

The Effect of Cooperative Strategies versus Concept Visualization on Reading Comprehension Ability of Intermediate EFL Learners

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Abstract—Reading in foreign language learning has an important place. While the advances in L1 reading comprehension have led us to gain a more comprehensive picture of the nature of reading, the similar studies in L2 context have not had the same impact. Furthermore, the fact that the majority of Iranian second language (L2) learners have been taught by traditional methods has compounded the problem. To unravel the aforementioned dilemma, this study was conducted to find out the effect of cooperative strategies versus visualization on Iranian English as a foreign language (EFL) students' reading comprehension. In order to carry out the study, 45 female EFL learners, with the age range of 17 to 18 were chosen and after administering the pretest, they were assigned to two experimental groups (visualization and cooperative strategies) and one control group. A predominantly quantitative approach coupled with quasi-experimental design was used. After the treatment, a posttest was given to all groups. The meticulous analysis of data using paired *t* test and One-Way ANCOVA indicated that the participants in cooperative group outperformed the students in visualization group on reading comprehension test. It also revealed that conventional teaching approach did not have any significant effect on students' performance in control group. This study offered some implications for teachers and course developers.

Index Terms— cooperative strategy, concept visualization, reading comprehension, EFL

I. INTRODUCTION

Reading in English as foreign language has a central role in academic learning. This can be attributed to the host of reasons. First, foreign language learners have little direct access and exposure to the target language outside of classroom context and hence most of their interactions come through reading (Boss, 2002, as cited in Altamimi, 2006). Second, foreign language students themselves consider reading as a special priority and they want “to be able to read for information and pleasure, for their career, and for study purposes” (Richards & Renandya, 2002, p. 273). In other words, the ability to read in a target language has been at the heart of many teaching methods (Grabe, 2009).

Having enjoyed abundant body of research in the last decade (see for example Anderson, 2000), reading comprehension study has now turned to become a hot topic in language teaching methodology. Interminable enquires have been made in reading comprehension that attempt to shed a light on this complex issue. Acquisition of literary skill is not an over-night endeavor. A successful reader learns to implement various strategies to handle reading comprehension obstacles. Grabe (2009) was very clear in emphasizing the importance of reading comprehension strategies: "Acquisition of better reading strategies is apparently needed to crack the illusion of comprehension in readers who are settling for low standards of comprehension. They need to acquire and implement strategies to facilitate deeper levels of comprehension" (p. 449).

From the host of reading strategies recommended for boosting reading comprehension, the role of visualization has been unclear. Generally speaking, lexical items leave us with pictures, echoes and feeling when they enter our mind through reading a text. The ability to create and see these pictures in mind, which is commonly known as *visualization* in literature, has been hypothesized to be one of the fundamental features in reading process (Ghazanfari, 2009). However, while it is generally believed that those second language learners who are able to produce image in their minds during reading process have far greater comprehension and recall than those who do not. Research findings show that L2 learners fail to transfer this capability to second language context (Tomlinson, 1997).

From the myriad of strategies recommended to bolster learner's reading comprehension, the role of visualization has been enigmatic (Tomlinson, 1997). McNamara (2007) categorizes visualization as a metacognitive reading strategy which leads in improvement in comprehension. Pressley (2000) considers visualization as the fifth strategy along with prediction, questioning, clarification, and summarization. In a similar vein, Johnson-Laird (1983) states that ultimate

goal of reader is construction of mental model. So as we can see research in this realm has a long and rich history (McNamara, 2007). Kordjuazi (2014) explored the effect of visual mnemonic practice on students' reading comprehension. The participants of this study were 55 Iranian psychologist seniors chosen out of 71 students based on their PET language proficiency test scores. They were divided into homogenous groups of experimental and control. The experimental group utilized the variety of visual mnemonic devices, including picture and visualization. To test reading comprehension, open-ended questioning was used. Results of independent *t* test clearly showed that the experimental group outperformed the control group. Erfani, Iranmehr, and Davari (2011) investigated the role of visualization on ESP reading comprehension ability of Iranian students. To this end, two homogeneous groups of students were considered as experimental and control groups. Before treatment, a pretest was also conducted to capture the initial differences. The students in experimental group were taught based on experimental method and the control group was taught based on traditional, conventional method common in Iranian ESP setting. After 24 sessions of two hours, a test of 30-item multiple choice was given to the both groups. The findings of the study revealed that students in experimental group experienced "significant advantage" in using visualization in promoting ESP reading comprehension.

Another highly valued issue is the role of cooperative strategies in language learning. Cooperative learning can be defined as "a set of instructional methods in which students work together in small, mixed ability learning groups" (Chen, 2000, p. 70). Cooperative learning aims at establishing a learner-centered teaching atmosphere where learners control their learning pace (Brown, 2001). Law (2011) studied the effect of cooperative learning strategies on fifth-grade students on achievement, motivation and reading proficiency. The research sample consisted of 279 students. They were assigned to three intact groups: 1) direct-instruction with jigsaw; 2) direct-instruction with drama activity, and; 3) direct-instruction with whole class-teacher-led activities. ANCOVA results indicated that there were significant differences between group performances on reading comprehension scores. Using jigsaw with teacher support improves reading comprehension.

A. Statement of the Problem

Since the 1980s, a number of grand breaking advances have been made in research on reading. While the advances in L1 context have led us to gain a more comprehensive picture of the nature of reading, the similar studies in L2 context have not had the same impact (Richards & Renandya, 2002). Furthermore, although extensive research studies have been conducted in the fledgling, yet rich realm of second language reading in the last decades, we have witnessed the dearth of research on reading strategies and their roles in L2 reading comprehension. Considering the problems stated above and the importance of reading comprehension in L2 context, it is vital to investigate whether visualization and cooperative learning strategies have any effect on the improvement of reading comprehension in L2 context.

B. Research Questions

Research questions of the present study are as follows:

Q1: Does visualization have any significant effect on reading comprehension ability of intermediate EFL learners?

Q2: Does cooperative learning strategies have any significant effect on reading comprehension ability of intermediate EFL learners?

Q3: Is there any significant difference between the effects of visualization and cooperative strategies on reading comprehension ability of intermediate EFL learners?

C. Research Hypotheses

The null hypotheses are:

H01: Visualization has no significant effect on reading comprehension ability of intermediate EFL learners.

H02: Cooperative strategies have no significant effect on reading comprehension ability of intermediate EFL learners.

H03: There is not a significant difference between the effects of visualization and cooperative strategies on reading comprehension ability of intermediate EFL learners.

II. METHOD

A. Participants

In order to conduct this study, 45 out of 60 EFL female learners, within the age range of 17 to 18 were chosen. They all came from Tehran Oxford Institute. To secure the representativeness of the sample, all of the learners were purposively selected. They were selected on the basis of the institute evaluation. Through Nelson test, 45 students whose scores were between one standard deviation above and below the mean score were selected for intermediate level and other participants were considered as outliers.

B. Instruments

In this study, three different tests were administered at three different points: one proficiency test for determining the level of participants; two reading tests which were used as pretest and posttest. Three instruments used in this study were as follows:

a) Nelson test (series 400A) as proficiency test (PT): Nelson English language proficiency test (Fowler & Coe, 1976) was administered to the participants prior to treatment so as to compare the means and make sure that the participants were homogeneous in terms of proficiency. Although, the participants were of the same level and grade, the researchers had to be sure of their equal level of proficiency. It consisted of 50 multiple-choice items made in four parts: grammar (two parts), vocabulary, and reading comprehension. The time allotted was 40 minutes. Nelson Test 400 (A) is usually used to identify whether our target participants are intermediate or not.

b) Pretest: Before the treatment, a pretest was administered to the participants in order to elicit the initial differences among the learners. The pretest consisted of 30 multiple choice reading items selected from TOEFL Actual Tests (August 2002) by Ebteda Publications.

c) Posttest: After the treatment, a posttest was given to all participants based on the materials or content covered during treatment or teaching phase. The posttest consisted of 30 multiple choice reading items selected from TOEFL Test Preparation Kit. The items were different from the pretest but they were selected based on the materials covered during the term.

C. Design of the Study

According to Dornyei (2007), since in educational contexts true experimental designs use random group assignments and it is not very practicable; therefore, quasi-experimental design is usually used. Quasi-experimental design can be simply illustrated as the following:

COG:	T1	X1	T2
VG:	T1	X2	T2
CG:	T1	T2

X1 stands for treatment given to cooperative group, X2 represents treatment for visualization group, COG represents cooperative group, VG stands for visualization group, CG represents control group, and T1/T2 for pre and post-tests. In this study, cooperative and visualization learning are the independent variables and the learners' reading comprehension is the dependent variable.

D. Procedure

First of all the Nelson general proficiency test (Nelson, series 400A) was administered to the participants before the treatment in order to compare their proficiencies and make sure that there was no significant difference between them. By administrating a Nelson test, 45 students whose scores were between one standard deviation above and below the mean were selected. Then the participants were purposively selected and were assigned randomly to three groups equally: cooperative group (COG) and visualization group (VG) and control group (CG). Then, a pre-test was given to students to capture the initial differences among the participants regarding their reading skill. Every session, one reading passage was given to students of all groups. Students in COG worked in small groups using Jigsaw technique, discussed the material together, shared their understanding, and helped each other when they were in trouble. The teacher then read aloud the passage, asked the follow up questions. If students had any problem, teacher would answer their questions.

Students in VG group were told before reading a text not to study it or translate it but to imagine pictures as they read it and then to change these pictures as they found further information in the text. They were also sometimes told to focus their images initially on what was familiar in the text and then to use these images to help them work out what was unfamiliar in the text. Another frequently given instruction was to picture a summary of each section of the text immediately after reading it and to attempt a pictorial summary immediately after finishing the text. "Sometimes visualization instructions were inserted into comprehension questions to help students to make connection" (Tomlinson, 2011, p. 369). It is worth mentioning that the instructions were given orally in English by the teacher in the classroom. Students in the control group were taught traditionally. They were taught the same material. However, no treatment was given to them. That is, the passage was read by the teacher aloud, it was translated, some English synonyms or antonyms might be given and then students preceded answering follow-up questions. The teaching period lasted for 8 sixty-minute sessions. After covering the course, a posttest was administered to all groups, in order to determine the effect of training on students.

III. RESULTS

A. Data Analysis

The distribution of scores for dependent variable should be normal for each value of the independent variable. To check this assumption, the Kolmogorov-Smirnov test was utilized. Table 1 shows the results of Kolmogorov-Smirnov test.

TABLE 1.
THE KOLMOGOROV-SMIRNOV TEST TO SHOW NORMALITY OF THE DISTRIBUTION OF THE DATA

	Kolmogorov-Smirnov ^a		
	Statistic	N	Sig.
Pre test	.830	60	.497*
Post test	.738	60	.647*

Given the statistics of Kolmogorov-Smirnov test is not significant, Table 1 shows that the assumption of normality of variables has been observed ($P > .01$).

In order to understand the average performance of the participants and distribution of their scores on each of the variables, it was attempted to present the descriptive statistics parameters (Mean, Standard deviation, Minimum score, and Maximum score) in Table 2.

TABLE 2.
DESCRIPTIVE STATISTICS

		N	Minimum	Maximum	Mean	Std. Deviation
Control	Pretest	20	76	98	85.75	5.437
	posttest	20	77	97	85.95	5.336
visualization group	Pretest	20	76	98	85.50	7.178
	posttest	20	77	99	86.5	7.104
cooperative group	Pretest	20	76	98	85.70	7.116
	posttest	20	77	99	88.90	6.719

With regard to first research hypothesis, visualization has no significant effect on reading comprehension ability of intermediate EFL learners, the descriptive statistics showed that there is a difference between pretest and posttest in visualization group in reading comprehension ability. In order to inspect whether this difference is significant, the paired-samples t test was utilized. The results of this analysis have been presented in Table 3.

TABLE 3.
PAIRED SAMPLES TEST

Paired Differences	95% Confidence Interval of the Difference						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Post Test - pretest	-.550	1.276	.285	-1.147	.047	-1.927	19	.069	

Based on the results presented in the Table 3, it can be concluded that With the 95% confidence that there is not a significant difference in the mean scores of the subjects between the pretest ($M=85.50$, $SD=7.178$) and posttest ($M=85.5$, $SD=7.104$) in visualization group ($t= 1.927$, $P > 0.05$). Based on the results presented in Table 3, significant change has not been observed in posttest scores in comparison to pretest scores. Therefore, the first research hypothesis was not rejected.

With regard to second research hypothesis, cooperative strategies have no significant effect on reading comprehension ability of intermediate EFL learners, the descriptive statistics showed that there is a difference between pretest and posttest in cooperative group in comprehension ability. In order to inspect whether this difference is significant, the paired-samples t test was utilized. The results of the analysis have been presented in the Table 4.

TABLE 4.
PAIRED SAMPLES TEST

Paired Differences	95% Confidence Interval of the Difference						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
ost-test - Pre-test	3.200	3.847	.860	5.000	1.400	3.720	19	.001	

Based on the results presented in the Table 4, it can be concluded that with 95% confidence, there is a significant difference in the mean scores of the subjects between the pretest ($M=85.70$, $SD=7.12$) and posttest ($M=88.90$, $SD=6.72$) in cooperative group ($t= 3.72$, $P < 0.05$). Based on the results presented in Table 4, significant change is observed in posttest scores in comparison to pretest scores. Therefore, the second research null hypothesis was rejected.

With regard to the third research hypothesis that stated there is no significant difference between visualization and cooperative strategies on reading comprehension ability of intermediate EFL learners, the descriptive statistics showed that there is a difference between control group, visualization group and cooperative group in comprehension ability. In

order to inspect whether this difference is significant, the ANCOVA analysis was utilized. The results of the analysis have been presented in Table 5.

TABLE 5.
TESTS OF BETWEEN-SUBJECTS EFFECTS

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power ^b
Corrected Model	2150.43a	3	716.81	125.64	.000	.87	1.00
Intercept	31.77	1	31.77	5.57	.022	.090	.64
Pretest	2038.20	1	2038.20	357.24	.000	.87	1.00
Group	108.02	2	54.01	9.47	.000	.25	.97
Error	319.51	56	5.71				
Total	456262	60					
Corrected Total	2469.93	59					

Based on the obtained results, it can be concluded that there is a significant difference between the three groups ($F=9.466$, $p<0.05$). In other words, it can be stated that the treatment had a significant impact on students' performance in cooperative group and they outperformed the others. Students in visualization group had better performance in comparison to control group but failed to excel cooperative group. Using Glass Size Method also supported this finding. The effect size is calculated by dividing the difference between two mean scores (in the pretest and posttest) of control group and cooperative group on the standard deviation of the control group.

The mean of cooperative group _ the mean of control group = 2.95

The standard deviation of the control group = 5.34

$$ES = \frac{2.95}{5.34} = .55$$

The effect size is 0.55. This shows the impact of treatment (cooperative group) on Iranian EFL learners' comprehension ability. Based on Cohen table, the variation range of scores is considered large.

IV. DISCUSSION

The purpose of the present study was to compare the effect of visualization versus cooperative learning strategies on intermediate EFL students' reading comprehension. The first research question inquired whether visualization has any significant effect on reading comprehension ability. Based on the results presented in Table 2, it was revealed that visualization did not have any *significant* effect on reading comprehension ($t= 1.927$, $P > 0.05$). Therefore, the first research hypothesis was not rejected. Using Glass Size Method also substantiated the aforementioned result.

Regarding the second research question which inquired whether cooperative reading strategies has any significant effect on reading comprehension ability, ANCOVA test indicated that the answer to this question is positive ($t= 3.72$, $P < 0.05$). Therefore, the second research hypothesis is rejected. Using glass size Method also confirmed this result with variation range of score is considered to be high ($ES= 0.55$).

The findings of this study revealed that cooperative learning strategies improved reading comprehension of participants in the cooperative group. Therefore, it can be claimed that cooperative learning strategies have positive effect on L2 learners' reading comprehension ability. Therefore, cooperative learning strategies can be used as effective pedagogical techniques in language classrooms to enhance students' reading comprehension ability.

The findings of the study, which showed that students in cooperative group had a significant improvement, are in line with the findings of the studies done by Ghaith (2003) and Sittler (1994). This can be interpreted in the light of the fact that in cooperative learning strategies group, students used a variety of learning activities in small teams to improve their understanding of the subject. Each member of the team was responsible for not only being taught, but also for helping teammates to learn (Johnson & Johnson, 1991).

In addition, the success of cooperative learning group in promoting can be attributed to cognitive processes of cooperative learning (Pan & Wu, 2013). Group discussion and sharing the information facilitate students' reading comprehension by fostering a supportive learning atmosphere, which provides more opportunities for explanation, logical inferences, and expand students' understanding of the material. Furthermore, it is devoid of threatening factors such as rivalry, inhibition, and anxiety.

Furthermore, as it can be resulted from the gathered data, students in visualization group improved slightly regarding their reading comprehension ability. This finding is in line with Ghazanfari (2009), Kordjazi (2014), and Tomlinson (1997) who have advocated the utilization of visualization in language classrooms. Visualization can be very effective and can make students motivated and more interesting classroom environment (Groeger, 1997). Motivation is hypothesized to be the major factor that influences the comprehension and recall of the information being read (Kordjazi, 2014). To keep learners motivated, language teachers should introduce reading comprehension techniques to make learners involved in the task. Visualization has proved to be of great advantage to keep learners motivated on the task and facilitate their reading comprehension.

Regarding the third research question which inquired whether there is any significant difference between visualization and reading comprehension ability of Intermediate EFL learners, the amassed results indicated that there is a significant difference ($F=9.466$, $p<0.05$) between the two experimental results. Using Glass Size Method confirmed that cooperative group is more effective than visualization group. Hence, the third research hypothesis was rejected.

The findings of the present study also revealed that students in cooperative group outperformed students in visualization group. This is by the virtue of the fact that students in cooperative reading class had more opportunities to actively learn by pre-reviewing the text, interacting with other group members, and helping each other during reading discussion. Thus, they scored high on reading test and outperformed the students in visualization and control groups.

Finally, using traditional techniques in reading class (control group) did not have any positive effect on reading comprehension ability of language learners. That is, resorting to tenants of Grammar-Translation Method, employing reading the text aloud, translation, and providing synonyms and antonyms if needed would not improve students' reading comprehension.

V. CONCLUSION

The results of the present study showed that cooperative learning strategies (e.g., Jigsaw, Student Team Learning) are effective on Iranian EFL learners' comprehension ability. The participants who received cooperative learning strategies performed significantly better than the participants who received visualization strategy. So, it can be concluded that the cooperative learning strategies are more effective than visualization in improving students' reading comprehension ability. Furthermore, students in visualization group improved slightly in terms of reading comprehension ability. However, the gain was not statistically significant. The results of similar studies (Ghazanfari, 2009; Tomlinson, 1997) indicated that the visualization had a significant impact on reading comprehension ability. However, the same was not observed in the present study.

It has been proved that cooperative learning strategies can have a positive impact on reading comprehension ability. Therefore, integration of healthy dose of cooperative reading strategies by teachers can foster students' comprehension ability in language classes. Teachers should consider that learning does not simply happen in vacuum and a variety of factors must be carefully taken into account. Therefore, they should abandon traditional teaching techniques (e.g., read aloud and translation to L1) which have proved to be counterproductive and instead they should employ a variety of cooperative learning strategies in language classes. Students should not only disregard translation as a means to improve their reading learning comprehension ability but also should accommodate their learning orientation with a variety of reading comprehension strategies which give them more opportunities to better comprehend the text. When students process a text by solely resorting to translation, they tend to fail to get the most out of the text. Therefore, information sharing, discussion, and teamwork cooperation must be considered.

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