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The Effects of Guided and Unguided Semantic Mapping on Iranian EFL Learners' Vocabulary and Grammar Knowledge

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Abstract. The purpose of this study was to investigate the efficacy of two types of semantic mapping (guided and unguided) on improving EFL learners' vocabulary and grammar learning. This study also explored whether the guided and unguided semantic mapping is equally effective in grammar and vocabulary learning. The sample consisted of Sixty Elementary female EFL learners with the age of 10-13 years old from Iran Language Institute in Shiraz. A proficiency test, a vocabulary knowledge test, a vocabulary post-test, and a grammar test were used as the instruments of the study. The participants were divided into three groups (20 students in each group). The study employed a quasi-experimental pre-test post-test design. The control group who did not receive any treatment, studied the same vocabulary and grammar issues based on the routine classroom procedure, while the guided experimental group received one empty semantic map for the one-word category and two empty semantic maps for two grammatical points for each session. In the unguided experimental group, the participants were required to draw semantic maps for vocabularies and grammatical points without having empty frameworks. The paired-samples t-test and the one-way ANOVA were used to analyze the data. The results

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revealed that after the treatment, the participants of both experimental groups (guided and unguided groups) outperformed the participants of the control group in terms of vocabulary and grammar. The results also showed that the participants of the guided experimental group significantly gained higher mean scores in the grammar production test compared with the unguided experimental group. Based on the results, it was concluded that both guided and unguided semantic mapping significantly enhance EFL learners' vocabulary and grammar learning. More specifically, guided semantic mapping was more effective in grammar production compared with the unguided semantic mapping.

Keywords: EFL learners, grammar learning, graphic organizer, guided semantic mapping, unguided semantic mapping, vocabulary learning

1. Introduction

Vocabulary and grammar learning is considered as significant language components for those who want to learn a second or foreign language.So, it can be asserted that vocabulary and grammar have vital roles in learning a second or foreign language. Thanh and Thi (2003) expressed that these language components can be used to connect the four skills (speaking, listening, reading, and writing) together. According to Saengpakdeejit (2014), as students use the English language inside and outside classrooms, they still have problems in mastering vocabularies while acquiring them. Thus, in the case of language learning, teachers need to use some strategies to enhance the effectiveness of vocabulary learning. In addition to vocabulary learning, students also need to know the forms and functions of grammar structures. The role of grammar and how to integrate it into a foreign language classroom are at the core of ESL and EFL learning and teaching context (Ellis, 2001). There are different strategies in order to enhance and facilitate learners' vocabulary and grammar learning, from which teachers can benefit. For example, graphic organizers (GOs) are visual tools that reveal the correlation between facts, notions, and ideas in a task (Hall & Strangman, 2002).

It is disappointing when students cannot communicate effectively due to a lack of appropriate vocabulary and also proper grammar forms and functions. As students may face problems in recalling the vocabularies and also using the appropriate structures in their written or spoken

sentences, using the semantic maps, which is a subgroup of Graphic Organizers (GOs), will be regarded as a technique for the students in the classroom. So, it is worthwhile that teachers use semantic or concept mapping strategies to teach vocabulary and grammar forms and functions in English classrooms. Mostly, the focus of previous studies was only on grammar or vocabulary learning; not both of them also they mainly focused on unguided semantic mapping strategy that was frustrating for learners. In this study, the researcher attempted to find out the effects of semantic mapping on the extent to which Iranian EFL learners retained new vocabularies and grammar forms and functions. This study also examined the efficacy of two methods of semantic mapping, guided and unguided semantic mapping strategies, for promoting learners' vocabulary and grammar learning.

2. Literature Review

Ausubel (1968) discussed that graphic organizers could be used as a suitable method for presenting knowledge. Ausubel (1968) indicated that graphic organizers could make a relationship between learners' previous knowledge and their newly learned concepts. He also argued that learning happens when learners expand their cognitive structure with new knowledge. According to Sam and Rajan (2013), "a graphic organizer is a visual representation of knowledge. It is a way of structuring information, of arranging important aspects of a concept or topic into a pattern using labels" (p. 157).

Semantic mapping, as a kind of graphic organizer, is a classroom technique in which a visual representation of ideas in a text or conceptual relationships within a text is used to assist with the reading of a text. The semantic map may be a teacher or a student-generated (Richards & Schmidt, 2002). Barcroft (2004) also defined semantic mapping as "the increased evaluation of an item concerning its meaning" (p. 200).

Crandall et al. (2002) considered semantic mapping as an example of a graphic organizer which "breaks down the components of a text, setting, and dialogue in a series of events or conflicts leading to a resolution-into chunks of text that can help students organize and comprehend the events of the text" (p. 2). The efficacy of semantic mapping has been

reported in different studies. For instance, a study conducted by Rassaei (2017) revealed that concept mapping was beneficial for promoting L2 reading comprehension among intermediate level Persian EFL learners.

Kaveh and Rassaei (2016) investigated the effectiveness of concept mapping for enhancing learners' vocabulary learning and strategy use. Based on the results of the study, the researchers concluded that semantic maps significantly improved learners' L2 vocabulary learning.

In another study, Omar (2015) examined the effect of applying compu ter-based concept mapping on learners' reading comprehension. Twentyfive male students who were at the EFL course at Umm- Alqura University constituted the sample of the study. The researcher used a pretest, a post-test, and a questionnaire as the instruments of the study. The results revealed that computer-based concept mapping had a positive effect on learners' reading proficiency and comprehension. Furthermore, the researcher reported that "students showed a positive attitude towards using concept mapping to facilitate not only the reading skill but all language skills, as well" (p.1).

Dahbi (2014) explored the effectiveness of using graphic organizers in teaching grammar to a group of second-year students from a secondary school in Morocco. The results of the study demonstrated that the performance of students increased through the use of graphic organizers.

An experimental study conducted by Abdelrahman (2013) investigated the influence of semantic mapping on improving Arabian learners' vocabulary knowledge. Fifty male students at Al-Imam Mohammad Ibn Saud Islamic University were divided into experimental and control groups. The participants of the experimental group received the instruction using semantic mapping for ten sessions. Treatment included four different types of maps: thematic maps, spider maps, problem and solution maps, and fishbone maps. The control group was taught vocabulary without the use of semantic mapping. A post-test was applied to both groups. The results showed a positive effect of using semantic mapping on applying traditional vocabulary teaching techniques, and it was also found that cooperative learning had a significant effect on vocabulary teaching and learning.

Biria and Sharifi (2013) researched to find the relationship between

Iranian university students' reading comprehension ability and using graphic organizers. The findings of the study showed a significant positive relationship between the two variables.

In a study conducted by Zahedi and Abdi (2012) on the use of semantic maps through teaching vocabularies to university students, the effectiveness of memory strategy instruction for improving learners' vocabulary learning was shown.

In another study, Liu, Chen, and Chang (2010) investigated the influence of computerized concept mapping on L2 grammar knowledge for 10 weeks. The participants were asked to draw computer-assisted concept maps for each grammar point. The results revealed a significant and positive effect of concept mapping on learners' grammar knowledge. Moreover, it was presented that concept mapping improves learners' awareness of other grammar strategies.

Chularut and DeBacker (2004) studied the influence of applying concept mapping on ESL learners' grammar and vocabulary knowledge, self-efficacy, and self-regulation. The results showed that concept mapping has a positive effect on learners' grammar and vocabulary knowledge, self-efficacy, and self-regulation.

As was presented in the previous part, different studies (Dahbi, 2014; Liu et al., 2010) investigated the effect of concept mapping on learners' grammar knowledge, and it was found that concept mapping can positively affect learners' grammar knowledge. However, a few studies (Chularut & DeBacker, 2004) compared the effect of using concept mapping on learners' grammar and vocabulary knowledge. So, the current study aimed to investigate the influence of semantic mapping on Iranian EFL learners' vocabularies and grammar forms and functions. Moreover, this study examined the efficacy of guided and unguided semantic mapping strategies, two methods of semantic mapping, for improving learners' vocabulary and grammar knowledge.

The study sought answers to the following questions:

1. Does guided semantic mapping enhance Iranian EFL learners' a) vocabulary, and b) grammar knowledge?

2. Does unguided semantic mapping enhance Iranian EFL learners' a)

vocabulary, and b) grammar knowledge?

3. Which of the above semantic mapping strategies (guided or unguided) is more useful to enhance learners' a) vocabulary, and b) grammar knowledge?

3. Methodology

3.1 Participants

Sixty Elementary female EFL learners (based on the institute levels) with the age of 10-13 years old from Iran Language Institute in Shiraz constituted the participants of the study. All participants were native Persian speakers. The participants were divided into three groups: two experimental groups and one control group. Each group included 20 participants. The participants belonged to three intact EFL classes, two experimental groups and one control group, each including 20 students. As this was the only context available to the researcher, the participants were selected based on non-random availability sampling.

3.2. Instruments

To collect the desired quantitative data, four instruments were used: a proficiency test, a vocabulary knowledge test, a vocabulary post-test, and a grammar test.

3.2.1 Proficiency test

To make sure that the three groups were equal in terms of vocabulary and grammar knowledge, the researcher used a proficiency test to measure the learners' proficiency knowledge at the beginning of the study. To this end, 15 vocabulary and 15 grammar items from Key English Test (KET) were selected based on learners' proficiency level. The learners were asked to answer the 30 items in 30 minutes. Then, learners whose scores were between two standard deviations above and two standard deviations below the mean were selected to take part in the study.

3.2.2 Vocabulary knowledge test

A vocabulary knowledge test was used as the pre-test. This test consisted of 50 vocabulary items. Each item included one English word which

was selected from the learners' course book, English Time3 (Rivers & Tayama, 2002). The participants were asked to write the Persian equivalent of the words. The average time to take this test was about 15 minutes. Based on the learners' answers to this test, those words which were least familiar to the learners were chosen as the target words and were used for the post-test. The validity of this test was confirmed through consulting with the researcher's advisor. The results of the Guttman reliability showed that the vocabulary knowledge test was reliable (r= .80).

3.2.3 Vocabulary Post-test

A vocabulary test that consisted of 15 multiple-choice items was used as the post-test. The items were based on the target words chosen in the pre-test. The allocated time for this test was 15 minutes. The researcher applied the Guttman reliability to estimate the reliability of the test. The results of the reliability revealed that the vocabulary test was highly reliable (r= .81).

3.2.4 Grammar Test

A grammar test, which consisted of two parts: 15 multiple-choice items that were based on target grammar structures and a production test for measuring learners' productive knowledge of grammatical points taught during treatment sessions. For this test, the learners were asked to write a short passage about a given topic. The criteria for scoring learners' production test were those grammatical aspects such as countable/uncountable nouns, past tense, and their subcategories for which the learners were asked to draw semantic maps. The same grammar test was used for the pre- and post-test. However, the multiple-choice items were presented in a different sequence. The grammar test was presented in two forms, one for pretest and the other for the post-test. The learners were asked to complete the test in 20 minutes. The researcher ran the Guttman reliability to estimate the reliability of the multiple-choice test. The results showed that the grammar test was reliable (r= .78). The validity of this test was confirmed through consulting with the researcher's advisor. Besides, to ensure the reliability of the grammar production test, two raters (the researcher and her colleague) rated the

production tests. As the participants were required to write five sentences as the answers to the production test, their scores were out of five. Then, the researcher ran the correlation between the two sets of scores to investigate inter-rater reliability. According to the results, the correlation coefficient was .97. It shows that there was a high agreement between the two ratings. Their validity was also confirmed via consulting with an expert.

3.3. Procedure

Sixty Iranian EFL learners were divided into three groups: two experimental groups (guided and unguided semantic mapping groups) and one control group. They were going to study English twice a week, about two hours each session. Their book was English Time3 (Rivers & Toyama, 2002). The process of data collection was done over seven sessions.

Before applying the treatment, sixty-five students took a homogeneity test (i.e., a KET (Key English Test)) at the first session. Based on the results of the proficiency test, sixty students were selected as the participants of the study. In the second session, the researcher administered the vocabulary and grammar pre-tests to ensure that there was no statistically significant difference between the groups in terms of vocabulary and grammar knowledge. Afterward, semantic mapping instruction was employed for experimental groups in the third session regarding how to draw semantic maps. The teacher introduced semantic maps in different shapes with connected lines and wrote the target word or the particular grammatical point in the central circle on the board and asked the students to brainstorm the topic with the related ideas. Then, the teacher put the related issues in the circles connected to the main topic. The semantic maps included two levels in addition to the central topic. The teacher also provided some printed semantic maps related to the lessons and distributed them among the students during the treatment sessions. According to Rassaei (2017), concept mapping taught learners to concentrate on the central topic, and elaborate the central concept with the related concepts to form the semantic map. In general, the learners practiced semantic mapping during four sessions. For each session, following the routine classroom activities, the learners were

asked to draw two semantic grammar maps and one semantic vocabulary map.

For vocabulary semantic mapping, there were a total of 20 words for which the learners were asked to draw semantic maps. The 20 words were categorized into four groups. Therefore, for each semantic mapping session, the learners were asked to draw a semantic map for one group of 5 related words.

For grammar semantic mapping, the learners were asked to draw semantic maps for two grammar forms: countable/uncountable nouns and past tense. For each semantic mapping session, besides drawing vocabulary semantic maps, the learners were asked to draw two semantic maps for the two grammar points. Therefore, the learners drew a total of eight semantic grammar maps.

Students in the guided semantic mapping group received treatment in terms of guided semantic mapping strategy. Learners were provided with an empty semantic map along with the items that should be fed into the map. For each session, one semantic map for the one-word category and two semantic maps for two grammatical points were prepared.

Students in the unguided semantic mapping group received treatment in terms of unguided semantic mapping. Learners were asked to draw semantic maps for vocabularies and grammatical points without having empty frameworks.

Students in the control group did not receive any treatment. They studied the same vocabulary and grammar issues based on the routine classroom procedure. The treatment took place for about four sessions in a classroom setting during the regular class time. At the end of the course, participants in all groups took the post-test to determine the effectiveness of guided and unguided semantic mapping strategies.

3.4. Data Analysis

In order to analyze the data, SPSS software (version 21) was used. To ensure the reliability of the vocabulary and grammar tests, the Guttman reliability was calculated. One-way ANOVA was used to compare the three groups, two experimental groups, and one control group, in the pre-test and the post-test scores. In addition, to compare the performance

of the participants sample in each group before and after the treatment, paired-samples t-test was run.

4. Results

4.1 Proficiency Test

As mentioned earlier, the researcher ran a proficiency test to select a homogeneous sample of the population. Table 1 shows the descriptive statistics of the results of the proficiency test.

Table 1: Descriptive Statistics of the Proficiency Test Scores

Descriptive Statistics

	N	*Minimum*	*Maximum*	*Mean*	*Std. Deviation*
proficiency	65	14	30	26.14	3.235
Valid N (listwise)	65				

The researcher selected the learners whose scores were between mean+2 standard deviations and-2standard deviations from the mean as the participants of the study. Then, the participants were divided into three groups (two experimental groups and one control group).

4.2 Grammar

In the next step, the researcher administered a multiple-choice grammar test as the pre-test. The descriptive statistics for the pre-tests of the experimental and control groups are provided. Table 2 reports the results of descriptive statistics.

Table 2: Descriptive Statistics of Grammar Scores

		N	Minimum	Maximum	Mean	Std. Deviation
Pre. Grammar	control	20	1	4	3.25	.910
	Experimental .guided group	20	2	4	3.50	.761
	Experimental .unguided group	20	1	4	3.50	.946
Post. Grammar	control	20	12	15	13.25	.967
	Experimental .guided group	20	14	15	14.75	.444
	Experimental .unguided group	20	13	15	14.00	.795

According to Table 2, the grammar pretest means scores of the guided and unguided experimental groups, and the control group are 3.50, 3.50,

and 3.25, respectively. The results of the descriptive statistics also show that the post-test mean scores of the guided and unguided experimental groups are 14.75 and 14.00, and that of the control group is 13.25.

To see if there is any significant difference between the three groups in terms of grammar knowledge before the treatment, the one-way ANOVA was run on the pretest scores of the three groups. The results are presented in Table 3.

Table 3: One-way ANOVA regarding the Difference between Three Groups in terms of Grammar Pretest Scores

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Pre. Grammar	Between Groups	.833	2	.417	.543	.584
	Within Groups	43.750	57	.768		
	Total	44.583	59			

The results presented in Table 3 reveal that there is not any significant difference between the guided and unguided experimental groups and control groups in terms of their grammar pretest scores (p=.584). It can be inferred that three groups were homogenous before the treatment.

Afterward, to explore if the difference between the experimental and control groups' pre and post-test mean scores is significant, paired sample t-tests were run on the three groups' pretest and post-test. (Table 4).

Table 4: Paired Samples t-test regarding the Difference between Pretest and Post-test Grammar Scores

Paired Samples Test[a]

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Control group	Pre. Grammar – post. Grammar	-10.000	1.076	.241	-10.504	-9.496	-41.560	19	.000
Guided experimental group	Pre. Grammar – post. Grammar	-11.250	.910	.204	-11.676	-10.824	-55.259	19	.000
Unguided experimental group	Pre. Grammar – post. Grammar	-10.500	.761	.170	-10.856	-10.144	-61.714	19	.000

According to the results presented in Table 4, the difference between the pre and post-test scores of the control group is significant (sig.=.00, p ¡.05). The results also show that there is a significant difference between the pre and post-test scores of the guided (sig. = .00, p¡.05) and unguided experimental groups (sig.=.00, p¡.05). According to the descriptive statistics presented in Table 4.2, all groups had higher grammar mean scores in the post-test (guided experimental=14.75, unguided experimental=14.00, control=13.25) compared with the pretest (guided experimental= 3.50, unguided experimental=3.50, control=3.25).

In the next step, to explore if there is any difference between the guided and unguided experimental groups and control groups in terms of their performances in the post-test, another one-way ANOVA was run. Table 5 depicts the results of one-way ANOVA.

Table 5: One-way ANOVA regarding the Difference between Three Groups in terms of Grammar Post-test Scores

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.500	2	11.250	19.142	.000
Within Groups	33.500	57	.588		
Total	56.000	59			

According to Table 5, there is a significant difference between the post-test scores of the experimental and control groups ($sig. = .00, p < .05$). To confirm where the differences occurred between groups, the Post hoc test was run. Table 6 shows the results of the Post-hoc test.

Table 6: Post-hoc Test to Compare the Groups in terms of Grammar Scores

(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.
control	Guided experimental group	-1.500*	.242	.000
	Unguided experimental group	-.750*	.242	.012
Guided experimental group	control	1.500*	.242	.000
	Unguided experimental group	.750*	.242	.012
Unguided experimental group	control	.750*	.242	.012
	Guided experimental group	-.750*	.242	.012

With referring to Table 6, there is a significant difference between the

guided group and the control ($sig. = .00, p < .05$) and unguided ($sig. = .01, p < .05$) groups in terms of grammar post-test scores. Based on the results of the descriptive statistics, the guided group (mean=14.75) significantly outperformed the control (mean=13.25) and unguided (mean=14.00) groups in the grammar post-test. The results of the post-hoc test also revealed that the difference between the unguided groups' grammar means score and that of the control group is significant ($sig. = .01, p < .05$). Therefore, based on the results of the descriptive statistics, it can be concluded that the unguided group (mean=14.00) significantly gained a higher grammar mean score in the post-test compared with the control group (mean=13.25).

As mentioned earlier, the researcher also administered a production test as the pre and post-test to measure learners' productive knowledge of grammatical points taught during treatment sessions. Table 7 demonstrates the results of the descriptive statistics of the production test.

Table 7: Descriptive Statistics of Production Test Scores

		N	Minimum	Maximum	Mean	Std. Deviation	Std. Error
Pretest. Production test	control	20	0	0	.00	.000	.000
	Experimental .guided group	20	0	0	.00	.000	.000
	Experimental .unguided group	20	0	0	.00	.000	.000
	Total	60	0	0	.00	.000	.000
Post-test. Production test	control	20	3	5	3.85	.745	.167
	Experimental .guided group	20	4	5	4.80	.410	.092
	Experimental .unguided group	20	4	5	4.75	.444	.099
	Total	60	3	5	4.47	.700	.090

The results show that all groups' mean scores in the production test equal to zero. According to Table 7, the experimental and control groups' mean scores are as the following: Control group (mean= 3.85), guided group (mean=4.80), and unguided group (mean=4.75).

To investigate if there is any difference between the groups in terms of their grammar production scores, the one-way ANOVA was run. Table 8 shows the pertaining results.

Table 8: One-way ANOVA regarding the Difference between Three Groups in terms of Grammar Production Post-test Scores

		Sum of Squares	df	Mean Square	F	Sig.
Post-test. Grammar production	Between Groups	11.433	2	5.717	18.620	.000
	Within Groups	17.500	57	.307		
	Total	28.933	59			

As Table 8 shows, the difference between the groups is significant ($sig. = .00, p < .05$). The researcher also ran the post-hoc test to explore all possible pair-wise comparisons of means. Table 9 shows the results of the post-hoc test.

Table 9: Post-hoc Test to Compare the Groups in terms of Grammar Scores

Dependent Variable	(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.
Post-test. Grammar production	control	Experimental .guided group	-.950*	.175	.000
		Experimental .unguided group	-.900*	.175	.000
	Experimental .guided group	control	.950*	.175	.000
		Experimental .unguided group	.050	.175	.960
	Experimental .unguided group	control	.900*	.175	.000
		Experimental .guided group	-.050	.175	.960

As shown in Table 9, there was a significant difference between guided ($sig. = .00, p < .05$) and unguided ($sig. = .00, p < .05$) groups' mean scores and the control group's mean score. Based on the results, guided (mean= 4.80) and unguided (mean= 4.75) groups significantly outperformed the control group (mean= 3.85) in the grammar production test. Based on the mean scores, the guided semantic mapping had the highest mean score in the post-test.

4.3 Vocabulary

The researcher administered a vocabulary test that consisted of 15 multiple-choice items as the post-test to explore the effect of guided and unguided semantic mapping on the learners' vocabulary knowledge. Table10 reports the results of the descriptive statistics of the vocabulary test.

Table 10: Descriptive Statistics of Vocabulary Test Scores

	N	Minimum	Maximum	Mean	Std. Deviation	Std. Error
Control	20	11	15	12.75	1.482	.331
Experimental .guided group	20	14	15	14.60	.503	.112
Experimental .unguided group	20	14	15	14.55	.510	.114
Total	60	11	15	13.97	1.275	.165

According to Table 10, the control, guided, and unguided groups' vocabulary mean scores are 12.75, 14.60, and 14.55, respectively. To examine if semantic mapping affects the learners' vocabulary knowledge, the researcher ran the one-way ANOVA to compare the three groups' vocabulary scores. Tables 11 and 12 show the results of the one-way ANOVA and posthoc test, respectively.

Table 11: One-way ANOVA regarding the Difference between Three Groups in terms of Vocabulary Test Scores

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	44.433	2	22.217	24.589	.000
Within Groups	51.500	57	.904		
Total	95.933	59			

The results of the one-way ANOVA presented in Table 11 indicate that there is a significant difference between the three groups' vocabulary scores ($sig. = .00, p < .05$).

Table 12: Post-hoc test (Scheffe test) to Compare the Groups in terms of Vocabulary Scores

(I) group	(J) group	Mean Difference (I-J)	Std. Error	Sig.
Control	Experimental .guided group	-1.850*	.301	.000
	Experimental .unguided group	-1.800*	.301	.000
Experimental .guided group	Control	1.850*	.301	.000
	Experimental .unguided group	.050	.301	.986
Experimental .unguided group	Control	1.800*	.301	.000
	Experimental .guided group	-.050	.301	.986

Table 12 also shows that there is a significant difference between the control group and two experimental groups. Based on the results of the descriptive statistics and the one-way ANOVA, it can be concluded

that guided and unguided groups significantly outperformed the control group in the vocabulary test. According to Table 12, the difference between the guided and unguided groups' vocabulary mean scores is not significant.

5. Discussion

The ultimate goal of the present study was to identify the efficacy of two types of semantic mapping as a teaching strategy on improving EFL learners' vocabulary and grammar learning. This study also aimed to investigate if guided and unguided semantic mapping is equally useful for teaching grammar and vocabulary. In what follows, the research questions are answered in light of the findings of the study. The results showed that in vocabulary, grammar, and grammar production post-tests, guided and unguided groups outperformed the control group. Besides, the guided group significantly gained a higher mean score in the grammar production test compared with the two other groups.

The first research question asked if guided semantic mapping enhance Iranian EFL learners' a) vocabulary, and b) grammar knowledge. The results of the comparison of the learners' grammar scores (both recognition and production tests) within the guided experimental group before and after the study showed that guided semantic mapping significantly enhance Iranian EFL learners' grammar knowledge. The results of one-way ANOVA on vocabulary and grammar scores also revealed that compared with the control group, the guided group significantly gained higher vocabulary and grammar mean scores in the post-tests. Therefore, it can be concluded that guided semantic mapping significantly enhances Iranian EFL learners' vocabulary and grammar knowledge. Therefore, the first research hypothesis is rejected.

The second research question posed in this study asked if unguided semantic mapping enhances Iranian EFL learners' a) vocabulary, and b) grammar knowledge.

Concerning the results of one-way ANOVA on grammar and production tests, it was concluded that unguided semantic mapping positively affects learners' grammar knowledge. Similarly, the results of one-way

ANOVA on the vocabulary test revealed that unguided semantic mapping enhances the learners' vocabulary knowledge. Thus, the second research hypothesis is rejected.

Schmitt (as cited in Thuy, 2013) emphasized: "presenting items to students in a systematized manner which will both illustrate the organized nature of vocabulary and at the same time enable students to internalize the items in the coherent way" (p.623). The guided semantic mapping also provides a situation for learners to organize words systematically and created a semantic link between the words by the topics or by the ideas in the context.

According to Novak and Wandersee (1991, as cited in Kalhor & Mehran, 2016), the effectiveness of concept mapping is "due to presenting a pattern and a framework to create and organize the knowledge, that not only permit utilization of the knowledge in new contexts, but also the retention of the knowledge for long periods of time" (p. 2).

According to Baleghizadeh and Naeim (2011), the effectiveness of semantic vocabulary teaching technique can be attributed to two main reasons. First, semantic mapping has both a meaningful and mechanical aspect. As words are presented according to the meaning-based relationships among them, semantic mapping can be considered as a meaningful technique, and it is mechanical in the sense that the words still need to be practiced out of context. The second reason that makes semantic mapping useful is its cognitive feature. As Margosein, Pascarella, and Pflaum (1982) stated, compared with the traditional vocabulary teaching techniques, semantic mapping has a more significant impact on vocabulary acquisition because "it motivates the students to call back their prior knowledge to new words and to create lexical network among words" (as cited in Abate & Tefera, 2015, p. 14).

The results of the present study are in line with the findings of the previous studies that showed the positive effect of semantic mapping on the enhancement of learners' vocabulary and grammar knowledge (e.g., Chang, Sung, & Cheng, 2002; Moradiyan Zardak et al., 2015). For instance, in a study conducted by Zahedi and Abdi (2012), the results showed that semantic mapping could improve learners' vocabulary learning. Similarly, Kaveh and Rassaei (2016) concluded that semantic

maps significantly enhance learners' L2 vocabulary learning.

Dahbi (2014), who investigated the effectiveness of using graphic organizers to teach grammar, also came to the same conclusion. Dahbi (2014) concluded that the performance of students increased through the use of graphic organizers.

The last research question in this study asked: Which of the above semantic mapping strategies (guided or unguided) is more useful to enhance learners' a) vocabulary, and b) grammar knowledge?

The results of the one-way ANOVA on the post-test scores revealed that guided groups significantly outperformed the unguided group in the grammar test. However, the findings showed that there was not any significant difference between the guided and unguided groups in the vocabulary and grammar production tests.

The results of the present study showed that guided learning could improve the effectiveness of semantic mapping in teaching and learning grammar. The obtained results can be justified based on the fact that guided semantic mapping provides opportunities for learners to practice new materials with teacher support. In the present study, the learners were provided with an empty semantic map along with the items that should be fed into the map. As in guided semantic mapping, the teacher gives the students the necessary help for a more accurate and appropriate grammar map; it ensures that students experience success and enjoyment so that they will gradually develop greater independence and competence.

In the case of grammar learning, the guided semantic mapping helped the guided group participants to organize the concepts and link them with previously learned concepts better than the unguided group. It shows that guided semantic mapping improves the learners' understanding and recognizing the grammatical concepts.

6. Conclusion

Based on the results of the study, it was concluded that both guided and unguided semantic mapping enhance vocabulary and grammar learning. The study also concluded that compared with the unguided seman-

tic mapping, guided semantic mapping is more effective in grammar learning.

As in semantic mapping, maps visually represent the relationships among categories of concepts, "they are an extremely practical framework for the storage of terms" (Dilek & Yrk, 2013, p. 1534). Therefore, as Stoller and Grabe (1993) indicated, "semantic mapping leads to better vocabulary retention because new vocabulary items are introduced in semantic networks" (p. 34).

The results of the present study can be interpreted as a support for what Novak and Wandersee (as cited in Kalhor & Mehran, 2016, p. 3) claimed: "semantic mapping facilitates meaningful learning and due to presenting a pattern and a framework to create and organize the knowledge. It permits not only utilization of the knowledge in new contexts, but also the retention of the knowledge for long periods".

The results of the previous studies (Clewell & Haidemose, 1986; Dilek & Yrk, 2013) also confirm the results of the present study. These studies reported that semantic mapping could be used as a framework for identifying the structural organization of texts and a means for improving learners' vocabulary learning.

6.1. Pedagogical Implications

The findings of the present study can provide learners, teachers, and curriculum developers with several pedagogical implications. Curriculum developers and syllabus designers can incorporate semantic mapping, guided semantic mapping in particular, in the language learning curriculum, at least in Iran. Furthermore, educational psychologists, language teachers, and learners should consider the possible effects of guided and unguided semantic mapping on EFL learners' vocabulary and grammar learning. Also, given the positive effect of guided semantic mapping on EFL learners' grammar learning, syllabus designers can include the guided semantic mapping courses in language learning materials.

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