meeting. I thought you were abroad.
A. around B. on C .in D. up

45. The plane is just going to take . . . . .
A. away B. out C. off D. up

In this series of questions, three words have the same sound but one does not. Choose the one that does not.

Example: A. go B. so C. show D. do

46. A. knees B. peace C. freeze D. keys
47. A. home B. sum C. crumb D. come
48. A. straighter B. greater C. water D. later
49. A. ache B. shake C. steak D. weak
50. A. another B. bother C. brother D. mother

Appendix B: Pre-test
Write the correct meaning of the following words either in Persian or English.

Name:
1. Taboo……
2. Far-off……
3. Locale……
4. Adapt……
5. Gratitude……
6. Sacred……
7. Conservative……
8. Custom……
9. Affection…
10. Tolerant……
11. Critical……
12. Dictate……
13. Trendy……
14. Idolize……
15. Decade……

16. Essential……
17. Imitate……
18. Cue……
19. Synthetic……
20. Celebrity……
21. Slick……
22. Casual……
23. Slogan……
24. Baggy……
25. Revolution ……
26. Exclusive……
27. Reasonable price……
28. Interior……
29. Subsequently……
30. Hire……
31. Crucial……
32. Reputation……
33. Cutting-edge……
34. Distinctive……
35. Ultimate……
36. Species……
37. Die out……
38. Appalling ……
39. Habitat……
40. Exploitation……
41. Extinct……
42. Survive……
43. Endangered……
44. Vulnerable……
45. Factor……
46. Decline ……
47. Demand……

Level:

48. Native……
49. Intentionally……
50. Awareness……

51. Preserve……
52. Chance……
53. Realize……
54. Industry ……
55. Soar……
56. Dense……
57. Supply……
58. Property……
59. District……
60. Inflation……
61. Calculation……
62. Mortgage……
63. Life expectancy……
64. Celebrate……
65. Bride……
66. Purity……
67. Fabrics……
68. Progress……
69. Cost of living……
70. Veil……
71. Modesty……
72. Eternal ……..…
73. Engraved……
74. Bloom……
75. Bouquet ……
76. Show off……
77. Originate……
78. Incorporate……
79. Ceremony……
80. Quit……
81. Suburb……
82. Crowd……
83. Increase……
84. Disappear……
85. Various ……
86. Protection……
87. Agriculture…

88. Hunt……
89. Cargo……
90. Python……
91. Generation…
92. Customer……
93. Recognize…
94. Diverse……
95. Talent……
96. Desirable……
97. Advertise……
98. calf-length……
99. Bell-bottom……
100. Union……