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Original Article

The Effect of Bilingual-Word-List versus Semantic Network Practices on EFL Lexical Competence

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ABSTRACT

Introduction: The crucial role of lexis over other language elements in language learning prompts the argument of finding the most suitable way to enhance vocabulary learning among the studies in the educational arena. Among various word learning strategies, semantic network practices have received the least attention from researchers. Accordingly, the present follow-up study aimed to touch upon effective vocabulary learning, in general, and compare semantic network practices with the most common learning strategy implemented by EFL learners (learning from bilingual word lists), in particular.

Methodology: The project investigated the effectiveness of the two treatments among 114 EFL university students of both genders who were assigned to two experimental groups to receive the treatments and the third group of 43 EFL learners as the control group. Word Associates Test (WAT) and Original Levels Test (OLT) were administered as pre-tests to research subjects. The participants in experimental groups received four pamphlets every other week. After eight weeks, the WAT and OLT were re-administered to the same sample as the post-tests to check the effect of the treatments on the breadth and depth of vocabulary knowledge.

Results: The comparative results indicated that both treatments had significant effects on the depth and breadth of vocabulary knowledge. The obtained results of the post-tests revealed the stronger role of semantic network practices on the depth of vocabulary knowledge than bilingual word lists. The comparisons of the mean scores of synonyms and collocations of WAT post-test in experimental groups indicated that class A (experimental group who received sematic network practices) significantly outperformed class B (experimental group who received bilingual word lists) in collocations.

Conclusion: The study concluded that the FL learners' mastery of new vocabulary knowledge is possible through obtaining a deep understanding of the acquired words.

1. Introduction

Vocabulary knowledge is an essential element that has contributed to nearly all aspects of foreign language (EL) proficiency (Meara, 1996). It is introduced as "the core component of all the language skills" by Long and Richards (2007, p. xii). Highlighting the role of vocabulary over syntax, Wilkins (1972) noted "without grammar very little can be conveyed, without vocabulary, nothing can be conveyed" (p. 111). Echoing the same idea, Laufer (1998) argued that the difference between foreign language learners and native speakers relies in the size of vocabulary they know. This knowledge in an L2 setting was confirmed to be a good predictor of language comprehension (Laufer, 1998).

The crucial role of vocabulary in all dimensions of FL proficiency cannot be neglected. Consequently, this relevance to language learning has resulted in significant numbers of theoretical and empirical studies in this area. Over the last two decades, many studies have attempted to shed light on strategies and techniques for enhancing vocabulary knowledge (e.g., Meara, 1996; Paribakht & Wesche, 1996; Qian, 1999; Schmitt, Ching Ng & Garras, 2011).

The interest in the field of FL vocabulary learning and teaching raised awareness about its nature as a

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multidimensional phenomenon. Lexical competence is an aspect of L2/FL competence that constitutes dimensions of vocabulary knowledge as grammatical, phonological, and morphological forms, besides syntactic patterns and lexical items (Meara, 1996). All these aspects are explained under two dimensions, namely vocabulary breadth and depth (Read, 2000). Competence is highly affected by the quantity (Laufer, 1998) as well as the quality (Nation, 1990) of the knowledge

Vocabulary breadth is considered the key dimension of lexical competence (Meara, 1996; Qian, 2002; Qian & Schedl, 2004). It deals with the quantity of the vocabulary a person knows (Meara, 1996; Paribakht & Wesche, 1996; Qian, 1999). Studies on vocabulary size sought to investigate the rate at which vocabularies grow in an L2/FL and introduce the factors affecting this growth (Meara, 1996). Many studies of vocabulary size in an L2 contributed to its effect on reading comprehension (e.g., Laufer, 1996; Liu & Nation, 1985; Marzban & Hadipour, 2012; Shen, 2008). This knowledge can be measured via vocabulary size tests designed based on the word family frequency lists from British National Corpus (BNC, Nation, 2006).

As vocabulary size extends, its importance is relatively reduced in favor of quality (Meara, 1996); that is, the independent measures of how well the person knows these vocabularies or the 'vocabulary depth', instead of how many words he/she knows or the 'vocabulary breadth' (Paribakht & Wesche, 1996; Read, 1993).

Vocabulary depth is the second dimension of lexical competence, which addresses the quality of vocabulary knowledge. It projects the appropriate patterns as well as the lexical items that can be used (Schmitt, Ching Ng & Garras, 2011). To elaborate on the appropriate knowledge of a word and what exactly this knowledge dealt with, Richards (1976) identified seven main aspects to be considered. To Richards (1976), knowing a word means the property of the knowledge of its probable occurrence in speech or print, limitations on the use in different settings, syntactic associations, root and derivations, associations with the other words, semantic values, and associated meanings.

The precise description of the depth of vocabulary knowledge (DVK) was too far to be reached practically (Meara, 1996). Later other scholars defined the knowledge in a more tangible way. Henriksen (1999) believes that vocabulary knowledge should include three main aspects of precision, depth, and receptive and productive knowledge. In the same vein, Nation (2001) lists four dimensions for DVK, including form, position, function, and meaning. Moreover, Read (2014) has named paradigmatic (synonyms), syntagmatic (collocations), and analytic (associations) as three aspects of DVK. The last category by Read (2014) includes all the components constituting the depth of vocabulary knowledge.

The DVK can be measured through two main approaches of developmental and dimensions (Read, 2000). The developmental approach is a five-Likert scale measuring the developmental mastery of a lexical item,

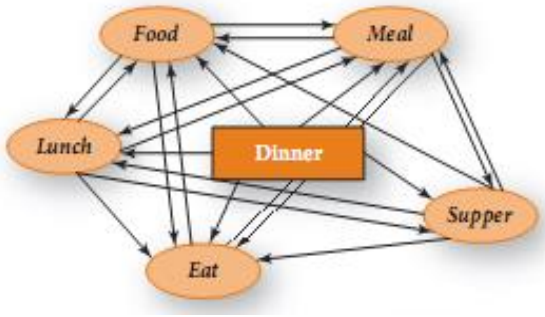

Figure 1.
The Semantic Network Related to "Dinner" Adopted from Traxler (2012, p. 88)

such as, the vocabulary knowledge scale by Paribakht and Wesche (1996), while the dimensions approach measures learners' familiarity with L2/FL words' meanings and their uses (Schmitt et al., 2011). Word association format (WAF) by Read (1993) and word associates test (WAT) by Read (1998) are the widely used tests of DVK regarding the dimensions approach.

As a whole, DVK deals with structuring words in the mental lexicon, that is, organization (Meara, 1996). The more organized the vocabulary of a learner is, the more proficient s/he will be (Read, 1998). Word organization can be processed through semantic networks that the vocabularies activate in the lexicon.

Psycho-linguistically, when a word is acquired and stored in the lexicon, its form is represented in lexical networks, while its meaning is stored in semantic memory (Traxler, 2012). According to Collins and Loftus (1975), each word in the memory creates a network of related concepts associated in a network, named word association/ semantic network (see Figure 1).

The learners encode the meanings of the words during mental processes in the lexicon (Collins & Loftus, 1975). According to semantic network theory, the word meaning is defined as whatever comes to mind when it is said (Collins & Loftus, 1975). A word network/semantic network comprises some nodes (concepts) and links to show the relationships between the concepts. In Traxler's definition, the meaning of a word will be captured through the activation of nodes and links (see Figure 2).

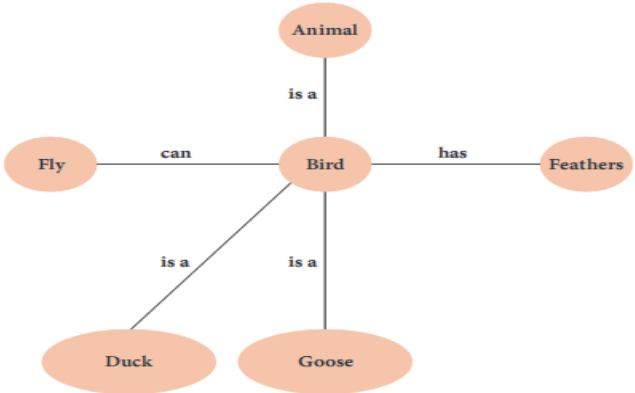

Figure 2.
A Piece of a Semantic Network from Traxler (2012, p. 83)

When labeling a source node, the search process is initiated and consequently activates the other related nodes linked to the source; this method is called spreading activation (Traxler, 2012). The lexical items are connected when they share features of meaning (e.g. "duck" & "goose"), that is, semantic relationship, or have co-occurrence in the language (e.g. "police" & "jail"), that is association (Traxler, 2012).

Comparing these two features, studies have shown that semantic relationship is a better predictor for vocabulary retention than association, for example, "duck" activates "goose" sooner than "bird" (Traxler, 2012). The more the links to the nodes, the more connections are represented; therefore, the more structured the lexicon will be (Traxler, 2012). Meara (1996) argued that the number of links shows the level of organization/structuring of that word. In an equivalent size condition, people with a higher structured vocabulary perform better (Meara, 1996). Concerning these ideas, scholars tried to use semantic networks as a strategy for vocabulary retention and acquisition (Delik & Yuruk, 2013).

Semantic mapping strategy has been commonly used in general vocabulary development, pre- and post-reading activities, and as a study skill (Heimlich & Pittelman, 1986). It was used by Delik and Yuruk (2013) as a new technique in comparison to traditional techniques in vocabulary learning. Semantic networks can help the learners associate the new words to the related stored words and experiences in the memory (Dilek & Yuruk, 2013); they can be used as an effective cognitive strategy for organizing knowledge. Another cognitive strategy which can activate the previous knowledge in an L2/FL setting and help knowledge organization is translation (Hummel, 2010). The use of bilingual vocabulary lists, including L1 translation, has been a common technique in L2 and FL settings to develop vocabulary knowledge.

One of the learners' most widely used strategies in foreign language contexts is bilingual word lists. The studies in the area of vocabulary knowledge always considered word lists (mono- or bilingual-) as a mnemonic strategy which is based on rehearsal and memorization and has a direct effect on short-term retention (Yamamoto, 2014). However, Hummel (2010) came up with an opposing idea. Following O'Malley and Chamot (1990), Hummel referred to translation as an effective cognitive strategy which is used most frequently by learners. According to these scholars elaboration is a cognitive strategy which deals with the conceptual processing of relating new information to previously stored knowledge. Elaboration strategy can help the organization of the learnt materials and meaningful personal associations (Hummel, 2010). In word lists, the words are decontextualized since they pave the way for elaborative strategies (Hummel, 2010); their meanings in L1 can activate the associations in L1 and transfer them to the FL context.

The learners process the words, for which they have prior knowledge more easily than those purely new lexical items (Traxler, 2012). Bilingual word lists provide the students with L1 equivalents for which they have prior knowledge since it can be probably more helpful than contextualized vocabularies in the retention and storage of the words in memory.

The present paper tries to check this probability and examine the effect of these word lists in different dimensions (breadth and depth) of lexical competence, rather than only breadth as was checked in the previous studies (e.g. Karami, 2012; Milton, 2008; Schmitt, Schmitt & Clapham, 2001; Tuan, 2011; Yamamoto, 2014).

Since semantic networks help word organization, they can enhance both the depth and breadth of vocabulary knowledge when used as a learning strategy. The effect of semantic network strategy on different dimensions of lexical competence, both size and depth, in comparison to L1 translation strategy in a foreign language setting has not been explored so far. This study aimed to measure the effect of semantic network and bilingual-word-list strategies on vocabulary breadth and depth separately; and compare the results to reveal the more effective strategy in EFL settings. To describe the study in detail, the following questions were sought to be answered:

1. Was the EFL university learners' vocabulary size progressed through practicing bilingual wordlists as measured by post-test?
2. Was the EFL university learners' vocabulary size progressed through practicing semantic network pamphlets as measured by post-test?
3. Was the EFL university learners' DVK enhanced through practicing semantic network pamphlets as measured by post-test?
4. Was the EFL university learners' DVK enhanced through practicing bilingual wordlists as measured by post-test?
5. Which type of treatment (bilingual glosses or semantic network practices) was more effective regarding vocabulary size?
6. Which type of treatment (bilingual glosses or semantic network practices) was more effective regarding DVK?

2. Methodology

2.1. Participants

Persian native speakers of both genders enrolled at a university level, attending general English courses, served as randomly-selected participants (n =157). Their age ranged between 19 and 25 (Mean = 21.5). They were from three classes that were later named A, B, and C. Class A comprised 58 (34 females, 24 males), class B included 56 (29 females, 27 males), and class C comprised 43 (28 females, 15 males) undergraduate students.

The results of ANOVA statistics on the pre-tests, Word Associates Test (WAT) by Read (1998) along with Original Levels Test (OLT) by Nation (1990), indicated that foreign language skill level was in approximately the same range in the three classes ($p > .05$); that is, the sample is homogenous (Table1).

Table 1.
ANOVA Statistics of the Scores on the Original Levels Test (size test) and Word Associates Test Pre-tests in the Three Classes

		Sum of Squares	df	Mean Square	F	Sig.
PreOLT	Between Groups	1.757	2	.879	.016	.985
	Within Groups	8713.912	154	56.584		
	Total	8715.669	156			
PreWAT	Between Groups	1066.563	2	533.282	2.832	.062
	Within Groups	29002.736	154	188.329		
	Total	30069.299	156			

1. discharge
2. encounter
3. illustrate
4. knit
5. prevail
6. Toss

Answers: 3, 2, 6

☐ Use pictures or examples to show meaning

☐ meet

☐ Throw up into the air

Figure 3.
An Example Item of Nation's (1990) Original Levels Test

2.2. Instrumentation

Materials for the study consisted of eight pamphlets:

a. Four bilingual word lists on the most frequent words in English, each including 30-33 vocabularies, given to class B.
b. Four monolingual pamphlets of semantic networks, including the same words in the bilingual lists, given to class A.
c. Class C, as control group, did not receive any treatment, but the same textbook was taught in this class.

To avoid teaching to the test phenomenon, the words were selected based on the frequent word lists 1000, 2000, and 3000 levels (Nation, 1990) and on the words used in WAT, including the target words, associates, and distracters.

The test instruments used were the first two levels of the Nation's (1990) OLT, a matching recognition vocabulary size test (see Figure 3 for example), and Read's (1998) WAT, a word associates test where test takers were required to choose four associates related to the word in question out of eight options presented (see Figure 4 for example).

The test takers were required to match the meanings in second column with the target words in the first column. This test was used to measure vocabulary breadth/size.

Eight options, associates, were given in two boxes, reflecting the meanings and collocations related to the target word in question. Test takers must pick four associates; two synonyms-two collocations, one synonym-three collocations, or three synonyms-one collocations. This test aimed to measure the depth of vocabulary knowledge.

2.3. Procedure

Participants took WAT and OLT as pre-tests at the beginning of the course. After ensuring the homogeneity of participants, classes A and B were assigned to two treatments in taking the pamphlets of the selected words at a two-week interval. Students in class A took semantic network pamphlets, while those in class B were given frequent bilingual word lists. Learners in class C, as the control group, received no pamphlet. Every other week the participants in the experimental groups received the new pamphlet. To motivate the students to study, vocabularies in the previous pamphlets were asked and practiced in the class. The words presented were exemplified, and their collocations were presented in both classes (A and B). After eight weeks, the WAT and OLT were re-administered to the same population as the post-tests to check the effect of treatments on the breadth and depth of vocabulary knowledge. The 40-item associates test of WAT was scored 160 (4 credits for each correct item), and the OLT, a 60-item recognition test, was scored 240 (4 credits for each correct item). To analyze the effectiveness of the treatments on the lexical competence, ANOVA calculations were used with the results of pre-tests and post-tests in the three groups. Using an independent samples t-test, the scores on the post-tests were compared in the experimental classes to check the effect of each treatment separately on the different dimensions of lexical competence. To scrutinize the effectiveness of the treatments, the independent samples t-test calculation was assigned to the mean scores of synonyms and collocations on WAT post-test in the experimental groups.

Bright

clever ☐ famous ☐ **happy** ☐ | **color** ☐ hand ☐ poem ☐

shining ☐ | taste ☐

Answers in **bold**

Figure 4.
An Example Item of Read's (1998) Word Associates Test

3. Results

3.1. Effectiveness of instructional treatments

Comparing the mean scores on the OLT and WAT tests in the three classes indicated the effectiveness of both treatments on the depth and breadth of vocabulary knowledge (Table 2).

Application of paired samples t-test to the scores on the OLT in class A revealed a significant difference between the scores on the pre-test (M = 17.41) and the ones on the post-test (M=23.94, p < .05); indicating the effectiveness of using semantic network pamphlets on the breadth of vocabulary knowledge. The statistical evidence of paired samples t-test suggested a significantly higher mean score on the WAT post-test (M = 108.72) for class A in comparison to the same pre-test (M = 71.18, p < .05), demonstrating the effectiveness of the practicing treatment (semantic network pamphlets) on DVK (Table 3).

The same statistical analysis was assigned to the scores in class B, and the interpretation of the results indicated the effectiveness of the treatment (using bilingual word lists) on the breadth and depth of vocabulary knowledge. The scores of class B on the OLT pre-test (M = 17.23) were significantly lower than the scores on their post-test (M = 26.76, p < .05). Comparing the pre-test scores on WAT in class B (M = 73.10, SD= 14.26) and the post-test scores (M = 94.75, SD = 18.18) revealed a significant DVK enhancement as a result of bilingual glosses practices (p < .05; Table 4).

Table 2.
ANOVA Statistics Related to the Results of the Post-tests (Original Levels Test and Word Associates Test) in the Three Classes

		Sum of Squares	df	Mean Square	F	Sig.
PostOLT	Between Groups	1729.442	2	864.721	10.356	.000
	Within Groups	12859.106	154	83.501		
	Total	14588.548	156			
PostWAT	Between Groups	44371.112	2	22185.556	69.960	.000
	Within Groups	48836.365	154	317.119		
	Total	93207.478	156			

df: Degree of freedom

Table 3.
The Paired Comparison of the Scores on the Original Levels Test and Word Associates Test Pre-tests and Post-tests in Class A

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
PreOLT A PostOLT A	- 68.534	3.22390	.42332	-7.38216	-5.68680	-15.436	57	**.000**
PreWAT A PostWATA	-37.53448	14.25853	1.87224	-41.28357	-33.78539	-20.048	57	.000

Std. deviation: Standard deviation; Std. error mean: Standard error mean; df: Degree of freedom

The results of the paired samples t-test on class C mean scores of pre-tests (M[preOLT] = 17.162, M[preWAT] = 66.581) and post-tests (M[post OLT] =18.395, M[postWAT] = 66.604) revealed no significant difference between the mean scores (p > .05), indicating that the enhancement in the OLT and WAT post-tests in the experimental groups (classes A and B) were due to the effectiveness of the treatments (Table 5).

Table 4.
The Paired Comparison of the Scores on the Original Levels Test and Word Associates Test Pre-tests and Post-tests in Class B

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pre OLT B Post OLT B	-9.53571	4.50036	.60139	-10.74092	-8.33051	-15.856	55	.000
Pre WAT B Post WAT B	-21.64286	11.82667	1.58041	-24.81006	-18.47565	-13.694	55	.000

Std. deviation: Standard deviation; Std. error mean: Standard error mean; df: Degree of freedom

Table 5.
Paired Samples T-test Related to the Mean Scores of Class C on the Original Levels Test and Word Associates Test Pre-tests and Post-tests

group		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
C	PreOLT - PostOLT	-1.23256	3.18357	.48549	-2.21232	-.25280	-1.539	42	. 15
	PreWAT - PostWAT	-.02326	5.46194	.83294	-1.70419	1.65768	-0.028	42	.978

Std. deviation: Standard deviation; Std. error mean: Standard error mean; df: Degree of freedom

Table 6.
The Independent Samples T-test for Comparison of the Mean Scores on the Original Levels Test Post-tests in Groups A and B

		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	95% Confidence Interval of the Difference	
									Lower	Upper
postOLT	Equal variances assumed	4.748	.031	-1.566	112	.120	-2.81958	1.80052	-6.38707	.74791
	Equal variances not assumed			-1.559	104.204	.122	-2.81958	1.80815	-6.40514	.76597

Std. error difference: Standard error difference; df: Degree of freedom

3.2. Comparative effectiveness between instructional treatments

The descriptive statistics estimated that the mean score in class B (M = 26.76) was statistically higher than mean score in class A (M = 23.98, p < .05). The independent samples t-test was applied to the mean scores on the OLT post-tests in the two groups (A and B) to compare the effectiveness of the treatments (bilingual word lists and semantic network practices) on the breadth of vocabulary knowledge (Table 6).

The statistical difference between the mean scores was not significant, indicating the fact that both treatments (bilingual wordlists and semantic network practices) affected the university EFL students' breadth of vocabulary knowledge in the same way.

The same statistical analysis was applied to the mean scores on the WAT post-tests in both classes of A and B. The results of the descriptive statistics estimated higher mean score in class A (M = 108.72, SD = 18.75) than class B (M = 94.75, SD = 18.18). The independent samples t-test revealed the significance of the difference in the two groups (p < .05); indicating the effectiveness of the semantic network practices on the university EFL students' DVK over bilingual word lists (Table 7).

3.3. Comparative analysis between the components of the word associates test

As shown in the previous sections, class A outperformed class B in WAT results, which indicated the significant effectiveness of semantic network practices in comparison to learning from bilingual word lists (p < .05). To clarify the results, the WAT was analyzed in detail.

The WAT comprised 40 items, each including 4 correct answers (synonyms or collocations). The entire score of the test (160) was calculated as 1 point for each correct answer, and the total score of the WAT (160 points) included 73 synonyms and 87 collocations in answers. To scrutinize the results, the mean scores of the correct answers of synonyms and collocations were separately calculated (Table 8).

The results of the independent samples t-test on synonym mean scores revealed that there was no significant difference between the mean scores on synonyms in the two experimental classes, A and B (p > .05). In contrast, this difference was significant (p < .05) for collocations. The interpretation of the results on synonym scores revealed that semantic network practices (the treatment used in class A) significantly enhanced collocation learning in comparison to bilingual word lists

Table 7.
The Independent Samples t-test Calculations for Comparison of the Mean Scores on the Word Associates Test Post-Tests in Groups A and B

		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	95% Confidence Interval of the Difference	
									Lower	Upper
Post WAT	Equal variances assumed	.465	.497	4.036	112	.000	13.97414	3.46201	7.11460	20.83368
	Equal variances not assumed			4.039	111.998	.000	13.97414	3.46011	7.11837	20.82991

Std. error difference: Standard error difference; df: Degree of freedom

Table 8.
The Mean Scores on Synonyms and Collocations of Word Associates Test in Classes A and B

	Classes	N	Mean	Std. Deviation	Std. Error Mean
synonyms	A	58	44.1552	13.25830	1.74090
	B	56	41.9107	11.64361	1.55594
collocations	A	58	64.5690	15.96610	2.09645
	B	56	52.8036	12.58342	1.68153

Std. error difference: Standard error difference; df: Degree of freedom

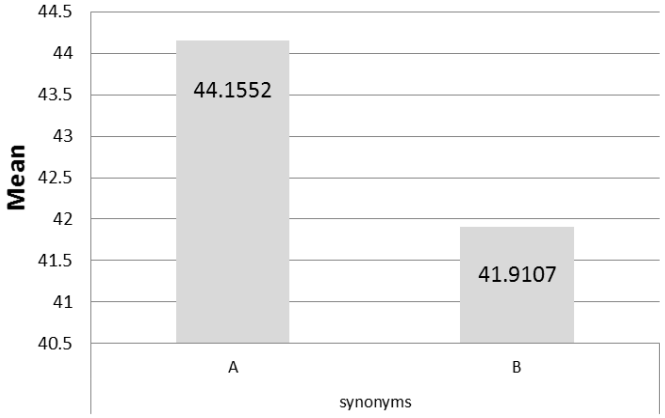

Figure 5.
The Synonyms Mean Scores Comparison in Classes A and B (Experimental Classes)

as a treatment used in class B (Figures 5 and 6).

As it was shown in the figures, learners in class A outperformed their counterparts in class B in both collocations and synonyms, but this advantage was significant only in collocations.

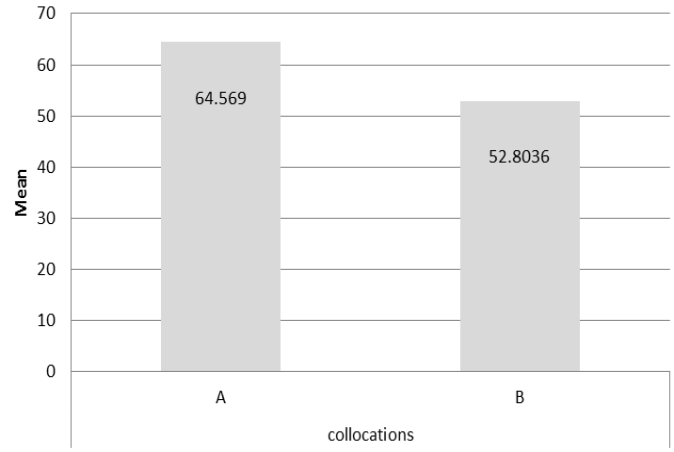

Figure 6.
The Collocations Mean Scores Comparison in Classes A and B (Experimental Classes)

4. Discussion

The results of quantitative data analysis showed that the improvement in both dimensions of lexical competence reflected the overall positive effects of the treatments (use of bilingual word lists and monolingual semantic network pamphlets) given to each group. Since the mean scores on the pre-tests and post-tests in class C did not show any significant difference, it could be inferred that the enhancement of vocabulary knowledge resulted from the treatments. Overall, the obtained results seem to bear testimony to the claims that the learners' lexical dimensions are related to each other so the shift in vocabulary size can consequently enhance the vocabulary depth. Richard (2011) echoed the same idea indicating the direct relationship between depth and breadth of vocabulary knowledge. Meara (1996) asserted that merely knowing a word is not vocabulary knowledge; the main idea is how to use the word, that is, the organization of the word in the mental lexicon acting as a guide to the word use. Meara's idea again supports the notion of the relation between the two vocabulary dimensions. Moreover, Shen (2008) confirmed the same idea by exploring the roles of depth and breadth of VK in EFL reading performance.

Comparing the results of the post-tests, the interpretation revealed the stronger role of semantic network practices on the DVK than the bilingual word lists. This implies the effectiveness of coherent vocabulary learning on structured vocabulary competence. The bilingual glosses included all of the words used in WAT besides some more frequent words, but these words were presented coherently in networks in the semantic pamphlets.

Another important finding in the present study is the same effect of both treatments on the breadth of vocabulary knowledge. This surprising result has already been explained by Nassaji (2004), Pulido (2007), and Qian (2002), indicating a strong relationship between lexical knowledge and vocabulary development. Lexical knowledge is a source which can guide learners in the process of lexical inferring. The collocations and synonyms presented in the semantic networks helped the learner develop new information about the words in the question and enhance vocabulary knowledge in size and depth. According to Nelson et al. (2013), word retention depends on the activation of its related neighbors, and these related words can act as cues to retrieve the target word. The meanings and phrases in the OLT might behave as cues to recall the words in question.

Class A higher performance on collocations offered evidence to substantiate Traxler's claim on word processing through semantic networks. Association (co-occurrence of the words in a language or semantic relationship, e.g. "police" and "jail") is a better predictor for vocabulary retention than semantic relationship, for example, "butterfly" activates "flower" sooner than "insect" does (Traxler, 2012). The co-occurrence of the vocabularies in the semantic network practices encouraged organized vocabulary learning. Besides, word organization can be processed through semantic networks that the vocabularies activate in the lexicon (Traxler, 2012).

There are certain limitations of this study that need to be underscored. First, the number of participants should be higher to meet the criteria of generalization. Second, since the OLT along with the WAT took a long time to be answered by the learners, they should be administered separately to prevent fatigue. However, this type of administration could decrease the reliability of the results. In addition, one of the key criticisms of using semantic networks is that they are teacher-made, so they

limit the creativity for gaining insights into learners' vocabulary knowledge. As asserted by Deyne et al. (2013), a natural network derived from learners' lexicon might provide a reliable approximation of their lexicon.

5. Conclusion

The findings of the study indicated the effectiveness of both types of materials (semantic network practices and bilingual word lists) on breath and depth of vocabulary knowledge though they showed that semantic network practices were more effective in the depth of vocabulary knowledge, synonyms, and collocations acquisition.

In sum, for language learners to master lexis and to be ultimately successful in acquiring a large amount of vocabulary, there is a need to obtain a deep understanding of the acquired words. The corollary is true. Mastering the depth of vocabulary knowledge without knowing large enough vocabulary is impossible (Richard, 2011). The findings have implications for both students and teachers of language to employ the semantic network practices in their English curriculums and for book designers to plan English textbooks, including coherent word practices. Besides, this study suggested a positive impact on the retention of new FL words by providing the type of vocabulary strategies.

The suggestions here pertain to the analysis of the comparative effectiveness of the semantic network treatment in detail to find the main cause for such effect on the depth and breadth of vocabulary knowledge. Since the concept of DVK is psychologically defined and deals with various forms of knowledge (Batty, 2007) It prompts one to argue its effect on lexical competence more quantitatively, taking into account cultural differences among various participant communities, gender, and educational levels. Another issue that needs further investigation is the exploration of the predictive role of depth and breadth of vocabulary knowledge on FL achievement.

Declarations

Competing interests

The author declares that she has no known competing financial interests or personal relationships that could have appeared to influence the present work.

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References

Batty, O. (2007). Vocabulary depth in written and oral assessment. In *JALT 2006 conference proceedings* (pp. 1100-1108).

Collins, A. M., & Loftus, E. F. (1975). A spreading-activation theory of semantic processing. *Psychological Review, 82*(6), 407-428. DOI: 10.1037/0033-295X.82.6.407

Delik, Y., & Yuruk, N. (2013). Using semantic mapping technique in vocabulary teaching at pre-intermediate level. *Social and Behavioral Sciences, 70*, 153-1544. DOI: 10.1016/j.sbspro.2013.01.221

Deyne, S. D., Navarro, D. J., & Storms, G. (2013). Better explanations of lexical and semantic cognition using networks derived from continued rather than single-word associations. *Behavior Research Methods, 45*, 480-498. DOI: 10.3758/s13428-012-0260-7

Heimlich, J. E., & Pittelman, S.D. (1986). *Semantic Mapping: Classroom Applications.* Delaware: International Reading Association. Available at: https://eric.ed.gov/?id=ED274959

Henriksen, B. (1999). Three dimensions of vocabulary development. *Studies in Second Language Acquisition, 21,* 303-317. DOI: 10.1017/S0272263199002089

Hummel, K. M. (2010). Translation & short-term L2 vocabulary retention: Hindrance or help? *Language Teaching Research, 14* (1), 61-74. DOI: 10.1177/1362168809346497

Karami, H. (2012). The development and validation of a bilingual version of the vocabulary size test. *RELC Journal, 43* (1), 53-67. DOI: 10.1177/0033688212439359

Laufer, B. (1996). The lexical threshold of second language reading comprehension what it is and how it is related to L1 reading ability. In K. Sajavaara & C. Faiweather (Eds.), *Approaches to second language acquisition* (pp. 55-62). Finland: University of Jivaskila.

Laufer, B. (1998). The development of passive and active vocabulary in a second language: same or different? *Applied Linguistics, 19* (2), 255-272.

Liu, Na., & Nation, P. (1985). Factors affecting guessing vocabulary in context. *RELC Journal, 16*, 33-42. Available at: https://www.wgtn.ac.nz/lals/resources/paul-nations-resources/paul-nations-publications/publications/documents/1985-Liu-Na-Guessing.pdf

Long, M. H., & Richards, J. C. (2007). Series editors' preface. In H. Daller, J. Milton & J. Treffers-Daller (Eds.), *Modelling and assessing vocabulary knowledge* (pp. 12-13). Cambridge, UK: Cambridge University Press. Available at: https://uwe-repository.worktribe.com/output/1024913/modelling-and-assessing-vocabulary-knowledge

Marzban, A., & Hadipour, R. (2012). Depth vs. breadth of vocabulary knowledge: assessing their roles in Iranian intermediate EFL students' lexical inferencing success through reading. *Social and Behavioral Sciences, 46*, 5296-5300. DOI: 10.1016/j.sbspro.2012.06.426

Meara, P. (1996). The dimensions of lexical competence. In G. Brown, K. Malmkjaer & J. Williams (Eds.), *Competence and performance in language learning* (pp. 35-53). New York: Cambridge University Press. Available at: https://www.lognostics.co.uk/vlibrary/meara1996a.pdf

Milton, J. (2008). Vocabulary uptake from informal learning tasks. *Language Learning Journal, 36* (2), 227-237.

Nassaji, H. (2004). The relationship between depth of vocabulary knowledge and L2 learners' lexical inferencing strategy use and success. *The Modern Language Journal, 90*(3), 387-401. DOI: 10.1111/j.1540-4781.2006.00431.x

Nation, I. S. P. (1990). *Teaching and learning vocabulary.* Boston, Mass: Heinle and Heinle Publishers.

Nation, I. S. P. (2001). *Learning vocabulary in another language.* (pp. 2-4). New York: Cambridge University Press. DOI: 10.1017/9781009093873

Nation, I. S. P. (2006). 'How large a vocabulary is needed for reading and listening?' *The Canadian Modern Language Review, 63* (1), 59-82. Availablea t: https://www.lextutor.ca/cover/papers/nation_2006.pdf

Nelson, D. L., Kitto, K., Galea, D., Mc Evoy, C. L., & Bruza, P. D. (2013). How activation, entanglement, and searching a semantic network contribute to event memory. *Memory and Cognition 41*(6), 797-819. DOI: 10.3758/s13421-013-0312-y

O'Malley, J., & Chamot, A. (1990). *Learning strategies in second language acquisition*. Cambridge University Press. DOI: 10.1017/CBO9781139524490

Paribakht, T. S., & Wesche, M. (1996). Enhancing vocabulary acquisition through reading: A hierarchy of text-related exercise type. *The Canadian Modern Language Review, 52*, 155-178. Available at: https://files.eric.ed.gov/fulltext/ED369291.pdf

Pulido, D. (2007). The effects of topic familiarity and passage sight vocabulary on L2 lexical inferencing and retention through reading. *Applied Linguistics, 28*(1), 66-86. DOI: 10.1093/applin/aml049

Qian, D. D. (1999). Assessing the roles of depth and breadth of vocabulary knowledge in reading comprehension. *Canadian Modern Reviews, 56,* 282-307. DOI: 10.3138/cmlr.56.2.282

Qian, D. D. (2002). Investigating the relationship between vocabulary knowledge and academic reading performance: An assessment perspective. *Language Learning 52*(3), 513-536. DOI: 10.1111/1467-9922.00193

Qian, D. D. & Schedl, M. (2004). Evaluation of an in-depth vocabulary knowledge measure for assessing reading performance. *Language Testing, 21*(1), 28-52. DOI: 10.1191/0265532204lt273oa

Read, J. (1993). The development of new measure of L2 vocabulary knowledge. *Language Testing, 10*(3), 355-371. DOI: 10.1177/026553229301000308

Read, J. (1998). Validating a test to measure depth of vocabulary knowledge. In A. J. Kunnan (Ed.), *Validation in language assessment* (pp. 41-60). Mahwah, NJ: Lawrence Erlbaum Associates. Availableat: https://psycnet.apa.org/record/1998-06667-002

Read, J. (2000). *Assessing vocabulary*. UK, Cambridge University Press. DOI: 10.1017/CBO9780511732942

Read, J. (2014). Second language vocabulary assessment. *Language Teaching, 46*, 41–52.

Richard, J-P. J. (2011). Does size matter? the relationship between vocabulary breadth and depth. *Sophia International Review, 33*, 107-120.

Richards, J. C. (1976). The role of vocabulary teaching. *TESOL Quarterly, 10*, 77-89. DOI: 10.2307/3585941

Schmitt, N., Ching Ng, J. W., & Garras, J. (2011). The word associates format validation evidence. *Language Testing, 28* (1), 105-126.

Schmitt, N., Schmitt, D., & Clapham, C. (2001). Developing and exploring the behavior of two new versions of the vocabulary levels test. *Language Testing, 18*(1), 55-88. DOI: 10.1177/026553220101800103

Shen, Z. (2008). The roles of depth and breadth of vocabulary knowledge in EFL reading performance. *Asian Social Science, 4*(12), 135-138. DOI: 10.5539/ass.v4n12p135

Traxler, M. J. (2012). *Introduction to psycholinguistics understanding language science*. Wiley-Blackwell. Availaable at: https://b2n.ir/e74086

Tuan, L. T. (2011). An empirical research on self-learning vocabulary. *Theory and Practice in language Studies, 1*(12), 1688-1695. Available at: http://www.academypublication.com/issues/past/tpls/vol01/12/03.pdf

Wilkins, D. A. (1972). *Linguistics in language teaching*. London: Arnold.

Yamamoto, Y. (2014). Multidimensional vocabulary acquisition through deliberate vocabulary list learning. *System, 42*, 232-243. DOI: 10.1016/j.system.2013.12.005