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The Effect of Semantic Mapping on High School EFL Students' Vocabulary Learning

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Abstract

The purpose of this study was to explore the effect of using the semantic mapping strategy on vocabulary learning of Iranian EFL learners in the tenth grade of high school. 60 students in the tenth grade of high school in three groups; the first group with 14 tenth-grade students that were used for piloting the two researcher-made parallel tests as a pre-test and post-test, and the two other groups consisting of 23 students in each group were considered as the control and experimental group. The experimental group received the treatment whereas the control group underwent a conventional method of vocabulary learning. In order to analyze the collected data, descriptive statistics, normality tests, homogeneity of variances tests, independent sample T-tests, and paired sample T-tests were used. The results indicated that using the semantic mapping strategy can be beneficial to develop vocabulary learning of Iranian EFL learners of tenth grade. Moreover, the study has provided some recommendations for educators.

Keywords: "Semantic Mapping", "High School", "Vocabulary Learning".

Introduction

It was by the 1990s that vocabulary "assumed its rightful place as a fundamentally important aspect of language development,"[1, p. 103]. Besides, he added that within it, people can think deeply about the past and know the present and future [1]. Moreover, Hambali pointed out that "talking about language means talking about vocabulary. It means that a language cannot be separated from vocabulary, since vocabulary is the basic component of language" [2, p. 5]. Furthermore, Wilkins described the importance of vocabulary in his quote, "While without grammar very little can be conveyed, without vocabulary, nothing can be conveyed" [3, p.41].

Students may find it simpler to learn the words if vocabulary learning tools are carried out. Vocabulary learning techniques for enhancing vocabulary learning are constantly being researched. Regarding vocabulary learning strategy, Gu and Johnson added that "although the use of a wide variety of strategies has been found to be characteristic of successful learners, the great majority of learners seem to favor some form of mechanical strategies such as repetition over deeper, more complex ones, such as semantic mapping, contextual guessing, and metacognitive strategies" [4, p. 643]. Semantic mapping, as a memory strategy, is one of the ways for brainstorming new words' relationships. As Richards and Renandya stated:

Elaboration involves expanding the connection between what the learners already know and new information. One way to do this is to choose L2 words from the surrounding context and explain their connection to the already learned word (Prince, 1996). In addition to presenting this new information, teachers should create opportunities to meet these useful, recently learned words in new contexts that provide new collections and associations (Nation, 1994). Exercises that can deepen students' knowledge of words include the following: sorting lists of words and deciding on the categories; making semantic maps with lists either provided by the teacher or generated by the learners; generating derivations, inflections, synonyms, and antonyms of a word; making trees that show the relationship between superordinates; coordinates, and specific examples; identifying or generating associated words; combining phrases from several columns; matching parts of collocations using two columns; completing collocation as a cloze activity; and playing collocation crossword puzzles or bingo [5, p. 261].

In addition, semantic mapping is the process of creating visual representations of categories and their relationships. Also, Pikulski and Ross defined semantic mapping as "the building of an understanding of how the target vocabulary words relate to known words and concepts" [6, p. 22]. Besides, Carrell et al. asserted that "semantic mapping can be used not only to introduce the key vocabulary from the passage to be read, but also to provide the teacher with an assessment of the students' prior knowledge, or schema availability on the topic" [7, p. 651]. Moreover, semantic mapping as a visuospatial approach, raise the reading comprehension of teaching-impaired pupils [8].

Besides, many studies have been conducted on the impact of semantic mapping strategy on vocabulary learning in different situations, but none of the previous studies have investigated the effect of using semantic maps strategy on the development of vocabulary learning for Iranian EFL learners in the tenth grade of high school in Shiraz. This research aims to discover the effect of using the semantic mapping strategy on vocabulary learning of Iranian EFL high school learners of tenth-grade classes. In addition, it can motivate other researchers in conducting other studies in the same scope. In other words, this study mainly aims at answering the following research question:

1-Does semantic mapping strategy have a significant effect on the vocabulary learning of tenth-grade high school students?

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Literature Review

As an important aspect of language learning, knowing vocabulary is considered the basic unit of language form. Because of the great value of vocabulary fluency in improving learners' language learning, teaching, and learning vocabulary is also very important. There are many definitions of vocabulary. All vocabularies are categorized into four categories, like the order of language acquisition, consisting of listening, speaking, reading, and writing [9], [10]. According to [9], listening vocabulary is all the words that are recognizable and understandable in an aural context. Moreover, Omer represented those words that learners use in everyday speech are speaking vocabulary; reading vocabulary as those that are recognizable and understandable in reading, and the more students read, the larger their reading vocabulary; and writing vocabulary as the word that learners can use in their written composition [9]. Besides, Hatch and Brown [11] claimed that listening and reading are considered receptive vocabulary, and speaking and writing vocabulary as productive vocabulary. Also, Thomas [12] considered receptive vocabularies as passive, and productive vocabularies as active ones.

Furthermore, semantic mapping, as a graphic organizer, guides learners in creating a visual representation of linkages between words, meaning, pictures, and propositional contents [13]. Besides, the term semantic mapping in language learning is usually known as brainstorming association which a word has, and schematization of the results [14]. Besides, according to Masters et al., the semantic mapping technique is defined as “used to motivate and involve students in thinking, reading and writing aspects. It enhances vocabulary development by helping students link new information with previous experience” [15, p. 34].

Jones and Thomas [16] stated that the semantic mapping strategy (SMS) is a visual strategy that reveals the major ideas of a specific topic and their relatedness. Also, they pointed out that there are several semantic maps, including word mapping for enhancing students’ understanding of keywords in a graphical shape; concept mapping for organizing information on a problem or subject; and story mapping as a graphical organizer for logical sequencing of events, themes, problems, and so on. Moreover, according to Col [17], semantic mapping, as a graphic organizer, consist of eight forms including a star diagram, spider diagram, fishbone diagram, cloud/cluster diagram, tree diagram, chain diagram, cycle diagram, and vocabulary map. Moreover, she mentioned that a star diagram is a graphic organizer suitable for compressing and establishing data about multiple trials, as well as facts, or attributes associated with a single topic. Furthermore, she asserted that it is valuable for basic brainstorming on a topic or principally listing all majors’ ideas related to a theme. This kind can also be used for narrative text; it aims to make remembering the story of the text more easily. Besides, according to [17], a spider map (sometimes called a semantic map) is a graphic organizer for investigating and citing a single aspect or topic for thought organizing. In addition, she claimed that a fishbone map, sometimes called a herringbone map, is a type of graphic organizer appropriate for exploring the many aspects or effects of a complex topic and helping the students organize their thoughts in a simple visual way [17]. Also, a cloud diagram (cluster diagram), as she asserted, is a type of non-linear graphic organizer to help systematize the generation of ideas based on a central theme known as a cloud diagram. Students can easily reflect on a topic, relate to an idea, or discover a new one using this type of diagram. Also, she said that tree diagrams are graphic organizers indicating how items are related. In this type, the trunks demonstrate the main topic, and the branches show relevant facts, aspects, effects, characters, individuals, or results. In addition, a chain diagram, or a sequence of events represents stages of a process. Moreover, a cycle diagram is a type of graphical organizer that shows how elements relate to each other in a repeating cycle. Vocabulary maps (vocabulary word maps or word maps) are those graphic organizers that can be beneficial for helping students learn new vocabulary. For each new vocabulary, students write the word, its definition, the part of speech (noun, verb, adjective, adverb, etc.), a synonym, and an antonym, draw a picture that illustrates the meaning of the word, and write a meaningful sentence using the word.

Instructional Sequence of Semantic Mapping

According to the literature, the use of semantic mapping in the classroom may be divided into various phases. Different scientists and researchers provide several steps for incorporating semantic mapping in the classroom. Besides, Zaid found the following sequence of instructions for carrying out a semantic map [18]. In Zaid’s variation, these steps are broken down into five phases which are explained [18]. First, the teacher indicates the topic by drawing a large oval and writing the reading’s topic inside of it. Through this, the students can guess what the purpose of the reading passage is. Second, for the brainstorming step, the teacher wants the students to use their minds and provide keywords and ideas which are interrelated to the topic to use their prior knowledge and experiences as a stepping block to new knowledge. Brainstorming as a practical use of the schema theory is necessary for connecting known and unknown concepts. The keyword and ideas are listed on the one side of the blackboard and all of the responses are accepted as they relate to the topic. Third, as pre-assignment, the teacher encourages the students to make connections among their suggestions. As category clusters are formed by the students and the teacher together according to the students’ ideas, both of them decide on a suitable heading or label for each of the clusters

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or categories of words [19]. When the clustering finishes, the teacher wants the students to make copies of the map. Fourth to personalize the map, after each student makes his/her own copy, the class is provided with some material such as a reading passage that is about the key concepts of the map and consists of more related information than the students have listed. As they read, students are decided what to add or eliminate from the map they have already created. Moreover, in this phase, new information is integrated with prior knowledge [18]. Finally, for the post-assignment synthesis, after they read the passage and add or eliminate some items, the whole class decides on the final shape of the map.

Although several studies related to the effectiveness of using semantic mapping on students' vocabulary achievement have been conducted by other researchers, no studies have been conducted focusing on the same considered context and forms of semantic mapping that are investigated. First, Al-Khasawneh and AlHawamdeh [20] conducted a study concerning the potentiality of semantic mapping in vocabulary learning enhancement with 60 Saudi Arabian English major students, who were randomly divided into two equal groups. The results demonstrated a highly significant difference between the groups, so they asserted that "these results could justify the importance of integrating the instruction of semantic maps in EFL courses, as it contributes to a better understanding of the relationship between words, and it enhances vocabulary mastery through its cognitive features" [20, p. 930]. Besides, Madina Ilxom qiz and Alisher o'g'li [21] conducted a study under the title of "the effect of semantic mapping in EFL vocabulary acquisition", considering 40 lower-intermediate pupils, aged from 19 to 27, as the participants. The results demonstrated that the vocabulary learning of those students who have been exposed to semantic mapping significantly differed from the other group. Thus, they concluded that this strategy is a valuable memory strategy for teaching in developing vocabulary learning. Then, twenty-four Indonesian eighth-grade students participated in another study proposed by Anditasari [22] concerning students' mastery of vocabulary in descriptive text using the semantic map as a strategy. The results indicated that semantic mapping was an effective strategy since it helped to develop vocabulary mastery in Indonesian eighth-grade students. Moreover, in a study managed by Risnawati in Indonesia [23], there was only one group consisting of 19 learners out of the 120 students of the eleventh-grade population. She conducted research to find the effect of using a semantic mapping strategy on students' vocabulary mastery After analyzing the data, the results indicated that the scores and their mean in the post-test were higher than in the pre-test. Finally, the results indicated that the semantic mapping strategy developed students' learning process and vocabulary mastery. Furthermore, Mohammed and Malo's study [24] at the University of Zakho, Kurdistan region-Iraq, aimed to assess vocabulary mastery and measure the effect of semantic map strategy on word awareness level; 28 juniors (18 males, 10 females) of a class participated. The findings demonstrated no significant effect of this strategy on the considered sample for understanding and developing lexical semantics topics. Then, in 2020, Mohammed and Al-Khazaali [25] carried out research that considered semantic mapping strategy instruction and Iraqi students' vocabulary achievement as the variables, 83 freshmen students of Al-Kadhum University College participated. The results indicated that this strategy significantly affects the vocabulary achievement of Iraqi students and those students who were given the semantic maps as treatment outperformed the other group. Besides, in a study conducted by Badr and Abu-Ayyash [26] with thirty male twelfth-grade students in the United Arab Emirates, the effectiveness of semantic mapping and rote memorization strategies on L2 vocabulary acquisition and memorization was investigated. They found that "the students' retrieval of the target vocabulary words improved as a result of implementing both strategies, but that the improvement which resulted from the use of semantic mapping overrode that which ensued from rote memorization" [26, p. 158]. Furthermore, Jaberi and Rassaei [27] conducted a study with 60 Elementary female EFL learners aged 10-13 about guided and unguided Semantic Mapping and its effect on vocabulary and grammar knowledge. As the results indicated, both learners' vocabulary and grammar learning was enhanced through guided and unguided semantic maps. But more significantly, this strategy affected on grammar learning of female learners. In addition, in a study under the title of "Enriching Students' Vocabulary by Implementing Semantic Mapping Strategy at the Tenth Grade of SMK Negeri 1 Ambon" in Indonesia, Nikjuluw and Cangkat [28] considered four males and sixteen females as the participants. The results demonstrated a significant effect of using this strategy to enrich vocabulary learning which can be concluded that semantic mapping was a good strategy for vocabulary enrichment of students. Besides, in a study done by Saeidi and Atmani [29], considering Semantic Mapping as a Pre-reading Activity to know whether semantic mapping affects teaching vocabulary or not, 120 intermediate (60 male and 60 female) were selected and randomly put into four equal groups, 30 participants in each group. The results showed that the SM techniques could be considered an effective teaching model in language classes. Also, about the genders, it showed no differences among them in receiving the semantic mapping. In addition, in the study done by Keshavarz et al. [30], at "Jahad Daneshgahi" Language Institute in Tehran, which considered semantic mapping strategy and vocabulary

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learning of intermediate EFL students as the variables of the study, 134 male and female students of nine intact classes, aged 16 to 26, were participated. The results of this study suggested that the semantic mapping strategy, as an effective vocabulary learning Despite the plethora of research studies on the scope of semantic mapping and vocabulary learning, all of the previous studies have intensively talked only about the effectiveness of semantic mapping in developing vocabulary learning at both national and international levels, but as far as the researcher knows, no researchers have talked intensively about the performance of Iranian EFL students in the tenth grade of high school in Shiraz.

Methodology

The present study employed a quasi-experimental design (intact group method), as it dealt with the investigation of the effect of semantic mapping strategy on Iranian EFL learners' vocabulary learning. The participants were 60 students in three groups; the first group with 14 tenth-grade students that were used for piloting the two researcher-made parallel tests as a pre-test and post-test, and the two other groups consisting of 23 students in each group were considered as the control and experimental group. The data were gathered through the Oxford Quick Placement test (OQPT), pre-test, and post-test. The second version of the Oxford Quick Placement Test (OQPT), as a standard tool, was used in this study to confirm and reassure that all the participants were at the same level of language proficiency (in the same level of homogeneity). This test of English language proficiency is developed by Oxford University Press and Cambridge ESOL [31]. Also, they asserted that it is flexible and makes teachers enable to have a method for identifying the learners' level of proficiency in English. The second version of OQPT has covered two parts that included items related to structure, vocabulary, and reading comprehension with a maximum possible score of 60 points [32]. It took 45 minutes for participants to answer 60 test items. Then, the test's result indicated that all the participants' scores in the experimental and control group ranged ٣١-41 to 30-٤0 respectively which were shown a pre-intermediate level of proficiency. Then, using Cronbach's alpha, the reliability of this test in both groups turned out to be 0.800. The second testing instruments were two multiple-choice parallel tests of vocabulary, which were developed for the purpose of this study. At first, 31 vocabulary items were selected from the test bank and some of them were from their exams which were for the first and second term exams

The results of the analysis are provided in the following section.

Results Discussion

strategy, enables students to learn and remember more words. Also, it showed no significant interaction between gender and the effect of teaching vocabulary learning through the use of a semantic mapping strategy.

of the academic year and based on the first three lessons of this grade textbook (Vision 1) and workbook consisting six readings and applied to 14 students of the same level and grade. Those were selected through convenience sampling which involved recruiting individuals primarily because they were available and willing. After obtaining the data, some modifications including Item facilities, item discriminations, and choice distributions of the items were calculated to have more standardized items. Then, two forms of 29 questions remained and called "Test One" and "Test Two" for the pre-test and post-test phases of the study. It took 35 minutes for participants to answer 29 test items. In addition, the reliability of test one, as the pre-test, was calculated through the KR-21 formula and split-half method, which turned out to be 0.805 and 0.827. Similarly, using the Kr-21 formula and split-half method, the reliability of test two, as the post-test, turned out to be 0.969 and 0.971. Besides, the reliability of the pre-test and post-test in the context of the present study's context through the use of Cronbach's alpha turned out to be 0.815 and 0.813.

Moreover, in the treatment phase, in every session, the procedure used by Zaid (1995), was applied in the experimental group. The steps of the treatment are explained in the following part.

First, the researcher introduced the main topic of the reading lesson was written on the whiteboard and the students could guess what the purpose of the reading passage was. Then the researcher requested the students to think about the related words to the topic. After brainstorming, they were encouraged to make connections among present words, then both the students and the teacher decided on a suitable heading for the categories of words. Then, in personalizing the map, the students made the pre-assignment map in color. After it, the class was provided with some material, a reading passage, that was about the key concepts of the map and consists of more related information than the students have listed. As the reading was being presented, the students decided what to add or eliminate from the map they had already created. Then, in post-assignment, as they read the passage and added or eliminated some items, the whole class with the teachers' guide, decided on the final shape of the map.

The learners' scores were compared to ensure that the two groups of them were at the same level of language proficiency. Table 1 exposed the control group learners' OQPT scores and related descriptive statistics.

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Table 1-The Control Group Learners' Descriptive Statistics of OQPT Scores

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
SUM	23	٣١	٤١	٣٥٫١٢	3.١٥١
Valid N (listwise)	23				

Table 1 shows that tenth-grade high school students had a mean score of ٣٥٫١٢ (SD=3.١٥١), and the minimum and maximum scores were found ٣١ and ٤١ respectively. In other words, this table indicates the descriptive statistics of the 23 learners.

Table 2-The Experimental Group Learners' Descriptive Statistics of OQPT Scores

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
SUM	23	٣٠	٤٠	٣٤٫٦٨	.٢٣٦٨
Valid N (listwise)	23				

Table 2 shows that tenth-grade high school students had a mean score of 35.60 (SD=), and the minimum and maximum scores were found 30 and 39 respectively. In other words, this table indicates the descriptive statistics of the 23 learners.

Therefore, the mean score has remained almost constant, but the standard deviation has increased from 3.28 to 3.43. So, the OQPT scores of the 23 learners in the control group are a little less distributed. These 46 language learners established the study sample of the present study. It should be noted here that the participants in this study were divided into two groups of 23 students in the control and experimental group. To further ensure the participants' homogeneity in language proficiency, their OQPT scores using the T-test of Independent-Samples were analyzed. The results of the normality tests and Independent-Sample T-test are reported in Tables 3 and 4.

Table 3-Results of the Normality Test for OQPT Scores

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
OQPT	.129	٤٦	.٠53	.٩٥8	٤٦	.٠92
a. Lilliefors Significance Correction						

As Table 3 indicated the results of the Shapiro-Wilk test are provided that the p-values values of each group and the total are bigger than 0.05. Therefore, the data is normally distributed in both groups. In addition, using Leven's test, the groups' homogeneity was analyzed

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Table 4-Results of the Homogeneity Test for OQPT Scores

Levene Statistic	df1	df2	Sig.
2.930	1	44	.094

As Table 4 indicates the sig. is bigger than 0.05 and it can be concluded that equal variances are assumed, and the groups were homogenous.

Since the results indicated the distribution of students; scores on OQPT were normal, parametric-tests can be run to investigate the experimental and control group learners' difference in terms of their proficiency. Therefore, OQPT scores were analyzed using the T-test of independent samples.

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Table 5-Results of Independent Samples Test for OQPT Scores

Independent Samples Test										
		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
OQPT	Equal variances assumed	2.930	.094	.533	44	.597	.438	.822	-1.219	2.094
	Equal variances not assumed			.533	40.842	.597	.438	.822	-1.222	2.098

As shown in Table 5, the sig.>0.05, equal variances are assumed. Thus, the results of the t-test showed that the difference between the two groups in their language proficiency level is not statistically significant; t (44) = 0.533, and p-value = 0.594>0.05, it shows that there is no statistically significant difference between the two groups. So, it is deduced that the two groups (experimental group and control group) were homogenous in terms of language proficiency at the beginning of the study.

Regarding the vocabulary tests (pre-test and post-test), normality tests, homogeneity tests, descriptive statistics, and Independent-Sample T-tests are presented.

Table 6-Descriptive Statistics for Pre-test Scores of Groups

Descriptive Statistics					
Group	N	Minimum	Maximum	Mean	Std. Deviation
Control	23	16	28	21.9۶	2.93۱
Experimental	23	1۷	2۹	23.۰۰	۲٫۹۳۹
Valid N (listwise)	46				

As the table represents, the control group (M=23.48, SD=2.93), and the experimental group (M=21.96, SD=5.62) were different in the pre-test.

Table 7- Results of the Normality Test for the Pre-test Scores of Groups

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Pre-test	.091	٤٦	.200*	.985	٤٦	.809
*. This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

As Table 7 indicated the results of the Shapiro-Wilk test are provided that the p-values values of each group and the total are bigger than 0.05. Therefore, the null hypothesis is accepted, in other words, data is normally distributed. In addition, using Leven's test, the groups' homogeneity was analyzed.

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Table 8-Results of the Homogeneity Test for the Pre-test Scores

Levene Statistic	df1	df2	Sig.
.005	1	44	.945

As Table 8 revealed the sig. is bigger than 0.05 and it can be deduced that equal variances are assumed, and the groups were homogenous.

As the results of the normality test show a normal distribution of the data, to investigate the significance of these mean differences, the independent-sample t-test was used.

Table 9- Results of Independent-Samples T-test Results of the Experimental and Control Groups on the Pre-test Scores

Independent Samples Test										
		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
Pre-test	Equal variances assumed	.005	.945	-1.206	44	.234	- 1.043	.865	- 2.788	.701
	Equal variances not assumed			-1.206	44	.234	- 1.043	.865	- 2.788	.701

As Table 9 shows in Leven's Test, sig. is bigger than 0.05, equal variances are assumed. Thus, the results of the t-test showed that the difference between the two groups in their vocabulary knowledge is not statistically significant; t (44) = -1.260, p-value = 0.234>0.05, it shows that there is no statistically significant difference between the two groups. So, it is deduced that both the experimental group and control group are the same in terms of the pre-test.

Table 10-Descriptive Statistics for Post-test Scores

Descriptive Statistics					
Group	N	Minimum	Maximum	Mean	Std. Deviation
Control	23	15	27	22.22	3.529
Experimental	23	18	29	24.48	3.189
Valid N (listwise)	46				

As the table shows, the control group (M=22.22, SD=3.52), and the mean scores of the experimental group (M=28, SD=1.38) were different in the post-test.

To investigate the significance of these mean differences, the normality test, homogeneity of variances, and Independent-Sample T-test was used.

Table 11- Results of the Normality Test for the Post-test Scores

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Post-test	.١٣٧	٤٦	.٠٣٠	.٩٥٥	٤٦	.٠٧١
a. Lilliefors Significance Correction						

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Based on Table 11, the results of the Shapiro-Wilk test indicated that the p-values of each group and the total are more than 0.05. Therefore, the null hypothesis is accepted, in other words, data is normally distributed. Considering the results of the normality test, to investigate the significance of these mean differences, an independent-sample t-test was used. In addition, using Leven's test, the groups' homogeneity was analyzed.

Table 12-Results of the Homogeneity Test for the Post-test Scores

Levene Statistic	df1	df2	Sig.
.269	1	44	.607

As Table 4.15 reveals the sig. is more than 0.05 and it can be deduced that the equal variances are not assumed, and the groups were homogenous.

As the results of the normality test show a normal distribution of the data, to investigate the significance of these mean differences, the independent-sample t-test was used.

Table 13-Results of Independent-Samples T-test Results of the Experimental and Control Groups on the Post-test Scores

Independent Samples Test										
		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-test	Equal variances assumed	.269	.607	-2.280	44	.028	- 2.261	.992	- 4.260	- .262
	Equal variances not assumed			-2.280	43.557	.028	- 2.261	.992	- 4.260	- .262

As Table 13 presents in Leven's Test, sig. is bigger than 0.05, equal variances are assumed. Thus, the results of the t-test showed that the difference between the two groups in their language proficiency level is statistically significant; t (44) = - 2.280, p-value = 0.028<0.05, it shows that there is a statistically significant difference between the two groups. So, it is deduced that both the experimental group and control group differed in terms of the post-test.

As Tables 9 and 13 designate, from the pre-test to the post-test, there was a mean difference between the performance of both groups. To compare each group's vocabulary learning test results separately before and after the treatment, Paired-Sample T-tests were performed.

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Table 14- Results of Paired-Sample T-test for Control Group

Paired Samples Test									
Tests	Group	Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pre-test Post-test	Co Co	-.261	3.018	.629	-1.566	1.044	-.414	22	.683

Table 15- Results of Paired-Sample T-test for Experimental Group

Paired Samples Test									
Tests	Group	Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pre-test Post-test	Ex Ex	-4.91304	5.72803	1.19438	-7.39003	2.43606	-4.113	22	.000

As is obvious in Tables 14 and 15, there was a mean difference between the level of scores of the experimental and control groups from the vocabulary pre-test to the post-test. By means of Tables 4.8 and 4.9, the mean difference in vocabulary test scores for the control group on the pre-test and post-test was not statistically significant, t (22) = -0.414, p-value = 0.683>0.05. Though the mean difference in vocabulary learning in experimental groups' pre- and post-tests was statistically significant, t (22) = -4.11, p-value = 0<0.05.

As the research question was about the effect of using the semantic mapping strategy on the vocabulary learning of tenth-grade high school students. Based on Tables 6, 9, 10, 13, 14, and 15 the results were stated. The results of the study presented that those who were exposed to semantic mapping significantly differed and outperformed better from the other group (conventional method). The result of this study is highlighted by those of [21] who investigated the potentiality of semantic mapping in vocabulary learning of 60 Saudi Arabian English major students. The results of their study provided the importance of integrating the teaching of semantic maps in English language courses because it helps to better understand the relationship between words and increases vocabulary mastery through its cognitive features. Also, according to [23] which were tried to discover the effect of using the semantic map on students' vocabulary in descriptive text with 24 Indonesian eighth-grade students. The results showed that semantic mapping as an effective strategy, facilitated students to a better development of vocabulary mastery. Moreover, Risnawati [24] conducted a study with 19 eleventh-grade learners to find whether using a semantic mapping strategy has any effect on their vocabulary learning or not. The results approved the effectiveness of the semantic mapping strategy on students' learning process and vocabulary mastery. In another study conducted by Jaberi and Rassaei [27], 30 male twelfth-grade students in the United Arab Emirates participated to investigate the effectiveness of semantic mapping and rote memorization strategies on L2 vocabulary acquisition and memorization. The results showed that the students' retrieval of the target vocabulary words improved as a result of implementing both strategies, but the improvement which resulted from the use of semantic mapping overrode that which ensued from rote memorization. Also, Nikijuluw and Cangkat [28] conducted a study with 60 Elementary female EFL learners aged 10-13 about guided and unguided Semantic Mapping and its effect on vocabulary and grammar knowledge. As the results indicated, both learners' vocabulary and grammar learning were enhanced through guided and unguided semantic maps. But more significantly, this strategy affected on grammar learning of female learners. Besides, in a study done by Saeidi and Atmani [29] considering Semantic Mapping as a Pre-reading Activity to know whether semantic mapping

affects teaching vocabulary or not, 120 intermediate (60 male and 60 female) were selected and randomly put into four equal groups, 30 participants each group. The results showed that the SM techniques could be considered an effective teaching model in language classes.

On the other hand, the results of the present study are contrasted with some other studies. First, in Mohammed and Malo's study [24], which aimed to assess vocabulary mastery and investigate the effect of semantic map strategy on word awareness level, 18 males, and 10 females in a junior class from the University of Zakho, Kurdistan region-Iraq, participated. The results presented that there is not any significant effect of using this strategy for understanding and developing lexical semantics topics. In addition, in the study done by Keshavarz et al. [30], at "Jahad Daneshgahi" Language Institute in Tehran, which considered semantic mapping strategy and vocabulary learning of intermediate EFL students as the variables of the study, 134 male and female students of nine intact classes, aged 16 to 26, were participated. The results of this study suggested that the semantic mapping strategy, as an effective vocabulary learning strategy, enables students to learn and remember more words. Also, it showed no significant interaction between gender and the effect of teaching vocabulary learning through the use of a semantic mapping strategy.

Conclusions

As the purpose of the present study was to investigate the effect of using the semantic mapping strategy on vocabulary learning of Iranian EFL learners in the tenth grade of high school, this study was conducted to contribute to the existing literature. Based on the results, The researcher concluded from this research [

that using the semantic mapping strategy can be beneficial to develop vocabulary learning of Iranian EFL learners in the tenth grade of high school. As a result, foreign language teachers should be encouraged to take this into account to improve students' vocabulary learning.

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