The Influence of Concept Mapping on Reading Comprehension of Iranian English Students Employing Persuasive and Descriptive Texts

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Abstract—Reading is considered as one of the complex skills in EFL context. Comprehension is the understanding of what is read. To be able to understand written material, learners need to use congenial strategies and have sufficient vocabulary. The present study intended to investigate the influence of concept mapping on reading comprehension of EFL learners employing persuasive and descriptive texts. A language proficiency test was administered to 70 EFL learners, among whom 52 learners were selected as the participants of the study. They were randomly assigned in four groups: two control groups and two experimental groups. Before any instruction the researcher administered a pre-test. Then, learners in two experimental groups received treatment of concept mapping as reading comprehension texts while learners in two control groups received no treatment of concept mapping. The results of pre test and posttest were analyzed by SPSS soft-ware using one way ANOVA statistical procedure. After analyzing the post-test scores, the results indicated that the learners in two experimental groups outperformed the learners in two control groups in reading comprehension. This study also showed that semantic mapping has different effect across types of texts. Learners who received persuasive text performed well than who received descriptive text.

Index Terms—concept mapping, reading comprehension, persuasive text, descriptive text

I. INTRODUCTION

Reading comprehension is one of the most important ways for learning English and it has a close relationship with an effective writing style. Reading comprehension enables students to become lifelong literates (Belets, Yasar, 2007 cited in Kirmizi 2009) and an effective reading process is based on using reading comprehension strategies effectively (Allen, 2003;Keer & Verhaegh, 2005 cited in Kirmizi 2009). In the teaching-learning process in schools, most of the learning instruments are the sources based on the language, and this puts an increased emphasis on the reading comprehension levels of students (Kirmizi, 2009). Recently, there has been a shift from what to learn to how to learn. In order to be efficient, learners try to use some strategies. Novak and Canas (2006, p.7) stated that by using concept mapping students learn how to learn meaningfully. He tried to help learners become better. So for 20 years he taught a course at Cornell University and now this course is published in 9 languages. This book is learning How to Learn.According to Gul and Boman (2006) concept maps were developed from the work of Novak (1992) and his colleagues in 1980 at Cornel University. Novak (1992) described a concept maps as organizational tools to represent knowledge as well as a meta-cognitive strategy to promote meaningful learning.

Learning English texts is not easy for majority of the students and also because of some limitations such as lack of facilities, crowded classes and traditional teaching methods; teachers are forced to change their techniques during teaching. The students' low achievement in learning from English texts requires an important research on teaching techniques to improve students' level. Persuasive and descriptive texts unlike chronological or cause and effect writing do not have an understandable written procedure and because they are mostly used in language learning, students need to have a better understanding of them. So we can provide a relation among concepts by using concept mapping techniques as a meta-cognitive strategy.

II. LITERATURE REVIEW

There are many references that show concept mapping is an important technique for learning English. For the first time, concept mapping was presented by Joseph Novak in 1972. He tried to extend concept learning in science education and he broadened it in science education. (Fahim & Mellati, 2012, p.20). Novak and Gowin (1984) have spent several decades researching and developing educational theories and they found concept mapping to be one tool that greatly enhances the learning process. Also the idea of concept mapping is according to Ausubel's learning theory, which stresses the assimilation of new data into the students 'prior knowledge for meaningful learning.Novak and Canas (2006, p.7) stated that by using concept mapping students learn how to learn meaningfully. He tried to help learners become better. So for 20 years he taught a course at Cornell University and now this course is published in 9 languages. This book is learning How to Learn. Shern, Trochim, and Lacomb (1995) believed that the concept mapping

technique is useful not only for explicating program theories but also for identifying the key elements of a program and portraying their relationships to one another. By definition of Ahangari and Beˡhzadi (2011, p.101) today, concept mapping has been used as an important tool for learning and teaching. By concept maps you can make your ideas visual. When we are building new concepts into the perceptual framework concept maps permit prior experience and understanding to be taken into consideration. Novak and Cannas (2006) believed that three ideas from Ausubel's assimilation theory emerged as central to their thinking. First, Ausuble sees the development of new meanings as building on prior relevant concepts and propositions. Second, he sees cognitive structure as organized hierarchically, with more general, more inclusive concepts occupying higher levels in the hierarchy and more specific, less inclusive concepts subsumed under the more general concepts. Third, when meaningful learning occurs, relationships between concepts become more explicit, more precise, and better integrated with other concepts and propositions. Cannas, Hoffman, Coffey, and Novak (2003, cited in Koc, 2012) believe that research in cognitive science has demonstrated that learning is meaningful when students are active and when they relate new knowledge to relevant concepts they already know. It also seems that making connection between new concepts and previous knowledge is a very significant part in language learning. Leauby and Brazina (1998, p 137) worked on use of concept mapping in accounting education and they concluded that since educational research has shown that that concept mapping is a powerful instrument to help students provide a framework for learning how-to-learn, maps may be an applicable strategy to adopt for accounting education.

III. METHODOLOGY

A. Objective of the Study

The present study aimed at finding out the effect of concept mapping strategy on students' reading proficiency and examining if using concept mapping strategy is different across types of texts (Descriptive vs. Persuasive). Based on these objectives the following research hypotheses are raised:

1) Concept mapping does not have significant effect on EFL students reading comprehension.

2) The effect of teaching semantic mapping is not significantly different across types of texts (Descriptive vs. Persuasive).

B. Participants

In order to conduct the present research, a language proficiency test was administered to 75 students who attended EFL classes in two big and important institutes in Sistan and Baluchestan province. From the results of proficiency test, 52 male and female students were selected. 30 of selected students were from Moallem institute (12 male and 18 female) and 22 students were selected from Khane Zaban institute (8 male and 14 female). The experiment on students was conducted during 2 terms (about 1.5 month).

C. Instrument

To achieve the aims of the study, the following tools were used:

Language Proficiency Test

A language proficiency test selected from Oxford Solution Book was administered for testing all the participants' initial homogeneity.

The items of the test fell into two types:

A) Grammar and vocabulary: Part A of the test dealt with grammar and vocabulary which included 50 multiple choice items.

B) Reading comprehension: Part B dealt with reading comprehension and included 1 true/false and 5 multiple choice items.

Pre-test

The pre-test included one persuasive text and one descriptive text which were selected from the following site *www.englishdaily626.com*. The persuasive text was entitled *Watching TV*. It consisted of 3 multiple choice items and 2 true false items. The descriptive text was entitled *Dinosaurs* and consisted of 6 multiple choice items and 1 true false item.

Posttest

The post-test included one persuasive text and one descriptive text which were again selected from *www.englishdaily626.com*. The persuasive text was entitled *Smoking*. It consisted of 4 multiple choice items and 1 true false items. The descriptive text was entitled *Quieting the Mind* and consisted of 3 multiple choice items and 1 true false items.

D. Data Collection Procedures

First, a language proficiency test selected from Oxford Solution Book was administered for testing all the participants' initial homogeneity. It was given to 75 students and just 52 male and female students whose scores were above 39 (upper intermediate level) were accepted. Second, as the study used the quasi-experimental design, the participants were selected after analyzing the results of a proficiency test and were then randomly assigned to four

groups (two experimental groups & two control groups). Before giving any instruction to the experimental groups, as a pre-test, the two groups received persuasive texts, and the two other groups received descriptive texts. I asked the participants to read texts and answer the questions following them. Third, following the pre-test the participants attended 15 seventy-five minute sessions. The participants in the experimental groups received the treatment of concept mapping during 15 sessions. Strategy training was done by applying treatment on two experimental groups and applying no treatment on two control groups. To conduct the treatment, every session a new persuasive text and a new descriptive text were taught to two groups of participants. The concept map of each text was drawn on the board by the researcher, and the participants followed the text according to its concept map. Fourth, when the treatment was over, all groups received a post test. Again two groups received persuasive texts and two groups received descriptive texts which consisted of a reading comprehension text with multiple-choice items.

E. Data Analysis

The results of pre test and posttest were analyzed by SPSS soft-ware using one way ANOVA statistical procedure and the differences between pre-test and posttest were analyzed by Paired Sample t-test and recommendations and suggestions in the light of the study findings were presented.

IV. RESULTS

While sampling details were mentioned in the last chapter, here, again they are repeated. A language proficiency test was administered to 72 learners and out of them just 52 participants (20 male & 32 female) were accepted. Table 1 presents the descriptive statistics of the four groups.

TABLE 1:
DESCRIPTIVE STATISTICS FOR THE PROFICIENCY TEST

	N	Mean	Std. deviation
Persuasive +cm	13	52.8462	3.86967
Persuasive -cm	13	52.0769	5.37683
Descriptive +cm	13	52.0000	.48807
Descriptive -cm	13	53.9231	3.30307
Total	52	52.7115	4.04551

Table 1 shows that the mean and standard deviation of the first group are 52.84 and 3.86 respectively, the mean and standard deviation of the second group are 52.07 and 5.37, and the mean and standard deviation of third group are 52.00 and 3.48, while the mean and standard deviation of the fourth group are 53.92 and 3.30. To see if the four groups did not differ significantly from each other in language proficiency an ANOVA was run the results of which follow:

TABLE 2:
ANOVA RESULTS FOR PROFICIENCY TEST

comprehension	Df	F	sig
Between groups	3	.620	.606
Within groups	48		
total	51		

The findings of above table show that the difference between groups on comprehension is not significant at 99% of confidence level with an $F=0.620$ and degrees of freedom 3 and 48. So the groups have similar profiles in terms of language proficiency.

A. Data Analysis for the First Question

As a second step, before any instruction the four groups received a pre-test. Two groups received persuasive texts and two groups received descriptive texts. Table 5 presents the descriptive statistics of the four groups in the pre-test.

TABLE 3:
DESCRIPTIVE STATISTICS FOR THE PRE TEST

	N	**Mean**	**Std. deviation**
Persuasive +cm	13	12.8462	2.82389
Persuasive -cm	13	11.5385	1.45002
Descriptive +cm	13	11.3077	2.13638
Descriptive -cm	13	11.0769	2.21591
Total	52	11.6923	2.25387

As revealed in table 5 the mean and standard deviation of the first group are 12.84 and 2.82 respectively, the mean and standard deviation of the second group are 11.53 and 1.45, and the mean and standard deviation of third group are 11.30 and 2.13, while the mean and standard deviation of the fourth group are 11.07 and 2.21.

The scores were subjected to a one-way ANOVA the results of which follow:

TABLE 4:
ANOVA RESULTS OF PRE TEST

comprehension	Df	F	sig
Between groups	3	1.668	.186
Within groups	48		
total	51		

As the findings of above table show, the between group DF is 3 and the within group DF is 48, and the difference between groups on pre test with F=1.66 at 95% of confidence level is not significant. Based on these data, it was concluded that the four groups have similar profiles in reading comprehension proficiency.

As the third step, the four groups received post-test. Again, two groups received persuasive texts and two groups received descriptive texts. Table 9 present descriptive statistics of four groups in the posttests.

TABLE 5:
DESCRIPTIVE STATISTICS FOR THE POSTTEST

	N	Mean	Std. deviation
Persuasive +cm	13	27.5385	1.61325
Persuasive -cm	13	22.3077	5.07255
Descriptive +cm	13	27.3846	2.87340
Descriptive -cm	13	22.5385	6.65351
Total	52	24.9423	5.05039

As shown in table 5, the mean and standard deviation of the first group are 27.53 and 1.61 respectively, the mean and standard deviation of the second group are 22.30 and 5.07, and the mean and standard deviation of the third group are 27.38 and 2.87, while the mean and standard deviation of the fourth group are 24.94 and 5.05. As the existence of a significant difference between the groups could not be determined through simple descriptive statistics, the data were subjected to a one-way ANOVA the results of which follow:

TABLE 6:
ANOVA RESULTS OF POSTTEST

comprehension	Df	F	sig
Between groups	3	5.450	.003
Within groups	48		
total	51		

The findings reported in the above table show the between group DF is 3 and the within group DF is 48, and the results revealed a significant difference between the groups on post-test with F=5.450 at 95% of confidence level. So groups do not have similar performance on post-tests and according to mean, group persuasive + CM and group descriptive + CM (which received concept map strategy training) have a better performance than two other groups.

When the results of pre-test and post test were analyzed, as the fourth step the differences between pre-test and post-test were analyzed by paired t-tests.

First, group one who received concept mapping instruction with reference to persuasive texts during 15 sessions.

TABLE 7:
PAIRED SAMPLES STATISTICS OF FIRST GROUP

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test (persuasive + CM)	11.6923	13	1.79743	.49852
	Post test (persuasive +CM)	27.5385	13	1.61325	.44743

The above table shows that first group in pre-test has a mean and SD of 11.62 and 1.79 respectively and also it has a mean and SD of 27.53 and 1.61 respectively in the posttest.

TABLE 8:
PAIRED SAMPLES TEST RESULTS OF FIRST GROUP

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1 group1 - group1	-15.84615	2.60916	.72365	-17.42285	-14.26946	-21.898	12	.000

Paired t-test results show that there is a significant difference between pretest and posttest of group one with t=-21.89 and degree of freedom 12 in 99% of confidence level. As the treatment of concept mapping was received by participants of this group it can be stated that because of the effect of concept mapping learners had a better

performance in the posttest and there is significant difference between group one's performance in the pre-test and posttest.

Second, group two who received persuasive text and no treatment of concept mapping.

TABLE 9:
PAIRED SAMPLES STATISTICS OF SECOND GROUP

		Mean	N	Std. Deviation	Std. Error Mean
Pair1	Pre test(Persuasive-CM).group2	11.5385	13	1.45002	.40216
	Post test (Persuasive-CM).group2	16.8462	13	1.14354	.31716

The above table shows that second group in pretest has a mean and SD of 11.53 and 1.45 and also it has a mean and SD of 16.84 and 1.43 respectively in the posttest.

TABLE 10:
PAIRED SAMPLES TEST RESULTS OF SECOND GROUP

	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1 .group2 – .group2	-5.30769	1.65250	.45832	-6.30629	-4.30909	-11.581	12	.000

Paired t-test results show that there is a significant difference between pre-test and posttest of the second group with t=-11.58 and degree of freedom 12 in 95% of confidence level. It means that learners had a better performance in posttest.

Although this could not be related to CM, as they did not receive CM. It could be perhaps due to some other factors like the number of vocabulary items learnt.

Third, group three who received descriptive text and also had concept mapping treatment during 15 sessions.

TABLE 11:
PAIRED SAMPLES STATISTICS OF THIRD GROUP

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test (Descriptive +CM).group3	11.3077	13	2.13638	.59252
	Post test (Descriptive +CM).group3	22.4615	13	1.71345	.47522

The above table show that third group in pretest has a mean and SD of 11.30 and 2.13 respectively and also it has a mean and SD of 22.46 and 171 respectively in the posttest.

TABLE 12:
PAIRED SAMPLES TEST OF THIRD GROUP

	Paired Differences							
			Std. Error Mean	95% Confidence Interval of the Difference				Sig. (2-tailed)
	Mean	Std. Deviation		Lower	Upper	t	df	
Pair 1 .group3 - .group3	-11.15385	3.07804	.85370	-13.01389	-9.29380	-13.065	12	.000

Paired t-test results shows that there is a significant difference between pretest and posttest of the third group with t=-13.06 and degree of freedom 12 in 95% of confidence level. As the treatment of concept mapping was received by participants of this group it can be stated that because of the effect of concept mapping learners had a better performance in the post-test and there is significance different between group three in pre test and posttest.

Fourth, group four who received descriptive text and no treatment of concept mapping.

TABLE 13:
PAIRED SAMPLES STATISTICS OF FOURTH GROUP

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pre test (descriptive -CM).group4	11.0769	13	2.21591	.61458
	Post test (descriptive-CM.group4	16.6923	13	1.18213	.32786

The above table shows that fourth group in pretest has a mean and SD of 11.07 and 2.21 respectively and also it has a mean and SD of 16/69 and 1/18 respectively in the posttest.

TABLE 14:
PAIRED SAMPLES TEST OF FOURTH GROUP

| | Paired Differences | | | | | | | |
| | | | | 95% Confidence Interval of the Difference | | | | |
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1 s.group4 - mind.group4	-5.61538	2.21880	.61538	-6.95619	-4.27458	-9.125	12	.000

Paired t-test results shows that there is a significant difference between pre test and post test of fourth group with t=-9.12 and degree of freedom 12 in 95% of confidence level. It means that learners had a better performance in post-test which may be due to factors other than CM.

B. Data Analysis for the Second Question

As the last step the difference between persuasive text and descriptive text were analyzed to understand that teaching semantic mapping is more effective in persuasive text or descriptive text.

TABLE 15:
INDEPENDENT SAMPLES STATISTICS

		Mean	N	Std. Deviation	Std. Error Mean
group	persuasive	25.7308	26	3.23181	.63381
	descriptive	12.0769	26	2.57563	.50512

The findings of above table shows that groups who received persuasive text have a mean and SD 25.73 and 3.23 respectively and groups who received descriptive text have a mean and SD 12.07 and 2.57.

TABLE 16:
INDEPENDENT SAMPLES T-TEST

| | Paired Differences | | | | | | | |
| | | | | 95% Confidence Interval of the Difference | | | | |
	Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
group persuasive - descriptive	13.65385	4.35378	.85385	11.89532	15.41238	15.991	25	.000

Independent samples t-test results show that there is a significant difference between persuasive text and descriptive text with t=15.99 and degree of freedom 25 in 95% of confidence level. Since persuasive text has greater mean so semantic mapping was more effective in persuasive texts.

V. DISCUSSION

As stated in the first hypothesis, there are no statistically significance differences between achieving reading comprehension by using concept maps in the experimental groups and achieving reading comprehension by control groups. To this hypothesis, means and standard deviations of the experimental and the control groups′ results were computed. T-test was used to measure the likely significance of differences.

The findings of the study were limited to the experiment "concept maps strategy "since all variables such as age, and general proficiency in English language were controlled for before the experiment.

The results of this study show that there were significant differences in favor of the experimental groups due to the concept maps strategy.

This result agreed with the results of almost all the previous studies like:

Pankratius (2006), Willerman and Harg (2006) Esiobu and Soyibo (2006), Chularu and DeBacker (2004), Snead and Snead (2004), Pegg (2007), that revealed the effect of using concept mapping on achieving in different subjects.

Ahangari and Behzadi (2011) revealed that the explicit teaching of computer-mediated concept mapping had a positive effect on the writing skill.

Talebinezhad (2007) revealed that students gained higher self -regulation as the result of concept maps strategy.

Dias (2010) revealed that the construction of meaning by the creation of concept maps can be an effective reading strategy in English as an L2. Also, Rice, Ryan, Samson (1998) showed that a concept map might be used in assessing declarative and procedural knowledge, both of which have a place in the science classroom. One important implication

of these results is that science curriculum and its corresponding assessment need not be dichotomized into knowledge/comprehension versus higher-order outcomes.

According to means and SDs and also other statistical analyses shown in chapter four it was observed that there was significant difference between experimental groups and control groups in reading comprehension and experimental groups had a better performance in posttest, due to using semantic mapping strategy.

The second hypothesis of the study was stated as follows:

The effect of teaching semantic mapping is not significantly different across types of texts (Descriptive vs. Persuasive).

Results showed that there were differences of statistical significant in types of texts and therefore rejected this null hypothesis. According to independent sample t-tests, it was observed that concept maps had more effect on learning from persuasive texts. These results agreed with Vakilifard and Armand (2006) who used concept maps in teaching comprehension texts. Their studies revealed that concept mapping has a positive effect on comprehension.

VI. CONCLUSION

This study intended to investigate the effect of concept mapping strategy training on the development of EFL learners' reading comprehension. The research questions dealt with the effect of concept mapping strategy on EFL learners' reading comprehension ability in general and in terms of different between persuasive and descriptive texts in particular. The findings of the study revealed that explicit teaching of concept mapping strategy was influential in the improvement of the EFL learners' reading comprehension. It also showed that Learners who received persuasive texts had a better performance than learners who received descriptive texts.

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