CHAPTER IV

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CHAPTER 4

ANALYSIS AND INTERPRETATION OF DATA

4.1.0 INTRODUCTION

Data analysis is that important step in research without which the objectives of the study cannot be achieved. It is only after careful analysis of the data that are gathered, the researcher can answer the multivariate questions about the study. According to Gay (2000) *"After the data have been collected, the 'romance' of field research is over and the difficult task of data analysis and interpretation begins."* Researcher makes use of statistical techniques to draw conclusions and inferences from data. The detailed process of objective wise analysis of collected data is described in this chapter.

As it is a Quasi-experiment study, the data analysis for the present study was done quantitatively with the help of both descriptive statistics and inferential statistics. The descriptive statistical techniques like, mean, standard deviation, standard error of mean, and for the inferential statistics, like, t-test and Analysis of Co-variance (ANCOVA) were used during the process of the data analysis. For the analysis of the reaction scale percentage and Intensity Index were used.

4.2.0 COMPARISON OF CONTROL AND ALL EXPERIMENT GROUPS

Comparison of control group that was taught through traditional method and all the experiment groups together those were taught through CAI, is done with the help of mean and standard deviation of pre-test and post-test score of control and experiment group which is given in table 4.1 for analysis.

Table 4.1: Mean, Standard Deviation of Pre-test (Covariate)and Post-test (Dependent Variable) scores of control and experiment groups along with their N

GROUPS	N	Mx	SDx	My	SDy
CONTROL	26	9.8	4.2	12.8	4.9
EXPERIMENT(Group1)	62	18.5	4.3	28.5	5.0

To compare control and all the experiment groups, the achievement of all three experiment groups was combined and it was compared with the control group. From the table 4.1, it can be seen that the pre-test mean score (Mx) for control and experiment groups are 9.8 and 18.5 with standard deviation (SDx) 4.2 and 4.3 respectively. The post-test mean scores (My) for control and experiment group are 12.8 and 28.5 with standard deviation (SDy) 4.9 and 5.0 respectively which show the difference between the mean scores of the control and the experiment groups. To know whether the difference between the adjusted post-test mean scores of the experiment and control is significant, Analysis of Co-Variance (ANCOVA) was used, where pre-test score was considered as covariate, as the groups were not equivalent. The summary of analysis of co-variance is given as below.

Table 4.2: Summary of ANCOVA taking x -Pre-test (Covariate) and y- Post-test as (Dependent Variable) of control and all experiment groups together

Sources of Variance	DF	SSx	SSy	SSxy	SSy.x	MSSy.x	SDy.x	F-Value
Among	1	1394.3	4483.0	2500.2	612.2	612.2		
Within	85	1621.5	2191.4	1442.1	908.8	10.7	3.3	57.3*
Total	86	3015.8	6674.4	3942.3	1521.0			

* Significant at 0.01 level with df of 1/85

From table 4.2 it was observed that the degree of freedom (df) for among and within groups were 1 and 85 respectively. The sum of squares of pre-test (SSx) were 1394.3 and 1621.5 for among and within groups respectively. The sum of squares of the post-test (SSy) were 4483.0 and 2191.4 for among and within groups respectively. The adjusted sum of squares for pre-test and post-test (SSxy) were found to be 2500.2 and 1442.1 for among and within groups respectively. The sum of squares of adjusted post-test (SSy.x) were found to be 612.2 and 908.8 for among and within groups respectively. The adjusted mean sum of squares of post-test (MSSy.x) were found to be 612.2 and 10.7 for among and within respectively. The adjusted F-value was found to be 57.3 which was found to be significant at 0.01 level of significance for the df of 1/85. Hence the null

hypothesis $H_0 1$ "There will be no significant difference between the adjusted post-test mean achievement scores of the students of control group and that of experiment groups those studied through CAI in English grammar, taking their pre-test score as covariate", is rejected. Hence it can be said that there is significant difference between the adjusted post-test means of control and experiment groups. Further to know the mean of which group is higher or which mean is lower, the details of mean scores and standard deviation of both the groups are given in the Table 4.3.

Table 4.3: Summary of mean, standard deviation of x - Pre-test (Covariate), y - Post-test (Dependent Variable), adjusted mean and adjusted standard deviation of the control group and the experiment groups

GROUPS	N	Mx	SDx	My	SDy	Myx	SDyx
CONTROL	26	9.8	4.2	12.8	4.9	17.4	3.3
EXPERIMENT (Group1)	62	18.5	4.3	28.5	5.0	24.6	3.3

From table 4 .3 it was found that the pre-test mean scores (Mx) of the control and the experiment groups were found to be 9.8 and 18.5 respectively. The standard deviations (SDx) for the respective pre-test mean scores of experiment and control groups were found to be 4.2 and 4.3. The post-test mean scores (My) of the control and experiment groups were found to be 12.8 and 28.5 respectively. The standard deviations for the respective post-test scores (SDy) of experiment and control groups were found to be 4.9 and 5.0 respectively. The adjusted post-test mean scores (Myx) of the control and experiment groups were found to be 17.4 and 24.6 respectively with adjusted standard deviation (SDyx) of 3.3 for both the groups. It showed that the experiment group scored higher than the control group in the post-test which may be due to the effect of CAI. As the Ho1 was rejected, it can be concluded that mean achievement of experiment groups that were taught through CAI is significantly higher than that of the control group. The means of control group and experiment groups are also shown in the graph 4.1 for better comprehension of the readers.

Graph 4.1: Graph of mean of x - Pre-test (Covariate), y - Post-test (Dependent Variable) and the adjusted post-test means of all three experiment groups together and the control group
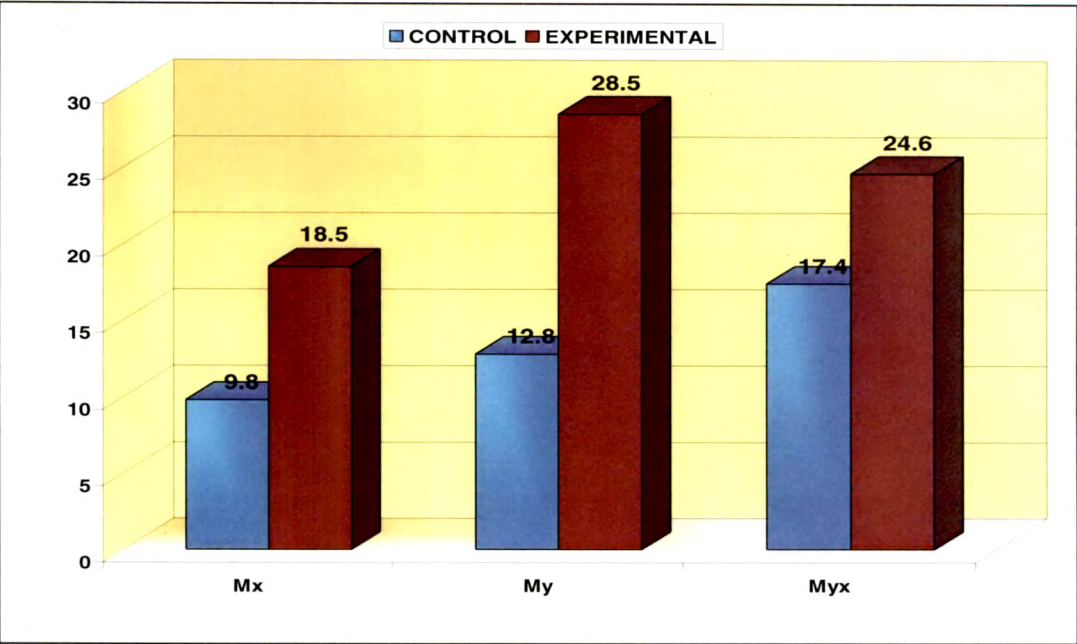
4.3.0 COMPARISON OF CONTROL AND EXPERIMENT GROUP-1 (ONLY CAI)

Comparison of control group which was taught with traditional method and the experiment group 1 (Only CAI) is done with the help of mean and standard deviation of pre-test and post-test scores of control and experiment group1 (only CAI) which are given in table 4.4 for analysis.

Table 4.4: Mean, Standard Deviation of Pre-test (Covariate) and Post-test (Dependent Variable) scores of control and experiment group1 (only CAI) with their N

GROUPS	N	Mx	SDx	My	SDy
CONTROL	26	9.8	4.2	12.8	4.9
EXPERIMENT(Group1)	20	18.5	6.0	25.9	5.6

From the table 4.4 it can be seen that the pre-test mean scores (Mx) for control and experiment groups are 9.8 and 18.5 with standard deviation (SDx) 4.2 and 6.0 respectively. The post-test mean scores (My) for control and experiment groups are 12.8 and 25.9 with standard deviation (SDy) 4.9 and 5.6 respectively. It shows the difference between the adjusted mean scores of the control group and experiment group1 (Only CAI). To find out whether the difference between adjusted mean scores of these two groups is significant or not, analysis of co-variance was used where pre-test scores were considered as covariate. The summary of analysis of co- variance is given as below.

Table 4.5: Summary of ANCOVA taking x - Pre-test (Covariate) and y - Post-test as (Dependent Variable) of control and experiment group1 (only CAI)

Sources of Variance	DF	SSx	SSy	SSxy	SSy.x	MSSy.x	SDy.x	F-Value
Among	1	854.1	1937.7	1286.5	151.0	151.0		
Within	43	1183.0	1249.8	1129.0	172.3	4.0	2.0	37.7*
Total	44	2037.2	3187.5	2415.5	323.4			

* Significant at 0.01 level with df of 1/43

From table 4.5 it was observed that the degree of freedom (df) for among and within groups were 1 and 43 respectively. The sum of squares of pre-test (SSx) were 854.1 and 1183.0 for among and within groups respectively. The sum of squares of the post-test (SSy) were 1937.7 and 1249.8 for among and within groups respectively. The adjusted sum of squares for pre-test and post-test (SSxy) were 1286.5 and 1129.0 for among and within groups respectively. The sum of squares of post-test and pre-test (SSy.x) is 151.0 and 172.3 for among and within groups respectively. The adjusted mean sum of squares of pre-test and post-test of control and experiment groups (MSSy.x) for among and within groups is 151.0 and 4.0 respectively. The adjusted F-value was found to be 37.7, which was found to be significant at 0.01 level of significance for df of 1/43. Hence the null hypothesis **H$_0$2 "There will be no significant difference between the adjusted post-test mean achievement scores of the students of control group and that of**

Graph 4.2: Graph of mean of x - Pre-test (Covariate), y - Post-test (Dependent Variable) and the adjusted post-test means of the experiment group1 (only CAI) and the control group
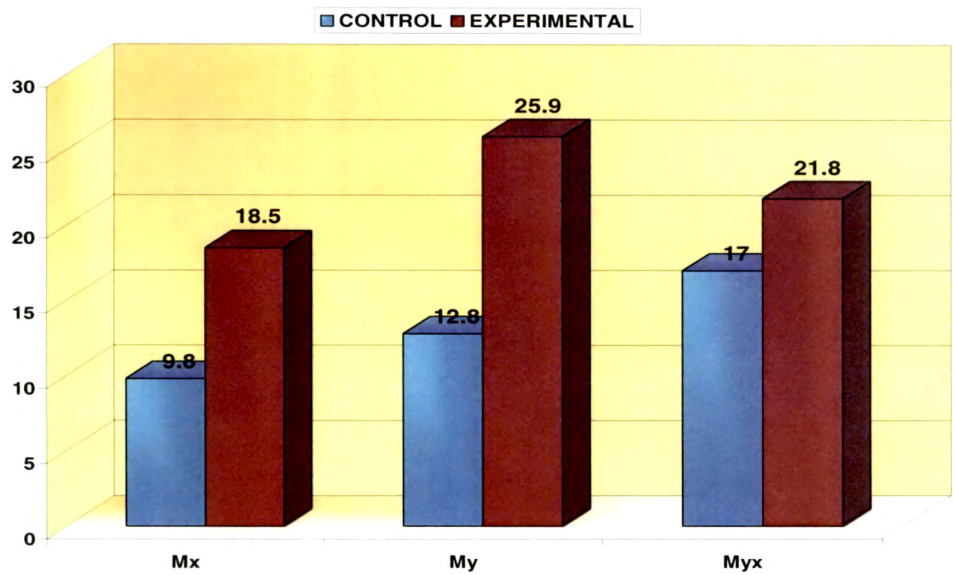
4.4.0 COMPARISON OF THE CONTROL AND THE EXPERIMENT GROUP2 (CAI WITH REPETITION)

Comparison of control group which was taught through traditional method and the experiment group2, taught through CAI with repetition, is done with the help of mean and standard deviation of pre-test and post-test score of control and experiment group which is given in table 4.7 for analysis.

Table 4.7: Mean, Standard Deviation of Pre-test (Covariate) and Post-test (Dependent Variable) scores of control and experiment group2 (CAI with repetition) along with their N

GROUPS	N	Mx	SDx	My	SDy
CONTROL	26	9.8	4.2	12.8	4.9
EXPERIMENT(Group2)	20	17.9	3.3	27.1	2.9

From the table 4.7 it can be seen that the pre-test mean scores (Mx) for control and experiment groups are 9.8 and 17.9 with standard deviation (SDx) 4.2 and 3.3 respectively. The post-test mean scores (My) for control and experiment group2 are 12.8 and 27.1 with standard deviation (SDy) 4.9 and 2.9 respectively which show the difference between the adjusted mean scores of the control and the experiment groups. To compare the adjusted mean achievement of control and the experiment group2 in English grammar and to find out whether the difference between adjusted mean scores of the control and the experiment group is significant, analysis of co-variance was used where pre-test score was considered as covariate. The summary of analysis of co-variance is given as below.

Table 4.8: Summary of ANCOVA taking x - Pre-test (Covariate), y - Post-test (Dependent Variable) of the control group and the experiment group2 (CAI with repetition)

Sources of Variance	DF	SSx	SSy	SSxy	SSy.x	MSSy.x	SDy.x	F-Value
Among	1	752.7	2387.3	1340.5	290.0	290.0		
Within	44	684.6	800.6	603.5	268.7	6.1	2.5	47.5*
Total	45	1437.3	3187.5	1944.0	558.7			

* Significant at 0.01 level for df 1/44

From table 4.8 it was found that the degree of freedom (df) for among and within groups were 1 and 44 respectively. The sum of squares of pre-test (SSx) were 752.7 and 684.6 for among and within groups respectively. The sum of squares of the post-test (SSy) were 2387.3 and 800.6 for among and within groups respectively. The adjusted sum of squares for pre-test and post-test (SSxy) were 1340.5 and 603.5 for among and within groups respectively. The sum of squares of post-test and pre-test (SSy.x) were 290.0 and 268.7 for among and within groups respectively. The adjusted mean sum of squares of pre-test and post-test of control and experiment (MSSy.x) for among and within groups were 290.0 and 6.1 respectively. The adjusted F-value was found to be 47.5, which was found to be significant at 0.01 level of significance with df of 1/44.

Hence the null hypothesis H_03 "There will be no significant difference between the adjusted post-test mean achievement scores of the students of control group and that of experiment group2 (CAI with Repetition) in English grammar, taking their pre-test score as covariate" , is rejected as the difference between the adjusted post-test means was found to be significant. Further to know the mean of which group is higher or which mean is lower, the details of mean scores and standard deviation of both the groups are given in the Table 4.9.
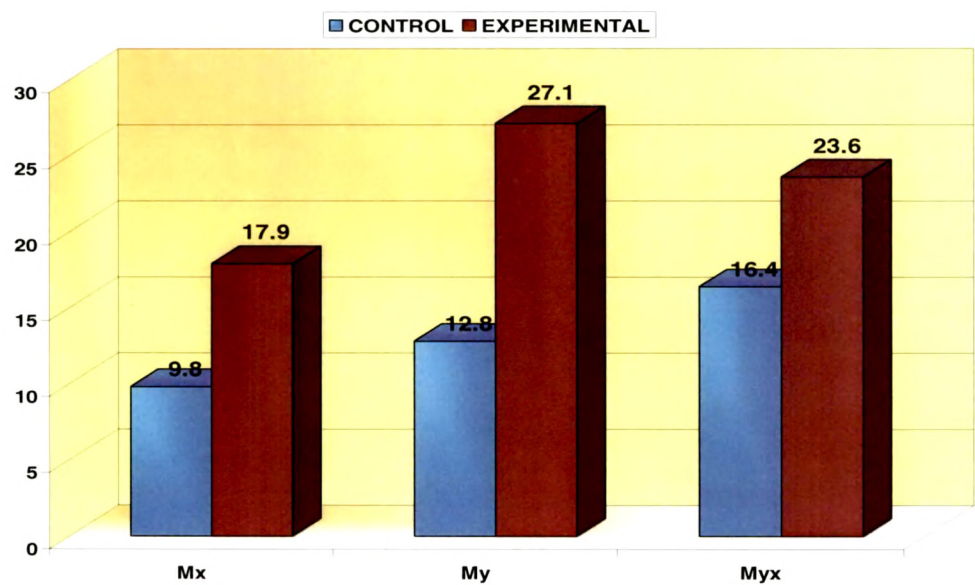
Table 4.9: Summary of mean, standard deviation of x - Pre-test (Covariate), y - Post-test (Dependent Variable) of the control group the experiment group2 (CAI with repetition)

GROUPS	N	Mx	SDx	My	SDy	Myx	SDyx
CONTROL	26	9.8	4.2	12.8	4.9	16.4	2.5
EXPERIMENT (Group2)	20	17.9	3.3	27.1	2.9	23.6	2.5

From table 4 .9 it was found that the pre-test mean scores (Mx) of the control and the experiment group2 (CAI with repetition) were found to be 9.8 and 17.9 respectively. The standard deviation (SDx) for the post-test mean scores for the control and experiment group2 (CAI with repetition) were found to be 4.2 and 3.3 respectively. The post-test mean scores (My) of the control and the experiment group2 (CAI with repetition) were found to be 12.8 and 27.1 respectively. The standard deviations (SDy) of the control and the experiment group2 (CAI with repetition) of post-test scores for the respective groups were found to be 4.9 and 2.9 respectively. The adjusted post-test mean (Myx) of the control and experiment group2 (CAI with repetition) were found to be 16.4 and 23.6 respectively with adjusted standard deviation (SDyx) of 2.5 for both the groups. It showed that the experiment group2 (CAI with repetition) scored more than the control group in the post-test which is due to the effect of CAI with repetition. As the Ho3 was rejected, it can be concluded that the adjusted mean achievement of experiment group2, taught through CAI with repetition is significantly higher than that of the control group.

For better view and comprehension of the reader, the means of both the groups are shown in the graph 4.3.

Graph 4.3: Graph of mean of x - Pre-test (Covariate), y - Post-test (Dependent Variable) and the adjusted post-test means of the experiment group2 (CAI with repetition) and the control group

4.5.0 COMPARISON OF THE CONTROL AND THE EXPERIMENT GROUP 3 (CAI with Discussion)

Comparison of control group which was taught with traditional method and the experiment group 3 is done with the help of mean and standard deviation of pre-test and post-test scores of control and experiment group3 (CAI with Discussion) which is given in table 4.10 for analysis.

Table 4.10: Mean, Standard Deviation of Pre-test (Covariate) and Post-test (Dependent Variable) scores of control and experiment group 3 (CAI with Discussion) along with their N

GROUPS	N	Mx	SDx	My	SDy
CONTROL	26	9.8	4.2	12.8	4.9
EXPERIMENT	21	19.2	3.0	32.2	3.8

From the table 4.10 it can be seen that the pre-test mean scores (Mx) for control and experiment groups are 9.8 and 19.2 with standard deviation (SDx) 4.2 and 3.0 respectively. The post-test mean scores (My) for them are 12.8 and 32.2 with standard deviation (SDy) 4.9 and 3.8 respectively which show the difference between the mean scores of the control and the experiment group3. To compare adjusted post-test mean achievement scores of the control and the experiment group 3 and to find whether the difference between them is significant, analysis of co-variance was used where pre-test score was considered as covariate. The summary of analysis of co-variance is given as below.

Table 4.11: Summary of ANCOVA taking x- Pre-test (Covariate), y- Post-test (Dependent variable) of the control group and the experiment group3 (CAI with discussion)

Sources of Variance	DF	SSx	SSy	SSxy	SSy.x	MSSy.x	SDy.x	F-Value
Among	1	1033.1	4364.4	2123.4	468.1	468.1		
Within	44	637.8	933.3	616.1	338.2	7.7	2.8	60.9*
Total	45	1671.0	5297.7	2739.5	806.3			

* Significant at 0.01 level for df 1/44

From table 4 .11 it was observed that the degree of freedom (df) for among and within groups were 1 and 44 respectively. The sum of squares of pre-test (SSx) is 1033.1 and 637.8 for among and within groups respectively. The sum of squares of the post-test

(SSy) is 4364.4 and 933.3 of among and within respectively. The adjusted sum of square for pre-test and post-test (SSxy) is 2123.4 and 616.1 for among and within groups respectively. The sum of squares of post-test and pre-test (SSy.x) is 468.1 and 338.2 for among and within groups respectively. The adjusted mean sum of squares of post-test of control group and experiment group3 (CAI with discussion) for among and within groups (MSSy.x) is 468.1 and 7.7 respectively. The adjusted F-value was found to be 60.9, which was found to be significant at 0.01 level of significance with df of 1/44. Hence the null hypothesis H_04 **"There will be no significant difference between the adjusted post-test mean achievement scores of the students of control group and that of experiment group 3 (CAI with Discussion) in English grammar, taking their pre-test score as covariate"**, is rejected as the difference between the adjusted post-test means of the control and the experiment group3 was found to be significant. Further to know the mean of which group is higher or which group is lower, the details of mean, standard deviation of both the groups are given in the Table 4.12.

Table 4.12: Summary of mean, standard deviation of x - Pre-test (Covariate), y - Post-test (Dependent Variable) of the control group and the experiment group3 (CAI with discussion)

GROUPS	N	Mx	SDx	My	SDy	Myx	SDyx
CONTROL	26	9.8	4.2	12.8	4.9	17.4	2.8
EXPERIMENT	21	19.2	3.0	32.2	3.8	27.6	2.8

From table 4 .12 it was found that the pre-test mean scores (Mx) of the control group and the experiment group3 (CAI with discussion) were found to be 9.8 and 19.2 respectively. The standard deviations (SDx) of post-test mean scores for the respective groups were found to be 4.2 and 3.0 respectively. The post-test mean scores (My) of the control and experiment group3 were found to be 12.8 and 32.2 respectively. The standard deviation of post-test scores (SDy) for the control and experiment groups were found to be 4.9 and 3.8 respectively. The adjusted post-test means (Myx) of the control and the experiment group3 were found to be 17.4 and 27.6 respectively with adjusted standard

deviation (SDyx) of 2.8 for both the groups. It showed that the students of experiment group3 scored higher than the students of control group in the post-test which is due to the implementation of CAI with discussion. As the Ho4 was rejected, it can be concluded that mean achievement of the experiment group3 (CAI with Discussion) is significantly higher than that of the control group. The means of the control and the experiment groups are also shown in the graph 4.4 for better comprehension of the readers.

Graph 4.4: Graph of mean of x - Pre-test (Covariate), y- Post-test (Dependent Variable) and the adjusted post-test means of the experiment group3 (CAI with discussion) and the control group.
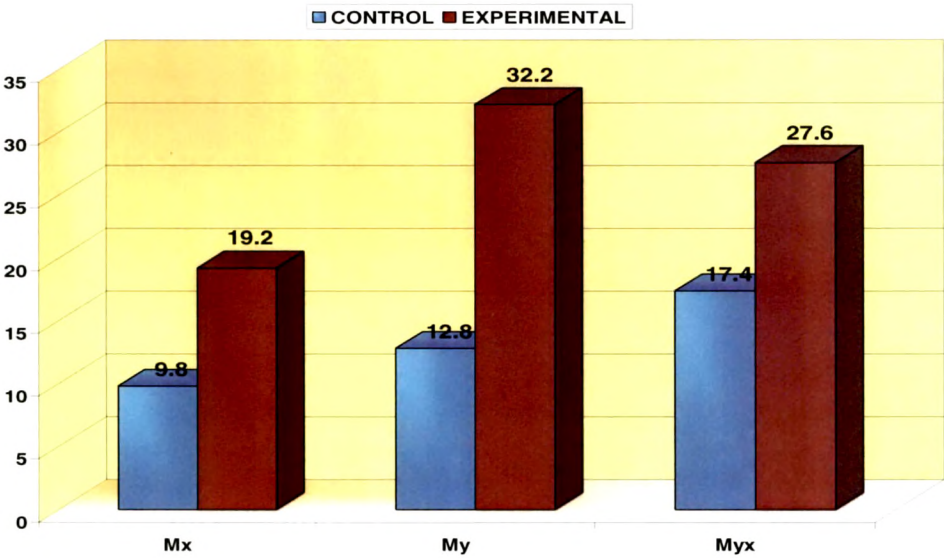
4.6.0 COMPARISON OF ALL THE EXPERIMENT GROUPS TAUGHT THROUGH DIFFERENT MODES OF CAI

Comparison of all the experiment groups taught through different modes of CAI is done with the help of mean and standard deviation of pre- test and post- test scores which is shown in the table 4.13.

Table 4.13: Mean, Standard Deviation of Pre-test (Covariate) and Post-test (Dependent Variable) scores of control and all experiment groups along with their N.

GROUPS	N	Mx	SDx	My	SDy
Group 1(only CAI)	20	18.50	6.05	25.90	5.58
Group 2 (CAI with repetition)	21	17.86	3.33	27.14	2.88
Group 3 (CAI with discussion)	21	19.24	2.97	32.19	3.92

From the table 4.13 it can be seen that the pre-test mean scores (Mx) of experiment groups- Group 1 (only CAI), Group 2 (CAI with Repetition) and Group 3 (CAI with Discussion) were 18.50, 17.86 and 19.24 with standard deviation (SDx) 6.05, 3.33 and 2.97 respectively. The post-test mean scores (My) for them were 25.90, 27.14 and 32.19 with standard deviation (SDy) 5.58, 2.88 and 3.92 respectively, which show the difference among the mean scores of the experiment groups. To compare the adjusted post-test mean achievement of all the experiment groups and to find out if the difference between any of them is significant or not, analysis of co-variance was used where pre-test score was considered as covariate. The summary of analysis of co variance is given as below.

Table 4.14: Summary ANCOVA taking x-Pre-test (Covariate), y - Post-test (Dependent variable) of all the three experiment groups - Group1 (only CAI), Group2 (CAI with repetition) and Group3 (CAI with discussion)

Sources of Variance	DF	SSx	SSy	SSy.x	MSSy.x	SDy.x	F- Value
Among	2	20.05	459.75	353.07	176.53		
Within	58	1149.38	1105.61	438.76	7.56	2.8	23.34*
Total	60	1169.44	1565.35	791.83			

* Significant at 0.01 level for df 2/58

From table 4.14 it was found that the degree of freedom (df) for among and within groups were 2 and 58 respectively. The sum of squares of pre-test (SSx) were 20.05 and 1149.38 for among and within groups respectively. The sum of squares of the post-test (SSy) were 459.75 and 1105.61 for among and within groups respectively. The sums of squares of adjusted post-test (SSy.x) were found to be 353.07 and 438.76 for among and within groups respectively. The adjusted mean sum of squares of post-test was found to be 176.53 and 7.56 for among and within respectively the adjusted standard deviation 2.8 for all three groups. The computed F-value was 23.34, which was found to be significant at 0.01 level of significance for the df of 2/58. Hence the null hypothesis H_05 **"There will be no significant difference in the adjusted post-test mean achievement score of the students studying CAI in different modes taking their pre-test score as covariate"**, was rejected as the difference between the adjusted post-test mean scores was found to be significant. Further to know the mean of which group was higher or which mean was lower, the details of mean scores and standard deviation of all three groups are given in the Table 4.15.

Table 4.15: Summary of mean, standard deviation of x - Pre-test (Covariate), y - Post-test (Dependent Variable) and adjusted means and standard deviation of the experiment groups - Group1 (only CAI), Group2 (CAI with repetition) and Group3 (CAI with discussion) along with their N

GROUPS	N	Mx	SDx	My	SDy	Myx	SDyx
Group 1(only CAI)	20	18.50	6.05	25.90	5.58	25.92	
Group 2 (CAI with repetition)	21	17.86	3.33	27.14	2.88	27.66	2.75
Group 3 (CAI with discussion)	21	19.24	2.97	32.19	3.92	31.65	

From table 4.15 it was observed that the pre-test mean scores (Mx) of the experiment groups taught through only CAI, CAI with repetition and CAI with discussion modes were found to be 18.50, 17.86 and 19.24 respectively. The standard deviations (SDx) for all three groups for pre-test mean scores were found to be 6.05, 3.33 and 2.97 respectively. The post-test mean scores (My) of three experiment groups were

found to be 25.90, 27.14 and 32.19 with standard deviations (SDy) of 5.58, 2.88 and 3.92 respectively. The adjusted post-test mean scores (Myx) of all the experiment groups were found to be 25.92, 27.66 and 31.65 respectively with adjusted standard deviation (SDyx) of 2.75 for all three groups. It showed that there was a difference in the achievement of the three experiment groups taught through three different modes i.e. only CAI, CAI with repetition and CAI with discussion. As Ho5 was rejected, it can be concluded that different modes of teaching had effected the achievement of the students and the difference between the post-test mean scores were found to be significant. The means of control group and experiment groups are also shown in the graph 4.5 for better comprehension of the readers.

Graph 4.5: Graph of mean of x - Pre-test (Covariate), y - Post-test (Dependent Variable) and the adjusted post-test mean of the experiment groups - Group1 (only CAI), Group2 (CAI with repetition) and Group3 (CAI with discussion)
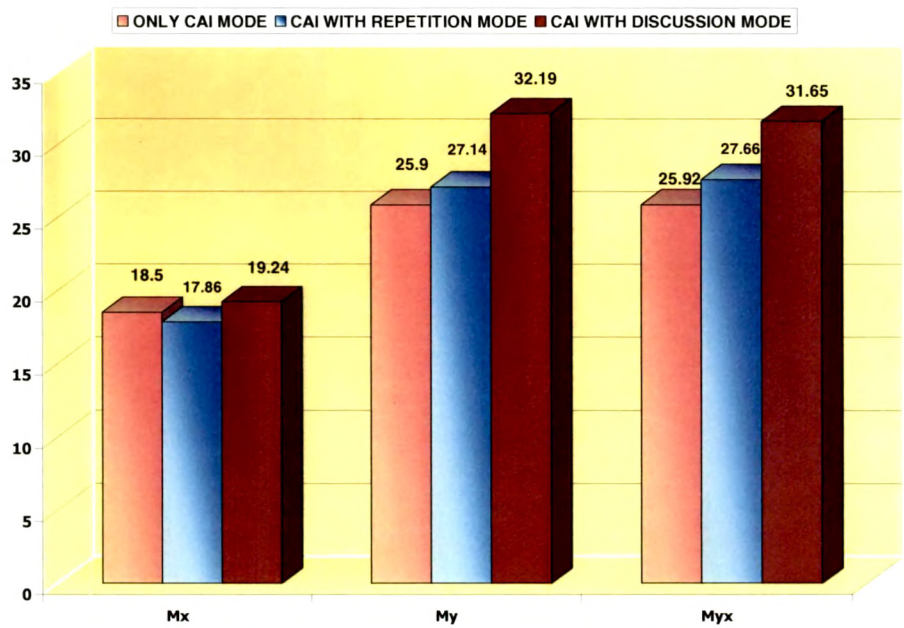
Further to find out the significant different between the pair of groups, i.e. group 1 and group 2; group 2 and group 3; and group 1 and group 3, t-test is used which is a part of the ANCOVA which is presented in table 4.16.

Table-4.16: Summary of difference between the adjusted means of all three experiment groups with each other i.e. Group-1 (only CAI), Group-2 (CAI with Repetition) and Group-3 (CAI with Discussion) with t- value

COMPARISON OF GROUPS	df	DIFFERENCE BETWEEN ADJUSTED MEANS	t-VALUE	SIGNICANCE
Group 1&2	39	1.74	2.02	Not significant
Group 2&3	40	3.99	4.71	0.01
Group 1&3	39	5.73	6.67	0.01

From the table- 4.16 it was found that the df for the group1 and group2 was 39 and the difference between the adjusted mean was 1.74. The calculated t-value for these two groups was 2.02, which is not significant at 0.01 level of significance. So the **Ho6 "There will be no significant difference between the adjusted post-test mean achievement scores of group 1 (only CAI) and group 2 (CAI with repetition) in English grammar, taking the pre-test as covariate"**, is retained. Hence it can be said that there is no significant difference in the post-test mean achievement scores of the students of group 1 and group2 in English grammar.

From the table- 4.16 it was found that the df of group 2 and group 3 was 40 and the difference between the adjusted post-test mean was 3.99. The calculated t-value for these two groups was 4.71 which show that the difference is significant from the table value 2.04 and 2.42 at 0.05 and 0.01 levels respectively. So the **Ho7 "There will be no significant difference between the adjusted post-test mean achievement scores of group 2 (CAI with Repetition) and group 3 (CAI with Discussion) in English grammar, taking the pre-test as covariate"**, based on the Ho 5 is rejected.

From the table - 4.16 it was found that the df of group1 and group3 was 39 and the difference between the adjusted post-test mean was 5.73. The calculated t-value for these two groups was 6.67 which show the significant difference from the table value 2.42 at 0.01 level. So the **Ho8 "There will be no significant difference between the adjusted post-test mean achievement scores of group 1 (only CAI) and group 3 (CAI**

with Discussion) in English grammar taking the pre-test as covariate" based on the **Ho 5** is rejected.

Out of all three modes of teaching, CAI with Discussion was found significantly better in terms of achievement in English grammar in comparison to other two modes i.e. only CAI, and CAI with Repetition.

4.7.0 EFFECTIVENESS OF THE DEVELOPED CAI IN TERMS OF STUDENTS' REACTIONS

To achieve objective TWO of the present study i.e. `To study the effectiveness of the developed CAI in different modes in terms of students' achievement in English Grammar and Reaction of Students'. A reaction scale was developed with 22 statements those representing different components like, development and implementation of the CAI package which is given in appendix. Out of these 22 statements, six statements were negative and 16 statements were positive. The data related to the reaction scale is analyzed in terms of percentage of reaction for different degree along with the intensity index which is given in table 4.17 which are followed by discussion.

Table-4.17: Summary of the reactions of the students towards the statements related to the developed CAI in Percentage and Intensity Index

Sr. No	Statements	SA %	A %	UD %	D %	SD %	II
1	I like CAI package presented through computer.	47.89	47.51	4.60	-	-	4.35
2	The presentation of the content was interesting.	42.68	50.41	4.88	0.81	1.22	4.10
3	The introduction for each topic was appropriate.	59.76	30.28	8.37	-	1.59	4.18
4	I would prefer to have other topics presented through this type of CAI package.	60.62	19.47	15.92	2.65	1.33	3.77
5	The explanation given for each topic needs more clarity and for better understanding.	13.64	22.73	38.64	6.06	18.94	2.36
6	The active participation of students helped to understand clearly the application of each topic.	44.53	42.11	8.50	4.86	-	4.12
7	The language used in the CAI package was easy.	43.48	42.51	5.80	7.73	0.48	3.76
8	The colour of the back ground of slides for each different topic needs to be more attractive.	17.83	23.26	9.30	34.11	15.50	2.26
9	The various slides shown for giving examples on each topic were proper.	45.85	38.43	10.48	4.37	0.87	4.09
10	The picture and the text presented for each slide is not totally appropriate.	8.88	17.75	7.10	30.77	35.50	2.86
11	Some pictures were more confusing in learning different topics.	13.08	32.31	30.00	24.61	-	2.17
12	I would like to have some more time in learning through this type of CAI packages.	54.39	29.71	13.81	1.67	0.42	3.98
13	The coloured and animated pictures helped us to develop our interest in learning grammar.	50.40	35.48	8.47	4.83	0.81	4.13
14	Each topic became easier while learning through CAI package.	47.21	36.05	12.88	2.58	1.29	3.95
15	Combination of text and graphics made our learning interesting for each topic	46.81	39.15	8.94	4.25	0.85	3.92
16	I would like to learn other topics of English grammar also with this kind of CAI.	45.45	31.82	18.59	4.13	-	4.03
17	Content presented in CAI package was not arranged properly.	6.43	21.05	10.52	32.75	29.24	2.95
18	Our English teacher should also use such CAI packages for teaching English grammar.	56.20	37.20	4.65	1.55	0.39	4.30
19	Teachers of others subjects should also use such CAI packages while teaching.	55.10	32.65	8.57	1.63	2.04	4.08
20	We can now apply the learnt knowledge in different life like situations.	43.67	33.19	18.34	4.37	0.44	3.88
21	The speech related to sentences would have been more effective in this CAI.	43.10	43.10	7.76	5.17	0.86	3.70
22	This kind of CAI can help us to learn ourselves.	62.26	29.57	4.67	3.11	0.39	4.28
	Total	**44.71**	**33.76**	**10.89**	**6.72**	**3.92**	**3. 53**

In terms of the reaction of the students towards the statement no1 'I like CAI package presented through computer', 47.89%, 47.51%, and 4.60% of them reacted strongly agree, agree, and undecided respectively. The intensity index of 4.35 showed highly favorable reaction of students towards the developed CAI in terms of their liking of the developed CAI.

For the statement no2 'The presentation of the content was interesting', 42.68%, 50.41%, 4.88%, 0.81%, and 1.22% of the students gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 4.10 showed favorable reaction of students towards the presentation of the content through developed CAI in interesting way.

For the statement no3 'The introduction for each topic was appropriate', 59.76%, 30.28%, 8.37% and 1.59% of the students gave their reaction in strongly agree, agree, undecided, and strongly disagree respectively. The intensity index 4.18 showed favorable reaction of students towards the introduction of the topic in the developed CAI.

In terms of the reaction of the students towards the statement no4 'I would prefer to have other topics presented through this type of CAI package', 60.62%, 19.47%, 15.92%, 2.65%, and 1.33% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 3.77 showed favorable reactions of them for the presentation of other topics through this type of CAI.

For the statement no5 'The explanation given for each topic needs more clarity and for better understanding', 13.64%, 22.73%, 38.64%, 6.06% and 18.94% of the students gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 2.36 showed that the students were undecided towards reaction for the explanation of the topics.

In terms of the reaction of the students towards the statement no6 'The active participation of students in learning helped to understand clearly the application of each topic', 44.53%, 42.11%, 8.50%, and 4.86% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 4.12 showed favorable reactions of students for the active participation and its effect to understand the topics clearly.

In terms of the reaction of the students towards the statement no7 'The language used in the CAI package was easy', 43.48%, 42.51%, 5.80%, 7.73% and 0.48% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 3.76 showed favorable reactions of students for the language being easy to understand.

For the statement no8 'The colour of the back ground of slides for each different topic needs to be more attractive', need of the appropriateness of the background colour of the slides of each different topic 17.83%, 23.26%, 9.30%, 34.11% and 15.50% of the students gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. As the statement was in negative sense, the intensity index 2.26 showed favorable reactions of students for appropriateness of the background colour of the slides of each topic. It means that they found the background appropriate.

In terms of the reaction of the students towards the statement no9 'Various slides shown for giving examples on each topic were proper', 45.85%, 38.43%, 10.48%, 4.37% and 0.87% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 4.09 showed favorable reactions of students for the appropriateness of examples on each different topic presented through the developed CAI.

For the statement no10 'The picture and the text presented for each slide is not totally appropriate', 8.88%, 17.75%, 7.10%, 30.77% and 35.50% of the students gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 2.86 showed undecided about the inappropriateness of the picture and the text.

In terms of the reaction of the students towards the statement no11 'Some pictures were more confusing in learning different topics', 13.08%, 32.31%, 30.00% and 24.61% of them gave their reaction in strongly agree, agree, undecided, disagree and respectively. The intensity index 2.17 showed they disagreed to that, which means they disagreed to the statement that the pictures were confusing for learning different topics.

For the statement no12 'I would like to have some more time in learning through this type of CAI packages', 54.39%, 29.71%, 13.81%,1.67% and 0.42% of the students gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree

respectively. The intensity index 3.98 showed favorable reactions of the students towards the requirement of more time to learn through the developed.

For the statement no13 'The coloured and animated pictures helped us to develop our interest in learning grammar', 50.40%, 35.48%, 8.47%, 4.83% and 0.81% of the students gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 4.13 showed that they agreed to it. It showed that the learning through coloured and the animated pictures made the learning of grammar interesting.

In terms of the reaction of the students towards the statement no14 'Each topic became easier while learning through CAI package', 47.21%, 36.05%, 12.88%, 2.58% and 1.29% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 3.95 showed the favorable reaction of the students to it. It showed that they had a positive reaction about learning becoming easier through CAI.

In terms of the reaction of the students towards the statement no15 'Combination of text and graphics made our learning interesting for each topic', 46.81%, 39.15%, 8.94%, 4.25%, and 0.85% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 3.92 showed that they gave favorable reactions to it and they found the combination of text and graphic helpful in leaning the topics interestingly.

For the statement no16 'I would like to learn other topics of English grammar also with this kind of CAI', 45.45%, 31.82%, 18.59% and 4.13% of the students gave their reactions in strongly agree, agree, undecided and strongly disagree respectively. The intensity index 4.03 showed their favorable reactions towards learning of other topics of English grammar with this kind of CAI.

In terms of the reaction of the students towards the statement no17 'Content presented in CAI package was not arranged properly', 6.43%, 21.05%, 10.52%, 32.75% and 29.24% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 2.95 showed that they were undecided towards the statement.

In terms of the reaction of the students towards the statement no18 'Our English teacher should also use such CAI packages for teaching English grammar', 56.20%, 37.20%, 4.65%, 1.55% and 0.39% of the students gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 4.30 showed their highly favorable reactions for the statement which showed that they expect their English teacher to use this kind of CAI to teach them.

For the statement no19 'Teachers of others subjects should also use such CAI packages while teaching', 55.10%, 32.65%, 8.57%, 1.63% and 2.04% of the students gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 4.08 showed the favorable reactions of them for the statement which showed they also expect other subject teachers also to make use of this kind of CAI.

In terms of the reaction of the students towards the statement no20 'We can now apply the learnt knowledge in different life like situations', 43.67%, 33.19%, 18.34%, 4.37% and 0.44% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 3.88 showed their favorable reactions for the statement about making use of the learnt knowledge in lifelike situation.

In terms of the reaction of the students towards the statement no21 'The speech related to sentences would have been more effective in this CAI', 43.10%, 43.10%, 7.76%, 5.17% and 0.86% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 3.70 showed their favorable reactions for the statement which showed that speech related to the topics would have been more effective.

In terms of the reaction of the students towards the statement no23 'This kind of CAI can help us to learn ourselves', 62.26%, 29.57%, 4.67%, 3.11% and 0.39% of them gave their reaction in strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index 4.28 showed their highly favorable reactions for the statement which showed that this kind of CAI is helpful in self learning.

The over all reaction of the students towards the developed CAI was 44.71 %, 33.76 %, 10.89%, 6.72 % and 3.92 % in strongly agree, agree, undecided, disagree and strongly

disagree respectively. The intensity index 3.53 showed their favorable reactions towards the teaching and learning through CAI. Thus CAI was found effective in terms of the reactions of the students.