Do Different Instruction Modalities Matter? Exploring the Influence of Concept Mapping and Translation Strategies Instruction on the Reading Comprehension Ability of Adult EFL Learners

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Abstract—The present study was an attempt to compare the effect of concept mapping strategy instruction and translation strategy instruction on the reading comprehension ability of the Iranian EFL learners. To do so, 90 EFL learners at the intermediate level studying in a language institute in Ardabil, north Iran were randomly assigned into three equal groups (concept map, translation and control). Having taken a reading pretest, the participants in experimental groups were instructed using mentioned strategies whereas the control group learners were taught the same content with no strategies integrated. Results of analysis of covariance (ANCOVA) revealed that the participants in the experimental groups significantly outperformed the participants in the control group, suggesting that the application of concept mapping and translation strategy training can generate more positive effect on the reading comprehension ability of the learners. Also, the findings of the study indicated that the concept mapping group outperformed the translation strategy group on the reading posttest. Pedagogical implications and suggestions of the study will be discussed.

Index Terms—concept mapping strategy, strategy-based instruction, translation strategy, reading comprehension, EFL learners

I. INTRODUCTION

Reading comprehension is the most significant source of information access in an EFL situation (Crystal, 1996). As Swalander and Taube (2007) maintain "good reading ability is the key to success in educational settings and this is why researchers try to find effective educational and psychological variables that can explain variations in reading ability and academic achievement" (p. 207). The literature on reading comprehension skill abounds studies which aim at integrating different teaching modalities to enhance the comprehension ability of EFL learners. Strategies-based instruction (SBI), in which learners get familiarize with techniques and procedures to facilitate making sense out of a text, is now widely assumed to boost the reading ability of second language learners. Antoniou and Souvignier (2007, p. 43) maintain that "effective reading requires the use of strategies that are explicitly taught". It could be argued that learners are most successful when their instructors employ different strategies to help them read and write challenging texts.

Although numerous studies have investigated and categorized the types of learning strategies employed by efficient language learners, 'there have been fewer studies focusing on the second goal of trying to teach language learning strategies in classroom settings (Chamot, 2005). One such strategy, which has attracted the reading researchers' attention, is concept mapping. In fact, the effect of concept mapping strategy instruction on the reading comprehension ability of the EFL learners has been the home of choice for ELT researchers since1980s (Talebinejad& Mousapour Negari, 2007). The positive effect of concept mapping instruction on different educational outcomes has been shown by many studies (Chularut& DeBacker, 2004; Liu, Chen & Chang, 2010; Ojima, 2006; Snead & Wanda, 2004). There are, however, few studies investigating the effect of concept mapping on reading comprehension of EFL learners.

In a study by Chularut and DeBacker (2004), the effect of concept mapping on academic achievement, self-efficacy, and self-regulation of students in English classes as a second language was investigated. The subjects of the study were college and high school students, who enrolled for English classes. The findings of the study showed that the group of students who used concept mapping achieved higher scores in English achievement, self-efficacy, and self-regulation in comparison to control group(as cited in Salehi, Jahandar, & Khodabandehlou, 2013).

Vakilifard and Armand (2006) studied the effect of concept map on French (as L2) reading comprehension. The findings of this study showed that the experimental group did better in reading comprehension in comparison to control group.

Moreira and Moreira (2011) used concept mapping in a research in foreign language class as an instrument for context comprehension of course books and achieving meaningful learning. The findings of the study showed that concept mapping can effectively lead to meaningful learning and students got self-confidence in transferring the concept to new situations.

Moreover, translation has often been classified as one of the cognitive learning strategies (Chamot, 1987; Chamot& Kupper, 1989; Chamot et al., 1987; O'Malley et al., 1985a; O'Malley et al., 1985b; Oxford, 1990). Chamot (2005) argues that translation could be considered a learning strategy and can affect quality and process of composing essays by the learners. Gómez, López and Marin, (2011) also consider translation as a learning strategy which reduces the learners' stress in reading comprehension activities.

Bassnett (1998) believed that "translation offers a crucial lesson in how to read, since it is a critical way into the text." She saw it as an effective means of forcing students to read texts thoughtfully and to concentrate on the lexical, grammatical and textual levels, and improving general knowledge, while "unveiling students' problems in comprehending (English) texts" (Brini, 2000, p.?). Translation can be a useful tool to analyze comprehension pitfalls, which may lead to problems in discourse processing (Abdrabou, 2003).With respect to empirical studies, Hsieh (2000) found that translation benefited Taiwanese students' English reading in terms of increasing their reading comprehension, reading strategies use, vocabulary learning, and cultural background knowledge. Liao (2006) conducted both quantitative and qualitative surveys on 351 Taiwanese students on their belief about translation. Liao reported participants as believing that translation helped them acquire English language skills like reading, writing, speaking, vocabulary, idioms, and phrases.

Recently, there have been many attempts and researches for improving the situation of learning/teaching English in Iran. However, as Jalilifar (2010) points out, "despite the growing interest in learning English as a foreign language in Iran, students at the college level seem rarely proficient enough to read and comprehend English language texts" (p.98). Due to Iranian learners' problems in comprehending texts, many of them loose their interest in reading English texts and this could lead to their failure in academic English courses. As such, "finding an efficient approach which facilitates learners' learning and helps them comprehend better seems to be quite necessary" (p. 98) (as quoted by Khajavi & Ketabi, 2012).

The present study was motivated by the above mentioned researches on the importance of teaching language learning strategies. More specifically, we intended to see if explicit teaching of "concept mapping" and "translation" strategies. Can pave the way and help the learners better decode the texts. The two mentioned strategies were selected on the assumption that the translation strategy is constantly used in Iranian EFL classes and concept mapping strategy would be a cogent strategy to help foreign language learners sum up English passages and easily appreciate what the gist of reading materials are.

Considering the purpose of the study, the following research questions were formulated.

R.Q.1 Does concept mapping strategy improve reading comprehension ability of Iranian EFL learners?

R.Q.2 Does translation strategy improve reading comprehension ability of the Iranian EFL learners?

R.Q.3 Is reading comprehension ability of the EFL learners differently improved through the concept mapping and translation strategies?

Considering the research questions mentioned above, the following null hypotheses were presented:

H01. Concept mapping strategy does not improve reading comprehension ability of Iranian EFL learners.

H02. Translation strategy does not improve reading comprehension ability of the Iranian EFL learners.

H03. Reading comprehension ability of the EFL learners is not differently improved through the concept mapping and translation strategies.

II. METHODOLOGY

A. Participants

The participants of the study were 90 intermediate level male and female students with the age range 18 to 25 in a language institute in Ardabil, Iran. These participants were chosen from a pool of 150 students according to their performance in a sample NELSON proficiency test.

B. Instrumentation

The data for the present study were collected by means of two tests as follows: a NELSON test and a validated researcher-made reading comprehension test which was used as both pre-test and post-test of reading comprehension development.

Based on the scores, 90 students whose scores fell within one standard deviation above and below the mean (19.83 ± 4.29) were selected as the main participants.

The second instrument was a test of reading comprehension (selected from among the reading tests presented in the test manual of the learners' course book). The test was piloted with30 similar students. The result is represented in Table 2.2. The reliability of the test was 0.83 as measured by KR-21 method. This test served as the post-treatment reading comprehension measure.

C. Procedure

To begin with, Nelson proficiency test was administered and, as mentioned above 90 intermediate learners were randomly divided into three groups. As the treatment in the first experimental group were instructed how to use concept mapping strategies to do reading comprehension tasks. More specifically, the learners were introduced to the nature of concept map as "a special form of a web diagram for exploring knowledge and gathering and sharing information" (Shimerda, 2007, p.118).Then they were asked to employ the five steps of concept mapping strategy on the reading materials. The steps were selected based on Yağmurşahin (2013, p.590).

In the second experimental group, the participants were asked to focus on translation strategies while doing reading comprehension. The learners in this group were expected to translate the given passages prior to answering the comprehension questions or analyzing the texts. The strategies they used were obtained from O'Brien (2011), who considers "translation strategies as basis for cognitive explorations" (p.23) and introduces translation strategies such as equation, substitution, divergence, convergence, amplification, reduction, diffusion, condensation, and reordering.

The learners in the control group did not receive any specific training on the concept mapping or translation strategy trainings; however, they went through the same passages and comprehension questions with the teacher explaining the meaning of unknown words and asking the learners to read aloud as well as paraphrase difficult sentences.. The treatment sessions lasted for 20 sessions and learners in all groups sat the posttest of the study immediately after the last session.

III. DATA ANALYSES AND RESULTS

As mentioned above NELSON test was administered to the original pool of the participants to select the intermediate level learners. Table I below shows descriptive statistics for the participants' performance on this test.

TABLE I.
DESCRIPTIVE STATISTICS FOR THE SCORES ON NELSON TEST

	N	Range	Minimum	Maximum	Mean	SD
NELSON	150	6.0	17.0	23.0	25.44	4.294

Following the proficiency measure, the participating groups sat the pretest of the study. Table II below represents the descriptive statistics for the scores on this test.

TABLE II.
DESCRIPTIVE STATISTICS FOR THE SCORES ON PRE-TEST

	N	Mean	Std. Deviation	Std. Error
Translation	30	25.00	1.414	.258
Concept Mapping	30	23.07	1.363	.249
Control	30	26.07	1.363	.249

Once the treatment sessions were over, the participants took the posttest of the study. Table III shows descriptive statistics for the groups' performance on this test.

TABLE III.
DESCRIPTIVE STATISTICS FOR SCORES ON POST-TEST

Group	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Translation	16.877	.141	16.596	17.158
Concept Mapping	20.532	.135	20.265	20.800
Control	15.942	.132	15.680	16.203

An analysis of covariance (ANCOVA) was run to compare the means of the three groups on the post-test of reading comprehension while controlling for possible differences between their entry reading ability. Before running the analysis it was necessary to make sure that the assumptions associated with ANCOVA were met.

A. Assumption of Homogeneity of Variances

As displayed in Table IV, the results of Levene's tests were non-significant (F (2, 87) = .1.68, P > .05) meaning that there was not any significant difference between the variances of the groups.

TABLE IV.
TESTING HOMOGENEITY OF VARIANCES IN POST-TEST SCORES

F	df1	df2	Sig.
1.683	2	87	.192

B. Linear Relationship between the Covariate and Dependent Variable

The linear relationship between the covariate (pre-test) and dependent variable (post-test) was checked through scatter plots drawn for each group. For this assumption to be met, the spread of dots should fall on the diagonal showing no marked rise-and-fall patterns.
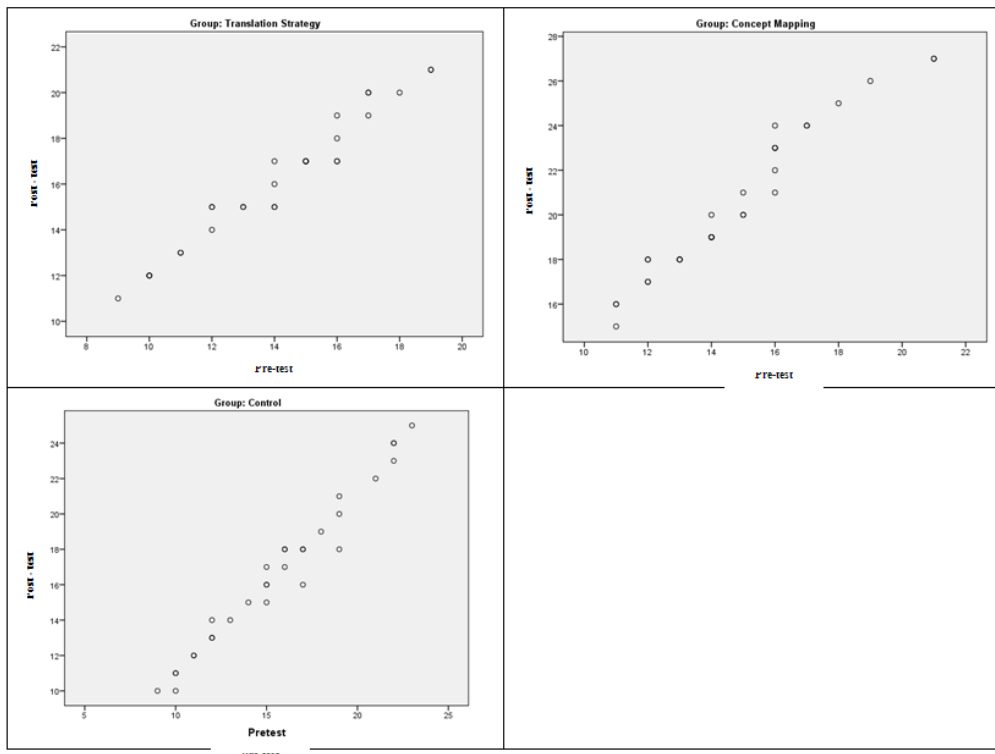

Figure 1. Scatter Plot Representing Testing Assumption of Linearity

C. Assumption of Reliability of the Covariate

The reliability of the pre-test as computed by KR-21 formula turned out to be 0.68, which can be considered as acceptable.

D. Assumption of Homogeneity of Regression Slope

The homogeneity of regression slopes can be probed by a single scatter plot containing all groups. As displayed in Scatter Plot 2 the regression slopes all showed the same trend. These results indicated that the three groups showed homogeneous regression slopes.
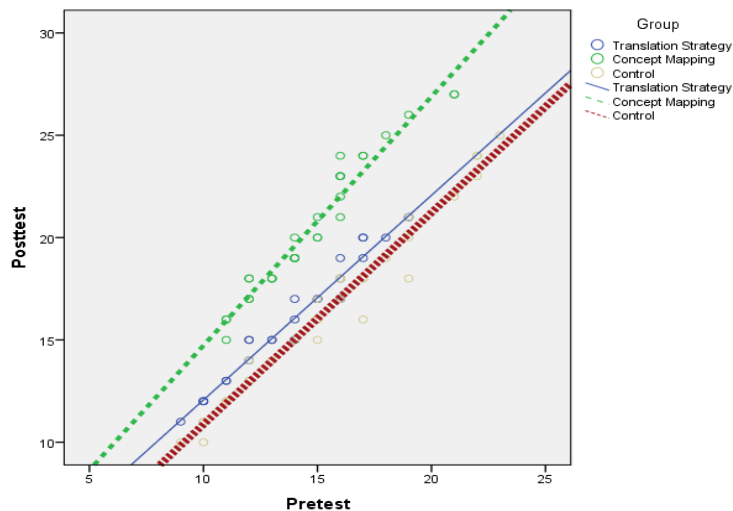

Figure 2. Scatter Plot Representing Testing Assumption of Homogeneity Regression Slope

An analysis of covariance (ANCOVA) was run to examine any likely influence of teaching strategies on reading comprehension ability of the learner. Since the sig value corresponding the group in Table V is far below the alpha level

of 0.05, it can be claimed that different interventions have been able to influence the reading comprehension ability of the learners differently (F (2, 86) = 312.94, P < .05, Partial η2 = .87).

TABLE V.
ANCOVA ON THE POST-TEST SCORES

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Pre-test	1056.996	1	1056.996	1785.742	.000	.954
Group	370.470	2	185.235	312.945	.000	.879
Error	50.904	86	.592			
Total	29875.000	90				

To find out where the exact differences lie, the post-hoc comparison tests was run to compare the groups two by two (Table VI below) in order to probe the three null-hypotheses raised in this study. The results indicated that:

A: There was a significant difference between the mean scores of the Concept Mapping (M = 20.53) and control group (M = 15.94; MD = 4.59, P < .05). Based on these results, it was concluded that the first null-hypothesis stating that "concept mapping strategy did not improve reading comprehension ability of Iranian L2 learners" was rejected. The Concept Mapping group outperformed the control group on the post-test of reading comprehension after controlling for possible effects of the pre-test.

TABLE VI.
POST-HOC COMPARISONS

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.b	95% Confidence Interval for Differenceb	
					Lower Bound	Upper Bound
Translation	Control	.935*	.195	.000	.460	1.410
Concept Mapping	Translation	3.655*	.196	.000	3.178	4.133
	Control	4.591*	.186	.000	4.137	5.044

*. The mean difference is significant at the .05 level.

B: There was a significant difference between the mean scores of the Translation Strategy (M = 16.87) and control group (M = 15.94; MD = .93, P < .05). Based on these results, it was concluded that the second null-hypothesis as "translation strategy did not improve reading comprehension ability of Iranian L2 learners" was rejected. The Translation Strategy group outperformed the control group on the post-test of reading comprehension after controlling for possible effects of the pre-test.

C: There was a significant difference between the mean scores of the Concept Mapping (M = 20.53) and Translation Strategy group (M = 16.87; MD = 3.65, P < .05). Based on these results, it was concluded that the third null-hypothesis as "reading comprehension ability of the L2 learners did not differentially improve using concept mapping and translation strategies" was rejected. The Concept Mapping group outperformed the Translation Strategy group on the post-test of reading comprehension after controlling for possible effects of the pre-test.

IV. DISCUSSION AND CONCLUSIONS

The current study used two strategy-based teaching interventions and examined the reading comprehension development of two groups comparing them against the performance of a third control group. The findings revealed that integrating concept mapping strategies in the process of reading instruction might help facilitate doing reading task and consequently assist retention. It seems that using concept maps can be more promising compared to even translation perhaps because it provokes learners to develop deeper insight into the content as well as linguistic forms assumed to play a role in making sense out of a written text.

The second finding of this research revealed that the translation strategy group outperformed the control group on the post-test of reading comprehension. This also represented that instructing reading through administration of phases of text translation might have the potential to facilitate comprehension. This finding is also supported by the previous research, though most of the researches conducted have not compared the impact of translation strategy training with other strategies used in teaching reading comprehension including concept mapping. Bassnett (1998) argued that translation strategies could increase the learner (translator)'s understanding of the text. Mahmoud (1998) also researched the impact of translation in FL reading comprehension and came to know that translation strategies were a neglected didactic procedure in this regard. He then suggested employing translation as a valuable tool in teaching the foreign language reading comprehension. Azizinezhad (2006) investigated the teachability of translation strategies and came to know that translation strategies could be taught to the learners and this really could help the low level learners come up with sound understanding of the materials they cover, though it could be considered a bit time−consuming. Liao (2006) studied the EFL learners' beliefs about and strategy use of translation in English learning and found that majority of the learners believed that translation strategies could help them improve their understanding of the second / foreign language texts and developing their foreign language.

Another finding of the study emerging from post hoc comparisons of the group performances in posttest depicted that use of concept mapping strategy yielded better results compared to translation strategy The findings of this study concerning the positive impact of concept mapping strategies on the EFL learners' reading comprehension development support some previous studies (e.g., Clayton, 2006; Deylam Salehi, etal, 2013; Douma, etal, 2009; Edwards, et al, 1983; Gómez, et al, 2011; Grab, 2002; Hadley, 2003).Our findings also corroborate Kalhor and Shakibaei's (2012) finding that categorical facilitation, which is a verbal input device within the body of concept mapping, positively affects L2 vocabulary learning and reading comprehension development in a classroom setting.

In conclusion, the results of the study suggest that use of concept mapping and translation strategies have a direct impact on students' reading comprehension ability and concept mapping seems to be even more beneficial in promoting L2 reading comprehension.

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