

## CHAPTER FOUR

### QUANTITATIVE DATA ANALYSIS

#### 4.0. Introduction

This chapter presents the results of the analysis of the quantitative data (pre and post learning together strategy questionnaires and pre and post identical reading comprehension test). Review and analysis of these data sources provided insight in answering the first and second research questions: RQ1: Is there a significant relationship between using Learning Together in undergraduate EFL reading comprehension classroom and students' reading comprehension achievement as determined by students' pre-test and post-test scores? RQ2: What are undergraduate EFL experimental group students' perceptions of the effectiveness of using Learning Together instruction in improving their reading comprehension achievement?

The first and second questions are directly connected to the results of the quantitative part, which relates test scores measuring reading comprehension and learning together strategy questionnaire scores to the effect of learning together strategy instruction. Quantitative analysis was conducted to investigate changes in students' reading comprehension achievement scores using statistical data. Statistical figures could show clear evidence to detect subjects' variances that if the learning together strategy instruction did influence their reading comprehension achievement scores and their perceptions of learning together strategy instruction.

In this study, pre-and post- reading comprehension tests results clarified how treatment group students were affected in their reading achievement scores after receiving the Learning Together strategy instruction. Also, the pre- and post-learning together strategy questionnaires were used to examine the major changes in the students' perceptions of learning together strategy instruction before and after the learning together strategy instruction.

In this chapter an analysis of the data collected for this research study is presented. The purpose is to examine the validity and reliability of the identical reading comprehension pre-test and post-test and five Likert-scale Learning Together strategy questionnaires. The identical reading comprehension pre-test and post-test, were administered two times during the course of the study. Each reading comprehension test was composed of three reading passages with eight questions per passage for a total of 24 questions per test. The researcher used the same three reading passages about *E-mail*, *Human body* and *Nuclear Weapons* and the corresponding 24 questions (8 questions per reading passage) on both the pre-test and the post- test.

One version of each of the five Likert-scale questionnaires was used for both two rounds. In order to make the analysis of these two rounds of five Likert-scale measures more succinct, the researcher had performed a detailed analysis of each testing round. He also had examined the data gathered at the first and second rounds of the questionnaires. Subsequently, the researcher had examined the data collected from the second round and had reported differences or conflicting results of those two rounds. The two tools of collecting data for the quantitative phase of the study, the identical reading comprehension pre-test and post-test and five Likert-scale Learning Together strategy questionnaires are discussed in details in the following sections.

#### 4.1. Pre- and Post- Reading Comprehension Tests

The purpose of the pre- and post-reading comprehensions tests was to assess student changes in reading comprehension and to what degree these changes influenced their reading achievement scores. To this end, two identical versions of the test were developed, one for the pre-test and the other for the post-test. Seven types of questions were used on both, the reading comprehension pre-test and post-test (See Appendix C for completed version of the pre-test and post-test).

These questions measured readers' abilities to ascertain:

1. factual information that is clearly stated in the reading passage
2. factual information that is not directly stated in the reading passage
3. the main idea of a paragraph embedded within the passage
4. the main idea of the entire reading passage
5. a paraphrase of a sentence or paragraph of the passage
6. the meanings of certain vocabulary terms that are meant to be understood from contextual clues in the passage
7. underlying unstated information that must be inferred from contextual clues in the passage.

One question per question type is on each test form, except for the vocabulary question. For that question type, two questions were provided for a total of eight questions per passage. Each test consists of three reading passages (24 questions per test).

#### 4.1.1. Comparison of the Mean Scores of the Pre- and Post- Reading Comprehension Tests

In order to show how Learning Together strategy instruction impacted Saudi undergraduate EFL students' reading comprehension achievement scores, the researcher compared the mean scores of the pre- and post-reading comprehension test for each group using paired sample t-test. Earlier to the t-test, the researcher designated the experimental group (n=40) and the control group (n=40). As the next procedure, to show how learning together strategy instruction impacted Saudi undergraduate EFL students' reading comprehension test scores, a paired-sample t-test was carried out to compare the mean scores in the pre- and post- reading comprehension tests for each group. As regards the experimental group, (n=40), the result of the t-test showed that there was a significant difference in scores between the pre-reading comprehension test (M = 16.24, SD = 4.46) and the post-reading comprehension test (M = 17.61, SD = 3.53) conditions;  $t(39) = -4.556$ ,  $p = .000$ . The result of the t-test is outlined in table 4.1.

**TABLE 4.1:** Paired sample t-test comparing the pre- and post-reading comprehension test scores of the experimental group

The experimental Group (n=40)	Pre- Post	Mean	SD	T	Df	P
		-1.368	1.852	-4.556	39	.000*

\*Significant at  $p < .05$

As regards the control group (n=40), the result of the t-test showed that there was no significant difference in the scores for the pre-reading comprehension test (M = 16.80, SD = 2.97) and post-reading comprehension test (M = 16.17, SD = 3.77) conditions;  $t(39) = 1.103$ ,  $p = .279$ . The result of the t-test is outlined in table 4.2

**TABLE 4.2:** Paired sample t-test comparing the pre- and post-reading comprehension test scores of the control group

The Control Group (n=40)	Pre- Post	Mean	SD	T	Df	P
		.633	3.146	1.103	39	.279*

\*Significant at  $p < .05$

In brief, the mean score of the control group decreased .63 in the post-reading comprehension test. On the contrast, the mean score of the experimental group increased 1.37 points in the post-reading comprehension test. According to the change of the mean scores of the two groups, the experimental group outperformed the control group in reading comprehension test by showing as much as 2.00 point (1.37 - (- 0.63)) difference. Consequently, it can be stated that learning together strategy instruction was effective and supportive for Saudi undergraduate EFL students to improve their reading comprehension achievement through the process of assessment.

#### 4.1.2. The Effectiveness of Learning Together Strategy Instruction for Proficiency Levels

As stated directly above, the general mean scores of the reading comprehension test had improved in the experimental group, showing a statistically significant difference. However, the improvement of the total mean score could not give sufficient explanation about what brought about the increase in the post-reading test score. By the same token, the comparison of total mean scores between the pre- and post-reading comprehension test was not sufficient to identify how the learning together strategy instruction was effective to the experimental group and proficiency level.

In order to understand in detail the effectiveness of Learning Together strategy instruction, the researcher first divided all the participants into three categorical variables based on their pre-reading comprehension test scores representing high level (scores 19 to 24), intermediate levels (scores 13 to 18), and lower level (scores 0 to 12). One-way ANOVA was carried out to justify the three different reading comprehension proficiency levels. The result of ANOVA showed that a statistically significant difference was found among the three different reading proficiency levels on the pre-reading comprehension test. The results showed that a statistical significant difference was found among three levels (high, intermediate, and lower levels) of reading proficiency of the control and experimental groups,  $F(2, 93) = 120.14, p = .000$ .

To examine how the learning together strategy instruction impacted the three different reading proficiency levels, two-way ANOVA was carried out. The three different reading proficiency levels were considered as independent variables and the mean differences (between the pre-and post-reading comprehension tests) were considered as dependent variables. The results of two-way ANOVA showed that there was no statistically significant relation between the treatment (the Learning Together strategy instruction) and proficiency level on the reading comprehension post-test ( $F(2, 87) = .434, 2 = .434, p = .784$ ). Conversely, there were statistically significant differences between the experimental group and the control group ( $F(2, 87) = 6.554, 2 = .131, p = .002$ ), and between reading proficiency levels ( $F(2, 87) = 44.82, 2 = .508, p = .000$ ) on the post-reading comprehension test. The result of two way ANOVA is outlined in table 4.3.

**TABLE 4.3:** ANOVA results of the post-reading comprehension test by proficiency levels

	High		Intermediate		Lower		Total	
	M	SD	M	SD	M	SD	M	SD
The Experimental Group (n=40)	21.20	1.47	18.25	2.01	13.75	2.45	17.60	3.53
The Control Group (n=40)	19.00	3.39	16.52	2.90	10.75	3.59	16.16	3.77

In brief, the learning together strategy instruction significantly affected the experimental group in the post- reading comprehension test, and the control group was less affected. Concerning the mean difference in the post-reading comprehension test among the three different reading proficiency levels, there was a statistically significant difference between all three different proficiency levels ( $p = .000$ ). This shows that the reading proficiency levels were affected in the post-reading comprehension test scores after the learning together strategy instruction. All reading comprehension proficiency levels in the experimental group indicated the differences from the control group. Specifically, the Learning Together strategy instruction was more effective for lower level students than high and intermediate levels of undergraduate EFL students.

In conclusion, the simple main effects analysis indicated that there was a significant difference between the experimental group and the control group. The experimental group was more affected by the learning together strategy instruction on their post-reading comprehension test than the control group. Additionally, there was a significant difference among the three different proficiency levels ( $p = .000$ ). After the Learning Together strategy instruction, all proficiency level students indicated a significant difference between the pre- and post-reading comprehension test scores.

## 4.2. The Learning Together Strategy Survey

At the end of the learning together instruction treatment, the EFL undergraduate experimental group students were requested to complete the Learning Together Strategy Survey to expose their visions on the use of the learning together strategy instruction, which consisted of thirteen 5-point Likert-type items and four factors: (1) active learning, (2) group discussion, (3) views of learning together strategy, (4) interaction (See Appendix E).

### 4.2.1. Experimental Group Student Views on Learning Together Strategy Instruction

The Learning Together Strategy Survey asked the EFL undergraduate experimental group students to compare their earlier expertise with traditional lecture instruction and their expertise with learning together strategy instruction. Table 4.4 shows the undergraduate EFL experimental group students' views on Learning Together strategy instruction. For easier clarification, the *strongly agree* and *agree* responses were combined into an *agree* response, and *strongly disagree* and *disagree* responses were combined into a *disagree* response.

Table 4.4 shows that 80% of the EFL undergraduate experimental group students thought that Learning Together strategy instruction could inspire them to active learning. Group discussion was the major method adopted in Learning Together strategy instruction classes, and 85% of the EFL undergraduate experimental group students asserted that group discussion benefited their reading comprehension, while 75% of the EFL undergraduate experimental group students thought that group discussion helped them obtain better post reading comprehension test scores.

In total, 70% of the EFL undergraduate experimental group students confirmed that they have learnt, have improved and have good command of taught reading comprehension skills from their partners in the course of the learning together strategy instruction process. Exactly 60% of the EFL undergraduate experimental group students felt satisfied with their partners' performance for the duration of Learning Together strategy instructional activities.

In spite of spending much time preparing and engaging in group discussions in the Learning Together strategy instruction process, 75% of the EFL undergraduate experimental group students preferred the learning together strategy instruction method to traditional lecture instruction method. In total, 55% of the EFL undergraduate experimental group students agreed that Learning Together strategy instruction fetched much pleasure to their reading comprehension study.

In brief, most of the EFL undergraduate experimental group students approved that Learning Together strategy instruction encouraged them to active learning, and enhanced their English reading comprehension skills; yet, 65% of the EFL undergraduate experimental group students felt satisfied from interaction with their group members.

**TABLE 4.4:** EFL undergraduate experimental group students' views on Learning Together strategy instruction

Compared with traditional lecture instruction,		Agree	No difference	Disagree
1.Active learning	learning together inspires me to more active learning.	80%	20%	
2. Group discussion	group discussion helps me grasp more key ideas from the text.	85%	15%	
	group discussion reminds me of neglected key points in the text.	95%	5%	
	group discussion helps me have more	90%	10%	

	comprehensive understanding of the text.			
	group discussion helps me determine the parts I don't really understand.	90%	10%	
	group discussion helps me improve my exam scores.	75%	25%	
3. Views of Learning together	learning together helps me realize others' study methods that benefit me.	70%	25%	5%
	learning together requires much more time to study.	75%	25%	
	learning together brings more pleasure to study.	55%	45%	
	I prefer learning together.	75%	25%	
4. Interactions	learning together increases my classroom participation.	55%	40%	5%
	learning together helps me share and help others which confirms my abilities.	60%	40%	
	during learning together, I feel satisfied with the interactions with my partners.	65%	30%	5%

The students responded to the post Learning Together Strategy Survey about their views toward working in the Learning Together group in EFL reading comprehension course. As Table 4.4 shows, most students agreed that they learned to work better with different students in the Learning Together groups, their EFL reading comprehension skills were improved by learning from each other, and they enjoyed working on reading comprehension exercises and assignments with other students in Learning Together groups more than they would have enjoyed working these tasks alone. Students also agreed that they learned more reading comprehension skills in Learning Together groups than traditional lecturing instruction used to be employed in a regular class setting.

### 4.3. Chapter Summary

The results of the quantitative data analysis phase of the study, discussed in this chapter, revealed an answer to the first research question, whether the cooperative learning strategy of Learning Together was more effective than the traditional lecturing method in improving undergraduate EFL students' reading comprehension achievement. Results indicated that the cooperative learning strategy of Learning Together had a significant effect on EFL students' reading comprehension achievement. The null hypothesis was rejected because there was a significant difference in the sample mean of students' reading comprehension achievement in the classroom receiving the cooperative learning strategy of Learning Together, when compared to the classroom in which students received traditional lecturing instruction. The next chapter, Chapter Five, provides the qualitative data analysis phase of the study, including observation, semi-structured interviews and focus group interviews.