The Second Output

Analysis uses F-test

1. **Hypothesis**
   Hypothesis for this case is:
   H_0 : Both variances are identical
   H_1 : Both variances are not identical

2. **Decision :**
   The Bases for taking decision:
   If probability > 0.05, H_0 is accepted
   If probability < 0.05, H_0 is rejected

Decision:

Seen that F-obtained value with Equal Variances Assumed is 0.039 with probability 0.845. On account of the fact that the probability > 0.05, it can be concluded that H_0 is accepted or in other words both variances are identical.

Since there is no significant difference from two variances, t-test with Equal Variances Assumed must be applied to differentiate Equality of Means. Analysis uses t-test with Equal Variances Assumed.

1. **Hypothesis**
   Hypothesis for this case:
   H_0 : Both population means are identical
   H_1 : Both populations means are not identical

2. **Decision :**
   The bases for taking decision
   If probability > 0.05, H_0 is accepted
   If probability < 0.05, H_0 is rejected

Decision:

Seen that t-obtained value for the pre-test Equal Variances Assumed is 0.390 with the probability 0.698. Since the probability >0.05, it can be inferred that H_0 is accepted. In short both means are identical.

Mean Difference:

After being tested with F-test and t-test, known Equal Variances Assumed, the next step is knowing how big the difference is.

From the output, it is clearly seen that the mean difference is 0.8190. This value is obtained from 54.569- 53.750 = 0.8190

From F-test on the previous discussion, it is obtained that the test for mean difference is done with Equal Variances Assumed. So no take a look at 95% confidence interval of the difference and the column of Equal Variances Assumed. In the column, it is obtained that:

Lower (mean difference of low parts) is -3.3906.

Upper (mean difference of up part) is 5.0286.

It means that the pre-test difference between the experimental and control group is around -3.39061 to 5.0286. While the mean difference is around 0.8190. Table 8 presents t-test for independent samples.

Table 10

Group Statistics

	group	N	Mean	Std. Deviation	Std. Error Mean
posttest	experimental	20	72.845	7.5413	1.3692
	control	20	65.625	7.3784	1.3945

Table 11

Independent Samples Test

			posttest	
			Equal variances assumed	Equal variances not assumed
Levene's Test for Equality of Variances	F		.061	
	Sig.		.806	
t-test for Equality of Means	t		3.702	3.702
	df		38	37.909
	Sig. (2-tailed)		.000	.000
	Mean Difference		7.2188	7.2188
	Std. Error Difference		1.9500	1.9502
	95% Confidence Interval of the Difference	Lower	3.3119	3.3114
		Upper	11.1279	11.1283

The First Output

The statistical summaries from both samples can be seen from the table 8 and 8.1. The post-test for experimental group is 72.845 and the post-test for control group is 65.625. In short, it can be said that the post-test value obtained by the experimental group is higher than that of the control group.

The Second Output

Analysis uses F-test

1. Hypothesis
   Hypothesis for this case is:
   H_0 : Both variances are identical
   H_1 : Both variances are not identical
2. Decision:
   The bases for taking a decision:
   If probability > 0.05, H_0 is accepted
   If probability < 0.05, H_0 is rejected

Decision:

Seen that F-obtained value with Equal Variances Assumed is 0.061 with probability 0.806. Since probability > 0.05, H_0 is accepted, or in other words both variances are identical/not significant.

Since there is no significant difference from two variances, t-test with Equal Variances Assumed must be applied to differentiate Equality of Means.

Analysis uses t-test with Equal Variances Assumed:

1. Hypothesis
   Hypothesis for this case:
   H_0 : Both population means are identical
   H_1 : Both population means are not identical
2. Decision taken
   The bases for taking a decision:
   If probability > 0.05, H_0 is accepted
   If probability < 0.05, H_0 is rejected

Decision:

Seen that t-obtained value for the pre-test with Equal Variances Assumed is 3.702 with the probability 0.000. Since the probability < 0.05, H_0 is rejected. In short, both means are not identical.

Mean Difference

After being tested with F-test and t-test, and known Equal Variances Assumed the next step is knowing how big the difference is. From the output, it is clearly seen that the mean difference is 7.2198. This value is obtained from 72.845-65.625= 7.2198. From F-test on the previous discussion, it was obtained that the mean difference was done with Equal Variances Assumed, so now take a look at 95% Confidence Interval of the Difference and the column of Equal Variances Assumed. In the column, it is obtained that:

Lower (mean difference of low part) is 3.3119.
Upper (mean difference of up part) is 11.1278.

It means that the post-test difference between the experimental and control group is around 3.3119 to 11.1278, while the mean difference is around 7.2198.

Before analyzing the data using the multiple regression analysis, there are some steps that should be done to fit an appropriate model analysis. Firstly, deciding a form of the model to be used; secondly, exploring and plotting the data to check, for example the distributions and outliers; thirdly, using a statistical usage to fit and estimate the chosen model –at this step the model may need to be reformulated to fit the analysis, and finally, interpreting the results of analysis.

The following procedures were taken in applying the multiple regression analysis in this study. First, this study hypothesized that the students in the experimental group would get better reading comprehension achievement that those in the control group; secondly, the data were presented graphically to check, for example, the distributions of the data and the possible outliers in the data.

Figure 5.1
Histogram of Prior Reading Comprehension Achievement Scores for Experimental and Control Groups

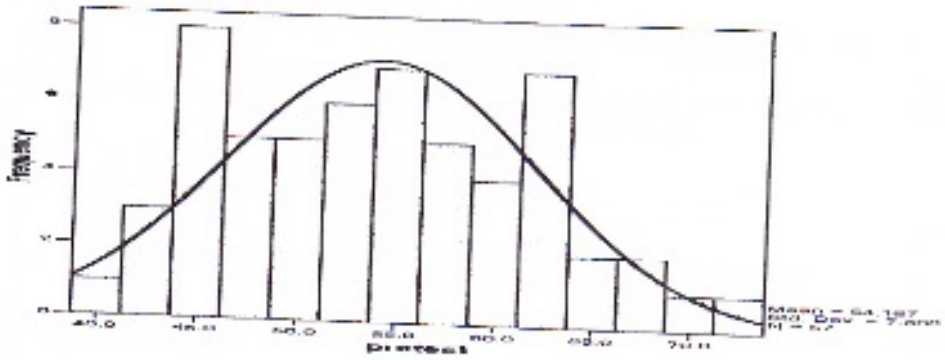


Figure 5.2
Histogram of Post Reading Comprehension Achievement Scores for Experimental and Control Groups

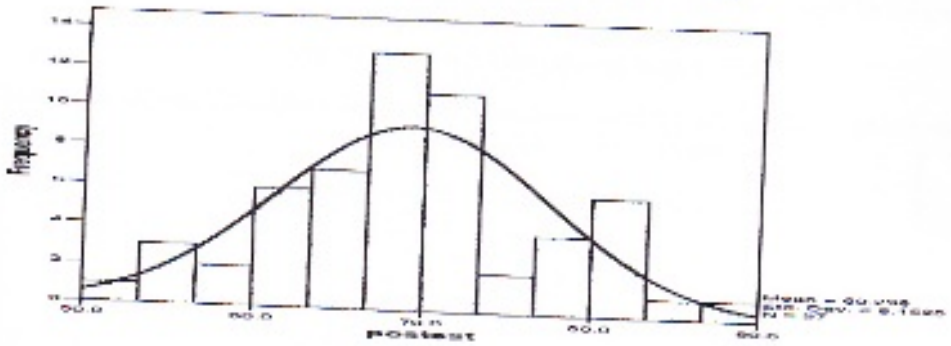


Figure 5.3
Boxplot of Post Reading Comprehension Achievement Scores by Gender of Students from Experimental and Control Groups

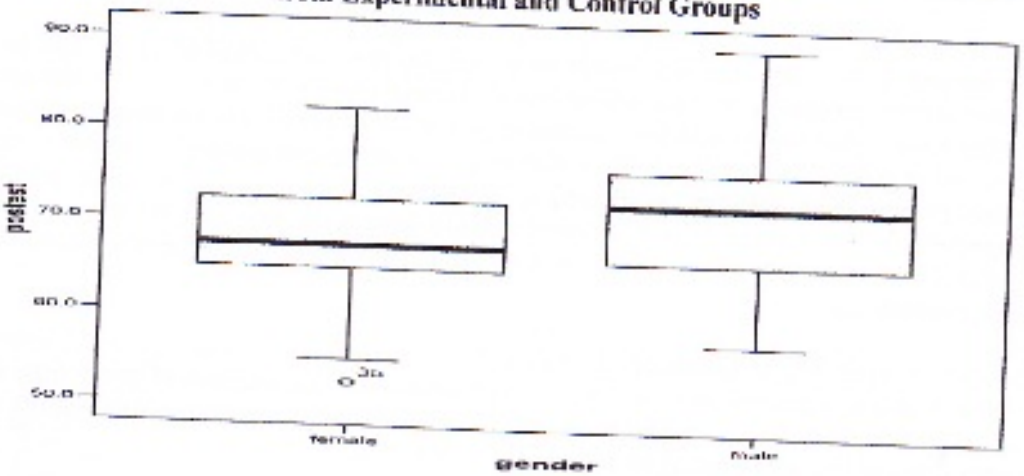


Figure 5.4
Boxplot of Post Reading Comprehension Achievement by Groups

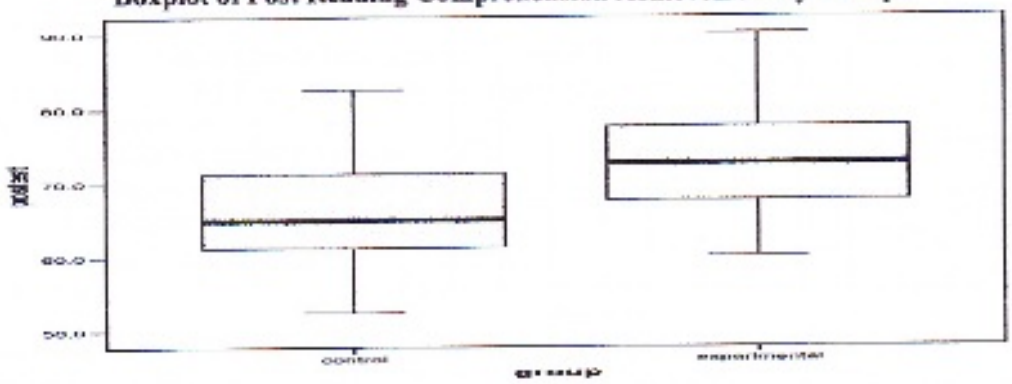
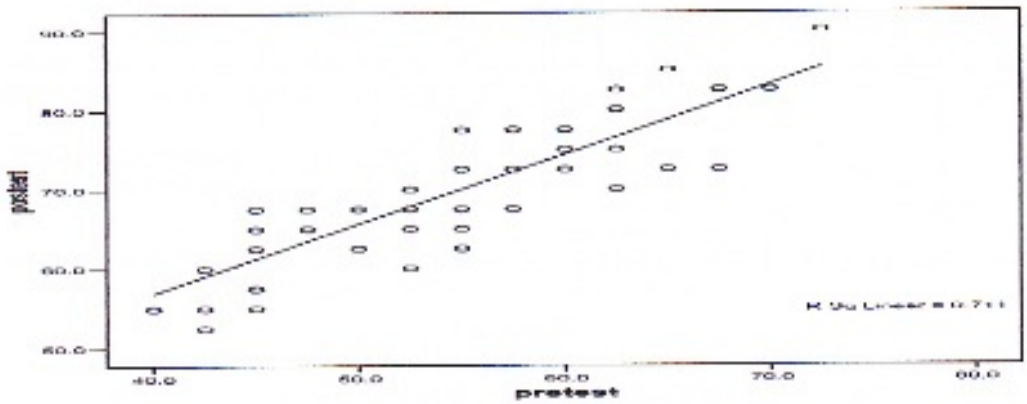


Figure 5.5
Scatterplot of Post Reading Comprehension Achievement Scores by Prior Reading Comprehension Achievement Scores for Experimental and Control Groups



The boxplot, histograms, and scatterplot show that (a) the distribution of prior and post reading comprehension scores are approximately normal (figure 4.1 and 4.2), (b) the male students have higher scores than female ones in post reading comprehension scores and there is an outlier (case 35) found in the boxplot of post reading comprehension scores by the gender (figure 4.3), (c) the experimental group has higher scores of post reading comprehension achievement than the control one and there is no even an outlier found in the boxplot of post reading scores and prior reading comprehension achievement scores are linearly correlated.

The outlier (case 35) as presented in figure 4.3 is eliminated in order to obtain a more reliable multiple regression analysis. The outlier shows that the increase of score from the pre-test and post-test is so low. This might be caused by the poor condition of the student, for example, she might have been ill on the day of the post-test.