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## ***The Effect of Semantic Mapping Strategy Instruction on Vocabulary Learning of Intermediate EFL Students<sup>1</sup>***

Mohammad Hossein Keshavarz (PhD) \*\*

Mahmoud Reza Atai (PhD) \*\*\*

Soheila Mossahebi Mohammadi\*\*\*\*

### **Abstract**

The present study attempted to investigate the effect of semantic mapping strategy instruction on vocabulary learning of Iranian intermediate students. A further concern of this study was to explore the probable interaction between the effect of teaching semantic mapping strategy and gender. Initially, 134 available male and female EFL students participated in this study. The instruments utilized in the study were a Nelson test and a teacher-made vocabulary test, which were employed at pre-test and post-test phases. Having established the homogeneity of the subjects in terms of general language proficiency, the 120 selected students were divided into four groups: 2 experimental (male-female) and 2 control groups (male-female). Then, in order to ascertain the homogeneity of the subjects in terms of vocabulary knowledge prior to the treatment, the vocabulary test was administered to all the groups. During the eight instructional sessions, the experimental groups received semantic mapping strategy instruction after reading each passage and then did the exercises. In the control groups, students were not taught how to use semantic mapping strategy and they were exposed only to the conventional vocabulary instruction activities. That is, they read the passages, did the exercises and activities, and new words were introduced through contexts and exercises. At the end of the experiment, the post-test was administered the results of which indicated that there was a significant difference among the means of the experimental and control groups. It was also revealed that there was no interaction between the effect of semantic mapping strategy instruction and gender. Hence, it is concluded that semantic mapping strategy instruction has a significant impact on vocabulary learning of Iranian intermediate EFL students regardless of their gender.

**Keywords:** Strategy Instruction, Semantic Mapping Strategy, Vocabulary Learning, Iranian EFL Learners.

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<sup>11</sup>-Professor of Teacher Training University, E-mail: mhkeshavarz@yahoo.com

\*\*\*-Assistant Professor of Teacher Training University

\*\*\*\*\_Lecturer at Khatam University

### Introduction

Teaching vocabulary has long been undervalued and neglected in the field of second language acquisition (Zimmerman, 1994). Richards (1979) was one of the first scholars to draw our attention to the fact that vocabulary is typically neglected in foreign or second language instruction. However, Nunan (1999) believes that although vocabulary suffered neglect for a long time, in recent years, the teaching of vocabulary has assumed its rightful place as a fundamentally crucial aspect of language development. Three factors have contributed to this change of attitude namely (a) the influence of comprehension-based and strategy - based approaches to language development, (b) the theoretical advances in the linguistic study of the lexicon, and (c) the exciting possibilities opened up by the development of computer - based language corpora.

Now that the importance of teaching vocabulary is generally appreciated, the general interest should shift to the application of more efficient methods and techniques for the teaching of vocabulary to foreign language students. Various approaches, methods, and techniques dealing with vocabulary instruction and/or acquisition have been proposed (Rivers, 1981; Sternberg, 1987; Laufer 1990, 1993, 1997; Oxford and Scarcella, 1994; Coady, 1993, 1997; Hulstijn, 1997; Grace 1998, 2000). For example, Coady (1993) argues that many current techniques for teaching vocabulary are artificial and frequently ineffective because they do not induce the learners to associate the new word-forms and concepts in their minds together with schemata they already know.

Rivers (1981) suggests that vocabulary cannot be taught. Language teachers must help their students by giving them ideas on how to learn vocabulary and some guidance on what to learn. Other researchers (Hulstijn, 1997; Laufer, 1990) also believe that students should be given more responsibility for vocabulary learning, and teachers should help them develop special effective learning techniques. Teaching vocabulary does not necessarily involve teaching specific words, but rather equipping learners with the strategies necessary to expand their vocabulary (Hulstijn, 1993; Grace, 1998, 2000). Sternberg (1987) argues that most vocabulary is learned through context, but that the learning-from-context method works best for teaching strategies, not for teaching specific vocabulary. In the same vein, Oxford and Scarcella (1994) argue that direct vocabulary instruction should involve learning specific strategies for acquiring words both in and out of class.

Although some scholars have stressed the importance of direct vocabulary instruction and the teaching of vocabulary acquisition strategies, little research has been carried out regarding the effectiveness of teaching specific vocabulary strategy (Brown & Perry, 1991). Among different vocabulary strategies, some strategies like semantic mapping, is just beginning to receive attention in the field (Brown & Perry, 1991; Johnson & Gu, 1996). Concerning graphic organizer research, Robinson (1998) states that few studies have focused on research-generated semantic maps. Therefore, more evidence appears to be needed to corroborate the benefits and effects that semantic maps are thought to provide (Yamashiro, 2001).

Semantic mapping strategy involves drawing a diagram of the relationships between words according to their use in a particular text and it is best introduced as a collaborative effort between the teacher and the class (Stahl and Vancil, 1986). This strategy incorporates a variety of other memory strategies such as grouping, using imagery and associating and elaborating (Oxford, 1990). Semantic mapping has been used in a variety of ways, including the following: It has been used as a means of improving the teaching of study skills (Hanf, 1971; Heimlich & Pittleman, 1986), as a framework for identifying the structural organization of texts (Clewell & Haidemos, 1986), as a strategy to promote the reading comprehension of learning disable students (Sinatra et al., 1984), as a pre-reading or pre-listening activities designed to help learners understand and remember vocabulary that will be heard or read (Oxford, 1990), as an assessment technique (Fleener & Marek, 1992), as a link between reading and writing instruction, as a way of facilitating below-level college readers' comprehension of complex conceptual relationships (Johnson & Steele, 1996). This strategy is also valuable for vocabulary development regardless of the learners' instructional level (Huynh et al, 2002).

A number of studies have been carried out regarding the effect of semantic mapping strategy instruction on learning vocabulary (Margosein et al, 1982; Crow & Quigley, 1985; Bos & Andres, 1990; Brown & Perry, 1991; Zaid, 1995; Morin & Goebel, 2001). Margosein et al (1982) worked with junior high school students and found significant effect for semantic mapping over context-rich and target-words treatment. Their work suggested that students should focus on words with similarities to other known words. Crow and Quigley (1985) experimented with a

semantic field approach, in which an association was formal between five related words and a keyword that could be mentally substituted in context. They also examined several processing strategies and found them to be superior to no strategy conditions. Bos and Andres (1990) compared the effect of three knowledge-based interactive vocabulary instruction techniques with a traditional definition approach to vocabulary instruction. Subjects were 61 junior high school students. In knowledge-based instruction, students were assigned to one of the three groups. Students in the semantic mapping group constructed a relationship map from vocabulary list. Students in the semantic –feature analysis group predicted the relations among concepts using a relation matrix. Students in another group analyzed the relation among the concepts. They concluded that students who received treatment with knowledge-based interactive vocabulary technique scored higher than other students. Brown and Perry (1991) described different vocabulary learning strategies focusing on the keyword and semantic processing techniques. What they found in their research with Arabic speaking EFL students learning English was that the keyword method in combination with semantic processing method promotes more vocabulary acquisition than the keyword used alone. Zaid (1995) examined the effect of teaching semantic maps on the vocabulary learning of beginning-level EFL students. He concluded that semantic mapping is an effective technique for teaching vocabulary and it incorporates many aspects of Communicative Language Teaching. Morin & Goebel (2001) offered semantic mapping strategy training to English-speaking College students for learning. Learners in this study who were exposed to semantic mapping did not appear to have an immediate advantage in terms of amount of L2 vocabulary learning, as compared with students who did

not use semantic mapping. However, learners in semantic mapping group ranked the familiarity with L2 vocabulary more highly and were able to group and learn more L2 vocabulary than learners in another group. They concluded that direct vocabulary instruction that teaches semantic mapping as an acquisition strategy is more effective than vocabulary acquisition activities that teaches only words rather than strategies for acquiring words.

Effective instruction in foreign or second languages requires an understanding of individual differences such as gender among learners (Scarcella & Oxford, 1992; Oxford & Ehrman, 1995). According to Larsen-Freeman and Long (1991) few studies have been conducted on actual foreign or second language performance of males and females, but those that exist are dedicated to the interaction between strategy use and gender. Although Tran (1988) discovered that Vietnamese women use fewer language learning strategies than men, most studies in this area seem to have reported a greater use of language learning strategies by women. For example, Oxford & Nyikos (1989), who looked at the strategies used by 1200 university students, concluded that gender differences had a “profound influence” (p. 296) on strategy use, and that females used strategies more frequently than males. Oxford & Ehrman (1995) concluded that women at the Foreign Service Institute definitely reported more use of strategies, and Green & Oxford (1995), reporting on a study of 374 students at the University of Puerto Rico, also concluded that females used strategies scientifically more often than males. Catalan (2003) discovered that Spanish-speaking students learning English as L2 showed significant gender differences in the use of vocabulary learning strategies. In this study, female significantly surpassed males in their use

of formal rule strategies, input elicitation strategies, rehearsal strategies and planning strategies. Oxford and Ehrman (1995) argue “teachers and researchers should keep trying to understand gender differences in strategy use when they appeared; and they should understand that gender differences may often be a mask for deeper differences of personality type and career choice”(p.379).

The present study aims at investigating the effect of semantic mapping strategy instruction on vocabulary learning of Iranian intermediate students. A further concern of this study was to explore the probable interaction between the effect of teaching semantic mapping strategy and gender. In order to achieve the purpose of the study, the following research questions were proposed:

**Q1:** Does teaching semantic mapping strategy have any effect on vocabulary learning of Iranian EFL intermediate students?

**Q2:** Is there any interaction between gender and the effect of teaching semantic mapping strategy at intermediate level?

## **Method**

### **Subjects**

Initially, 134 male and female students at Jahad Daneshgahi Language Institute in Tehran participated in this study in 1983. They were students of nine intact classes. Although the level of language proficiency of these subjects had been determined by the institute itself, in order to have more homogeneous groups, a Nelson test was administered and 120 intermediate students whose scores were between one standard deviation above and below the mean of the test were selected. Then, they

were classified into four groups (two male and two female). One of the male groups was considered as an experimental and the other one as a control group. The same was done for females. The age range of the subjects was 16-26. It is worth pointing out that all the students were native speakers of Persian.

### **Instrumentation**

Two instruments were utilized in this study. The first one was a test of Nelson (adopted from Nelson English Language Tests, by Fowler and Coe (1976), series 200 B), which was employed to ascertain the homogeneity of the subjects in terms of language proficiency. The test was piloted with a group of subjects similar to the original sample. It consisted of three parts: cloze tests, structure and vocabulary. All parts were in the form of Multiple-Choice questions. Altogether, there were 50 items and the time allotted was 45 minutes. To estimate the reliability of the test, the K-R 21 formula was utilized and a value of 0.71 was obtained which indicated that the test was reliable.

The second testing instrument was a multiple-choice test of vocabulary, which was developed for the purpose of the present study, as follows. First, 45 vocabulary items were selected from the course materials. Then, these items were administered to 14 students at the same level for pilot study. After obtaining the data, the process of item analysis was carried out. Item facilities, item discriminations and choice distributions of the items were calculated. Finally, some of the items which were most difficult or easy were discarded, some were modified,



and the 30 remaining items were used in the pre-test and the post-test phases of the study. The reliability of the vocabulary test was also calculated through KR-21 formula and spilt-half method, which was estimated to be 0.92 and 0.90, respectively, which seemed promising for the purpose of the study. In order to examine the validity of the test, it was validated against the foresaid Nelson standard test of proficiency. The correlation coefficient between the Nelson test and the vocabulary test turned out to be 0.95.

### **Materials**

The materials used in this study were the same for all the groups. There were 8 units, each including a reading passage and some vocabulary exercises and activities. The reading passages were adopted from “*Vocabulary Builder*”, volumes 1 and 2 by Seal (1987). The exercises and activities were also adopted from the two books of “*Vocabulary Builder*” and “*English Vocabulary in Use*”, pre-intermediate and intermediate, by Redman (1997).

To ensure the appropriateness of the passages in terms of text difficulty for the intended groups, first from the students’ course book (the Reading Section) six passages were randomly selected. Then, the readability formula was run to obtain an index of readability of these passages. The mean index turned out to be 15.02. Next, the readability formula was run for the passages in the materials used in this study, which turned out to be 15.16, which was quite suitable for the purpose of this study.

In order to ascertain that words in the materials which were aimed to teach and test, were new for the subjects, a list of 200 vocabulary was given to a group of subjects similar to the original sample and asked them to write the meaning of the words they knew. Then by comparing their answers, 150 words, which were new for all the students, were selected to prepare the materials and semantic maps.

### Design

The design of this study is an intact-factorial one; it is intact because there is no true randomization as the students were already placed in classes on the basis of some criteria: scores on a placement test or successful completion of the prior course. It is factorial in that the effects of two independent variables are studied simultaneously.

The internal validity of the research was taken into account through controlling potentially effective variables such as level of proficiency, native language, nationality, students' age and teaching methodology. Table 1 represents the schematic design of the study.

**Table 1**  
**Graphic Representation of the Research Design**

GROUPS	GENDER	
	Male	Female
Experimental (strategy training)	31	30
Control (placebo)	30	29

### **Procedure**

To accomplish the purpose of this study, first 134 male and female students were selected from Jahad Daneshgahi Language Institute in Tehran. Due to practical limitations, it was not possible to select a randomized sample; therefore, an intact group design was adopted.

Second, a Nelson test was administered to establish the homogeneity of the students. After changing the scores to (z) scores, 120 students with the (z) scores of one standard deviation above and below the mean were selected. Then, the subjects were divided into four groups: 2 experimental (male-female) and 2 control groups (male-female).

Third, a standardized vocabulary test, which was constructed and validated for the purpose of this research, was administered to the subjects as the pre-test.

Fourth, some materials, which were prepared in advance, were given to all the students. The subjects of the experimental groups received semantic mapping strategy instruction after reading each passage. The instruction lasted four weeks and classes were 2 hours long and were taught twice a week. Forty-five to fifty minutes of each class time were dedicated specifically to vocabulary instruction.

In order to teach semantic mapping strategy in the experimental classes, the following phases, proposed by Morin & Goebel (2001) were carried out:

**Phase 1:** In the first session, the strategy was presented and described explicitly. Then, it was explained why, when and how this strategy can be used.

**Phase 2:** In each session, after reading a passage, the teacher wrote the central theme of the text on the board.

**Phase 3:** Then, the class was divided into small groups. Each group was given a part of the central concept and was invited to provide related words. Students were encouraged to ask for words they didn't know or were not included in each passage.

**Phase 4:** The teacher wrote suggested words on the board and connected them with lines and arrows to the main topic. All the semantic maps were created on the board, so that they could be shared with all the students in the class.

**Phase 5:** After creating the semantic maps, the groups had to manipulate the words and concepts by explaining to the rest of the class why they included them in their semantic maps, and how they were related to the central concept. Students also described or explained words that they had produced that were not in their text and were not known by the rest of their classmates. Then, the students copied the maps in their notebooks. In order to teach same words in the experimental classes, in addition to the map which was created by the students on each topic, a similar map which was prepared for the purpose of this study in advance, was also given to the students.

**Phase 6:** At the last phase, vocabulary produced in these activities was reviewed a number of times in the following class periods.

In the control groups, learners were also given the opportunity to acquire, review, and expand their vocabularies. As in the experimental groups, these classes were 2 hours long and were taught twice per week.

Forty-five to fifty minutes of each class were dedicated specifically to vocabulary instruction. But in the control groups, students were not encouraged to organize new words around a central concept. They read passages and did the exercises and new words were introduced through contexts and exercises.

It is worth mentioning that the instruction of both groups was carried out by one of the researchers.

Later, after eight sessions of teaching semantic mapping strategy to the experimental groups and giving no strategy instruction to the control groups, the post-test was administered to all the groups.

### **Results and Discussion**

After administration of the Nelson Test in the first session of the study, the subjects were divided into four intact groups (2 experimental and 2 control groups). Then, the performance of the students in the groups was compared with each other. In order to ascertain the homogeneity of the four groups, descriptive statistical analysis was done on the collected data and a one-way ANOVA was run. The results are shown in Tables 2 and 3.

**Table 2**  
**Descriptive Statistics for the Proficiency Test**

Group	N	Mean	Standard	Minimum	Maximum
			Deviation		
1	30	34.9	4.2859	28	40
2	29	34.6897	4.465	28	41
3	31	35.0968	3.3302	29	40
4	30	35.3	3.6403	29	40
Total	120	35	3.9043	28	41

**Key:** Group1: Experimental (Female)

Group2: Control (Female)

Group 3: Experimental (Male)

Group 4: Control (Male)

**Table 3**  
**One-Way ANOVA for the Proficiency Test**

	Sum of	D.F	Mean	F-observed	F-critical
	Squares		Squares		
Between Groups	6.083	3	2.028	0.130	2.70
Within Groups	1807.917	116	15.585		
Total	1814.000	119			

Table 2 reveals that the experimental groups (Groups 1 and 3) performed nearly the same as the control groups (2 and 4) in the proficiency test.

As presented in Table 3, the F- observed value, 0.130, at the 3 degree of freedom, is lower than the critical value of F, i.e., 2.70 at .05 level of significance. By this comparison, it was revealed that the four research groups enjoyed similar level of proficiency, and that the groups were not significantly different with respect to proficiency level prior to the study.

In order to establish the homogeneity of the groups in terms of vocabulary knowledge prior to the study, a vocabulary test was administered to all the groups. Then, the performance of the students on the pre-test was compared and analyzed applying a one-way ANOVA the results of which are displayed in tables 4 and 5.

**Table 4**  
**Descriptive Statistics for the Vocabulary Test (Pre-test)**

Group	N	Mean	Std.	Minimum	Maximum
			Deviation		
1	30	9.2	3.0218	5	16
2	29	9.3793	2.8083	5	15
3	31	9.8710	3.1806	5	16
4	30	10.2333	2.4870	6	15
Total	120	9.6750	2.8816	5	16

**Table 5**  
**One-Way ANOVA for the Vocabulary Test (Pre-test)**

	Sum of	D.F	Mean	F-observed	F-critical
	Squares		Squares		
Between Groups	19.847	3	6.616	0.792	2.70
Within Groups	968.478	116	8.349		
Total	988.325	119			

As shown in Table 5, the F observed value is 0.792 at the 3 degree of freedom which is less than the critical value of F, i.e., 2.70 at .05 level of significance. These results indicate that there is not a significant difference between the mean scores of the groups and the experimental groups performed nearly the same as the control groups in the vocabulary test taken as the pre-test.

After 8 sessions of instruction, the same vocabulary measure which was used as the pre-test was administered to the groups as a post-test. In order to answer the first and second research questions in this study, a two-way analysis of variance (ANOVA) was run. The descriptive statistics for each group and the results of the analysis of variance are displayed in tables 6 and 7.



**Table 6**  
**Descriptive Statistics for the Post-test**

Gender	Group	Mean	SD	Minimum	Maximum
Female	Experimental	25.4	3.7838	15	30
	Control	17.345	4.0994	10	25
Male	Experimental	25.1935	3.6826	15	30
	Control	17.5333	3.6268	12	25

**Table 7**  
**Two-Way ANOVA (Group and Gender)**

Source of variation	Sum of Squares	DF	Mean Squares	F-observed	F-critical
Group	1851.271	1	1851.271	128.280**	3.94
Gender	2.414	1	2.414	0.000	3.94
Group * Gender	1.169	1	1.169	0.081	3.94
Total	3525.467	119			

As displayed in table 7, the F-observed value for the effect of grouping variable, is 128.280. This amount of F at 1 degree of freedom is much greater than the critical value of F, i.e. 3.94, indicating that there is a significant difference between the subjects' mean scores.

Thus, the first null-hypothesis stating that teaching semantic mapping strategy has no effect on vocabulary learning is rejected and it can be concluded that the experimental groups, both male and female, outperformed the control groups on the post-test. This finding is in line with the general conclusion drawn from other related studies (Morgosein et al, 1982; Crow & Quigley, 1985; Bos & Andres, 1990; Zaid, 1995; Morin & Goebel, 2001; Huynh et al, 2002) that teaching semantic mapping strategy has a significant effect on learning vocabulary. As an example, Morin and Goebel (2001) found that direct vocabulary instruction that teaches semantic mapping as an acquisition strategy is more effective than vocabulary acquisition activities that teach only words rather than strategies for acquiring words.

As far as the second research question is concerned, the F-observed for the interaction between the grouping variable and gender is 0.081. This amount of F indicates that there is no interaction between these two variables ( $F\text{-observed} = 0.081 < F\text{-critical} = 3.94$ ) (See table 7). Therefore, the second null hypothesis stating that there is no interaction between gender and the effect of teaching semantic mapping strategy is confirmed. It is worth mentioning that previous studies have been conducted on the interaction between gender and overall strategy use or the use of broad categories of strategies. According to Larsen- Freeman and Long (1991) few studies have been conducted on actual foreign or second language performance of males and females, but those that exist are dedicated to interaction between strategy use and gender. Oxford and Ehrman (1995) argue that “teachers and researchers should keep trying to understand gender differences in strategy use when they appear, and they should understand that gender differences may often be a mask for deeper

differences of personality type and career choice”(p.379). However, the significance of the present study lies in the fact that it has investigated the interaction between gender and semantic mapping strategy, as one of the effective vocabulary learning strategies, for the first time.

### **Conclusions**

As a general conclusion, the findings of the present study confirm the claim that semantic mapping strategy instruction has a significant effect on vocabulary learning of intermediate students. In other words, training in semantic mapping strategy, as one of the effective vocabulary learning strategies, allows students to learn and recall more words. The results of this research also indicate that there is no interaction between gender and the effect of teaching semantic mapping strategy on vocabulary learning. Therefore, as Oxford & Ehrman (1995) suggest, males and females should be encouraged and allowed to develop the most effective learning approaches they can, and neither should be pushed into a gender-stereotyped set of strategies.

The findings of the present study have some implications for learners and teachers and syllabus designers. Learning vocabulary through semantic mapping strategy would be more enjoyable and meaningful for the learners, because it moves away from the boring and tedious process of looking up words in a dictionary. The findings may encourage teachers who still believe in teacher-centeredness in language teaching to change their viewpoints in favor of more learner-centered approaches. Syllabus designers and textbook writers can embody sections related to semantic maps into the materials they develop. In this way, they

can introduce a lot of new words in a map and improve both memory and comprehension of these words.

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### **Appendix**

Semantic Feature Analysis: Semantic-Feature Analysis (Anders & Bos, 1986) is a strategy that helps reinforce vocabulary that is essential to understanding important concepts in a text. Huynh, U., Lizarraga, L. & Wilkerson, B. (2002) state that semantic feature analysis uses a grid to help the students explore how a set of things is related to one another. By analyzing the grid the students will be able to see the connections, make predictions and master important concepts.



**Samples of semantic maps**







