

CHAPTER -V

DATA ANALYSIS, INTERPRETATION AND DISCUSSION

5.1 Testing of Null Hypotheses

The present chapter is devoted to the analysis and interpretation of the collected data to achieve objectives and to test the hypotheses presented in the previous chapter. The analysis of the data has been presented in tabular form as under –

Table No. 5.1 Significance of difference between Post test scores of Experimental group and Control group

Group	n	Mean	S.D	df	t
Experimental Group	30	41.23	6.36	58	2.39*
Control Group	30	37.4	7.21		

***Significant at 0.05 level**

From table no. 5.1 it can be observed that the mean of the scores of experimental group is 41.23 whereas the mean of the scores of the control group is 37.4 the calculated t-value was found to be 2.39 which is significant at 0.05 level of significance. This implies that the difference in the level of achievement of experimental group and control group is significant.

In the light of this, the null hypothesis no.1.1 that “there will be no significant difference between the mean achievement scores in the post test of the experimental group and the control group” is rejected.

The graphical representation of the scores is shown below.

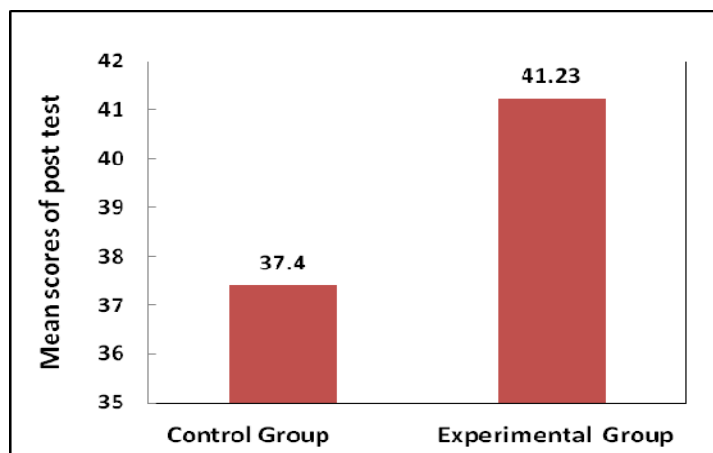


Figure 5.1: Graphical representation of the mean scores of post test of control group and experimental group

Table No. 5.2 Significance of difference between Delayed post test scores of Experimental group and Control group

Group	n	Mean	S.D	df	T
Experimental Group	30	40.23	4.15	58	2.53*
Control Group	30	35.4	9.77		

***Significant at 0.05 level of significance**

From table no. 5.2 it can be observed that the mean of the scores of experimental group in the delayed post test is 40.23 whereas the mean of the scores of the control group in the delayed post test is 35.4. The t-value of 2.53 obtained for the delayed post test scores of the experimental group and control group was found to be significant at 0.05 level of significance with df 58. This implies that the difference in the level of achievement of experimental group and control group is significant.

In the light of this, the null hypothesis no. 1.2 that “there will be no significant difference between the mean achievement scores in the delayed post test of the experimental group and the control group” is rejected.

The graphical representation of the data is shown below.

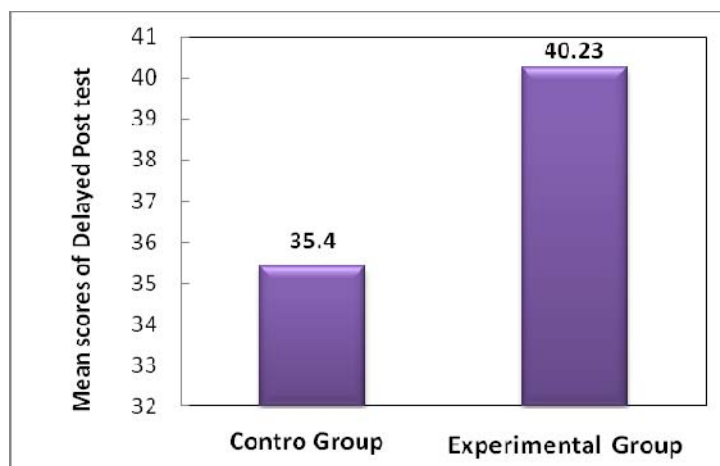


Figure 5.2: Graphical Representation of the mean scores of delayed post test of control group and experimental group

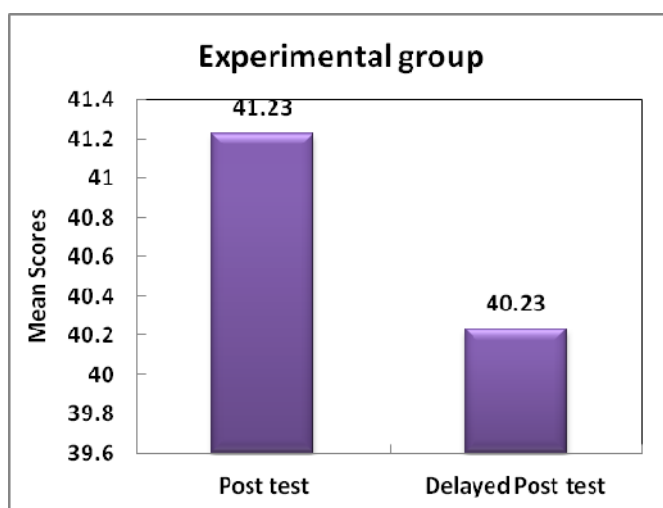
**Table No. 5.3 Significance of difference between post test and
Delayed post test scores of Experimental group**

Experimental Group	n	Mean	S.D	df	T
Post Test	30	41.23	6.36	29	1.52*
Delayed Post Test	30	40.23	4.15		

***Not Significant**

From table no. 5.3 it can be observed that the mean of the post test scores of experimental group is 41.23 whereas the mean of the delayed post test scores is 40.23. The t value of 1.52 obtained was found to be not significant at 0.05 level of significance with df 29. This implies that the difference in the level of achievement of students on post test and delayed post test of the experimental group is not significant.

In the light of this, the null hypothesis no. 1.3 that “there will be no significant difference between the mean achievement scores in the post test and delayed post test of the experimental group is accepted. The graphical representation of the data is shown below



**Figure 5.3: Graphical representation of the post test and delayed post test
scores of Experimental group**

**Table No. 5.4 Significance of difference between post test and
Delayed post test scores of Control group**

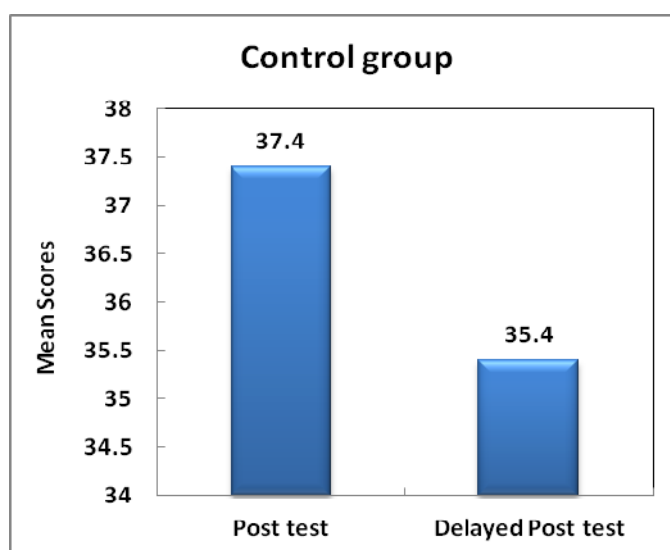
Control Group	n	Mean	S.D	df	T
Post Test	30	37.4	7.21	29	1.86*
Delayed Post Test	30	35.4	9.77		

***Not Significant**

As seen from table no. 5.4 the mean of the post test scores of control group was found to be 37.4 whereas the mean of the delayed post test scores was found to be 35.4. The t value of 1.86 obtained for the post test scores and delayed post test scores of the Control group was found to be not significant at 0.05 level of significance with df 29. This implies that the difference in the level of achievement of control group is not significant.

In the light of this, the null hypothesis no. 1.4 that “there will be no significant difference between the mean achievement scores in the post test and delayed post test of the control group” is accepted.

The graphical representation of the same is given below



**Figure 5.4: Graphical representation of the post test and delayed post test
scores of control group**

As it evident from the above tables, the difference between the post test scores of the experimental group and control group is significant. This implies that the students belonging to the experimental group have performed better than the students of the control group. Also the delayed post test scores of the experimental

group and control group is significant. This finding suggests that the students of the experimental group were able to perform better than the students of the control group even after fifteen days.

From these results we can infer that the cooperative learning lesson plans prepared for teaching science at standard VIII was effective as the experimental group students have performed better than the control group students.

When the significance of difference between post test scores and delayed post test scores of the experimental group as well as the control group was tested it was found that it is not significant. But on comparing the mean values of the experimental group and control group it was found that the mean of the post test scores and delayed post test scores of the control group is 37.4 and 35.4 respectively. In contrast to this, the mean of the post test and delayed post test scores of the experimental group is 41.23 and 40.23 respectively. The difference between mean value of the post test and delayed post test of the control group is more than the difference between mean values of the post test and delayed post test of the experimental group. This shows that the students of the experimental group were able to retain and recall more than control group students even after fifteen days. This again points out towards the effectiveness of the cooperative Learning.

Table No. 5.5 Achievement Scores of Teams

Teams	Average Achievement Scores	
	Post Test	Delayed Post Test
Team 1	8.08	7.85
Team 2	8.52	8.15
Team 3	8.64	8.54
Team 4	8.04	8.24
Team 5	8.2	8.24
Team 6	8.32	8.29

***Team 3 secured a highest score in Achievement Test**

As presented in table number 5.5 six teams were formed during group activity task and during the assessment of the group tasks were done by the researcher. Along with the individual achievement of students Team scores were also monitored. After every test team scores were calculated and at the end of the programme the team having the highest achievement scores was rewarded. Average Achievement scores of each team were presented in above table. As it shown in table that Team 3 has a highest average score i.e. 8.64 and 8.54 in post test and delayed post test respectively, it was declared a Winning Team among all the Teams.

5.2 Analysis of the Feedback Form

For the first statement 83.33 percent students responded that they have studied in a group of their friends whereas 16.66 percent said that they have not studied in a group at all. When they were asked that whether they liked to study in groups, 83.33 percent students reported that they liked to study in group of friends. When inquired about the reasons, 80 percent students said that it was joyful learning, 72 percent students said that it helps in sharing a doubt with friends, 60 percent students said that it helps in completion of task in a fast manner, 40 percent students said that use of videos and pictures helps in better understanding of concepts and 20 percent students said that the learning material provided by the researcher gave a detailed information about the topic. For the same statement 16.66 percent students reported that they did not like to study in group of friends. When enquired about the reasons, 60 percent students said that some students were not ready to work in a group, 80 percent students reported that in a group some students were not ready to share their knowledge and they try to complete the task alone and 40 percent students said that roles assigned by the researcher were not accepted by the students.

A large majority of the students i.e. 93.33 percent have said about the third statement that they feel happy while working with friends rather than working alone and a very few students, only 6.66 percent have said that they like to work alone. When the students were asked about their learning from friends, 66.66 percent students reported that they benefited by learning few things from their friends whereas 33.33 percent students said that they have not learnt anything from their friends.

Table No. 5.6 Analysis of the Feedback Form

Sr. No.	Statements	Experimental Group			
		Yes		No	
		N	%	N	%
1.	Have you ever studied with a group of your friends?	25	83.33	5	16.66
2.	Did you like studying in such an atmosphere where you learn in a group of friends? If Yes why? 1. It is joyful learning 2. Students are free to ask doubts in their groups 3. Students are able to complete their work fast 4. Use of interesting videos and pictures develop the interest and helps in better understanding 5. Learning material having extra information was provided by the teacher If No why? 1. Some students are not ready to work in a group 2. Students do not share information with the group members and complete the work alone 3. Students are not ready to accept the roles assigned in groups	25 20 18 15 10 5	83.33 80.00 72.00 60.00 40.00 20.00	5 3 4 2	16.66 60.00 80.00 40.00
3.	Do you feel working with friends is better than working alone?	28	93.33	2	6.66
4.	Do you feel that you learnt a few things from your friends?	20	66.66	10	33.33
5.	Do you feel more comfortable learning with your friends than learning with your teacher?	28	93.33	2	6.66
6.	Did you feel free to make mistakes when you worked with your friends than while learning with your teacher?	30	100		
7.	Did you feel that learning with your friends has helped you to improve your understanding of difficult concepts?	26	86.66	4	13.33
8.	Will you in future try to discuss and learn in groups with your friends?	28	93.33	2	6.66

When the researcher asked do you feel more comfortable learning with your friends than learning with your teacher, 93.33 percent students gave positive views about it and only 6.66 percent students gave negative views about this

statement. All the students i.e. 100 percent were agreed to the sixth statement that they felt free to make mistakes in learning with their friends rather than learning with their teacher.

Regarding the seventh statement, 83.33 percent students confirmed that learning with their friends helps in better understanding of concept whereas 13.33 percent students reported that it was not so. But when the students were asked that whether they would like to study in such an atmosphere in the future, 93.33 percent students responded that in future they would surely like to learn in a group of friends whereas 6.33 percent students reported that they would like to learn through traditional method.

5.3 Discussion

As is evident from the above tables, the difference between the post test scores of the experimental group and control group is significant. This implies that the students belonging to the experimental group have performed better than the students of the control group. Also the difference between delayed post test scores of the experimental group and control group is significant. This finding suggests that the students of the experimental group were able to perform better than the students of the control group even after fifteen days.

From these results we can infer that the cooperative learning lesson plans prepared for teaching science at standard VIII were effective as the experimental group students have performed better than the control group students.

When the significance of difference between post test scores and delayed post test scores of the experimental group as well as the control group were tested it was found that it is not significant. But on comparing the mean values of the experimental group and control group it was found that the mean of the post test scores and delayed post test scores of the control group are 37.4 and 35.4 respectively. In contrast to this, the mean of the post test and delayed post test scores of the experimental group are 41.23 and 40.23 respectively. The difference between mean value of the post test and delayed post test of the control group is more than the difference between mean values of the post test and delayed post test of the experimental group. This shows that the students of the experimental group were able to retain and recall more than control group students even after

fifteen days. This again points out towards the effectiveness of the cooperative Learning.

In addition to this, during the implementation phase it was observed that initially the students had problems adjusting in the groups as they were not accustomed to such type of group learning but later on they started feeling good and settled well in the groups. The possible reason for this may be that it was their first exposure to this kind of learning. Even students are so much conditioned to traditional learning that it sometimes becomes difficult for them to come out of that cocoon. It takes time to adjust to new methods. But when they were asked if they would like to study by this method in future, more than 90 per cent gave affirmative answer i.e. they showed interest and readiness for the strategy which points out towards a positive impact of the strategy as a large number of students were found to have positive reactions towards the group learning.

It was also observed that interaction among students increased so their interpersonal skills, communication skills also improved and as they were continuously focused on the task their achievement also improved. This helped them shed off their hesitation as well as decrease their anxiety. All this helped them and the students were observed to have more self confidence.

Also statistical analysis of the data points towards the positive outcome of the cooperative learning. Hence, from the above discussion we can conclude that the cooperative learning proved to be effective than the traditional learning for teaching Science at standard VIII.