The relationship between semantic mapping instruction, reading comprehension and recall of Iranian undergraduates reading English texts[1]

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Abstract

This study investigated the effectiveness of semantic mapping, an interactive reading strategy, on reading comprehension and recall of Iranian undergraduate students (non-EFL majors) reading texts in English. It also examined whether there is an interaction between gender and the effect of teaching semantic mapping strategy on reading comprehension and recall. The subjects in this study were 120 male and female lower-intermediate undergraduate students taking a general English course at Urmia University. A Certificate in Advanced English (CAE) reading test was administered to measure students' proficiency at the beginning of the treatment. Afterwards, the subjects were semi-randomly (Mackey & Gass, 2005) divided into experimental and control groups. The experimental group was instructed on how to apply semantic mapping strategy to their reading process, while the control group received normal reading instruction. After administering two post-tests and a delayed recall post-test based on the General English text book, quantitative and qualitative findings supported the findings of earlier research on the benefits of the application of semantic mapping in the experimental group, but failed to show a significant difference between males and females.

Resumen

Este estudio versa sobre la efectividad del "mapeo semántico", una estrategia interactiva de lectura sobre comprensión de la lectura y recuerdo de contenido de estudiantes de licenciatura iraníes al leer textos en inglés. Asimismo, examina si existe una interacción entre género y el efecto de la enseñanza de la estrategia de mapeo semántico al leer y recordar contenido. Los sujetos en este estudio fueron 120 estudiantes de licenciatura de nivel intermedio bajo, tanto hombres como mujeres tomando un curso general de inglés en la Universidad de Urmia. Para determinar la aptitud de los estudiantes se les aplicó un examen del Certificado en Lectura de Inglés Avanzado (CAE) al principio del tratamiento. Posteriormente, se dividió a los sujetos en un proceso semi-azaroso, en grupos experimental y de control. Al grupo experimental se le indicó como aplicar la estrategia de mapeo semántico, mientras que el grupo de control recibió las instrucciones normales de lectura. Tras administrar dos exámenes posteriores y un post-examen retrasado de memoria, basado en el libro de texto General English, los resultados cuantitativos y cualitativos respaldaron los hallazgos de la investigación anterior en el beneficio de la aplicación del mapeo semántico en el grupo experimental, pero no mostraron ninguna diferencia entre hombres y mujeres.

Introduction

ESL and EFL students are a population who need special attention in reading development, especially those who wish to pursue academic work in their second language. Learning how to read informational text to obtain content–area knowledge becomes critical for their success. Reading from text involves abilities to remember main ideas and certain details, to link

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the text to readers' prior knowledge, and to recognize and build rhetorical frames which organize the text information (Grabe & Stoller, 2002). In order to improve language learners' reading skills, different studies have been carried out to discover the effectiveness of various reading strategies (as instances of learning strategies). Learning strategies (including reading strategies) are important in language learning because they enhance students' learning, and students make use of them for active, self-directed involvement that is essential for developing communicative competence (Oxford, 1990).

Regarding the importance of strategies in EFL learners' success and their growing interest in effective language learning, the present study scrutinized the effect of applying one such strategy, i.e., "semantic mapping" on reading comprehension and recall of written text. It also examined whether there was an interaction between gender and the effect of teaching semantic mapping strategies on reading comprehension and recall. More specifically, the research reported here attempted to test the following null-hypotheses:

> H1: Receiving instruction through semantic mapping has no significant effect on Iranian undergraduate students' comprehension of reading texts.

> H2: There is no relationship between students' gender and the effectiveness of semantic mapping strategy on reading comprehension.

> H3: Receiving instruction through semantic mapping has no significant effect on Iranian undergraduate students' recall of reading texts.

> H4: There is no relationship between students' gender and the effectiveness of semantic mapping strategy on recall.

A brief review of the related literature

Semantic mapping is a technique developed by Johnson and Pearson (1978) and has its roots in cognitive psychology. It assumes that students come to class with some fragmentary knowledge or even misconceptions about the topic the teachers are going to teach. Semantic mapping is indeed a graphic representation of one's ideas and attitudes toward a key concept and is used to categorize and connect the jumbled stuffs. According to Zaid (1995), semantic mapping is a visual representation of knowledge, a picture of conceptual relationship. Zaid defines semantic mapping as a graphic arrangement showing the major ideas and relationships in text or between word meaning and a categorical structuring of information. In teaching reading, semantic mapping helps teachers to get students to focus not just on individual details but also on the structure of a text and helps in the conceptualization of paragraph and short essay structure.

A large body of literature supports that prior knowledge of text-related information strongly affects reading comprehension. The brainstorming phase of semantic mapping (intended to activate the readers' prior

knowledge) gives the teacher an insight into the schemata of each of his/her students, thus revealing the amount of interest, level of readiness, gaps, misconceptions, and errors (Pearson & Johnson, 1978). Typically, in brainstorming, ideas from one student will trigger ideas from other students "in chain reaction thought process" (Heimlich & Pittelman, 1986, p. 34). Other advantages of semantic mapping are: motivating students of all grades, integrating thinking with reading, integrating assessment with teaching, and making judgments concerning the appropriate instruction needed (ibid).

In order to enhance the comprehensibility of reading passages, Curtain (1997) proposes techniques such as advance organizers, story mapping, story grammars and semantic mapping as pre-reading strategies. She argues that previewing new structures and vocabulary and helping students make connections between the new concepts and the old ones allow them to draw on their background knowledge to aid comprehension. Confirming previous research findings, she mentions that "encouraging students to draw meaning from the pictures in the reading or additional or related visuals can also help text comprehension" (p.1).

El-Koumy (1999) acknowledges that 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 previous knowledge. El-Koumy (1999) conducted research comparing the effects of three semantic mapping strategies on reading comprehension of learners of English as a foreign language. These groups were instructed by the researcher using the same reading material, but using three different semantic mapping strategies: 1) teacher-initiated semantic mapping, 2) student-mediated semantic mapping, and 3) teacher-student-interactive semantic mapping. Reading comprehension of all the subjects was tested both prior to and at the end of the treatment. The results showed no significant differences in mean scores on the pre-test among the three groups of the study. On the other hand, the post-test results revealed that students in the teacher-student-interactive semantic mapping group scored significantly higher than the teacher-initiated semantic mapping group and student-mediated semantic mapping group.

Similarly, Griffin et al. (1995) also investigated the facilitative effect of graphic organizers (GO) instruction (as an example of semantic mapping strategy) and the degree of explicitness in GO instruction with 99 L1 fifth-grade students in five treatment conditions: explicit GO instruction, explicit-comprehension instruction without GO, implicit GO instruction, implicit-comprehension instruction without GO, and traditional basal instruction. The training was conducted over a 10-day period with 45 minutes per day in the students' classrooms. The GOs used in the study were designed to reflect the hierarchy of information within the passage and the relationships of this information within the hierarchy, but not the

discourse structure of the text. The results showed no significant difference in subjects' performances on the immediate and delayed post-tests with short-answer comprehension items, and subjects who received GO instruction did not perform better in either immediate or delayed recall of the training material. (Actually, the students who received traditional basal instruction performed significantly better than those who received implicit GO instruction in the delayed recall of the teaching material.) However, students who received GO instruction performed significantly better on the recall of novel social studies text material as a transfer measure than students who received the traditional basal instruction.

Block and Pressly (2002) point out that comprehension involves more than thirty cognitive and metacognitive processes. Comprehension instruction, therefore, involves a complex and long-term commitment to teach students the necessary strategies and to provide them with sufficient practice to use them effectively. It should not be forgotten that most of the strategies introduced for developing reading and/or learning may be context and individual specific, and that is why, before generalizations are voiced out for prevalent use of such techniques, their efficacy should be carefully tested in a variety of contexts. As with all techniques, needless to say, semantic mapping should also not be overused. Heimlich and Pittelman (1986) and Zaid (1995) caution teachers not to have their students make overly detailed and multileveled semantic maps that result in only confusing visual displays.

Recall is defined as the ability to remember later the material that one has learned or read. Hayes (1989) mentions that recall protocols have mostly been used for research purposes rather than for the purpose of reading achievement. As its use in L2 reading research became more prevalent, issues concerning the use of recall to measure L2 reading comprehension have attracted researchers' attention. Research on recall in L2 reading has concentrated on a variety of issues. While some researchers have focused on scoring, others have compared recall with other testing methods and still others have examined how factors such as activating background knowledge by semantic mapping training affected L2 readers' recall.

Kobayashi (1995), for instance, believes that research findings regarding recall protocols for assessing reading tasks have been fruitful, but the issue of whether the requirement of memory in immediate recall tasks can provide an accurate understanding of what readers do and do not comprehend has remained unexplored. The requirement of memory in recall protocols has provided insights into L2 readers' reading comprehension process, for instance, on how readers store, organize, retrieve and reconstruct the text. The researchers have, however, been unable to trace studies dealing with the effect of semantic mapping training on recall in the relevant literature.

Method

Subjects

The subjects in this study were 120 pre-intermediate undergraduate students (two separate classes) taking a general English course at Urmia University. There were sixty students in each class (control vs. experimental), with an unequal number of females and males either group. For reasons of logistics, it was not possible to randomize the subjects, and an intact group design was accordingly used in the study. A standard reading test using the Certificate of Advanced English (CAE) was administered to measure students' language proficiency at the beginning of the research, the results of which indicated no significant difference between control and experimental groups. Although the groups were intact in design, they were semi-randomly assigned to control and experimental groups (Mackey & Gass, 2005). The characteristics of the subjects of the research have been presented in Table 1 below.

Group	Major	N	Female N	Male N	Age Range	L1: Turkish N	L1:Kurdish N	L1: Persian N
Experimental	Educational Science	60	38	22	18-23	36	15	9
Control	Geography	60	45	15	18-25	31	23	6

Table 1 Characteristics of the subjects

Materials

The materials which were used in the study consisted of some printed models of graphic organizers for teaching the strategy of semantic mapping, and a standard reading comprehension test which was the institutional version of a Certificate in Advanced English to assess the learners' reading proficiency at the beginning of the treatment. The teaching materials contained ten reading passages from the *General English* course book (Pourgive, et al., 2006).

It is worth mentioning that apart from the CAE reading paper used as both the pre-test and the post-test, another post-test was also used, the content of which was based on *General English* book with the same readability level as the materials taught during the treatment period. The mean readability index of post–test based on the *General English* book turned out to be in 15.88 in Fog Index and the mean readability of texts in the book was 15.84.

Additionally, in order to provide qualitative information on the effectiveness of using semantic mapping as a pre-reading strategy, the ideas of the candidates in the treatment group were solicited via informal conversations with the candidates. A delayed post-test was also used to measure subjects' recall two weeks after the immediate post-test; additionally summary writing tasks (as recall protocols) were obtained from both groups to produce further data on the subjects' recall of reading materials.

Procedure

The design of the study was a non-probabilistic intact group design and for reasons of logistics, it was impossible to have true random sampling of the subjects. Two classes were, however, randomly chosen among numerous groups taking a General English course at Urmia University to follow cluster random sampling procedure. The first group was semi-randomly assigned as the control group and the second group as the experimental group. Before the treatment began, both groups took a standard reading test (CAE) for the purpose of comparability. The results showed no statistically significant differences between the groups. The experimental group was instructed on how to apply semantic mapping strategy to their reading process by the researchers in ten thirty-minute sessions for the duration of two months. The semantic mapping strategy to be taught was divided to: 1) before-reading semantic mapping strategy; 2) during-reading semantic mapping strategy; and 3) after-reading semantic mapping strategy. To think aloud the semantic mapping strategy in each stage, the researchers informed learners how they used the topic to predict the forthcoming ideas, and then they checked those predictions. They stopped reading and asked questions of themselves concerning the main idea, key words, etc. The researchers showed the students how they could activate their background knowledge, guessed the meaning of unknown words from the context, how they skipped some others, what helped them come up with that guessing and how they summarized and outlined the ideas or points discussed in the text.

The think-aloud training was given in English and Persian. During a think-aloud or concurrent verbal protocol, the candidate who is performing a language task (usually a writing or reading task) speaks aloud about what he/she is doing. Polio (2012) mentions that "The goal is to get the subjects to verbalize what is currently going through their minds" (p.148). It is worth noting that think-aloud modeling was not provided just once, rather, the researcher continued to model, when necessary throughout the remainder of the instructional sequence. Though the teacher's initial modeling was simple and straightforward, subsequent modeling of the semantic mapping strategy gradually involved the students (e.g., as the teacher read the passage, students told him what to do and the teacher did it and gradually revealed to students more sophisticated cognitive processes, for example, activating prior knowledge, monitoring semantic mapping comprehension, repair strategies, and so forth). Additionally, during treatment the experimental group was taught how to construct the content of a passage in the form of a tree graph and reflect on the hierarchy of information within the passage and the relationship of this information within the hierarchy. Also they were taught how to illustrate the interrelationship among ideas and details in the text through the use of semantic maps. The kinds of semantic maps and graphic organizers which were used depended on what kind of reading materials was taught. During this period the control group received no instruction on reading comprehension via semantic mapping.

Finally, after the strategy instruction program, to measure the overall improvement of reading comprehension ability of the subjects in both groups and to compare the relative effectiveness of semantic mapping strategy training, the learners in both experimental and control group took the same CAE reading paper and a second post-test based on *General English*, part of which consisted of writing a summary. Two weeks after the post-tests, a delayed post-test and recall protocols was used to gauge subjects' recall.

Data analysis

To accept or reject the stated null-hypotheses, the data obtained during the pre-test and the post-test were analyzed in a series of steps. In order to make sure that the subjects in the control and experimental groups were of the same reading proficiency level at the start of the investigation, an independent samples *t*-test was used. Two-way ANOVAs were used to find out whether any differences existed between groups in terms of the application of semantic mapping strategy and gender between control and experimental groups for both CAE and *General English* immediate and delayed post-tests. Finally, mixed-approach data analysis of recall protocols was conducted to supplement quantitative findings by comparing the subjects' summaries in terms of the length, the number and the complexity of sentences produced.

Findings

Quantitative findings

The quantitative finding of this research concerning the relationship between semantic mapping training and reading comprehension partially appeared in Taghavi and Sadeghi (2008). This report however is meant to offer analyses related to the relationship between semantic mapping instruction and recall on the one hand as well as *qualitative findings* on the other. In order to make sure that the subjects in the control and experimental groups were of the same reading proficiency level at the start of the investigation, an independent samples *t*-test was used to compare their CAE scores and as shown in Tables 2 and 3, the difference between the mean scores on the pre-test was not statistically significant. This suggests that students in the two groups were fairly equivalent in their reading comprehension ability at the beginning of the study.

Group	N	Mean	Std. Deviation	Std. Error Mean
1	60	2.9833	2.01260	.25983
2	60	2.7667	2.06148	.26614

Group 1: Experimental group   Group 2: Control group

Table 2 CAE pre-test results for experimental and control groups: Group statistics

	Levene's Test for Equality of Variances	
	F	Sig
Equal Variances Assumed	.430	.513
Equal Variances not Assumed		

Table 3 Independent t-test for CAE pre-test scores of experimental and control groups

To verify the hypotheses proposed earlier, the following two-way ANOVAs were used to find out whether any differences existed between groups in terms of the application of semantic mapping strategy and whether acted as the moderator variable in the case of both CAE and *General English* post-tests.

As shown in Table 4, the results revealed that the F-ratio was significant for semantic mapping at the $P \leq 0.05$ level in the case of CAE post-test, so the first hypothesis was rejected. The same table also reveals that there was not any statistically significant relationship between students' gender and effectiveness of semantic mapping strategy training on reading comprehension, which leads us to confirm the second null-hypothesis as far as CAE post-test is concerned. No significant interaction effect was observed either, meaning that semantic mapping strategy and sex did not interact to produce a different effect.

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Corrected Model	45.657	3	15.219	3.997	.009
Intercept	1331.290	1	1331.290	349.671	.000
Sex	.018	1	.018	.005	.945
group	37.270	1	37.270	9.789	.002
Sex* group	.008	1	.008	.002	.965
Error	441.643	116	3.807		
Total	2086.000	120			
Corrected Total	487.300	119			

a. R Squared = .094 (Adjusted R Squared=.070)

Table 4 Tests of between –subjects effects based on CAE post-test

Regarding the fact that CAE proved a very difficult test for both groups and led to insufficient variance, it was decided that another simpler test would be a better replacement, and for this purpose, a passage selected from the book students read for their course was selected at a similar readability level as the average readability of the passages in the book and was made into another post-test. The test was piloted and revised several times before it was administered to the target control and experimental groups. The performance of the subjects and their differences are depicted in Table 5 below.

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Corrected Model	844.021	3	281.340	33.908	.000
Intercept	9526.132	1	9526.132	1148.110	.000
Sex	.206	1	.206	.025	.875
group	674.521	1	674.521	81.295	.000
Sex* group	1.207	1	1.207	.145	.704
Error	962.479	116	8.297		
Total	13214.000	120			
Corrected Total	1806.500	119			

a. R Squared= .467 (Adjusted R Squared=.453)

Table 5 Tests of between–subjects effects based on SAMT post-test

As shown in Table 5, as far as the post-test based on *General English* book (called SAMT post-test) is concerned, the results revealed that the F-ratio was significant for semantic mapping at the $P \le 0.05$ level, so again the first hypothesis is rejected. The same results also reveal that there was not any statistically significant relationship between the subjects' gender and effectiveness of semantic mapping strategy training on reading comprehension which confirms our observation above that the second null-hypothesis should be confirmed.

In order to avoid the problem of having incomparable males and females which could pollute the result of ANOVA as far as gender variable was concerned, it was further decided to randomly select fifteen members of males and equivalent number of females from each group (in the above samples) and run the analyses again. Table 6 shows the relevant statistics.

Source	Type III Sum of Squares	df	Mean Square	F	Sig
Corrected Model	399.396	3	133.132	17.541	.000
Intercept	6045.815	1	6045.815	796.598	.000
Sex	.333	1	.333	.044	.835
group	399.263	1	399.263	52.607	.000
Sex* group	.003	1	.003	.000	.984
Error	432.604	57	7.590		
Total	6932.000	61			
Corrected Total	832.000	60			

a. R Squared= .467 (Adjusted R Squared=.453)

Table 6 Tests of between –subjects effects based on SAMT post-test

As shown in Table 6, the results revealed that the F-ratio was significant for semantic mapping at the $P \le 0.05$ level, so the first null-hypothesis is rejected for a third time. The results also revealed that there was not any relationship between students' gender and the effectiveness of semantic mapping strategy training on reading comprehension; neither was there

any interaction effect observed, providing us with some more evidence to confirm our second hypothesis.

To investigate the possible effect of semantic mapping training and gender as independent variables on recall of reading materials another two-way ANOVA was run on delayed post-test scores (based on *General English* Book). Table 7 indicates the relevant descriptive statistics.

Group	N	Mean	Std. Deviation	Std. Error Mean
1	60	7.1667	1.87007	.24143
2	60	1.4333	1.51116	.19509

Dependant Variable: Recall
Group 1: Experimental group   Group 2: Control group

Table 7 Descriptive statistics based on delayed post-test

As indicated in Table 7, the total mean of experimental group is higher than that of control group. The results of application of a two-way ANOVA are provided below in Table 8.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	992.941[a]	3	330.980	114.862	.000
Intercept	1903.974	1	1903.974	660.748	.000
Sex	828.072	1	828.072	287.371	.000
group	4.953	1	4.953	1.719	.192
Sex * group	1.247	1	1.247	.433	.512
Error	334.259	116	2.882		
Total	3546.000	120			
Corrected Total	1327.000	119			

Dependant Variable: Recall
Group 1: Experimental group   Group 2: Control group

Table 8 Tests of between–subjects effects based on delayed post-test

As it can be seen in Table 8 the results revealed that the F-ratio was significant for recall at the $p \leq 0.05$ level, so the third null-hypothesis is rejected meaning that semantic mapping training has a positive effect on recall. The results also revealed that there was not any relationship between students' gender and the effectiveness of semantic mapping strategy training on recall. Therefore, the fourth null-hypothesis is confirmed meaning that semantic mapping training did not differently for males and females.

Qualitative-quantitative findings

On the basis of the informal questions asked of subjects in the experimental group after the treatment was over, 70% of the subjects in the experimental group believed that semantic mapping training had positive effect on their comprehension and recall of reading texts. This observation is another piece of evidence to reject the first and third null hypotheses. Additionally, to provide both qualitative and quantitative information on the role of semantic mapping in text recall, as a part of immediate and delayed post-tests, subjects in both groups were asked to write a summary of the reading texts. The criteria used in judging the quality of recall protocols were based on the number of words, the quality of writing, the length, the number and the complexity of the sentences used. Incorrect spelling and syntax were not taken into account in the scoring of these written protocols.

In analyzing recall protocols, it was observed that subjects in the experimental group produced on average about forty words in their recall protocols. In terms of the number of sentences, they produced more sentences with a better writing quality judges in terms of grammar, vocabulary and style. Accordingly, the sentences produced by subjects in the experimental group were complex, and included more clauses and conjunctions. In addition, the semantic mapping group used more key ideas and mentioned more key concepts in their writing, and their ideas were more complete than those of the control group.

On the other hand, the majority of the subjects (nearly 90%) in the control group did not write many words in their recall protocols and most of the sentences of those subjects who produced recall protocols were not intelligible. They wrote incomplete sentences and the number of words in each sentence was few. However, both groups' protocols included grammatical and spelling mistakes.

Accordingly, qualitative data analysis of recall protocols of two groups leads us to admit the superiority of recall protocols of the experimental group. The qualitative findings also revealed that semantic mapping training had significant effect on both the amount and the quality of recall of subjects in experimental group. It is worth mentioning that the number of words and sentences and the quality of sentences written by females and males (in both groups) in recall protocols were roughly similar. Therefore, qualitative findings provided further support that gender did not have any significant effect on the effectiveness of semantic mapping training on recall of reading texts.

Discussion

The results of our study confirmed that semantic maps are particularly valuable because a good semantic map can show the key parts of a whole and their relations at a glance, thereby allowing a holistic understanding that words alone cannot convey. Our findings revealed that in this study gender as a moderate variable did not have any effect on the effectiveness

of semantic mapping on reading comprehension and recall. As it was mentioned previously however, the number of males and females were not equal in this study. If the number of males and females were equal and large enough in size, the results might have been different.

The results of the study also showed that there were some areas of correlation between semantic mapping activity and principles and objectives of CLT (Communicative Language Teaching). Semantic mapping is *interactive* because in drafting the map, students work with each other both before and after the targeted language. It is an *informational-gap activity* since the students must fill in gaps in the map and in their personal schemata of the topic as the map takes shape. It is a *predictive activity* because in the pre-reading phase, the students' discussion basically anticipates what will appear in the reading material. It is *student-centered* because the semantic map makes use of the students' prior knowledge and because students control the input at each stage of the maps building. It is *teacher-friendly* because it allows the EFL teacher unobtrusively to pre-assess the students' readiness to do an assignment, to take immediate steps (as in vocabulary introduction) to enhance their preparation, and to post-evaluate how well the students integrated or synthesized what they had studied. And finally, it is an *integrative activity*, since it allows students to connect previous knowledge with new knowledge, thereby expanding their reservoir of knowledge through that interrelationship.

As far as language teaching and learning are concerned, most English learners are interested in using language for expression of meaning, and as CLT is beginning to gain a foothold in Iranian language institutes, and recently in pre-university English courses, so the semantic mapping activity in this context can help students and syllabus designers to achieve their communicative goals of teaching reading interactively. The need for comprehension strategies is something that both students and teachers are aware of. One of the problems in applying comprehension strategies seems to be unfamiliarity with the techniques through which students can better comprehend and recall reading materials. It is recommended therefore that teachers teach designing semantic maps to students because a semantic aspect of a text plays an important part in reading comprehension process. If students at different proficiency levels organize the text semantically, this will enable them to read more effectively and with improved comprehension. Semantic mapping as a teaching technique helps students to increase comprehension because of its multiple advantages in reading comprehension. The major advantage of semantic mapping is that it integrates new information with prior knowledge. It is used as a strategy to activate, assess and embellish students' prior knowledge of a topic before reading, so it seems to have considerable merit.

Conclusion

This research aimed at investigating the effect of semantic mapping training on reading comprehension and recall of Iranian university students (non-EFL) majors. The motivation came from: 1) the key role of reading

skill in the educational system of Iran where EFL learners need to read a huge amount of written English and 2) the observation that in reading classes, most teachers take the mental processes involved in reading for granted and go directly to the creation of a related product.

 The results displayed that semantic mapping instruction had a significant effect on students' reading comprehension and recall, but there was not any statistically significant relationship between gender and the effectiveness of semantic mapping training on reading comprehension and recall. While the study suffers from design problems of non-randomized sampling, and the findings may not therefore be generalizable to wider similar contexts, the results reported here seem to suggest that the familiarity of readers in knowing about and applying the pre-reading strategy of semantic mapping will lead to better comprehension and recall, although further research may be required to substantiate this claim, especially in EFL contexts.

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