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# The Comparative Effect of Using Semantic Mapping and Mnemonics on EFL Learners' Vocabulary Achievement

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### ABSTRACT

This study aimed at examining the comparative effect of using mnemonic techniques and semantic mapping strategy on EFL learners' vocabulary achievement. To fulfill this, 50 male students aged 13-16 were selected via administering Key English Test (KET) from among 70 conveniently sampled students of elementary EFL learners from a public language school in Tehran. They were then randomly divided into two experimental groups namely mnemonics and semantic mapping and received 12 sessions of instruction. The semantic mapping group was taught how to utilize semantic mapping, whereas the mnemonics group was taught to make use of mnemonic flashcards, while learning vocabulary. Finally, a post-test on vocabulary was conducted on both groups and an independent sample t-test analysis was conducted to see whether the treatments had a significantly different effect on learners' vocabulary achievement or not. The results of the statistical analysis revealed that there was no significant difference between using mnemonic techniques and semantic mapping strategy on EFL elementary learners' vocabulary achievement. In the past, vocabularies were usually learnt through rote-learning memorization and repetition which were ineffective and tedious but based on the outcome of this study, learners can utilize vocabulary achievement techniques and strategies such as mnemonics and semantic mapping which are influential and enjoyable.

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**Keywords:** Semantic mapping strategy, Mnemonic techniques, Vocabulary achievement.

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### INTRODUCTION

Vocabulary is an inseparable part of language (Shen, 2003). Therefore, the importance of the vocabulary learning must not be forgotten. Rivers (1981) stated that, "vocabulary cannot be taught. It can be presented, explained, included in all kinds of activities, but it must be learnt by individuals" (p. 28). There is a widespread agreement upon the need for learners to enhance their vocabulary knowledge (Allen, 1993; Coady, 1997; Laufer, 1998). For example, Laufer (1998) considers vocabulary as the heart of language learning and language use. Holden (2001) asserted, one of the difficult aspects in learning foreign language is the retention and retrieval of new words. Zinhong (2000) rightly claimed that students must discover a way to develop their lexicon and vocabulary knowledge; if they don't, they will lose their interest and motivation in learning L2. Or in the best scenario they will feel insecure in learning a foreign language (Morgan & Rinvoluceri, 1986).

According to Nation (2004), memory strategies in the case of learning second or foreign language are considered vital in vocabulary teaching. Coady (1993) argued that, current methods and techniques which teachers are applying in their classes are almost ineffective and artificial, because these methods will not oblige the students to associate the new words and concepts in their minds together with the schema, which they already know. Therefore the crucial role of memory strategies such as semantic mapping and mnemonics which may expand second or foreign language learners vocabulary knowledge, must not be neglected.

### **1.1 Semantic Mapping Strategy**

Semantic mapping is the process for constructing visual graphics of categories and their relationship (Novak & Growin, 1984). It is an approach which helps students to relate new words to their own experiences and prior knowledge. Semantic maps are visual graphics which represent the relationship between category of concepts (Jonassen, 1999) while the learners perform a particular learning task (Hall & Strangeman, 2002). They include a key concept (main idea), within categorized concepts connected to the key concept. The association between key concept and categorized concepts are showed visually in diagram or map. Antonacci (1991) claimed that, semantic mapping is a visual strategy for expanding vocabulary knowledge by presenting categorized words related to one another. Semantic mapping is an effective strategy to build up schema or prior knowledge in learners. Generally, the framework of semantic mapping includes: the concept word, two category examples, and other examples. The first researcher who designed and developed semantic mapping procedure to enhance the teaching of study skill was Hanf (1995). According to Debate (2006), semantic mapping strategy can make a summary out of the main ideas, and it can also help students to build up their schema which do not yet possess.

### **1.2 Mnemonics Techniques**

Mnemonics techniques are systematic procedures for enhancing the memory and making information more meaningful. "The word mnemonic means "aiding the memory". Thus a mnemonic system or technique is a system or technique which aids memory, and mnemonics refers in general to methods of memory improvement." (Higbee, 1975, p.611). Mnemonics are strategies that improve memory and their specific use is in developing better approaches to encode information, with associations among new and previously-acquired information in long-term memory, so this way will be much easier to retrieve and recall information (Zimbardo, Johnson, & weber, 2006). According to Ellis (1995), learners can improve their memorization of new words, if they use mnemonic strategies, such as visual methods, which contain pictures, visualization or imagining response method. Cohen and Aphek (1980) claimed that, association is a mnemonic link to some particular element(s) which would help individuals in recalling the particular vocabulary, this mnemonic links includes linking to meaning, sound, sound and meaning, structure, context, mental image, particular letter or letters in a word, proper names, signs and etc. The common technique in mnemonics refers to as Keyword method, which was proposed by Atkinson and his collaborators (Atkinson, 1975; Atkinson & Raugh, 1975; Raugh, Schupbach, & Atkinson, 1977).

However, the comparative effect of semantic mapping and mnemonics on learners' vocabulary achievement has not yet been argued. Therefore, the aim of this study was to determine which one of these two vocabulary learning strategies has a more significant effect on learners' vocabulary achievement.

Research question and null hypothesis of this study are as follow:

Is there any significant difference between the effect of using mnemonics and semantic mapping strategy on EFL learners' vocabulary achievement?

There is no significant difference between the effect of using mnemonics and semantic mapping on EFL learners' vocabulary achievement.

## **2. Literature Review**

### **2.1 Studies on the effectiveness of semantic mapping strategy**

One of the major benefits of semantic mapping is that it helps students to build their schema. For instance, Toms Bronowski (1983) found that middle grade students who learned new vocabulary through semantic mapping did better than students who relied upon other methods of learning vocabulary. Reutzel (1985) found semantic useful for representing story elements and it improved reading comprehension of fifth grade students. According to Troyer (1994), semantic mapping is an effective strategy in improving both the reading comprehension and writing performance of upper elementary school children. Broomley (1992) stated that mapping expands schema by allowing new information to be related to prior knowledge. Bos and Anders (1990) utilized semantic maps in study of metacognitive strategies with learning disabled students. They found out that the semantic mapping would be a effective instructional tool in the learning of content area concepts. Armbuster and Anderson (1984) argued that semantic mapping helps students to analyze the relationships between ideas in the text. Therefore, it facilitates comprehension and recall of information at a delayed period of time.

### **2.2 Studies on the effectiveness of mnemonic techniques**

Several scholars were the major pioneers in the area of using mnemonics methods. (Bower, 1973; Atkinson, 1975; Scruggs & Mastropieri, 1985; Richmond, Cumming & Klapp, 2008; Mastropieri, Scruggs, & Levin, 1986). Who then also sparked interest in utilizing mnemonics due to its effectiveness in improving and enhancing learners' vocabulary learning.

A study by Bower (1973) showed that mnemonic techniques were far more effective than simple rehearsal for remembering five successive list of twenty unrelated items, participants who used mnemonics remembered 72 items while the group using simple rehearsal only remembered 28 items.

Atkinson (1975) investigated the effect of linking acoustic mnemonic to imagery mnemonic among students learning Russian. The students were given an English word sounded similar to Russian word. They were then told to imagine that word interacting with the true definition of the word. Due to his successful results, Not only did this spark interest in using mnemonics as an teaching aid for teachers, but it also lead to a whole new application of mnemonics (Atkinson, 1975 p. 133; Scruggs & Mastropieri, 1990).

After Atkinson's (1975) successful experiment, Scruggs, Mastropieri and Levine (1985) examined the effect of mnemonics on disabled children using acoustic, symbolic, mimetic and list learning mnemonics. The children who were taught through mnemonics outperformed the students taught through standard or traditional methods. Scruggs and Mastropieri (1989) claimed that, Pictorial representations of material can also help to bypass verbal limitations.

Richmond, Cummings, and Klapp (2008) performed one of the only recent studies to investigate the effective of method of Loci, Pegword and Keyword method in classroom; a similar study to Mastropieri, Scruggs, and Levin (1986).

Mastropieri, Scruggs, and Levin (1986) found Keyword mnemonics very effective, that enhances students' retention. Loci and Pegword mnemonics had at least improvement on students' scores.

### **3. Methodology**

#### **3.1 Design**

The design of the present study is quasi-experimental, since the participants were selected non-randomly. Besides there were two experimental groups in this study which were compared with each other, so the design of this research is comparison group design. Since just the post-test of the two experimental groups were compared, the design of the present study was post-test design. Also age and gender were the two control variable of the study.

#### **3.2 Instrumentation**

Key English Test (KET): first testing instrument was KET (2004) consisted of 72 items including three sections of reading (35 items), writing (10 items), listening (25 items) and speaking (2 parts). The allotted time for this test was an hour and thirty minutes. The test includes skills of grammar and structure, reading and vocabulary, writing and speaking.

Practice Book O: The main instructional material for both experimental groups was 'Practice Book O' published by McMillan and McGraw-hill (2007). It consists of 6 units, and all of the six units were taught to the participants.

Mnemonic flashcards: mnemonic flashcards, designed by Sarah Majors (2001), were used to teach unknown vocabularies to the first experimental group (mnemonics group).

Two Researcher-made Vocabulary Tests: a vocabulary test including 40-items was administered to the both experimental groups as a pre-test. At the end of the 12 sessions of instruction a posttest including 35-items was administered to both groups. The pre-test and posttest were parallel tests and all of their items were chosen from the main coursebook of this study. It's worth mentioning that both pretest and posttest were piloted with 25 participants prior to their main administration.

#### **3.3.1 Participants**

Fifty elementary level male students aged 13-16 participated in this study. The KET test was piloted at the onset by 25 students similar to the target group. In order to carefully homogenize the participants of the study, a general proficiency test which was KET in this study, was given to 70 students and 50 of them who scored one standard deviation above and below the mean were selected non-randomly as the target sample of the study. Those 50 students were divided into, two experimental groups- namely semantic mapping group and mnemonics group- each experimental group included 25 students.

#### **3.3.2 Pre-treatment stage**

First and foremost, the researcher piloted the KET to 25 elementary EFL learners with the age range of 13-16, with the almost same characteristics of the target samples. Due to calculating the reliability of the test, item facility, item discrimination and choice distribution were analyzed. 10 malfunctioning items were omitted and 72 items which were proper based on the estimation were used for homogenization. The reliability of the piloted KET turned out to be 0.89.

The piloted KET was administered to 70 participants then 50 out of 70 learners who had taken KET for homogenization scored one standard deviation above and below the mean and were chosen as the target sample in the study.

After homogenization, the participants took a researcher-made vocabulary test including 40 items, so that the researcher could find participants' unknown vocabularies from the test and exclude the known vocabularies from the treatment. After that, item facility, item discrimination, and choice distribution of the test were analyzed. Four items were either revised or replaced by better items. Therefore, the final version with the reliability index of 0.87 had 40 multiple choice items for the pretest.

The results of actual administration of vocabulary test showed that 5 items from part one of the test that were known to participants were excluded from the posttest.

In the next step, the researcher- randomly assigned 50 participants into two experimental groups. Each group took 12 sessions of instructions, each unit was taught in two sessions. So the time of the whole treatment for both experimental groups were 12 sessions and 45 minute portion of a standard 90 minute class was devoted to the treatment.

### ***3.3.3 The First Experimental Group***

The first experimental group was taught through Mnemonics. In the initial step of treatment, the researcher presented the unknown words through Mnemonic flashcards. The unknown word was written on each flashcard, along with the image which was related or associated with that word. The image helps the learners to get familiar with the new words. This strategy is expected to be useful for elementary learners to remember the unfamiliar words. After introducing the unknown words by the teacher, then the researcher asked the students to look at the flashcards and try to memorize the unfamiliar words by relating each image to each word.

When the students memorized the flash cards, then the learners engaged in two Mnemonic-based activities. The first one was called 'Taboo'. In this activity, the researcher divided the class into team A and B. Team A sat in a group on one side of the classroom. Team B sat on the other side. Then, the teacher put one chair in the front of each group, in the way that the whiteboard was behind the chairs. The members of each group took turns to sit down, in the way that their teammates were in front of them and the whiteboard was behind them. It was obligatory for the student who was sitting in the front of the members of his group, not to see the whiteboard, since he had to guess the words written on the board by the teacher. Once the teacher wrote the words on the board and yelled 'go' the teams had one minute, using only verbal clues, to get their seated teammate to say the item written on the board. The only rule was that the students who were using verbal cues, could not say the item written on board, fully or partially. If the student who was in the mentioned seat, uttered the word, he scored a point for his team.

After that, the teacher engaged the students in another activity called 'Pictionary'. The researcher asked one member of each team to go to board and then the teacher handed a written word to each one of the students. The students had one minute to get their team to say the item only by drawing the pictorial clues on the board. In this activity, written words, verbal clues, or gestures were forbidden. The first team who said the word scored a point.

Additionally, some of the units of the previously mentioned course book, Practice Book O, included Mnemonic rhymes. The teacher asked students to memorize the rhymes, so that they could remember the unknown words within the rhymes. Because in this way it might be easier for learners to memorize and recall the unfamiliar words, when they are presented in meaningful context. According to Res (1977) "songs can effectively reinforce teaching by helping to practice and revise vocabulary, idioms, sentence patterns, pronunciation, stress, rhythm, and intonation in a variety of language styles, and offer cultural background information ...without resource to barren drill".

### ***3.3.4 The Second Experimental Group***

The second experimental group was taught through semantic mapping technique. After introducing semantic mapping strategy by the teacher, and when the learners got completely familiarized with this technique, the teacher asked the students to do their course book tasks and activities which were based on semantic mapping strategy. The course book included 30 semantic mapping-based tasks and activities. As all semantic mapping-based tasks and activities were based on the texts called "Home-School Connection", the learners needed "Home-School Connection" texts, to do each task and activity. Each session 2 to 3 Home-school connection texts were practiced.

The teacher asked their students to read the mini-story, and then they had to use semantic mapping strategy and made a web word connection between the main idea and details of the story by using the words and vocabularies which they already learned. For example if the text was about animals, the teacher asked students to categorize each animal (e.g. mammals, birds, fish, reptile, amphibians, etc.) based on their characteristics by drawing a web of word or maps to relate each animal to its category.

After introducing different categories of words, teacher used two semantic mapping-based activities. The first one was called 'outburst'. So, the researcher divided the class into teams A and B. The teacher assigned each team a particular topic (e.g. sports, vehicles, things in office) which is to be kept from the other team. Each team met for 5 minutes in private and collectively drew up a list of ten items related to topic. After the lists are made, the game begins. The teacher told team A the name of the team B's topic. Team A then had one minute to try to guess the items on team B's list (hence producing a noisy outburst). The members of team B must listened and ticked the items which team A manage to guess. For every word team A guessed correctly, they scored a point. For every word they missed, team B got the point. After the points were recorded, it was team B turn to guessed team A's list.

Teacher then tasked the students to do second activity called 'Categories'. The researcher divided the class into 3 or 4 teams and assigned secretary for each group. On one side of the board, wrote down six categories related to the current topic (e.g. sports, jobs, verbs, etc.). To start the game, the teacher randomly selected a letter of the alphabet. Each team must then work together to quickly find a word for each of six categories that started with chosen letter. The first team to complete all six categories shouted 'stop!' the class then stopped writing and a member of the team fill in the categories by using semantic maps. The teacher then checked each word with the class and also elicited what other teams had for each category. The team which

filled more categories more quickly earned one point in each round. The teacher then chose a different category and another round were played. The researcher tried to implement to do as many rounds as possible in this game.

### 3.3.5 Post-treatment stage

A vocabulary achievement posttest was made by the researcher including 35 items which the learners showed that they were not familiar with on the pretest and were taught to them during the instruction. The test was administered at the end of the treatment. Students have to respond to part one, which included 20 items and part two, which included 15 fill in the blanks items. The allocated time was 30 minutes and each correct answer was given one point.

Prior to the actual administration, the vocabulary achievement posttest test was piloted with 25 participants who had the same characteristics of the main participants of the study. The reliability of the test was calculated through Kuder-Richardson formula and it turned out to be 0.84 .

It's worth mentioning that vocabulary pretest and posttest were parallel tests.

## 4. Results

Following the data collection, the two experimental groups took a posttest so that their performance was evaluated after the treatment. Hence, an independent sample t-test analysis was conducted to see whether the treatments had a significantly different effect on learners' vocabulary achievement or not.

Table 1. Descriptive Statistics of Posttest Scores

	N	Range	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error
posttestexp1	25	8.00	27.00	35.00	30.8000	2.70801	7.333	.257	.464
posttestexp2	25	7.00	25.00	32.00	28.8800	2.31517	5.360	-.389	.464
Valid N (listwise)	25								

According to the data, with a mean of 30.80, the first experimental group had outperformed the second experimental group who scored a mean of 28.80. The standard deviations equaled 2.70 and 2.31 respectively. Regarding the distribution of posttest scores, it could be seen that the ratio of skewness/std error of skewness fell between the range of -1.96 and 1.96 for both groups showing the normalcy of the scores distribution. Figures 1 and 2 below illustrate this.

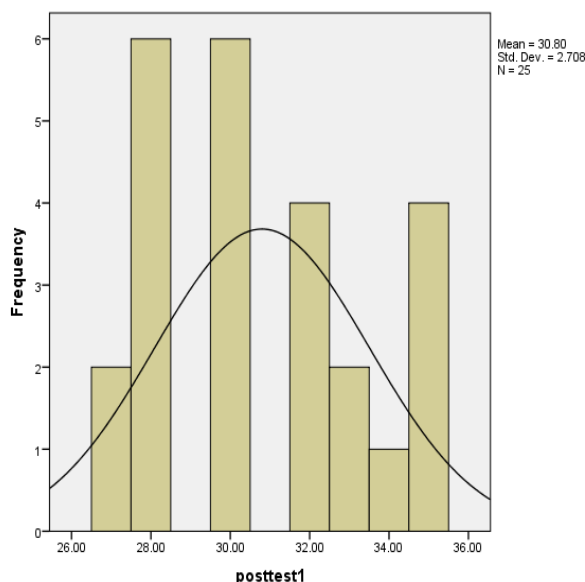


Figure 1. Distribution of Experimental Group 1 Posttest Scores

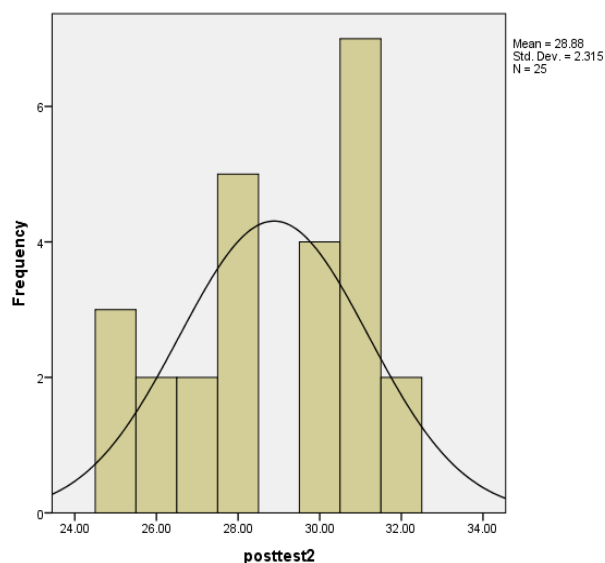


Figure 2. Distribution of Experimental Group 2 Posttest Scores

In order to investigate the null hypothesis of the study, an independent samples t-test was run. Table 2 illustrates the data.

Table 2. Independent Samples Test between Experimental Groups' Posttest Scores

		Levene's Test for Equality of Variances		t-test for Equality of Means				95% Confidence Interval of the Difference		
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
posttest	Equal variances assumed	.225	.638	1.858	48	.069	1.40000	.75369	-.11540	2.91540
	Equal variances not assumed			1.917	44.953	.062	1.40000	.73021	-.07075	2.87075

Considering the data in the Table, it is clear that the Sig value of Levene's test was larger than the critical value ( $p=.638>.05$ ), therefore the line for equal variances was considered. With ( $F=.225$ ,  $t=1.858$ ,  $p=.069$ ) it was confirmed that the two experimental groups were not significantly different in vocabulary achievement following the treatment. Therefore, the null hypothesis of the study was not rejected.

#### 4.1 Discussion

The results of this research have shown that both of the vocabulary learning strategies (Mnemonics and semantic mapping) were able to effectively increase the students' vocabulary knowledge. A comparison of pre-test and post-test through independent samples t-test of both experimental groups showed elevation in scores and although, the students in mnemonic group performed slightly better than those in semantic mapping group, but there was not a significant difference between the two groups. Based on the statistical results p-value was greater than 0.05 ( $P>0.05$ ), which means that there was no statistically significant difference between the means of two experimental groups. Thus, the researcher was not able to reject the null hypothesis.

Therefore, the findings imply that Mnemonics and semantic mapping strategies promote vocabulary achievement for elementary level EFL learners. This means that there was no significant difference between EFL elementary learners who used visual memory strategies with those who used semantic mapping strategy.

This study showed the same outcome as the study of Banisaeid (2013). The study of Banisaeid (2013) was conducted to compare the effect of memory and cognitive strategies training on vocabulary learning of intermediate learners. The results of the study showed that there was no significant difference between the effect of cognitive and memory strategy training on intermediate EFL learners' word learning. In general, the findings suggested that memory strategy training and cognitive strategy training respectively enhance memory and cognitive strategy uses.

The finding of this research is also in line with the published study of Gains and Redman (1986). They claimed that visual aids are varied from of devices such as pictures, flashcard, drawings, photographs, tables, charts etc. are considered equally effective tools to make the vocabulary learning clear to learners.

## 5. Conclusion

The results of this study showed that participants in both experimental groups welcomed learning vocabularies through unfamiliar but exciting vocabulary strategies and they have disliked using routine and cliché ways of vocabulary learning. Although the results of this study did not prove any significant difference between the effect of mnemonics and semantic mapping on EFL elementary learners' vocabulary achievement, teachers of teenage learners can take the idea of specialists rote to exploration of the ways these techniques work for teenage learners. This means that the results of this study open up new horizons for teacher of teenage learners to dig into the special characteristics abilities and attitudes children bring with them into the classroom.

Since the participants of both experimental groups in this study improved their knowledge of vocabulary through the use of semantic mapping and mnemonics as vocabulary learning techniques and strategies, learners of English language should take the use of vocabulary achievement techniques and strategies into account, provided that they want to expand their terminologies. In the past, vocabularies were usually learnt through rote-learning memorization and repetition which were ineffective and tedious but the vocabulary achievement techniques and strategies which are used these days, such as mnemonics and semantic mapping which were utilized in this study are influential and enjoyable.

As it was previously mentioned students are willing to focus on vocabularies through new strategies and techniques; and using such strategies can be used as motivating device for EFL young learners and therefore can improve their language skills and abilities. Thus, those responsible for designing syllabus and developing materials for EFL learners should include some exciting vocabulary strategies and techniques in a materials and syllabus in order to increase students learning excitements and abilities.

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