

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

This chapter deals with the presentation and analysis of data.

The following statistics were applied for the analysis of data:

Mean, standard deviation, variance and z-test for the two independent groups.

In this chapter, the following symbols refer to as given below:

CG=	Control group
EG=	Experimental group
PCG=	Pre-test scores for control group
PEG=	Pre-test scores experimental group
EGPT=	Post-test scores for experimental group
CGPT=	Post-test scores for control group
EG1=	Post-test reading comprehension scores for the experimental group
CG1=	Post-test reading comprehension scores for the control group
EG2=	Post-test writing ability scores for the experimental group
CG2=	Control group (writing ability scores)

- CG3= Post-test listening comprehension scores for the control group
- EG4= Post-test speaking ability scores for experimental group.
- CG5= Post-test, different aspects of grammar for control group.
- EG5= Post-test, different aspect of grammar for experimental group.
- CG6= Post-test, recall scores for control group.
- EG6= Post-test recall scores for the experimental group.
- CG7= Post-test, use of structures, scores for the control group.
- EG7= Post-test, use of structures scores for the experimental group.

This chapter has been divided into three parts. Part-I deals with the tabulation and analysis of pre and post-test. Part-II deals with measuring the proportionate amount of time taken by the teacher, 'teacher + students' and students in the experimental and control group. Part-III relates to the analysis of attitudes scale for calculating the attitude of the experimental group towards the group work activities.

PART I

Analysis of pre-test and post-test

Table1. The Mean Pre-test Scorers of the Control and Experimental Groups at the Elementary and Secondary Stage.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	PCG	40	13.45	3.61	13.02	0.53471
	PEC	40	13.85	3.06	9.36	
Elementary	PCG	56	13.38	6.18	38.24	0.1064
	PEC	56	13.5	6.24	38.99	

Table-1 shows that the mean, standard deviation and variance of the control and experimental group at the secondary school stage are 13.45, 3.61, 13.02 and 13.85, 3.06, 9.36 respectively. The computed z value of the two independent groups (0.53471) at the secondary stage is less than the tabulated value (1.96). So the difference between the means of two groups is not significant at 0.05 level of significance. Similarly the mean, standard deviation and variance of the control and experimental group at the elementary stage are 13.38, 6.18, 38.24 and 13.5, 6.24 and 38.99 respectively. The computed z value (0.1064) is less than tabulated value (1.96), which shows that the difference between the means of the two groups at the elementary stage is not significant at .05 level of significance. The not significant z values at the elementary and secondary stage indicate that the experimental and control groups at each stage were equivalent at the time of starting the experiment.

Table-2 The Mean Post-test Scorers (Academic Achievement) of the Control and Experimental Groups.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	CGPT	40	35.72	17.79	316.51	9.14748*
	EGPT	40	63.23	6.71	45.00	
Elementary	CGPT	56	20.63	12.76	162.82	5.01*
	EGPT	56	33.53	14.44	208.51	

* Significant at 0.05 level.

Table-2 indicates that the mean, standard deviation and variance of the control and experimental group at the secondary school stage are 35.72, 17.79, 316.51 and 63.23, 6.71, 45.00 respectively and that of the elementary stage are 20.63, 12.76, 162.82 and 33.53, 14.44, 208.51 respectively. The computed z value (9.14748) of the two independent groups at the secondary stage exceeds the tabulated value (1.96). So the difference between the means of two groups is significant at 0.05 level. Similarly the computed z-value of the two independent groups at the elementary stage (5.01) exceeds the tabulated value (1.96) thus indicating that the difference between the means of two groups is significant at 0.05 level. Thus, at both the elementary and secondary stage, the experimental groups performed significantly better than the control groups in the post-test, testing the academic achievement of the students. Therefore the first null hypothesis is rejected.

Table-3 The Mean Post-Test Scorers (Reading Comprehension) of the Control and Experimental Groups.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	CG1	40	7.08	1.38	1.92	9.04144*
	EG2	40	9.25	0.63	0.40	
Elementary	CG1	56	1.91	1.71	2.91	3.46*
	EG2	56	2.95	1.45	2.10	

* Significant at 0.05 level.

Table-3 shows that the mean, standard deviation and variance of the control and experimental group at the secondary stage are 7.08, 1.38 1.92 and 9.25, 0.63, 0.40 respectively while that of the elementary stage are 1.91, 1.71, 2.92 and 2.95, 1.45, 2.10 respectively. The computed z value of the two independent groups at the secondary and elementary stage are 9.04144, 3.46 respectively. These values are greater than the tabulated value (1.96) thus indicating that the difference between the means of the two groups is significant at both the secondary and elementary stage. Thus, at both the elementary and secondary stages, the experimental groups showed significantly better performance than the control group in the post-test (reading comprehension). Thus the second null hypothesis is rejected at both the given stages.

Table-4 The Mean Post-Test Scorers (Writing Ability) of the Control and Experimental Groups.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	CG2	40	2.63	3.45	11.88	5.05*
	EG2	40	6.44	3.30	10.91	
Elementary	CG2	56	0.57	1.31	1.70	4.44*
	EG2	56	1.88	1.78	3.17	

* Significant at 0.05 level.

Table-4 indicates that the mean, standard deviation and variance of the control and experimental group at the secondary school stage are 2.63, 3.45, 11.88 and 6.44, 3.30, 10.91 respectively while that of the elementary stage are 0.57, 1.31, 1.70 and 1.88, 1.78, 3.17 respectively. The computed z value of the two independent groups at the secondary and elementary stage are 5.05044, 4.44 respectively both of which are greater than the tabulated value (1.96). This indicates that the difference between the mean post-test scores of the two group at both the secondary and elementary stages is significant. Thus the experimental group at each stage performed significantly better than the control group in the post-test, testing the writing ability to the students. Thus the third null hypothesis is rejected at the secondary as well as elementary stage.

Table –5 The Mean Post-Test Scorers (Listening Comprehension) of the Control and Experimental Groups.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	CG3	40	4.48	2.75	7.54	3.37848*
	EG3	40	7.00	3.23	10.46	
Elementary	CG3	56	2.34	1.05	1.10	5.56*
	EG3	56	3.55	1.25	1.56	

* Significant at 0.05 level.

Table-5 shows that the mean, standard deviation and variance of the control and experimental group at the secondary stage are 4.48, 2.75, 7.54 and 7.00, 3.23, 10.46 respectively while that of the elementary stage are 2.34, 1.05, 1.10 and 3.55, 1.25, 1.56 respectively. The computed z value at the secondary and elementary stage i.e. 3.37848, 5.56 exceed the tabulated value (1.96), this indicating the significant difference between the mean post-test scores of the two group at both the secondary and elementary stages. Thus the experimental group at each stage performed significantly better than the control group in the post-test, testing the listening comprehension of the students. Thus the fourth null hypothesis is rejected at both the given stages.

Table-6. The Mean Post-Test Scorers (Speaking Ability) of the Control and Experimental Groups.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	CG4	40	3.4	2.84	8.09	9.21396*
	EG4	40	7.88	1.16	1.34	
Elementary	CG4	56	2.91	0.86	0.74	4.122*
	EG4	56	3.61	0.93	0.86	

* Significant at 0.05 level.

Table-6 indicates that the mean, standard deviation and variance of the control and experimental group at the secondary school stage are 3.4, 2.84, 8.09 and 7.88, 1.16, 1.34 respectively while that of the elementary stage are 2.91, 0.86, 0.74 and 3.61, 0.93, 0.86 respectively. The computed z values at the secondary and elementary stages i.e. 9.21396 and 4.122 exceed the tabulated value (1.96). thus showing the significant difference between the mean post-test scores (speaking ability) of the two group at the secondary as well as the elementary stage. Thus the experimental group at each stage showed significantly better performance than the control group in the post-test, testing the speaking ability of the students. Thus the fifth null hypothesis is rejected at the secondary as well as the elementary stage.

Table-7. The Mean Post-Test Scorers (Applying the Rules of Grammar) of the Control and Experimental Groups.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	CG5	40	7.6	6.74	45.48	7.55784*
	EG5	40	16.58	3.31	10.93	
Elementary	CG5	56	4.45	4.99	24.87	4.8446*
	EG5	56	9.75	6.5	42.24	

* Significant at 0.05 level.

Table-7 portrays the mean, standard deviation and variance of the control and experimental group which are 7.6, 6.74, 45.48 and 16.58, 3.31, 10.93 respectively at the secondary stage and 4.45, 4.99, 24.87 and 9.75, 6.5, 42.24 respectively at the elementary stage. The computed z values at the secondary and elementary stages are 7.55784 and 4.8446 respectively. These values exceed the tabulated value (1.96), which indicate the significant difference between the mean post-test scores (applying the rules of grammar) of the two groups at both the given stages. Thus the experimental group at each stage showed significantly better performance than the control group in the post-test, in which the students were required to apply the rules of grammar. Thus the sixth null hypothesis is rejected at the secondary as well as the elementary stage.

Table-8. The Mean Post-Test Scorers (Recall) of the Control and Experimental Groups.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	CG6	40	6.3	2.17	4.73	6.69159
	EG6	40	8.73	0.72	0.53	
Elementary	CG6	56	2.77	2.39	5.71	3.1678
	EG6	56	4.52	3.37	11.38	

* Significant at 0.05 level.

Table-8 indicates that the mean, standard deviation and variance of the control and experimental group at the secondary stage are 6.3, 2.17, 4.73 and 8.73, 0.72, 0.53 respectively while that of the elementary stage are 2.77, 2.39, 5.71 and 4.52, 3.37, 11.38 respectively. The computed z values at the secondary and elementary stages i.e. 6.69159 and 3.1678 exceed the tabulated value (1.96), which indicate the significant difference between the mean post-test scores (recall) of the two groups at the two given stages. Thus the experimental group at each stage performed significantly better than the control group in the post-test, testing the recall of the students. Thus the seventh null hypothesis is rejected at both the secondary and elementary stages.

Table-9. The Mean Post-Test Scorers (Use of Structures) of the Control and Experimental Groups.

Stage	Variables	Number of students	Mean	Standard Deviation	Variance	Computed Z-value
Secondary	CG7	40	4.15	2.76	7.62	5.8382*
	EG7	40	7.33	2.05	4.21	
Elementary	CG7	56	1.04	2.45	6.00	14.57*
	EG7	56	7.30	2.09	4.36	

* Significant at 0.05 level.

Table-9 indicates that the mean, standard deviation and variance of the control and experimental group at the secondary stage are 4.15, 2.76, 7.62 and 7.33, 2.05, 4.21, respectively while that of the elementary stage are 1.04, 2.45, 6.00 and 7.30, 2.09, 4.36 respectively. The computed z values at the secondary and elementary stages i.e. 5.8382, 14.57 are greater than the tabulated value (1.96). Thus indicating the significant difference between the mean post-test scores (use of structures) of the two groups at both the secondary and elementary stages. Thus the experimental group at each stage, performed significantly better than the control group in the post-test, testing the use of structures by the students. Thus the eighth null hypothesis is rejected at the secondary as well as the elementary stage.

PART II

Calculating the proportionate amount of time taken by the "teacher", "teacher + students" and "students" in the experimental and control group at the elementary and secondary stages.

Table-10 Proportionate Amount of Time Taken by the "Teacher", "Teacher + Students" and "Students" in the Experimental and Control Group.

Stage	Group	Days	Total time	Time taken by Teacher		Time taken by Teacher + Students		Time taken by students	
				Hours	%	Hours	%	Hours	%
Secondary	Control	22	12.83 hours	5.1	38.2	4.63	36.1	3.1	24.4
	Experimental			2.55	19.9	2.78	21.7	7.5	58.4
Elementary	Control	22	12.83 hours	3.45	26.88	7.3	56.88	2.1	16.24
	Experimental			1.9	14.86	4.28	33.38	6.65	51.82

Table-10 indicates that at the secondary stage the percentage of time taken by the "teacher", "teacher + students" and "students" in the control and experimental group is 38.2, 36.1, 24.4 and 19.9, 21.7, 58.4 respectively. Similarly at the elementary stage percentage of the time taken by "teacher", "teacher + students", and "students" in the control and experimental group is 26.88, 56.88, 16.24 and 14.86, 33.38, 51.82 respectively. It indicates that at the secondary stage 34% (58.4-24.4) more time is taken by the students of the experimental group as compared to the control group. Similarly in the control group 18.3 % (38.2-19.9) more time

is taken by the teacher as compared to the experimental group. In the same way 14.4% (36.1-21.7) more time is taken by the "teacher and students".

At the elementary stage 35.58 % (51.82-16.24) more time is taken by the students in the experimental group as compared to the control group. In the case of control group, 12.02% (26.88-14.86) more time is taken by the teacher and 23.50% (56.88-33.38) more time is taken by the "teacher + students" as compared to the experimental group.

PART III

Analysis of attitude scale for measuring the attitude of the experimental group students towards group work activities at the elementary and secondary stages.

Table-11 Students Like to Work in a Group

Stage	Number of students	Yes responses	%	No responses	%	Undecided responses	%Age
Elementary	56	56	100	0	0	0	0
Secondary	40	39	97.5	0	0	1	2.5

Table-11 shows that 100 % of the students at elementary stage and 97.5 % of the students at secondary stage like to work in a group. Only 2.5 % of the students at secondary stage cannot decide whether they like to work in a group or not.

Table-12 Easiness to Work in a Group

State	Number of students	Yes responses	%	No responses	%	Undecided responses	%
Elementary	56	55	98.2	1	1.78	0	0
Secondary	40	39	97.5	0	0	1	2.5

Table-12 indicates that 98.2 % of the students at elementary stage and 97.5 % of the students at secondary stage feel easy to work in a group. They understand the material in a better way. Only 1.78 % of the students at the elementary stage do not feel easy to work in a group. Only 2.5 % of the students at secondary stage cannot decide whether they feel easy to work in a group or not.

Table-13 Better Effect of Group Work on the Learning Speed

State	Number of students	Yes responses	%	No responses	%	Undecided Responses	%
Elementary	56	55	98.2	1	1.78	0	0
Secondary	40	38	95	0	0	2	5

Table-13 indicates that 98.2 % of the students at elementary stage and 95 % of the students at secondary stage think that their speed of learning gets better while working in groups. While, only 1.78 % of the students at the elementary stage think that group work does not improve their learning speed whereas at the secondary stage only 5 % of the students cannot decide in any way.

Table-14 Students Want to see their Own Group on the Top

State	Number of students	Yes responses	%	No responses	%	Undecided responses	%
Elementary	56	56	100	0	0	0	0
Secondary	40	40	100	0	0	0	0

Table-14 indicates that 100 % of the students at both the elementary and secondary stages want to bring their groups at the top position in the class.

Table-15 Dull Students can Improve by Working in Groups

State	Number of students	Yes responses	%	No responses	%	Undecided responses	%
Elementary	56	54	96.4	2	3.6	0	0
Secondary	40	36	90	0	0	4	10

Table-15 indicates that 96.4% of the students at the elementary stage and 90.% of students at the secondary stage hold the opinion that dull students can improve by working in a group. Only 3.6 % of the students at the elementary stage disagree with the statement. Whereas at the secondary stage, 10 % of the students cannot decide in any way.

Table-16 The Language Skills can Improve by Working in a Group.

Stage	Number of Students	Reading Yes %	Writing Yes %	Listening Yes %	Speaking Yes %
Elementary	56	52 92.86	45 80.36	30 53.57	0 0
Secondary	40	36 90.	32 80.	31 77.5	20 50

Table-16 indicates that 92.86% of the students at the elementary stage and 90.% of students at the secondary stage hold the opinion that reading comprehension of the students can improve by working in groups. Similarly according to 80.36% of the students at the elementary stage and 80% of the student at the secondary stage, working in groups has positive effect on the writing ability of the students. In the same way 53.57 % of the students at the elementary stage and 77.5 % of the students at the secondary stage think that group work improves their listening comprehension. 50% of the students at the secondary stage think that speaking ability can be improved by working in a group. Whereas, at the elementary stage no student is in favour of the view that speaking ability can be improved by working in a group.

Table-17 Better Way of Learning Grammar

Stage	Number of Students	Deductive Approach		Through the Textbook		Through Group Work	
		Yes	%	Yes	%	Yes	%
Elementary	56	8	14.28	12	21.48	36	64.28
Secondary	40	13	32.5	1	2.5	26	65

Table-17 shows that 14.28 % of the students at the elementary stage and 32.5% of them at the secondary stage are in favour of the view that deductive approach is the better way of learning grammar whereas 21.48 % of the students at the elementary stage and only 2.5 % of the students at the secondary stage think that grammar can be learnt in a better way through text-book reading. Similarly, the view of 64.28 % of the students at the elementary stage and 65 % of them at the secondary stage is that group work is the better way of learning grammar.

Table-18 Time Wasted in a Group

State	Number of students	Yes responses	%	No responses	%	Undecided responses	%
Elementary	56	1	1.8	54	96.4	1	1.8
Secondary	40	0	0	40	100	0	0

Table-18 indicates that 1.8 % of the students at the elementary stage accept the view that time is wasted by working in a group while no student (0 %) at the secondary stage is in favour of this statement. Similarly only 1.8 % of the students at the elementary stage cannot decide whether the time is wasted in a group or not whereas no student (0%) at the secondary stage gives opinion under this category. Whereas 96.4 % of the students at the elementary stage and 100 % of the students at the secondary stage reject the view that time is wasted in a group.