

CHAPTER IV DATA ANALYSIS

4.1 INTRODUCTION

Data analysis and data interpretation is a very important part of a dissertation paper, research paper or thesis paper. Analysis of data involves a number of closely related operation that are performed with the purpose of summarizing the collected data and organizing these in such a manner that they will yield answer to the research question or suggest hypotheses or questions if no such questions or hypotheses had initiated the study (Prof Wilkinson and Bhandarkar). Interpretation is also important in a research paper or thesis or dissertation etc. After data analysis, the researcher interprets the table and the results. Through data analysis and interpretation, the null hypothesis is examined. In this study, the researcher examined her null hypothesis through the statistics t-test. Here, the researcher interprets how the effect of independent variable (teaching method) on the dependent variables (achievement test scores) by comparing the mean score.

4.2 CAPTION OF OBJECTIVE 1

Group wise comparison of mean scores of achievement test of students on pre-test

Objective: To compare the mean scores of achievement in Science of ICT integrated teaching and without ICT integrated teaching on pre-test.

Hypothesis: Ho 1: there is no significant difference between mean scores of achievement in Science of ICT integrated teaching and without ICT integrated teaching on pre-test. The data were analysed with the help of t- Test. The output are as given in Table 4.1, 4.2 and 4.3.

Analysis: As the null hypothesis is a non-directional hypothesis (that assumes there is difference in the means but not in which direction i.e. positive or negative) hence we use two tailed paired sample t-test. To test the significance of difference in the means we will follow three indicators; t-value, p-value, and the CI value. From the student t-value table find the critical value of t on the basis of CI and df, compare this critical value with the actual value of t we derive from the test. If the actual value exceeds the critical value, the difference in the means will be significant; hence, we can't accept the null hypothesis. In case of p-value, if the actual p-value is less than 0.05, the difference will be very significant. Looking at the CI, if the range does not include 0, then the difference becomes significant. If all the assumptions above are reversed, the difference in means will not be significant; hence we accept the null hypothesis.

Table 4.1: Paired Sample Statistics

	Mean	N	Standard deviation	Standard Error Mean
With ICT	11.29	35	4.974	0.841
Without ICT	10.97	35	3.356	0.567

Table 4.2: Paired Samples Statistics

	N	Correlation	Sig.
With and without ICT	35	0.22	0.902

Table 4.3: Paired Samples Test

	Paired Differences					T	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 With ICT – without ICT	.314	5.940	1.004	-1.726	2.355	.313	34	.756

THE INTERPRETATION OF THE RESULT GIVEN IN TABLE 4.1,4.2 AND 4.3.

The data were analysed with the help of t-test and the results are given in Table 4.4.

Table 4.4: Grouping wise M, SO, N and t-value of pre-test achievement scores of students

Group	M	SD	N	t-value	Remark
With ICT	11.29	4.97	35	0.313	0.05
Without ICT	10.97	3.35			

From the Table 4.4, it can be seen that the calculated t-test is 0.313 which is not significant because calculated t-value (0.313) is less than critical t-value (2.032) at 95% confidence interval and 34 degrees of freedom at the significant level 0.05. Secondly, the p value (0.756) is less than threshold value (0.05) which also proves the same. Thirdly, the confidence interval includes 0 as it varies from -1.726 to 2.355 which tell that there is no significance difference in the means. It indicates that there is no significant difference in mean score of achievement in science of ICT integrated teaching group students and without ICT integrated teaching group students on pre-test stage. Thus, the null hypothesis that there is no significant difference between mean score of achievement in Economics of ICT integrated teaching and without ICT integrated teaching on pre-test is not rejected.

Therefore, it may be said that both ICT integrated teaching and without ICT integrated teaching students are found to achieve same degree of achievement scores in Science on pre-test.

4.3 CAPTION OF OBJECTIVE 2

Group wise comparison of mean scores of achievement test of students on post-t

Objective: To compare the mean scores of achievement in Economics of ICT integrated teaching and without ICT integrated teaching on post-test.

Hypothesis: Ho 2: There is no significant difference between mean scores of achievement in Economics of ICT integrated teaching and without ICT integrated teaching on post-test. Data were analysed with the help of t-Test and the outputs are as given in Table 4.5, 4.6 and 4.7.

Table 4.5: Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Mean Error
With ICT	22.17	35	4.155	0.702
Without ICT	15.97	35	3.374	0.570

Table 4.6: Paired Samples Correlations

	N	Correlation	Sig.
With ICT and without ICT	35	0.135	0.441

Table 4.7: Paired Samples Test

	Paired Differences					T	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Paired Difference 1: With ICT - Without ICT	6.200	4.987	.843	4.487	7.913	7.355	34	.000

THE INTERPRETATION OF THE RESULT GIVEN IN TABLE 4.5, 4.6 AND 4.7

The data were analysed with the help of t- Test and the results are given in Table 4.8

Table 4.8: Group wise M, SO, N and t-value of post-test achievement scores of students

	Mean	N	Standard Deviation	Standard Error Deviation
With ICT	22.17	35	4.155	0.702
Without ICT	15.97	35	3.374	0.570

From the Table 4.8, it can be seen that the calculated t-value is 7.355 which is significant because the calculated t-value (7.355) is more than critical t-value (2.032) at 95% confidence interval and 34 degrees of freedom and at significant level 0.05. Looking at p value, the actual values (0.000) is less than 0.05, hence the difference is significant. Lastly, CI is all positive, hence does not include "0". It indicates that mean score of achievement in Science of ICT integrated teaching group students on post-test differ significantly from without ICT integrated teaching group students on post-test. Thus, the null hypothesis that there is no significant difference between the mean score of achievement in Science ICT integrated teaching and without ICT integrated teaching on post-test is rejected. Further, the mean score of achievement

in Science at post-test with ICT integrated teaching is 22.17 which is significantly higher than the mean score of achievement in Science at post-test without ICT integrated teaching is 15.97. The mean difference between two groups is 6.20. Therefore, it may be said that the post-test achievement in Science of students improve significantly when taught through ICT integrated instruction.

4.4 CAPTION OF OBJECTIVE 3

Testing wise comparison of mean scores of group taught through ICT

Objective: To compare the mean score of achievement in Science at pre-test and post-test stages of group taught through ICT.

Hypothesis: Ho 3: There is no significant difference between mean score of achievement in Science at pre-test and post-test stages of group taught through ICT.

The data were analysed with the help of correlated t- Test and the outputs are as given in Table 4.9,4.10 and 4.11.

Table 4.9: Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
With ICT pre - test	11.29	35	4.974	0.841
With ICT post-test	22.17	35	4.155	0.702

Table 4.10: Paired Samples Correlations

	N	Correlation	Sig.
With ICT pre-test and post-test scores	35	0.748	0.000

Table 4.11: Paired Samples Test

	Paired Differences					t	Df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Paired & post test scores	-10.886	3.332	.563	-12.030	-9.741	-19.326	34	.000

THE INTERPRETATION OF THE RESULT GIVEN IN TABLE 4.9, 4.10 AND 4.11

The data were analysed with the help of correlated t-Test and the result are given in Table 4.12.

Table 4.12: Testing wise M, SD, N, r and correlated t value of Achievement in Science of group taught through ICT

Testing	M	SD	N	R	Correlated t-test	Remark
Pre-test	11.29	4.97	35	0.74	19.32	0.05
Post-test	22.17	4.15				

From the Table 4.12, it can be seen that the correlated t-Test is 19.32 which is greater than critical t-value 2.032. So that correlated t-test is significant at 0.05 level with $df=34$. The p value (0.000) which is less than 0.05 hence it is significant. Looking at the correlation value which is 0.784 suggest there is high correlation between the two mean scores (correlation varies from -1 to +1 where -1 refers to no correlation and +1 refers to perfect correlation). It indicates that mean scores of Achievements in Science at pre-test and post-test stage of experimental group taught with the help of ICT integrated teaching differ significantly. Thus, the null hypothesis that there is no significant difference between in mean scores of achievements in Science of ICT integrated teaching pre-test and post-test stage of experimental group students is rejected. Further, the mean scores of achievement in Science at post-test with ICT integrated teaching is 22.17 which is significantly higher than Achievement in Science before teaching whose mean score at pre-test is 11.29. The mean scores difference between the pre-test and post-test of experimental group is 10.88. Therefore, it may be said that Achievement in Science of students improved significantly when taught through ICT instructional material.

4.5 CAPTION FOR OBJECTIVE 4

Testing wise comparison of mean scores of groups taught without ICT

Objective: To compare the mean scores of achievements in Economics at pre-test and post-test stages of group taught without ICT.

Hypothesis: Ho 4: there is no significant difference between mean scores of achievement in Science at pre-test and post-test stages of group taught without ICT.

The data were analysed with the help of correlated t- Test by using and the outputs are as given in Table 4.13,4.14 and 4.15.

Table 4.13: Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pre-test scores	10.97	35	3.356	0.567
Post-test scores	15.97	35	3.374	0.570

Table 4.14: Paired Samples Correlations

	N	Correlation	Sig.
Without ICT pre-test and post-test scores	35	0.810	0.000

Table 4.15: Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre-test score & post-test score	-5.000	2.072	.350	-5.712	-4.288	-14.275	34	.000

THE INTERPRATATION OF THE RESULT GIVEN IN TABLE 4.13, 4.14 and 4.15

The data were analysed with the help of correlated t- Test and the results are given in Table 4.16

Table 4.16: Testing wise M, SD, N, r, Correlated t value of Achievement in Economics of group taught without ICT

Testing	M	SD	N	R	Correlated t-test	Remark
Pre-test	10.97	3.35	35	0.81	14.27	0.05
Post-test	15.97	3.37				

From the Table 4.16, It can be seen that the correlated t-value is 14.27 which is significant at 0.05 level with df=34. It indicates that mean scores of Achievements in Science at pre-test and post-test stages of control group taught without help of ICT integrated teaching differs significantly. Thus, the null hypothesis that there is no significant difference between in mean scores of Achievements in Science of without ICT integrated teaching pre-test and post-test stages of Control group is rejected. Further, the mean scores of achievement in Science post-test without ICT integrated teaching is 15.97 which is significantly higher than Achievement in Science before teaching whose mean score at pre-test is 10.97. But the mean scores difference between pre-test and post-test of control group which was taught without ICT instructional material is less i.e. 5. Therefore, it may be said that Achievement in Science of students can be improved significantly when taught without ICT instructional material.