CHAPTER 4
DATA ANALYSIS AND INTERPRETATION

4.1.0 Introduction

This chapter provides a comprehensive analysis and interpretation of the data collected in order to assess the impact of ICT on the academic achievement of Class 6 students in Social Science. The analysis involves two groups of students which were the experimental group that experienced ICT integration and the control group that received traditional instruction. Pre-test and post-test measures were used for the experimental group and control group to assess achievement test scores.

4.2.0 Data Summary

Table 4.1: Data summary of control and experimental group (pre-test and post-test)

Group	Test type	N	Mean	Standard deviation
Control group	Pre-test	19	18.31	5.67
Control group	Post-test	19	21.74	5.13
Experimental group	Pre-test	21	18.28	5.65
Experimental group	Post-test	21	23.24	5.36

4.3.0 Hypothesis Testing and Interpretation

1) H_0 1: There is no significant difference in the mean score of pre-test academic achievement scores in Social Science between the control (taught with traditional method) and experimental group (taught with ICT).

Table 4.2: independent sample t-test for experimental and control group (pre-test)

Group	N	$\bar{X}$	SD	Df	P	t-cl	t-cr	Interpretation	decision
experimental	21	18.28	5.65	38	0.49	0.16	2.02	Not significant	Accept H_{01}
Control	19	18.31	5.67						

Here, N= Total item, $\bar{X}$= Mean, SD= Standard deviation, t-cl= t-calculated, t-cr= t-critical, Df= degree of freedom

Interpretation: our calculated value (0.16) is less than table value (2.02) at 0.05 significance level. Therefore, there is no statistically significant difference in the initial academic achievement of the two groups i.e. control (taught with traditional method) and experimental group (taught with ICT). This indicates that they were comparable at the beginning of the study.

2) H_0 2: There is no significant difference between the mean score of academic achievement in social science of pre-test control group and post-test control group (taught with traditional method).

Table 4.3: paired sample t-test for control group (pre-test and post-test)

Test	N	Mean	SD	Df	P	t-cl	t-cr	Interpretation	Decision
Pre-test	19	18.31	5.67	18	0.00	4.08	2.1	Significant	Reject
Post-test		21.74	5.13						H_{02}

Here, N= Total item, X= Mean, SD= Standard deviation, t-cl= t-calculated, t-cr= t-critical, Df= degree of freedom

Interpretation: our calculated value (4.08) is more than table value (2.1) at 0.05 significance level. And hence, there is statistically significant improvement in academic achievement within control group (taught with traditional method) i.e. traditional method is still useful in teaching Social Science for yielding good academic achievement in Social Science.

3) H_0 3: There is no significant difference between the mean score of academic achievement in social science of pre-test and post-test experimental group (taught with ICT).

Table 4.4: paired sample t-test for experimental group (pre-test and post-test)

Test	N	Mean	SD	Df	P	t-cl	t-cr	Interpretation	Decision
Pre-test	21	18.28	5.66	20	0.0	8.43	2.08	Significant	Reject
Posttest		23.24	5.37		0				H_{03}

Here, N= Total item, X= Mean, SD= Standard deviation, t-cl= t-calculated, t-cr= t-critical, Df= degree of freedom

Interpretation: our calculated value (8,43) is much more than table value (2.02) at 0.05 significance level. And hence, there is statistically significant improvement in academic achievement within experimental group (taught with ICT). However experimental group yielded better improvement in academic achievement as their mean score and t-value are higher than the control group. Both traditional method and ICT-integrated approach are good for teaching social science. However ICT-integrated approach is more suitable than traditional method for teaching Social Science.

4) H_0 4: There is no significant difference in the mean score of post-test academic achievement scores in Social Science between the control (taught with traditional method) and experimental groups (taught with ICT).

Table 4.5: independent sample t-test for experimental and control group (post-test)

Group	N	$\bar{X}$	SD	Df	P	t-cl	t-cr	Interpretation	decision
Experimental	21	23.24	5.36	38	0.19	0.88	2.02	Not	Accept
Control	19	21.74	5.13					significant	H_{04}

Here, N= Total item, $\bar{X}$= Mean, SD= Standard deviation, t-cl= t-calculated, t-cr= t-critical, Df= degree of freedom

Interpretation: our calculated value (0.88) is less than table value (2.02) at 0.05 significance level. Therefore, there is no statistically significant difference in the post-intervention phase academic achievement of the two groups i.e. control (taught with traditional method) and experimental group (taught with ICT) at significance level of 0.05.

ICT-mediated teaching didn't yield significant improvement because of no prior exposure to ICT integrated learning of students, lesser time period of ICT intervention i.e. only 1 week and poor class period selection (8^{th} period/last period was used for teaching students with ICT-mediated instruction as it was only available period for using smart classroom). Generally, in last period, interest of students regarding learning things decreases significantly. If ICT-mediated teaching was used in earlier period it may have yielded significant academic achievement in comparison to the traditional (chalk and talk method) teaching.

5) H_0 5: There is no significant improvement in academic achievement (gain scores) of Class 6 students taught using ICT-based methods compared to those taught using traditional methods.

Table 4.6: independent sample t-test for experimental and control group (gain scores)

Group	N	$\bar{X}$	SD	Df	P	t-cl	t-cr	Interpretation	decision
experimental	21	4.95	2.63	38	0.16	1.03	2.02	Not significant	Accept H_{05}
Control	19	3.63	3.59						

Here, N= Total item, $\bar{X}$= Mean, SD= Standard deviation, t-cl= t-calculated, t-cr= t-critical, Df= degree of freedom

Interpretation: our calculated value (1.03) is less than table value (2.02) at 0.05 significance level. Therefore, there is no statistically significance difference between the gain scores of experimental and control group at 0.05 significance level.

However difference in mean score of experimental and control group suggest that experimental group was at leading edge in terms of gain score i.e. academic achievement.