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The Effect of Types of Semantic Mapping Strategy Instruction on the Reading Comprehension of Iranian Intermediate EFL Students

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Abstract

The purpose of the study was to investigate the effectiveness of two types of semantic mapping strategies (teacher-student interactive semantic mapping strategy and teacher-initiated semantic mapping strategy) on reading comprehension of Iranian intermediate EFL students. The participants of this study were 144 female students at Qazvin Kish-Mehr Language Institute. The instruments used in this study were a Nelson test and a teacher-made reading comprehension test. The latter was utilized in this study at pre-test and post-test phases. The materials consisted of four reading passages. Having established the homogeneity of the students in terms of general language proficiency, 90 students were selected and divided into three groups: one comparison and two experimental groups. During the four instructional sessions, one experimental group received teacher-student interactive semantic mapping strategy instruction, while the other experimental group received teacher-initiated semantic mapping strategy instruction. In the comparison group, however, students were not instructed to use any semantic mapping strategy. Rather, they were instructed to read intensively. At the end of the experiment, the post-test was administered to all groups in the study. In order to carry out the statistical analyses of the study the following techniques were used. To ensure the homogeneity of the groups, a one way ANOVA was used. To investigate the effects of the strategies, another one way ANOVA was run. The results indicated that semantic mapping has a significant impact on the improvement of reading comprehension ability of Iranian intermediate EFL students. The findings of this study may encourage syllabus designers and textbook writers to embody sections related to semantic maps into the materials they develop.

Key words: semantic mapping, strategy instruction, reading

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1. Introduction

There has been a growing interest in changing the focus of classroom instruction from a teacher-centered one to a learner-centered one. In particular, there has been a growing interest in identifying how learners can take charge of their own learning and in clarifying how teachers can help students become more autonomous (Rubin, 1987).

In order to direct students towards autonomy, teachers should change their attitudes towards language teaching and learning and come to an understanding of the learners' central role in the process of learning. They should be confident that there exist a number of strategies which can be incorporated into their existing curricula, that can be taught to students with some extra effort, and that can improve the overall class performance. This means that the teachers' role is not limited to simply providing comprehension input but can include a variety of learning strategies.

As far as reading comprehension is concerned, Grabe (1997) states that reading is a strategic and purposeful process. Willams (1986) asserts that "the pendulum in the recent years has swung towards an emphasis on teaching appropriate teaching skills and strategies"(p. 43). Singhal (2001) states that educators are pressed to develop effective instructional means for teaching reading in order to meet the reading needs of students within 21st century. Alexander (1996) states that students need systematically orchestrated reading instruction in order to become motivated strategic readers.

Levine, Ferenz, and Reves (2000) state "the ability to read academic texts is considered one of the most important skills that students of English as a second langrage (ESL) and English as a foreign language (EFL) need to acquire" (p.1). Carrell (1998) argues that students at any level will not acquire reading strategies if they have not been explicitly taught. Through strategies, which are the actions that readers actively select and control, readers can achieve desired goals and objectives (Carrell, 1998). Chamot (1999), on the basis of what has been done and the results of so many studies in reading comprehension strategy learning and teaching, concludes that:

Ongoing monitoring of student's use of both instructed and individually developed strategies are essential if teachers are to scaffold their instruction successfully. In scaffolded instruction, teachers begin with explicit instruction and gradually reduce prompts and cues to students. In this way students begin to assume responsibility for and regulation of their own learning (p.4).

Kern (1989) believes that explicit instruction in reading comprehension is an effective way to improve reading comprehension ability. Now that the importance of explicit reading instruction is appreciated, the general interest should shift to the application of more efficient strategies for teaching of reading to students of foreign languages. There are various methods and strategies for teaching reading in teaching methodology textbooks. Among different reading strategies, a strategy to facilitate reading comprehension that has generated considerable interest among regular and special education researchers over the past twenty-five years is the use of semantic mapping (Horton, Lovitt, & Bergerud, 1990).

The semantic aspect of a text plays an important role in the reading comprehension process. As Frederiksen (1982) points out, "Apparently, understanding a text involves analyzing it into highly structured semantic units that are acquired, stored, retrieved, and in other ways processed as units" (p.58). In support of this information, research has clearly demonstrated that good readers rely more on semantic cues than on syntactic cues (DeFord, 1981; Sprenger-Charolles, 1991). Therefore, the need for teaching semantic organization is necessary to enable students to read effectively and with improved comprehension. Pehrsson and Robinson (1985) explain that "The reader who fails to organize ideas in ways similar to the author's will fail to comprehend the intended meanings" (p.26).

In the light of the above information, semantic mapping has emerged as a teaching technique to increase comprehension. This technique has become popular in the teaching of reading comprehension because of its multiple advantages in this area. The major advantage of this technique is that it integrates new information with prior knowledge. As Prater and Terry (1988) point out:

When we consider the influence of background knowledge on reading comprehension, we should also consider effective classroom techniques that activate students' prior knowledge. Semantic mapping is one of these techniques. If semantic mapping is used as a strategy to activate, assess, and embellish students' prior knowledge of a topic before reading, it seems to have considerable merit (p.103).

Heimlich and Pittelman (1986) also state that:

> Semantic mapping appears to motivate students of all age levels and to involve them actively in the thinking-reading process. The process of semantic mapping also allows teachers to assess and interpret what students know as

> well as to make judgments concerning the appropriate instruction needed. These judgments can be based upon what students demonstrate they already know about a topic, rather than teachers having to assume what the students know. (pp. 45-46)

Research has also confirmed the effectiveness of using the semantic mapping technique in teaching reading comprehension. In many studies, participants in the semantic mapping group scored significantly higher than the no-map control group on tests of recall and/ or reading comprehension of both expository and narrative texts (Sinatra, Stahal-Gemake, & Berg, 1984; Reynolds, & Hart, 1990; Melendez, 1993). A group of researchers obtained positive results with the teacher-initiated semantic mapping strategy (e.g., Alvermann, 1981; Dyer, 1985; Idol, 1987). Another group of researchers reported that the teacher-student interactive semantic mapping strategy was effective in improving reading comprehension (e.g., Englert & Mariage, 1991; Johnson, Pillelman, Toms-Bronowski, & Levin, 1984). In sum, the two semantic mapping strategies have been continually valued by researchers as useful instructional strategies for developing reading comprehension. However, very little direct comparison among the two strategies has been made.

Therefore, the purpose of the study is to compare directly the effect of teacher-initiated semantic mapping strategy and teacher-student interactive semantic mapping strategy on reading comprehension of EFL intermediate learners. To this end, the following null hypotheses were formulated.

H1. Semantic mapping strategy instruction does not have any effect on reading comprehension of Iranian EFL intermediate learners.

H2. There is not any significant difference between reading instruction with and without the use of the teacher-student interactive semantic mapping strategy in terms of achievement in reading comprehension.

H3. There is not any significant difference between reading instruction with and without the use of the teacher-initiated semantic mapping strategy in terms of achievement in reading comprehension.

H4. There is not any significant difference between reading instruction with the use of teacher-student interactive semantic mapping strategy and teacher-initiated semantic mapping strategy in terms of achievement in reading comprehension.

2. Literature Review

Celce-Murcia (2001) points out that reading requires drawing information from a text and combining it with information and expectations that the reader already has. Perkins and Jones (1985) assert that " pre-knowledge or background knowledge of a topic of reading passage on which comprehension questions are based is essential to the comprehension process" (p.137). Weber (1979) notes:

For comprehension to take place, the meaning of individual words must be remembered and integrated into grammatical and semantic organization of a text, and the results related to a general knowledge about the world specific knowledge at hand (p.97). Nassaji (2003) states that

> Reading is not a single factor process. It is a multivariate skill involving a complex combination and integration of a variety of cognitive, linguistic, and nonlinguistic skills ranging from the very basic level processing abilities involved in decoding print and encoding visual configuration to high-level skills of syntax, semantics, and discourse, and to skill higher-order knowledge of text representation and integration of ideas with the reader's global knowledge. (p. 261)

Fundamental to text comprehension is the reader's ability to organize information and connect new knowledge to knowledge he or she already possesses (Chen & Graves, 1995). Along the same line, Chastain (1988) defines reading as a complex activity, requiring mental processing which involves "the activation of relevant knowledge and related skills to accomplish an exchange of information from one person to another" (p. 216). The importance of semantic mapping strategy and teacher-student interactive semantic mapping strategy and their roles in L2 reading comprehension motivated the origination of the present study.

3. Method

3.1 Participants

144 female students at Qazvin Kish Mehr English Language Institute participated in this study. The participants were the researcher's own students. Although the level of language proficiency of the participants had been determined by the institute officials, in order to have more homogeneous groups, a Nelson test was administered and 90 intermediate students whose scores were between one standard deviation above and

below the mean of the test were selected. Then, they were classified into three groups (1 comparison and 2 experimental groups). The participants were aged between 19-30. It is worth mentioning that all the participants were Persian native speakers living in Qazvin.

3.2. Instrumentation

The following two instruments were used to measure the variable under investigation:

A) Language Proficiency Test

In order to ensure the homogeneity of the control and the experimental groups in terms of English language proficiency, a Nelson test (adopted from Nelson English Language Tests, by Flower and Coe (1976), series 200 B) was administered. 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. There were 50 items and the time allotted was one hour.

B) Reading Comprehension Test

A reading comprehension test, consisting of 30 Multiple-Choice items, was developed by the researcher based on the course materials prior to the study. Then, these items were administered to 30 similar 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. Then, the items which were very difficult or easy were modified and corrected. Finally, these items were used as the pre-test and post-test.

3.3. Procedure

At the beginning of the experiment, all the participants were pre-tested. To ensure the homogeneity of the groups, a one way ANOVA was used. Following the pre-testing, they were classified into three groups. All groups were then instructed by the researcher. One experimental group received teacher-initiated semantic mapping strategy before reading each passage. Another experimental group received teacher-student interactive semantic mapping strategy before reading each passage.The instruction took four weeks and classes were one hour long and were taught once a week. In the comparison group, the participants were also given the opportunity to improve and expand their reading comprehension ability. As in the experimental classes, this class was also one hour long for four sessions. However, in this group, no semantic mapping strategy was taught. The students were instructed to read intensively. After four sessions of teaching semantic mapping strategies to the experimental

groups and intensive reading to the comparison group, all the students took part in the post-test. To investigate the effect of the strategies one way ANOVA was run.

4. Results and Discussion

The study aimed at investigating the effect of two different types of semantic mapping strategy instruction on reading comprehension at intermediate level. To achieve the purpose of the study the following research questions were proposed.

Q1: Does semantic mapping strategy instruction have any effect on the reading comprehension of EFL intermediate students?

Q2: Is there any significant difference between reading instruction with and without the use of teacher-student interactive semantic mapping strategy in terms of achievement in reading comprehension?

Q3: Is there any significant difference between reading instruction with and without the use of teacher-initiated semantic mapping strategy in terms of achievement in reading comprehension?

Q4: Is there any significant difference between reading instruction with the use of teacher-student interactive semantic mapping strategy and teacher-initiated semantic mapping strategy in terms of achievement in reading comprehension?

As presented in Table 1, The F-observed value is .029. This shows that F-value at 2 and 87 degrees of freedom is lower than the critical value of F, i.e. 3.84. Therefore, it can be concluded that there are no significant differences among the mean scores of the three groups on the Nelson Test.Thus, the three groups enjoyed similar level of language proficiency prior to the administration of the treatments.

Table1
One-Way ANOVA for the Nelson Test by Group

	Sum of Square	*df*	*Mean Square*	*F*	*Sig*
Between Groups	.956	2	.478	029	.971
Within Group	1436.867	87	16.516		
Total	1437.822	89			

As shown in Table 2, the F-observed value is .189. This depicts that the F-value at 2 and 87 degrees of freedom is lower than the critical value of F, i.e. 3.84. Therefore, it can be concluded that the three groups enjoyed

the same level of reading comprehension ability before the administration of the treatment.

Table 2
One-Way ANOVA for the Pre-Test by Group

	Sum of Square	*df*	*Mean Square*	*F*	*Sig*
Between Groups	1.356	2	.678		
Within Group	312.600	87	3.593	.189	.828
Total	313.956	89			

As can be seen in table 3, the F-observed value was 105.77. This displays F-value at 2 and 87 degrees of freedom exceeded the critical value of F, i.e. 3.84. This vividly depicted the fact that there are significant differences among the mean scores of the three groups on the post-test of reading comprehension. Therefore, the first null-hypothesis proposed in this study as there is no significant effect of semantic mapping strategy instruction on the reading comprehension of the Iranian EFL intermediate students was rejected and it can be concluded that semantic mapping has a significant impact on the improvement of the reading comprehension ability of the students.

Table 3
One-Way ANOVA for the Post-Test

	Sum of Square	*df*	*Mean Square*	*F*	*Sig*
Between Groups	891.467	2	445.733		
Within Group	366.633	87	4.214	105.770	.000
Total	1258.100	89			

The significant F-value necessitates the application of the Post-hoc Scheffe test (Table 4) in order to compare the pairs of means individually. Based on the results of Table 4, the following conclusions can be drawn:

A: There is a significant difference between the mean scores of the comparison and interactive semantic mapping groups. As displayed in Table 5, the mean scores for the comparison and interactive semantic mapping groups are 18.97 and 26.63 respectively. Thus, the second null hypothesis stating that there is no significant difference between reading instruction with and without the use of teacher-student interactive

semantic mapping strategy in terms of achievement in reading comprehension is rejected. That is to say, the interactive semantic mapping group outperformed the control group on the posttest.

Table 4
Multiple Comparisons (Scheffe Test)

Dependent Variable	*(I) Group*	*(J) Group*	*MeanDifference (I-J)*	*Std. Error*	*Sig*	*95% Confidence*	
						Upper Bound	*Lower Bound*
Post Test	Comparison	Interactive Mapping	-7.667(*)	.530	.000	-8.99	-6.35
		Teacher Mapping	-30133(*)	.530	.000	-4.45	-1.81
	Interactive Mapping	Teacher Mapping	4.533(*)	.530	.000	3.21	5.85

Table 5
Descriptive Statistics for the Post-Test

	N	*Mean*	*SD*	*95% Confidence Interval for Mean*				
				Std.Error	*Lower Bound*	*Upper Bound*	*Minimum*	*Maximum*
Comparison	30	18.97	1.732	.316	18.32	19.61	16	22
Ineractive Mapping	30	26.63	2.205	.403	25.81	27.46	21	30
Teacher Mapping	30	22.10	2.187	.399	21.28	22.92	17	26
Total	90	22.57	3.760	.396	21.78	23.35	16	30

B: There is a significant difference between the mean scores of the comparison and teacher-initiated semantic mapping groups. As displayed in Table 5, the mean scores for the comparison and teacher-initiated semantic mapping groups are 18.97 and 22.10, respectively. Thus, the third null hypothesis stating that there is no significance difference between reading instruction with and without the use of teacher-initiated semantic mapping strategy in terms of achievement in reading comprehension is rejected. In other words, the teacher-initiated semantic mapping group performed better than the control group on the posttest.

C: There is a significant difference between the mean scores of the teacher-student interactive and the teacher-initiated semantic mapping groups. As displayed in Table 5, the mean scores for the interactive and teacher-initiated semantic mapping groups are 26.63 and 22.10 respectively. Thus, the final null hypothesis stating that there is no significant difference between reading instruction with the use of teacher-student interactive semantic mapping strategy and teacher-initiated semantic mapping strategy in terms of achievement in reading comprehension is rejected. That is to say, the interactive semantic mapping strategy is much more effective than the teacher-initiated semantic mapping strategy. The main purpose of this study was to explore the effect of two different types of semantic mapping strategy instruction on reading comprehension of EFL intermediate learners. The results revealed that there was a significant difference among the mean scores of the control and the experimental groups on the post-test. Therefore, it can be concluded that semantic mapping strategies have a significant impact on the improvement of the reading comprehension of EFL intermediate students.

The results also revealed that there was a significant difference between the two types of semantic mapping strategies (i.e. teacher-initiated and teacher-student interactive semantic mapping strategies). Therefore, it can be concluded that teacher-student interactive semantic mapping strategy might have the potential to activate students' prior knowledge more fully than teacher-initiated semantic mapping strategy. A second possible explanation is that teacher-initiated semantic mapping strategy is less effective for developing EFL students' reading comprehension, in comparison with the teacher-student interactive semantic mapping strategy. These findings are compatible with some of the empirical studies conducted earlier. For instance, Carrell (1989) found that strategy training in reading comprehension with semantic mapping and ETR (Experience, Text, Relationship) method both improved reading comprehension scores. Avery and Gross (1996) found that teaching reading comprehension through semantic mapping techniques helps students have a more sophisticated framework of understanding and a stronger knowledge base. (Griffin, Malone, & Kameenui, 1995) also found that explicit semantic mapping instruction played important roles in students' ability to generalize the instruction to novel textual materials. In a different study, Kozminsky (2004) found that text semantic mapping as graphic organizers are effective tools that assist learning process before, during, and after texts are read. These findings also support Prater and Terry's views (1988) who suggest that semantic mapping is a very

effective technique that activates students' prior knowledge and it has considerable merit. They also claim that semantic mapping appears to motivate students of all age levels and to involve them actively in the thinking process. However, from a theoretical point of view it seems that teacher-initiated semantic maps may inhibit students' creativity and fail to create independent readers. Clarke (1990) claims that the involvement of the teacher and the students in map construction helps not only in-depth processing but motivation as well. Furthermore, the teacher-student interactive semantic mapping strategy can provide the teacher with an opportunity to correct misinformation, introduce new ideas, or change interpretation.

5. Conclusion and Implications

The present study was an attempt to investigate the effect of two types of semantic mapping strategy instruction on reading comprehension of Iranian intermediate learners. The results vividly depicted the fact that semantic mapping has a significant impact on the improvement of reading comprehension ability of the students. The results also revealed that there was a significant difference between the two types of semantic mapping strategies (i.e. teacher-initiated and teacher-student interactive semantic mapping strategies). Therefore, it can be concluded that teacher-student interactive semantic mapping strategy might have the potential to activate students' prior knowledge more fully than teacher-initiated semantic mapping strategy. A second possible conclusion is that students might share their own prior knowledge with that of the teacher. A third conclusion is that the teacher-student interactive semantic mapping strategy might allow the teacher to focus students' attention on higher order thinking skills which in turn enhances reading comprehension. A final conclusion is that the interaction between the teacher and the students might increase students' motivation.

The results of this study may be of benefit to EFL teachers and students. The findings may encourage teachers who still believe in teacher-centeredness in language teaching to change their viewpoints in favor of more learner-centeredness approaches. The findings also help teachers realize the influence of activating background knowledge of students on reading comprehension. The results are especially of great value to teachers who, despite devoting time to reading instruction are usually faced with students' problems in comprehending. Teachers can teach semantic mapping strategies

to link the process of reading comprehension to building bridges between the known and unknown in order to ease comprehension.

The results also benefit students. Learning reading skill through semantic mapping strategies would be more enjoyable and meaningful, because such strategies link new concepts in a meaningful way to pre-existing concepts and provide a personally meaningful context for understanding. Furthermore, such strategies may motivate students of all grade levels and integrate thinking with reading.

Textbook writers and syllabus designers will also benefit from the results of this study. The findings of this study may encourage syllabus designers and textbook writers to embody sections related to semantic maps into the materials they develop. In this way, they may increase students' motivation, activate and embellish students' background knowledge which enjoys a symbiotic relationship with text comprehension. Another advantage of using textbooks with explicit strategy use and training is that such textbooks reinforce strategy use and encourage students to apply them on their own to foster comprehension.

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