A STUDY OF THE EFFECTIVENESS OF CONSTRUCTIVIST APPROACH IN THE TEACHING OF SOCIAL SCIENCE AT CBSE ENGLISH MEDIUM SECONDARY SCHOOL LEVEL

A

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Chapter 5 -

Data Analysis
&
Interpretation of Data

Chapter 5

Data Analysis & Interpretation of Data

5.1 Introduction

This Study was designed to assess the effectiveness of the Constructivist approach through (5E) on student understanding of Social Science. While Chapter 3 provided details of the design and methodology adopted, this section gives details of the analysis and interpretation of that data.

The Study adopted a quasi-experimental design; 2 groups – Control and Experimental were identified to study the effectiveness of the intervention i.e. Lesson Plans (LP) designed on the 5E Model. The treatment by the Researcher was confined to one group

– Experimental group, while the Control group studied the same course content via the traditional approach by another teacher.

The collected data was analyzed using suitable statistical techniques e.g. 2-sample independent t-Test and MANCOVA. Reaction feedback, as collected from the Experimental Group in Likert Scale (1 to 5) was also analyzed. This Chapter also discusses the various issues related to the Study and provides suggestions to the various stakeholders of the Social Science education system like the policy makers, teachers, school management and the prospective Social Science research students.

5.2 Data Analysis

The analyses of data were done as per the predetermined Objectives of the Study. The analyzed data has been presented in the following 6 sections:

- analysis of data obtained from Post-Tests 1, 2, 3.
- analysis of data obtained from Comprehensive Post-Test
- analysis of data obtained from Observations during implementation
- analysis of data obtained from the Reaction Feedback Scale.

Tools Used for Data Analysis

Statistical techniques e.g. Mean, Standard Deviation, 2 Sample independent t-Test and Multiple Analysis of Covariance (MANCOVA) were employed for carrying out the data analysis.

The information/data obtained through Pre-Test on Control and Experimental Groups were analyzed by using the 2 Sample independent t-Test.

The Post-Tests data were analyzed using the MANCOVA.

Responses obtained from the Reaction Scale were analyzed through frequency of responses.

5.3 Analysis of Pre-Test Scores Formation of Equivalent Groups:

Two groups were randomly selected – one, Standard IX-C, as the Experimental Group and the other, Standard IX-A, as Control Group. However, no random sampling of individual student could be done for either group as this was not permitted.

Prior to commencement of the Study, both the groups were equated on their Social Science knowledge of the previous academic year via a Pre-Test and the scores obtained by both the groups are given in Table 5.1 below:

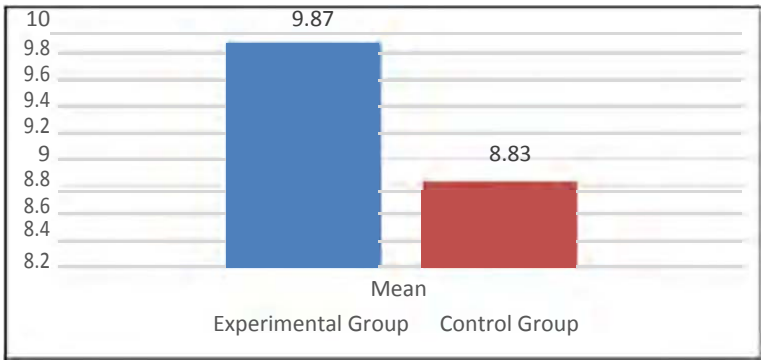
Table: 5.1
Pre-Test Scores of Experimental & Control Groups

Group	N	Full Marks	Minimum	Maximum	Mean	SD
Experimental Group	33	15	5.7	13.50	9.87	1.82
Control Group	33	15	3.9	11.70	8.83	1.90

Table 5.1 reveals that Mean Pre-test scores are 9.87 and 8.83 with Standard Deviation (SD) of 1.82 and 1.90 for Experimental Group and Control Group respectively. It means that the mean scores and SD of both the groups were nearly equivalent i.e. both the groups were at par in terms of their Social Science knowledge.

The same result is graphically presented in Fig. 5.1 below:

Fig 5.1: Pre-Test Scores of Experimental & Control groups



The 2-sample independent t-Test was carried out to test whether there is any significant difference in Mean Score existed between the two groups, at the start of the experiment. The results are given in Table 5.2 hereinafter:

Table 5.2

Result of 2 sample independent t-Test

Pre-Test 1 Scores – Experimental and Control Groups	t-test for Equality of Means			
	Mean Difference	p-Value	t	Df
	1.05	0.062	2.28	64

The above table shows the p-Value of 0.062 which is more than the statistically significant value of 0.05. In other words, there was no significant difference in the Pre- Test Scores of the two groups as the p-Value is more than 0.05.

Therefore, it may be construed that the Experimental and Control Groups were at par with respect to their Social Science knowledge of the preceding academic year, based on the Pre-Test Scores.

5.4 Effectiveness of Constructivist Approach: Analysis & Interpretation

The following sections give details of the analysis of the third objective i.e. to study the effectiveness of the approach:

- by comparing Mean Achievement Scores of Experimental and Control groups of students in Social Science in Post-Test 1
- by comparing Mean Achievement Scores of Experimental and Control groups of students in Social Science in Post-Test 2
- by comparing Mean Achievement Scores of Experimental and Control groups of students in Social Science in Post-Test 3
- by comparing Mean Achievement Scores of Experimental and Control groups in Comprehensive Post-Test.

Section 1: Analysis and Interpretation of data obtained from Post-Test 1

Tables 5.3 (a) and (b) below gives the scores achieved by the students of Experimental and Control Groups in Post-Test 1.

Table 5.3

(a) Post-Test 1 Scores of Experimental Group -

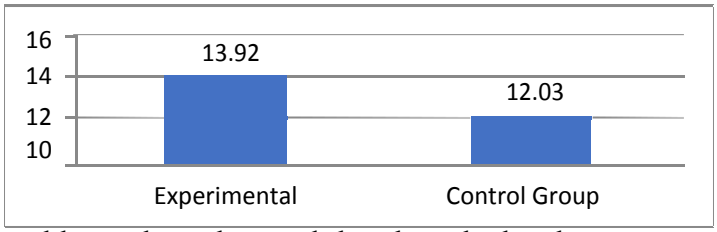
Test	N	Full Marks	Minimum	Maximum	Mean	Std. Deviation (SD)
Post-Test 1	33	15	8.00	15.00	13.92	1.49

(b) Post-Test 1 Scores of Control Group -

	N	Full Marks	Minimum	Maximum	Mean	Std. Deviation (SD)
Post-Test 1	33	15	.00	15.00	12.03	3.07

The above scores are presented in Figure 5.2 below:

Fig. 5.2: Post-Test 1 Scores of Experimental and Control Groups



The above tables and graph reveal that the calculated means are 13.92 and 12.03 with standard deviation of 1.49 and 3.07 for Experimental and Control Group Students respectively. Thus, Mean Achievement Score obtained by the Experimental Group is higher than that of the Control Group. Lower standard deviation of the Experimental Group also indicates that these students did better of the two groups, at the individual level.

Section 2: Analysis and Interpretation of Data obtained from Post Test 2

Descriptive statistics of the scores achieved by the students of Experimental and Control Groups for Post-Test 2 are presented in Table 5.4 (a) and (b) below:

Table 5.4

(a) Post-Test 2 Scores of Experimental Group

Test	N	Full Marks	Minimum	Maximum	Mean	Std. Deviation (SD)
Post-Test 2	33	15	10.50	15.00	13.71	1.15

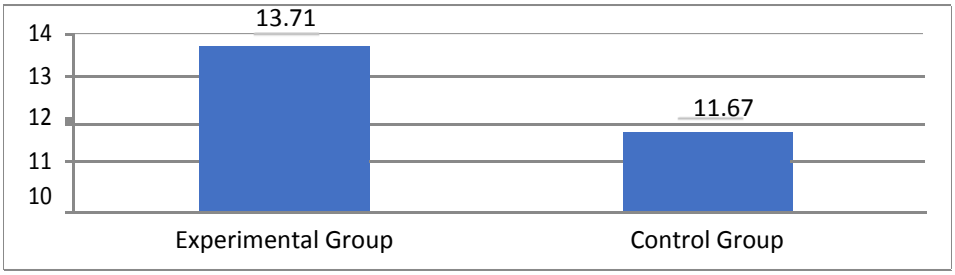
(b) Post-Test 2 Scores of Control Group

	N	Full Marks	Minimum	Maximum	Mean	Std. Deviation (SD)
Post-Test 2	33	15	.00	15.00	11.67	2.85

The above scores are presented in the Fig. 5.3 below:

Fig. 5.3

Post-Test 2 Scores of Experimental and Control Groups



The above tables and graph give the means of 13.71 and 11.67 with standard deviation of 1.15 and 2.85 for Experimental and Control Group students respectively. Thus, the mean score of Experimental Group is greater than that of the Control Group. Lower Standard Deviation of Experimental Group also indicates that these students did better of the two groups, at the individual level.

Section 3: Analysis and Interpretation of Data obtained from Post Test 3 Descriptive statistics of the scores achieved by the students of Experimental and Control Groups for Post-Test 3 are given below in Table 5.5 (a) and (b).

Table 5.5

(a) Post-Test 3 Scores of Experimental Group -

Test	N	Full Marks	Minimum	Maximum	Mean	Std. Deviation (SD)
Post-Test 3	33	15	7.00	14.50	11.09	2.03

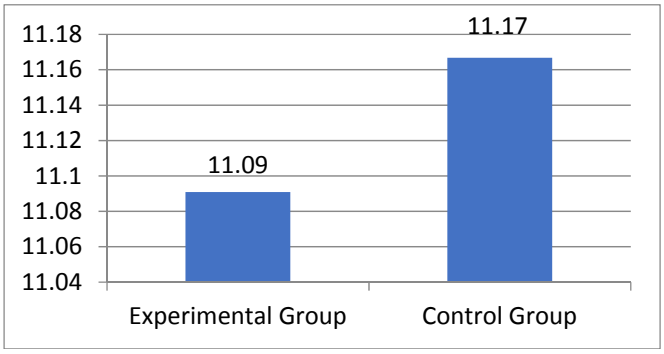
(b) Post-Test 3 Scores Control Group

	N	Full Marks	Minimum	Maximum	Mean	Std. Deviation (SD)
Post-Test 3	33	15	.00	14.00	11.17	2.82

The above scores are presented in Fig. 5.4 below:

Fig. 5.4

Post-Test 3 Scores of Experimental and Control Groups



The above tables and graph give the means of 11.09 and 11.17 with standard deviation of 2.03 and 2.82 for Experimental and Control Group respectively. From this, it is seen that the means of both the groups are nearly the same and not much different.

Section 4: Analysis and Interpretation of Data obtained from Comprehensive Post Test.

Descriptive statistics of the scores achieved by the students of Experimental and Control Groups in the Comprehensive Post-Test are given in Tables 5.6 (a) and (b) hereinafter:

Table 5.6

(a) Comprehensive Post-Test Scores of Experimental Group

Test	N	Full Marks	Minimum	Maximum	Mean	Std. Deviation (SD)
Comprehensive Test	33	15	8.70	14.70	12.85	1.58

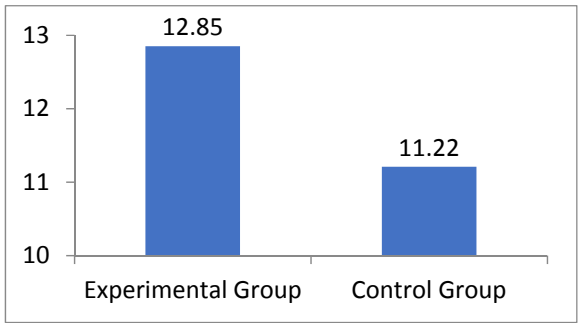
(b) Comprehensive Post-Test Scores of Control Group

	N	Full Marks	Minimum	Maximum	Mean	Std. Deviation (SD)
Comprehensive Test	33	15	.00	14.40	11.22	2.68

The above scores are presented in Figure 5.5 below:

Fig. 5.5

Comprehensive Test Scores of Experimental and Control Groups



The above tables give the means of 12.85 and 11.22 with standard deviation of 1.58 and 2.68 for Experimental and Control Group respectively. Thus, the Mean Score of the Experimental Group is greater than that of the Control Group. Lower standard deviation of Experimental Group indicates that the students at the individual level also did better of the two groups.

For further analysis to study whether the difference in mean and standard deviation in Post-Tests 1,2,3 and Comprehensive Post-Test is statistically significant, Multivariate Analysis of Covariance (MANCOVA) was proposed – after controlling for the Pre-Test Score in the two groups.

In addition, there may have been few Confounding Variables like test anxiety, stress, physical environment, group cohesiveness, etc. that have bearing on the scores. MANCOVA takes care of such variables in the statistical calculations. To ascertain whether MANCOVA can be used for the analysis, Box's Test of the Covariance Matrices is required to be conducted.

Table 5,7 gives the results of the Box's Test of the Covariance Matrices:

Table 5.7

Box's Test of the Covariance Matrices

Box's Test of Equality of Covariance Matrices	
Box's M	46.34
F	4.32
p value	0.000

The above table shows that the observed covariance matrices of the dependent variables are equal across groups. Hence, we can use MANCOVA.

Table 5.8 below gives MANCOVA analysis showing the pair wise comparison of group means of both the groups, after controlling for the Pre-Test Scores.

Table 5.8 MANCOVA ANALYSIS

Pair wise Comparisons								
Dependent Variable	(I) Group		(J) Group		Mean Difference (I-J)	Std. Error	P value	N
	Group	Mean	Group	Mean				
Post-Test 1	Experimental Group	13.92	Control Group	12.03	1.89*	0.595	0.002	33
	Control Group	12.03	Experimental Group	13.92	-1.89*	0.595	0.002	33
Post-Test 2	Experimental Group	13.71	Control Group	11.67	2.04*	0.536	0.000	33
	Control Group	11.67	Experimental Group	13.71	-2.04*	0.536	0.000	33
Post-Test 3	Experimental Group	11.09	Control Group	11.17	-0.08	0.603	0.900	33
	Control Group	11.17	Experimental Group	11.09	0.08	.603	0.900	33
Comprehensive Test	Experimental Group	12.85	Control Group	11.22	1.63*	0.542	0.004	33
	Control Group	11.22	Experimental Group	12.85	-1.63*	0.542	0.004	33
*** The mean difference is significant at the .05 level.**								

The above table shows the pair wise difference in the scores in two groups for each of the respective scores after controlling for the Pre-Test score. The areas where the p value is less than 0.05 (statistical significance) shows that there is a difference in the scores of each of the respective group for the corresponding test score. The significant values show that the test score in experimental group was higher than the control group.

Based on the Mean Scores obtained by the two groups in **Post-Test 1,** the Null Hypothesis (H_{01}) "There will be no significant difference in the Mean Achievement Scores of the Experimental and Control Group students in Social Science in Post-Test 1", is rejected since the p-Value is less than 0.05 (actual value: 0.002). In other words, Mean Scores achieved by the Experimental Group is significantly higher than that of the Control Group.

Based on the Mean Scores obtained by the two groups in **Post-Test 2**, the Null Hypothesis (H_{02}), "There will be no significant difference in the Mean Achievement Scores of the Experimental and Control Group students in Social Science in Post-Test 2", is rejected since the p-Value is less than 0.05 (actual value: 0.000). In other words, Mean Scores achieved by the Experimental Group is significantly higher than that of the Control Group.

Based on the Mean Scores obtained by the two groups in **Post-Test 3**, the Null Hypothesis (H_{03}), "There will be no significant difference in the Mean Achievement Scores of the Experimental and Control Group students in Social Science in Post-Test 3", is failed to be rejected since the p-Value is more than 0.05 (actual value: 0.900). In other words, there was no significant difference between the two groups in terms of the Mean Score obtained by them.

Based on the Mean Achievement Scores obtained by the two groups in **Comprehensive Post-Test,** the Null Hypothesis (H_{04}), "There will be no significant difference in the Mean Achievement Scores of the Experimental and Control Group students in Social Science comprehensive Post-Test", is rejected since the p-value is less than 0.05 (actual value: 0.004).

In other words, scores achieved by the Experimental Group was significantly higher than that of the Control Group implying that the intervention based on the Constructivist approach was indeed beneficial in the understanding of Social Science concepts.

Section 5: Analysis & Interpretation of 'Observations' During Implementation

While NCERT has developed materials and systems for Continuous and Comprehensive Evaluation (CCE) for the elementary stage of education, the concepts are equally relevant to Secondary level. "The 'Comprehensive' term in CCE recommends that student learning is seen holistically by the teacher along with the personal and social qualities. The on-going assessment (especially through observation) of regular pupil activity in class should also cover development in these areas. This is what makes it comprehensive". (NCERT, 2013, pp6).

The Researcher kept this recommendation in mind and acted on the same during the implementation of the Lesson Plans. The Researcher did detailed observations during the teaching-learning process, during group work, discussion, debates, etc. This has provided a lot of insights about the students, their preferences and styles of learning, as well as challenges in assimilating and comprehending knowledge.

The Researcher followed 5E model based on the Constructivist approach. During her teaching, she evaluated the students after teaching each of the ten (10) topics. She engaged the students through discussion, group activities and debates during the 5E cycle. The Researcher ensured a student-centric approach while giving students activities to help them connect the present work to their prior knowledge and experience. There were 5 to 6 groups of students engaged in different activities. While these processes were on, the researcher walked up to each group and observed their discussion. Sometimes, she also participated in the discussion. During the different stages of implementation, the Researcher observed the students' learning behaviors very closely in order to see the impact of the intervention on their understanding of the Social Science concepts. In this way, she gave verbal feedback to the students on their activities. On receiving the feedback, the students explored further in their activities and researches. The Researcher explained and elaborated the topic in detail. Evaluations were based on the content that was discussed in the class. The researcher asked questions based on knowledge, understanding, application and high order thinking skill. The students discussed the answers amongst their groups. After discussion, one of them orally gave the answer in the class. After listening to the answers, the researcher gave the feedbacks, as required. Otherwise, if the answer was correct, the researcher asked the next question. In this way, 5 – 6 questions were asked, and feedback was given. Following this process, all the topics along with the evaluation processes were completed. Sometimes, such evaluations were carried out in the written form. The students were told to write the main points of the answers on the blackboard.

Once the points were written on the blackboard, the Researcher gave feedback immediately and the whole class came to know of the correct answers. It became the first-hand experience of writing the correct answers. When the evaluation assignments were given in the class, the Researcher continuously moved from one student to another and in this way, she covered the whole class, checking their notebooks on how they wrote the answers. The Researcher also gave guidance if the answers were not correctly written. This made the communication between the researcher and the students effective that helped to establish good rapport between them. In this process, the researcher became a facilitator. All the topics were thoroughly evaluated. After completing each Lesson, written Post-Test was conducted. Questionnaires for Post-Test 1, Post-Test 2 and Post-Test 3 were prepared by the Researcher which were validated by the subject experts. A 40 minutes test (for each of Post-Tests 1, 2, 3) with full marks 15 was conducted. Rubrics were prepared, and all the individual papers were assessed by the Researcher and she could understand the development of each student. After completion of all the Post-Tests, the Researcher also conducted one Comprehensive Post-Test covering all the Lessons (1, 2, and 3) together. Questionnaire for Comprehensive Post-Test was prepared by the researcher and was validated by the the subject experts. The Comprehensive Post-Test was for 90 minutes with full marks 50. Questions covered all areas of knowledge, understanding, application and higher order thinking. The Researcher prepared the rubrics for correcting the evaluation paper. Accordingly, she checked the answer papers that gave the Researcher the idea of the development in students' academic ability.

Thus,

Observation of student participation and responses in the various stages of the 5E model of teaching was important source of data to gauge whether students were able to make the required connections between the present, past and future. The learning tasks assigned had to ensure active engagement (mental and physical) of each student. The next stage 'Exploration' was equally crucial wherein the researcher designed activities that allowed students to go to the next level and investigate – in this phase it was important to assess how students were investigating and arriving at conclusions by observing patterns, seeing connections and recognizing new situations, technologies and procedures. The stage of 'Explanation' revealed their ability to explain their concepts with clarity and good communication skills.

Not only this; their ability for negotiation, interpretation, collaborative learning and the ability to convey ideas via other media too was observed. Having understood the concept, students were able to extend and apply this knowledge to other situations and observation helped the researcher to gauge how well students were able to transfer their learning.

While observation of the earlier phases helped the researcher to evaluate the 'process' aspects, the final phase of 'Evaluation' helped the researcher to evaluate the 'learning outcomes.' To conclude, observation helped the researcher to evaluate student learning towards achieving the pre-determined educational objectives.

Section 6: Analysis & Interpretation of Reaction Feedbacks of Experimental Group Students

The following section gives the data analysis for the fourth research objective – to study the effectiveness of the 5E Constructivist approach in terms of reaction feedbacks of the students towards the intervention. The Researcher intended to analyze the reaction feedbacks of the 33 students of the Experimental Group on the effectiveness of the Constructivist teaching method. Such responses / feedbacks were collected against 59 questions / statements set under the headings, Introduction (6), and '5E' components – Engage (13), Explore (9), Explain (16), Elaborate (6) and Evaluate (9).

Frequency and percentage analysis were done to analyze the responses given by the students.

The detailed results are presented hereinafter:

Group 1: Introduction (6 Statements)

Table 5.9 gives the Student Reaction Feedbacks on the 6 statements:

Table 5.9

Group 1 (Introduction): Student Reaction Feedbacks on Effectiveness of Constructivist Teaching Approach

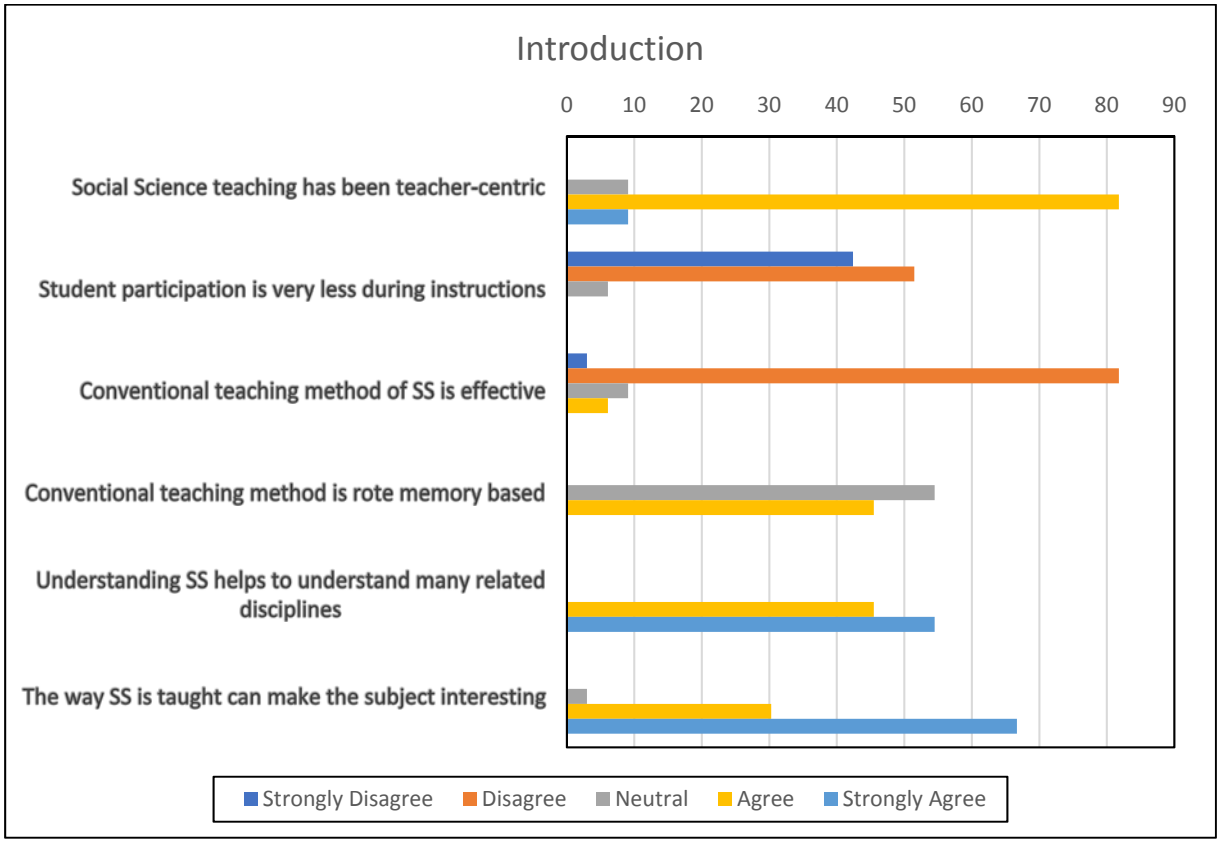
Sl. No.	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1		2		3		4		5					
				Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
1.0	**Introduction**																
1.1	Social Science teaching has been teacher-centric	P	33	0	0	0	0	3	9.1	27	81.8	3	9.1	3	5	4	4
1.2	Student participation is very less during instructions	N	33	14	42.4	17	51.5	2	6.1	0	0	0	0	1	3	2	1.6
1.3	Conventional teaching method of SS is effective	N	33	1	3	27	81.8	3	9.1	2	6.1	0	0	2	4	2	2.2
1.4	Conventional teaching method is rote memory based	P	33	0	0	0	0	18	54.5	15	45.5	0	0	3	4	3	3.5
1.5	Understanding SS helps to understand many related disciplines	P	33	0	0	0	0	0	0	15	45.5	18	54.5	4	5	5	4.5
1.6	The way SS is taught can make the subject interesting	P	33	0	0	0	0	1	3.0	10	30.3	22	66.7	3	5	5	4.6

P = Positive Impact (Effectiveness of Constructivist Teaching)
N = Negative Impact (Effectiveness of Constructivist Teaching)
F = Frequency

The above table is presented in Fig. 5.6 below:

Fig: 5.6

Group 1 (Introduction) : Student Reaction Feedbacks



Following findings emerged from the Table 5.9 and Fig. 5.6 **(Introduction)**:

9.1 % and 81.8% students "strongly agreed" and "agreed" respectively with the statement that Social Science teaching has been teacher-centric, while 9.1 % students remained neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.0.

42.4% and 51.5% students "strongly agreed" and "agreed" with the statement that Student participation is very less during instructions while 6.1% remained neutral. The overall reaction to this statement was found to be Negative with a Mean of 1.6%.

81.8% students "disagreed" and 3% students "strongly disagreed" with the statement that Conventional teaching method of SS is effective. While 9.1% students were neutral, 6.1% "agreed" with the statement. The overall reaction to the statement was found to be Negative with a Mean of 2.2

45.5 % students "agreed" with the statement that Conventional teaching method is rote memory based while 54.5 % students were neutral with respect to the statement. The overall reaction to this question was found to be Positive with Mean 3.5.

54.5% and 45.5% students “strongly agreed” and “agreed” respectively with the statement that understanding SS helps to understand many related disciplines. Thus, students were aware of the different related disciplines while learning this subject. The overall reaction to this statement was found to be Positive with Mean 4.5.

66.7 % and 30.3% students “strongly agreed” and “agreed” respectively with the statement that the way SS is taught can make the subject interesting. 3% students were neutral. The overall reaction to this statement was found to be Positive with Mean 4.6

Conclusion

Based on data analysis of the first group **(Introduction)**, the instructional strategy was found to be beneficial and interesting. Majority of the students reported that till date Social Science teaching had been teacher centric with minimal student participation during the instruction. They felt, after going through the intervention, that conventional teaching methods were rote memory based and the way the subject is taught in the class, can make it interesting as well as help them to understand many related disciplines.

Group 2: Engage (13 Statements)

Table 5.10 & Table 5.11 below summarize the Student Reaction Feedbacks on the 13 statements:

Table 5.10

Group 2 (Engage) : Student Reaction Feedbacks on Effectiveness of Constructivist TeachingApproach

Sl. No.	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1		2		3		4		5					
				Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
2.0	**Engage**																
2.1	I liked the group discussion as it was easy to comprehend	P	33	0	0	0	0	0	0	15	45.5	18	54.5	4	5	5	4.5
2.2	Learning through group discussion was fun and enjoyable	P	33	0	0	0	0	0	0	15	45.5	18	54.5	3	5	5	4.5
2.3	Could respond to the questions well	P	33	0	0	0	0	2	6.1	24	72.7	7	21.2	3	5	4	4.2
2.4	Did not like this method of teaching as it is time-consuming	N	33	14	42.4	18	54.5	1	3.0	0	0	0	0	1	3	2	1.6
2.5	This method of teaching hampers the class discipline	N	33	11	33.3	21	63.6	1	3.0	0	0	0	0	1	3	2	1.7
2.6	Liked this method as it connected to my past knowledge	P	33	0	0	0	0	8	24.2	14	42.4	11	33.3	3	5	4	4.1

P = Positive Impact (Effectiveness of Constructivist Teaching)
N = Negative Impact (Effectiveness of Constructivist Teaching)
F = Frequency

Table 5.11
Group 2 (Engage) : Student Reaction Feedbacks on Effectiveness of Constructivist Teaching Approach

Sl. No.	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1		2		3		4		5					
				Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
2.7	Could not learn because of group activities	N	33	14	42.4	19	57.6	0	0	0	0	0	0	1	2	2	1.6
2.8	Did not like it as there was too much noise in the class and could not concentrate	N	33	16	48.5	17	51.5	0	0	0	0	0	0	1	2	2	1.5
2.9	Able to see how the past events are interconnected with present events	P	33	0	0	0	0	1	3.0	18	54.5	14	42.4	3	5	4	4.4
2.10	Design of the unit on democracy was well planned	P	33	0	0	0	0	1	3.0	16	48.5	16	48.5	3	5	4	4.5
2.11	Teacher offered effective support and guidance	P	33	0	0	0	0	0	0	12	36.4	21	63.6	4	5	5	4.6
2.12	Questions posed by teacher forced me to think independently	P	33	0	0	0	0	1	3.0	16	48.5	16	48.5	4	5	5	4.5
2.13	Previous experience on the subject was taken care of	P	33	0	0	0	0	3	9.1	24	72.7	6	18.2	3	5	4	4.1

P = Positive Impact (Effectiveness of Constructivist Teaching)
N = Negative Impact (Effectiveness of Constructivist Teaching)
F = Frequency

The above results are represented in the Fig. 5.7 and 5.8 below:

Fig: 5.7
Group 2: Engage (Statements 2.1 to 2.6)

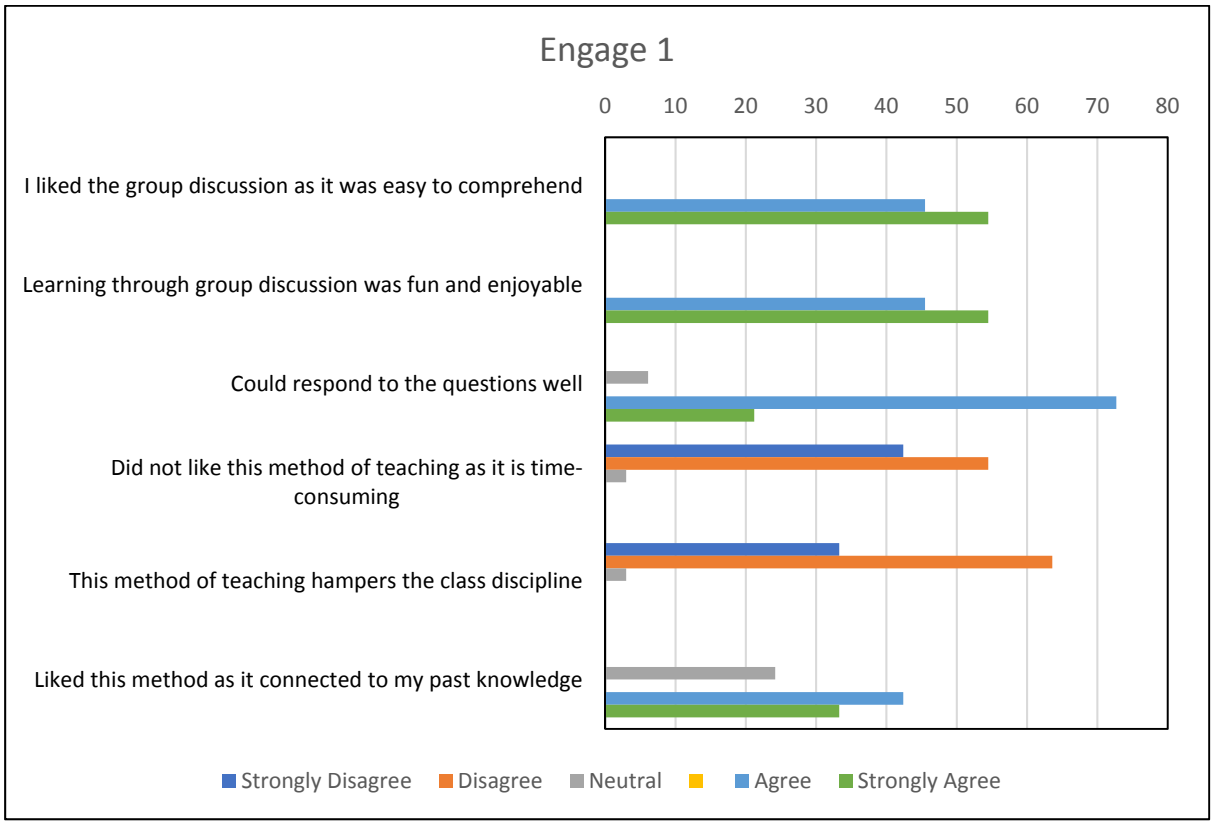
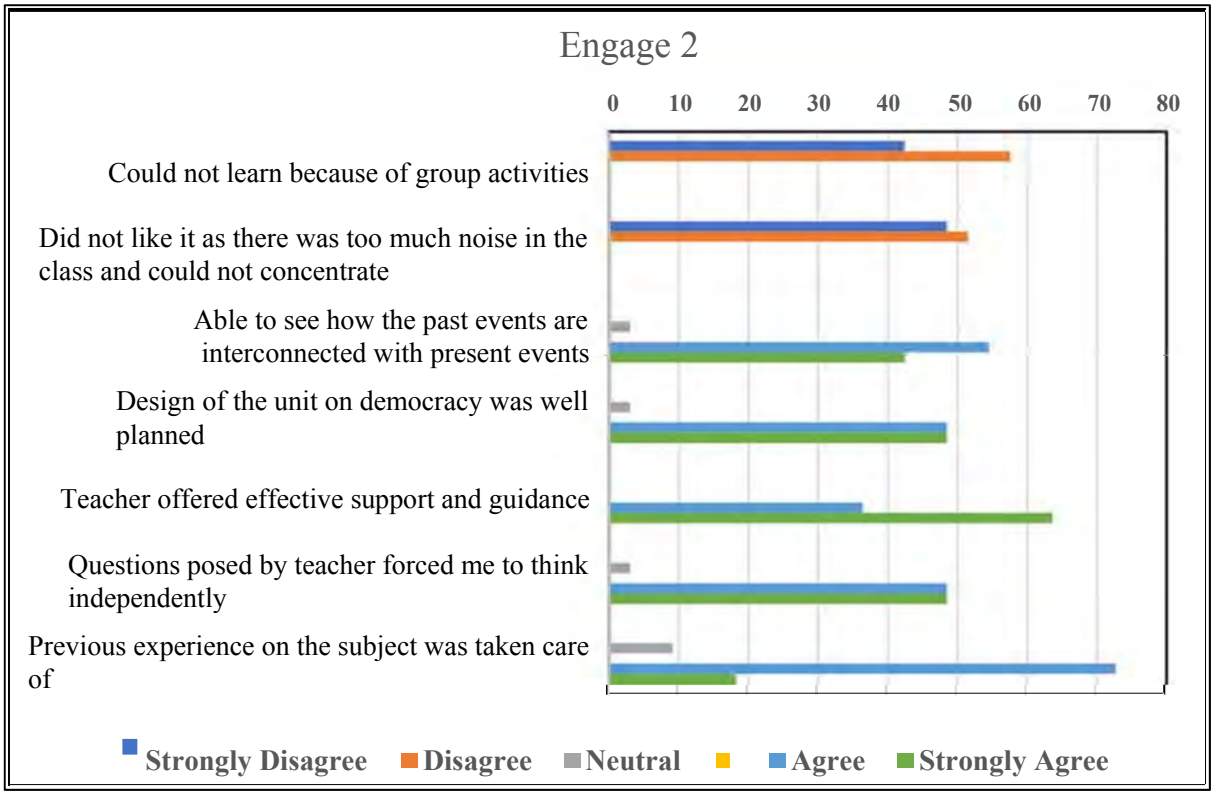


Fig. 5.8
(Graph Covering 2.7 to 2.13)



Following findings emerged from Tables 5.10 & 5.11 and Fig. 5.7 & 5.8 **(Engage)**:

It was observed that 54.5% students "strongly agreed" while 45.5% students "agreed" with the statement that they liked group discussion method as it made things easy to comprehend. It was important to note that none of the students disagreed or strongly disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.5.

The analysis revealed that 54.5 % and 45.5% students "strongly agreed" and "agreed" respectively with the statement that learning through group discussion was fun and enjoyable. Thus, there were no students who disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.5.

21.2% and 72.7 students "strongly agreed" and "agreed" respectively with the statement that they could respond well to the questions posed by the teacher. 6.1% student were neutral. Also, there was no student who "disagreed" and "strongly agreed" with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.2.

42.4% and 54.5% students "strongly disagreed" and "disagreed" respectively with the statement that they did not like this method of teaching as it was time-consuming. 3% students remained neutral. The overall reaction to this statement was found to be Negative with a Mean of 1.6.

To the statement on whether the method hampered class discipline, the analysis revealed that 33.3% and 63.3% students "strongly disagreed" and "disagreed" respectively with the statement that this method of teaching hampers the class discipline. 3% students remained neutral. The overall reaction to the statement was found to be Negative with a Mean of 1.7.

In response to the question that whether they liked the method as it was connected to their past knowledge, 33.3% students "strongly agreed" with the statement; 42.4% "agreed" and 24.2% were neutral. There was no student that disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.1.

When asked whether learning was affected due to group activities, it was observed that no student agreed with the statement, rather, 42.4% students "strongly disagreed" and 57.6% students "disagreed" with the statement. The overall reaction to this statement was Negative with a Mean of 1.6.

To the statement on there being too much noise in the class which hampered concentration, it was observed that none of the students "strongly agreed" with the statement; 51.5% students "disagreed" and 48.5% students "strongly disagreed" with the statement. The overall reaction to this statement was found to be Negative with a Mean of 1.5.

42.4% students “strongly agreed” while 54.5% students “agreed” with the statement that the method helped them to see how past and present events are interconnected. 3% students were neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

48.5% students “strongly agreed” and another 48.5% students “agreed” that the unit on Democracy was well planned while 3% students neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.5.

To the statement regarding the effective support and guidance offered by the teacher, it was observed that 63.6% students “strongly agreed” while 36.4% students “agreed” with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.6.

48.5% students “strongly agreed” with the statement that questions posed by teacher forced them to think independently while another 48.5% students “agreed” with the statement. There was no disagreement with the statement (0.00%). The overall reaction to this statement was found to be Positive with a Mean of 4.5.

18.2 % students “strongly agreed” and 72.7% students “agreed” with the statement that previous experience on the subject was taken care of. 9.1% student remained neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.1.

Conclusion

Thus, on the basis of the above data analysis **(Engage)**, it was found that majority of the students liked the group discussion method as it made the content more comprehensible and enjoyable; subsequently they felt that they could respond to questions better as it helped to connect to their past knowledge and the questions forced students to be independent thinkers. There were very few students who did not find this method effective or found the method time consuming. Most of the students reported that the role of the teacher was to provide support and guidance and to design effective learning environments.

Group 3: Explore (9 Statements)

Table 5.12& 5.13 given below captures the Student Reaction Feedbacks on the 9 Statements:

Table 5.12
Frequency of Student Reaction Feedbacks on Effectiveness of Constructivist Teaching Approach

Sl. No	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1		2		3		4		5					
				Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
3.0	**Explore**																
3.1	Concepts became clear as we ourselves actively participated in project making on manifestoes of different political parties	P	33	0	0	0	0	0	0	14	42.4	19	57.6	4	5	5	4.6
3.2	Teacher facilitated learning by moderating the discussions	P	33	0	0	0	0	0	0	19	57.6	14	42.4	4	5	4	4.4
3.3	It was interesting to learn through group activities and project making	P	33	0	0	0	0	0	0	14	42.4	19	57.6	4	5	5	4.6
3.4	This method has helped me to organize my concepts in Social Science	P	33	0	0	0	0	0	0	14	42.4	19	57.6	4	5	5	4.6
3.5	Liked this method because it encouraged me to use our talents	P	33	0	0	0	0	0	0	17	51.5	16	48.5	4	5	4	4.5

P = Positive Impact (Effectiveness of Constructivist Teaching)
N = Negative Impact (Effectiveness of Constructivist Teaching)
F = Frequency

Table 5.13
Frequency of Students' Reaction on the Effectiveness of Constructivist Teaching Approach

Sl. No.	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1		2		3		4		5					
				Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
3.6	This method helped to develop my analytical skill	P	33	0	0	0	0	0	0	20	60.6	13	39.4	4	5	4	4.4
3.7	Enjoyed the co-operative learning environment	P	33	0	0	0	0	0	0	19	57.6	14	42.4	4	5	4	4.4
3.8	Newspaper reading activity on advantages of democracy enriched my knowledge	P	33	0	0	0	0	1	3.0	18	54.5	14	42.4	4	5	4	4.4
3.9	This method gave me the opportunity to think, reflect and share ideas	P	33	0	0	0	0	0	0	13	39.4	20	60.6	4	5	5	4.6

P = Positive Impact (Effectiveness of Constructivist Teaching)
N = Negative Impact (Effectiveness of Constructivist Teaching)
F = Frequency

The above results are represented in the figure 5.9 and 5.10.

Fig: 5.9
Statement 3.0: Explore (Statements 3.1 to 3.5)

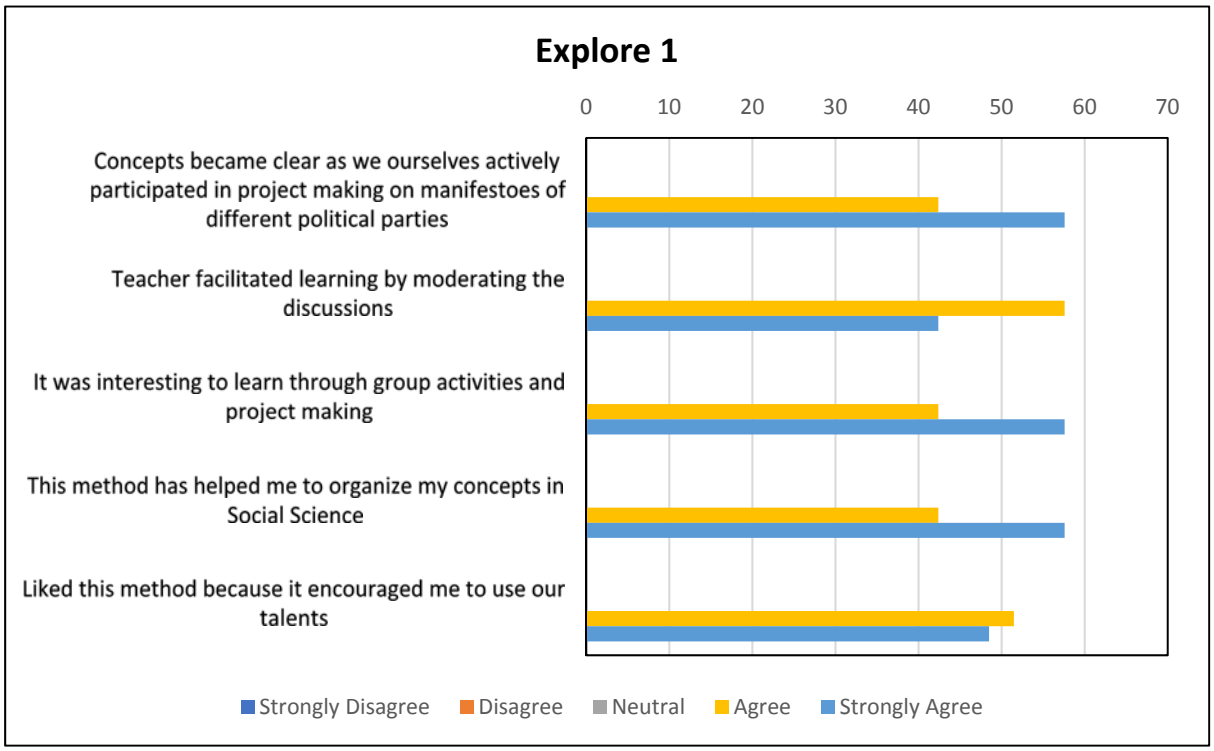
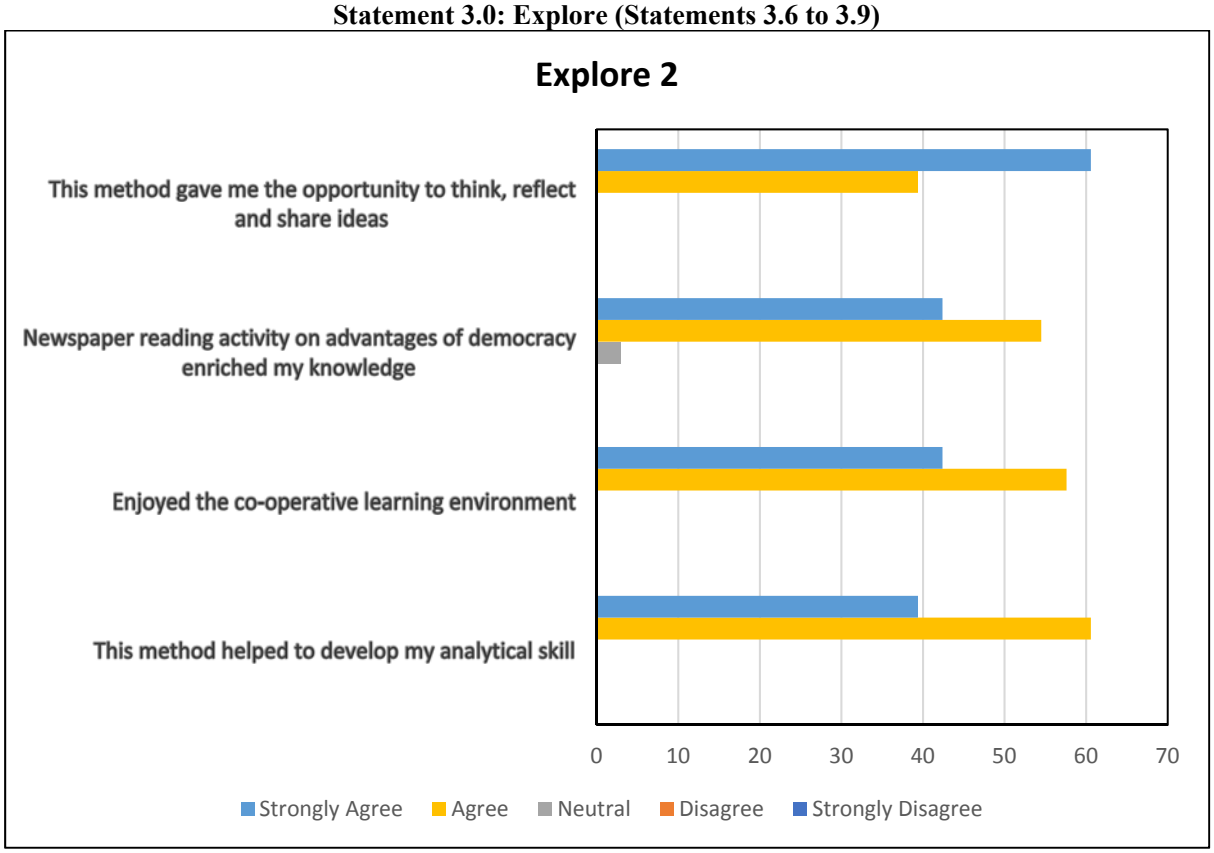


Fig: 5.10
Statement 3.0: Explore (Statements 3.6 to 3.9)



Following findings emerged from Tables 5.12 & 5.13 and Fig. 5.9 & 5.10 (**Explore)**:

57.6% students "strongly agreed" and 42.4% students "agreed" with the statement that concepts became clear as they actively participated in project making. Thus, none disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.6. To the statement on whether the Teacher facilitated learning by moderating the discussions, the data revealed that 42.4% students "strongly agreed" and 57.6% students "agreed" with the statement. None disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

57.6% students "strongly agreed" and remaining 42.4% students agreed that it was interesting to learn through group activities and project making the overall reaction to this statement was found to be Positive with a Mean of 4.6.

57.6% students "strongly agreed" while the balance 42.4% students "agreed" that this method has helped them to organize their concepts in Social Science. There was no student who disagreed with this statement. The overall reaction to this statement was found to be Positive with a Mean of 4.6.

The data revealed that 48.5% students "strongly agreed" and 51.5% students "agreed" with the statement that they liked this method because it encouraged them to use their talents. Thus, there was no student that disagreed to the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.5.

To the statement on whether the method helped to develop analytical skills, 39.4% students "strongly agreed" with the statement while 60.6% students "agreed" with the statement. There was no disagreement from any student and the overall reaction to this statement was found to be Positive with a Mean of 4.4.

The data analysis revealed that 42.4% students "strongly agreed" and 57.6% students "agreed" that they enjoyed the co-operative learning environment. Thus, no students disagreed with the statement. The overall reaction to this statement to this question was found to be Positive with a Mean of 4.4.

42.4% students "strongly agreed" and 54.5% students "agreed" that Newspaper reading activity on advantages of democracy enriched their knowledge. 3% students remained neutral. The overall reaction to this statement was found to be Positive with a mean of 4.4.

In response to the statement whether the method gave them opportunity to think, reflect and share ideas, the data analysis revealed that 60.6% students "strongly agreed" and 39.4% students "agreed" with the statement while not a single student disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.6.

Conclusion

Based on the above data analysis **(Explore)**, it was found that a large majority of the students liked the cooperative learning environment, group activities, project making activities and they benefitted from this teaching approach. They felt that the intervention helped them to develop analytical skill and gave them opportunity to think, reflect and share ideas.

Group 4: Explain (16 Statements)

Table 5.14 & 5.15 given below present the Student Reaction Feedbacks on the 16 Statements:

Table 5.14

Frequency of Students' Reaction on the Effectiveness of Constructivist Teaching

Sl. No.	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1		2		3		4		5					
				Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
4.0	**Explain**																
4.1	Teaching was student-centric	P	33	0	0	0	0	0	0	27	81.8	6	18.2	4	5	4	4.2
4.2	Concepts were introduced well through explanation given by the students	P	33	0	0	0	0	5	15.2	17	51.5	11	33.3	4	5	4	4.2
4.3	Teacher explained after giving us learning experiences	P	33	0	0	0	0	0	0	21	63.6	12	36.4	4	5	4	4.4
4.4	Project on election made the topic clear as I actively participated in it	P	33	0	0	0	0	1	3.0	17	51.5	15	45.5	4	5	4	4.4
4.5	I could interact with fellow students	P	33	0	0	0	0	0	0	21	63.6	12	36.4	4	5	4	4.4
4.6	I could listen to and question ideas	P	33	0	0	0	0	1	3.0	16	48.5	16	48.5	3	5	4	4.5
4.7	I could connect previous knowledge to recent incidences	P	33	0	0	0	0	0	0	19	57.6	14	42.4	4	5	4	4.4
4.8	I could learn at my own pace	P	33	0	0	0	0	3	9.1	14	42.4	16	48.5	3	5	4	4.4
4.9	This method of teaching made us more confident	P	33	0	0	0	0	0	0	10	30.3	23	69.7	4	5	5	4.7

P = Positive Impact (Effectiveness of Constructivist Teaching) | N = Negative Impact (Effectiveness of Constructivist Teaching) | F = Frequency

Table 5.15
Frequency of Student Reaction Feedbacks on Effectiveness of Constructivist Teaching Approach

Sl. No.	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1 Strongly Disagree		2 Disagree		3 Neutral		4 Agree		5 Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
4.10	Was encouraged to explain in my own words	P	33	0	0	0	0	0	0	14	42.4	19	57.6	4	5	5	4.6
4.11	Ongoing discussions were very useful in understanding new ideas	P	33	0	0	0	0	0	0	14	42.4	19	57.6	4	5	5	4.6
4.12	Liked the skit on philosophy of Constitution as it summarized units of Social Science in a simple way	P	33	0	0	0	0	5	15.2	16	48.5	12	36.4	3	5	4	4.2
4.13	I did not like the teaching method at all	N	33	26	78.8	7	21.2	0	0	0	0	0	0	1	2	1	1.2
4.14	It was clear to me what I was expected to learn after completing each unit of SS	P	33	0	0	0	0	3	9.1	18	54.5	12	36.4	3	5	4	4.3
4.15	Working in a team made learning more interesting and effective	P	33	0	0	0	0	0	0	19	57.6	14	42.4	4	5	4	4.4
4.16	The skit performed in class illustrated each unit of Constitutional design clearly	P	33	0	0	0	0	1	3.0	20	60.6	12	36.4	3	5	4	4.3

P = Positive Impact (Effectiveness of Constructivist Teaching)
N = Negative Impact (Effectiveness of Constructivist Teaching)
F = Frequency

The above results are represented in Fig. 5.11 and 5.12

Fig: 5.11: Explain (Statements 4.1 to 4.9)

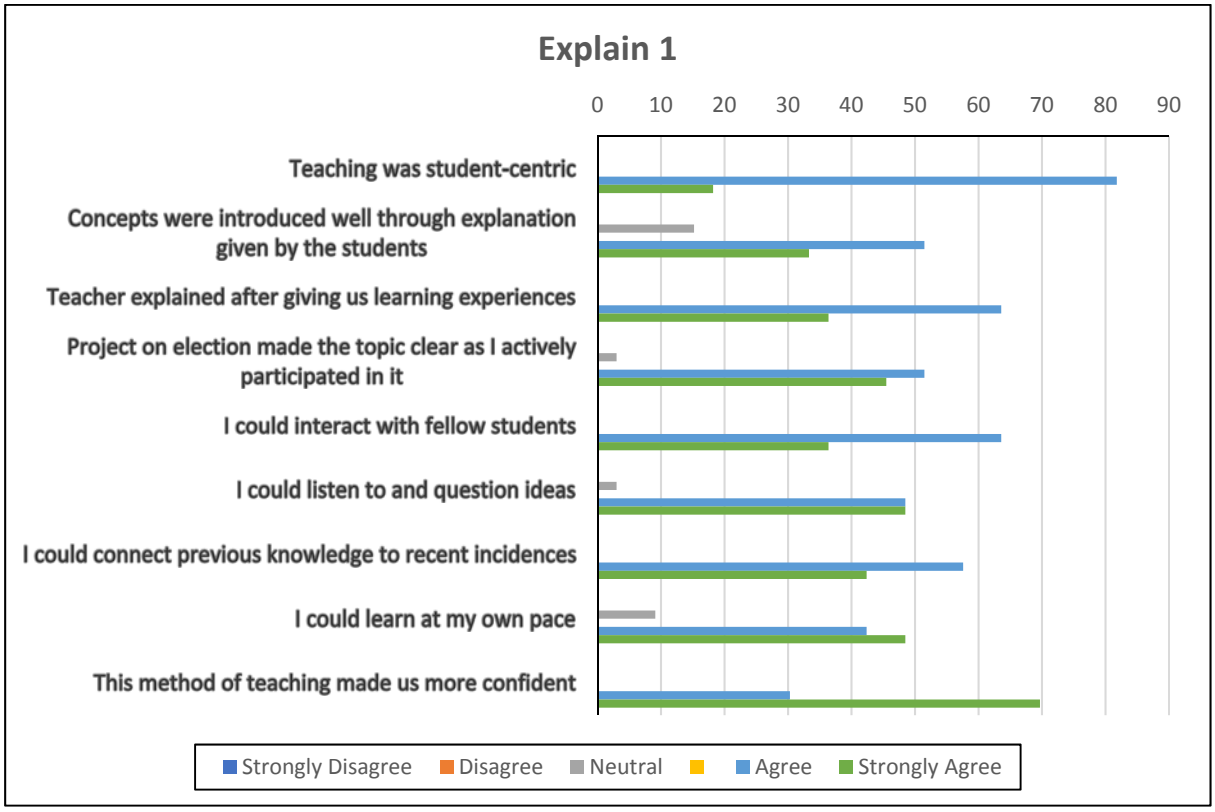
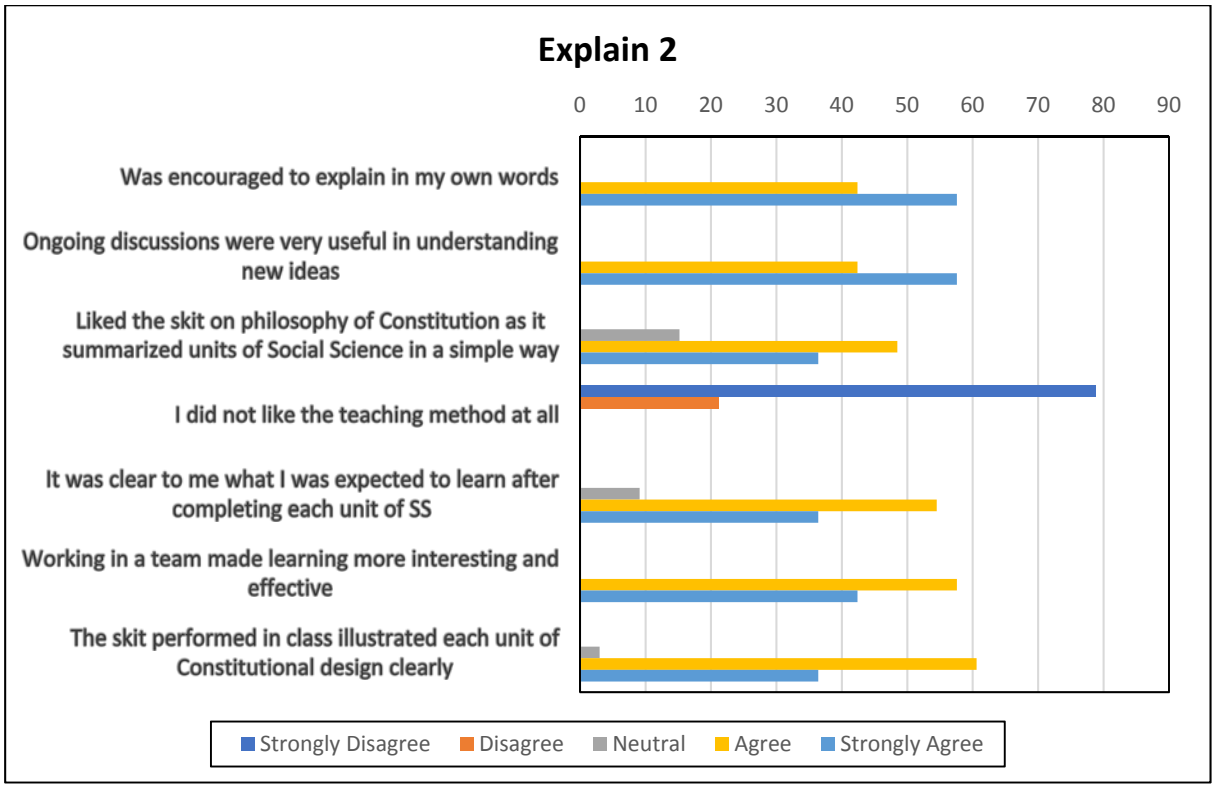


Fig: 5.12: Explain (Statements 4.10 to 4.16)



Following findings emerged from Tables 5.14 & 5.15 and Fig. 5.11 & 5.12 **(Explain)**:

18.2% students "strongly agreed" while 81.8% of the students "agreed" with the statement that present day teaching was student centric. None disagreed with the statement. The overall, reaction to this statement was found to be Positive with a Mean of 4.2.

33.3% students "strongly agreed" and 51.5% students "agreed" with the statement that Concepts were introduced well through explanation given by the students. No one disagreed with this statement. The overall reaction to this statement was found to be Positive with a Mean of 4.2.

The data analysis revealed that 36.4% students "strongly agreed" while 63.6% students "agreed" with the statement that the teacher explained after giving learning experiences. None disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

It was found that 45.5% and 51.5% students "strongly agreed" and "agreed" with the statement that active participation made the topic clear to understand. 3% students remained neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

To the statement that interaction with fellow students was possible during instruction, 36.4% students "strongly agreed" while 63.6% students "agreed" with the statement. There was no one that disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

48.5% students "strongly agreed" and another 48.5% students "agreed" with the statement that they could listen to and question ideas. 3% were neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.5.

A very significant finding was that 42.4% students "strongly agreed" while 57.6% students "agreed" with the statement that they could connect previous knowledge to recent incidences. None disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

48.5% students "strongly agreed" and 42.4% students "agreed" with the statement that they could learn at their own pace; 9.1% students remained neutral and none disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.4. 69.7% students "strongly agreed" and 30.3% students "agreed" with the statement that the method of teaching made them more confident. There was no student that disagreed to the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.7.

57.6% students “strongly agreed” and 42.4% students agreed with the statement that students were encouraged to explain in their own words. Thus, none disagreed with the statement. The overall the reaction to this statement was found to be Positive with a Mean of 4.6.

The data analysis revealed that 57.6% students “strongly agreed” and 42.4% students “agreed” with the statement that the ongoing discussions are very useful in understanding new ideas. None disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.6.

36.4% students “strongly agreed” and 48.5% students “agreed” with the statement that they liked the skit on philosophy of Constitution as it summarized units of Social Science in a simple way. 15.2% students remained neutral and none disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.2.

To the statement that whether the students did not like the teaching method at all, 0.00% students “strongly agreed” with the statement. 78.8% students “strongly disagreed” and 21.2% students “disagreed” with the statement. The overall reaction to this statement was found to be Negative with a Mean of 1.2.

With reference to the statement that it was clear to students what they were expected to learn after completing each unit of SS, the data analysis revealed that 36.4% students “strongly agreed” with the statement while 54.5% students “agreed” with the statement. 9.1% students remained neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.3.

The data analysis found that 42.4% students “strongly agreed” and 57.6% students “agreed” with the statement that working in a team made learning more interesting and effective. Thus, there was no student who disagreed to the above. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

With respect to the activity conducted (skit) to illustrate each unit of Constitutional design clearly, it was found that 36.4% students “strongly agreed” while 60.6% students “agreed” with the statement. 3% students were neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.3.

Conclusion

On the basis of the above data analysis **(Explain)**, the instructional strategy was found to be student-centric, helped students to interact with fellow students and to connect previous knowledge to new topics, learn at their own pace and made them more confident. They were also encouraged to explain in their own words and work in a team.

Group 5: Elaborate (6 Statements)

Table 5.16 below shows the Student Reaction Feedbacks on the 6 statements:

Table 5.16

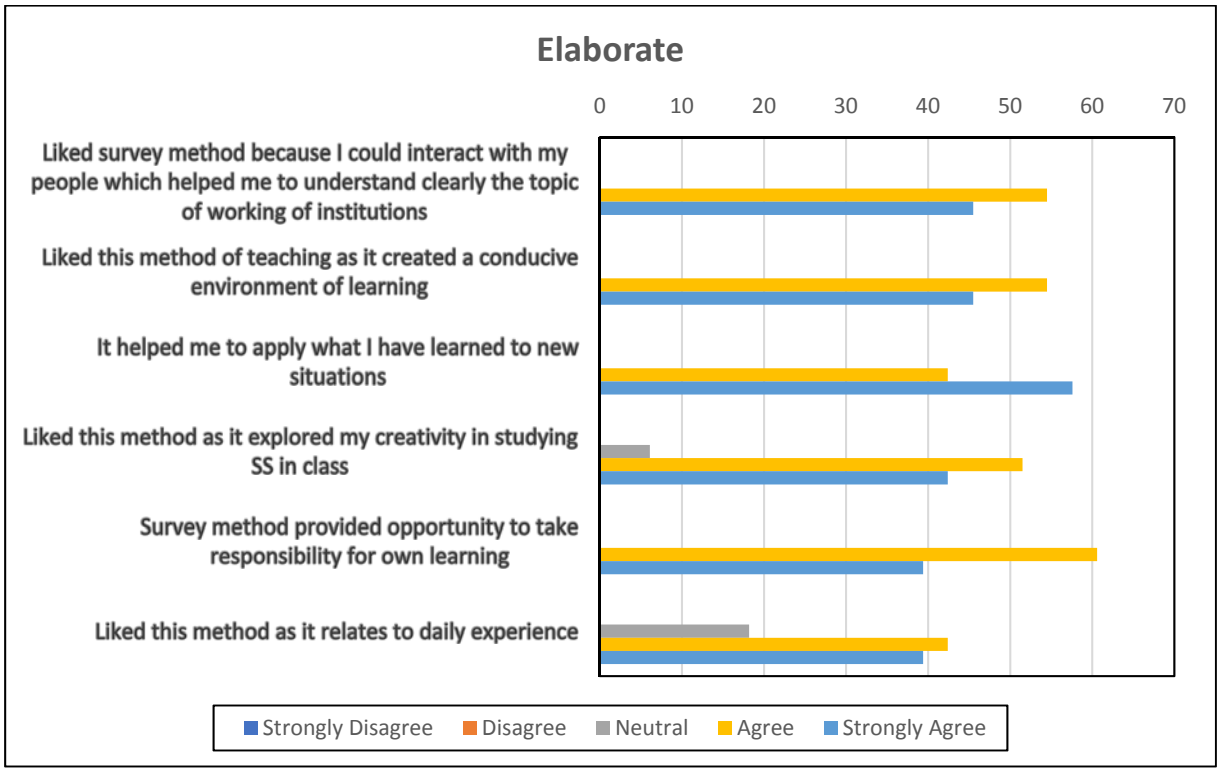
Student Reaction Feedbacks on Effectiveness of Constructivist Teaching Approach

Sl. No.	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1		2		3		4		5					
				Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
5.0	**Elaborate**																
5.1	Liked survey method because I could interact with my people which helped me to understand clearly the topic of working of institutions	P	33	0	0	0	0	0	0	18	54.5	15	45.5	4	5	4	4.5
5.2	Liked this method of teaching as it created a conducive environment of learning	P	33	0	0	0	0	0	0	18	54.5	15	45.5	4	5	4	4.5
5.3	It helped me to apply what I have learned to new situations	P	33	0	0	0	0	0	0	14	42.4	19	57.6	4	5	5	4.6
5.4	Liked this method as it explored my creativity in studying SS in class	P	33	0	0	0	0	2	6.1	17	51.5	14	42.4	3	5	4	4.4
5.5	Survey method provided opportunity to take responsibility for own learning	P	33	0	0	0	0	0	0	20	60.6	13	39.4	4	5	4	4.4
5.6	Liked this method as it relates to daily experience	P	33	0	0	0	0	6	18.2	14	42.4	13	39.4	3	5	4	4.2

P = Positive Impact (Effectiveness of Constructivist Teaching) | N = Negative Impact (Effectiveness of Constructivist Teaching) | F = Frequency

The above results are represented in the Fig. 5.13 below:

Fig. 5.13: Elaborate (Statements 5.1 to 5.6)



Following findings emerged from Table 5.16 and Fig. 5.13 **(Elaborate)** are given below:

The data analysis revealed that 45.5% students "strongly agreed" while remaining 54.5% students "agreed" with the statement that they liked the survey method because they could interact with people who helped them to understand clearly the topic. The overall reaction to this statement was found to be Positive with a Mean of 4.5.

45.5% students "strongly agreed" while remaining 54.5% students "agreed" with the statement that they liked this method of teaching as it created a conducive environment for learning. The overall reaction to this statement was found to be Positive with a Mean of 4.5.

To the statement whether the method helped them to apply what they have learnt to new situations, 57.6% students "strongly agreed" while remaining 42.4% students "agreed" with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.6. 42.4% students "strongly agreed" and 51.5% students "agreed" with the statement that they liked this method as it explored their creativity in studying SS in class. 6.1% students remained neutral with no student who disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

From the analysis it was observed that 39.4% students “strongly agreed” while the remaining 60.6% students “agreed” with the statement that the survey method provided opportunity to take responsibility for one’s own learning. There was no student that remained neutral or disagreed with the statement**.** The overall reaction to this statement was found to be Positive with a Mean of 4.4. 39.4% students “strongly agreed” and 42.4% students “agreed” with the statement that they liked this method as it related to their daily experiences. 18.2% students remained neutral and there was no student who disagreed. The overall reaction to this statement was found to be Positive with a Mean of 4.2.

Conclusion

Based on the above data analysis **(Elaborate)**, the instructional strategy was found to be student-centric, helped students to interact with fellow students and to convert previous knowledge to new topics, learn at their own pace and made them more confident. They were also encouraged to explain in their own words and work in a team.

Group 6: Evaluate (9 Statements)

Table 5.17 below gives the Student Reaction Feedbacks on the 9 statements:

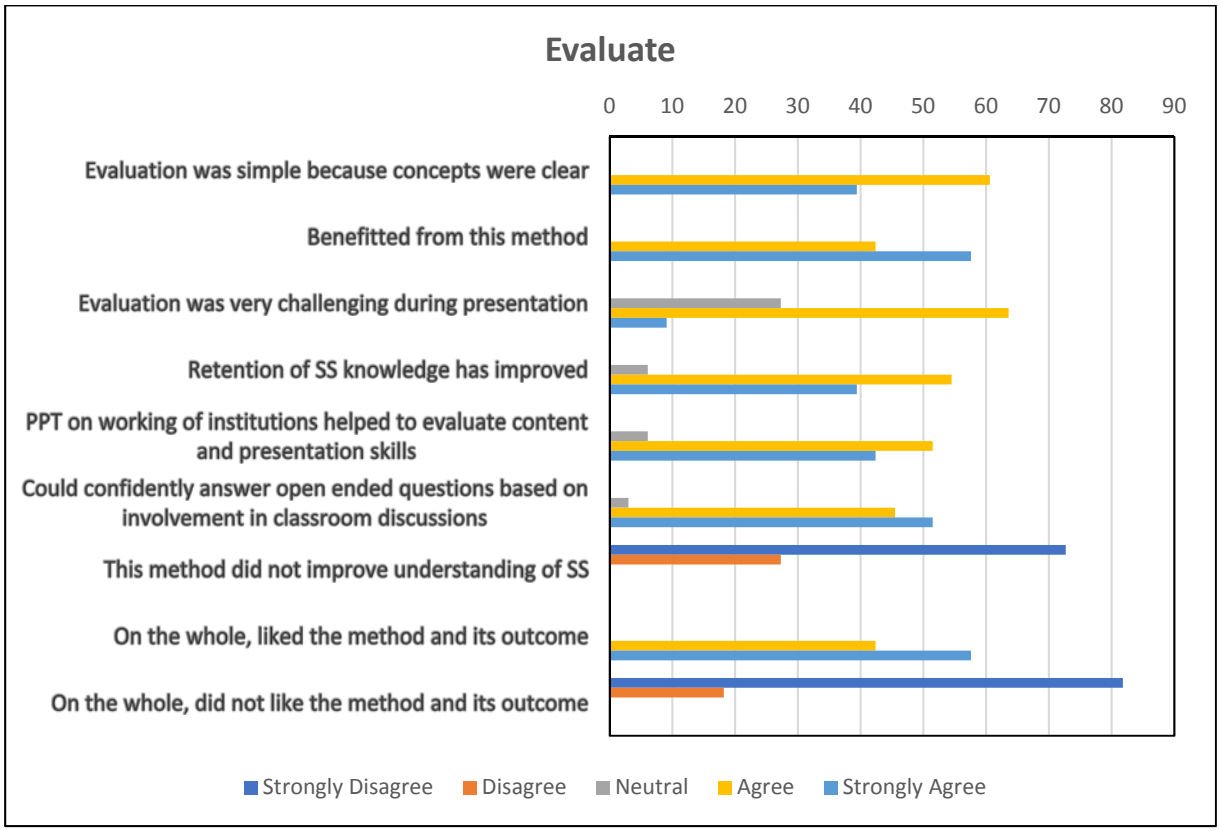
Table 5.17

Sl. No.	Questions	Impact	No.	Students' Reaction										Summary of Students' Reaction in 1 – 5 Likert Scale			
				1		2		3		4		5					
				Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree		Min	Max	Median	Mean
				F	%	F	%	F	%	F	%	F	%				
6.0	**Evaluate**																
6.1	Evaluation was simple because concepts were clear	P	33	0	0	0	0	0	0	20	60.6	13	39.4	4	5	4	4.4
6.2	Benefitted from this method	P	33	0	0	0	0	0	0	14	42.4	19	57.6	4	5	5	4.6
6.3	Evaluation was very challenging during presentation	P	33	0	0	0	0	9	27.3	21	63.6	3	9.1	3	5	4	3.8
6.4	Retention of SS knowledge has improved	P	33	0	0	0	0	2	6.1	18	54.5	13	39.4	3	5	4	4.3
6.5	PPT on working of institutions helped to evaluate content and presentation skills	P	33	0	0	0	0	2	6.1	17	51.5	14	42.4	3	5	4	4.4
6.6	Could confidently answer open ended questions based on involvement in classroom discussions	P	33	0	0	0	0	1	3.0	15	45.5	17	51.5	3	5	5	4.5
6.7	This method did not improve understanding of SS	N	33	24	72.7	9	27.3	0	0	0	0	0	0	1	2	1	1.3
6.8	On the whole, liked the method and its outcome	P	33	0	0	0	0	0	0	14	42.4	19	57.6	4	5	5	4.6
6.9	On the whole, did not like the method and its outcome	N	33	27	81.8	6	18.2	0	0	0	0	0	0	1	2	1	1.2

P = Positive Impact (Effectiveness of Constructivist Teaching) | N = Negative Impact (Effectiveness of Constructivist Teaching) | F = Frequency

The above results are represented in the Fig. 5 14 given below:

Fig: 5.14: Evaluate (Statements 6.1 to 6.9)



Following findings emerged from Table 5.17 and Fig. 5.14 (Evaluate):

From the data given above it could be observed that 39.4% students "strongly agreed" and 60.6% students "agreed" that Evaluation was simple because concepts were clear. There were no students who disagreed with the statement or remained neutral. The overall reaction to this statement was found to be Positive with a Mean of 4.4.

57.6% students "strongly agreed" and the remaining 42.4% students "agreed" that they benefitted from the method of teaching. There were no students who disagreed with the statement or remained neutral. The Impact of this question was found to be Positive with Mean 4.6.

9.1% students "strongly agreed" while 63.6% students "agreed" that Evaluation was very challenging during presentation. 27.3% students remained neutral and there was no student that disagreed with the statement. The overall reaction to this statement was found to be Positive with a Mean of 3.8.

The data analysis showed that 39.4% students "strongly agreed" and 54.5% students "agreed" with the statement that retention of SS knowledge had improved. 6.1% students remained neutral with respect to this statement and there was no student who disagreed. The overall reaction to this statement was found to be Positive with a Mean of 4.3.

42.4% students “strongly agreed” while 51.5% students “agreed” with the statement that the PowerPoint presentation on working of institutions helped to evaluate content and presentation skills. 6.1% students remained neutral with respect to this statement and there was no student who disagreed. The overall reaction to this statement was found to be Positive with a Mean of 4.4.
It is seen from the analysis, that 51.5% students “strongly agreed” while 45.5% students “agreed” with the statement that they could now confidently answer open ended questions based on involvement in classroom discussions. 3.0% students remained neutral with respect to this statement and there was no student who disagreed. The Impact of this question was found to be Positive with Mean 4.5.
From the data above, it was observed that 72.7% students “strongly disagreed” and the remaining 27.3% students “disagreed” with the statement that this method did not improve understanding of SS’. Thus, all students agreed that the method improved their understanding of SS. The overall reaction to this statement was found to be Negative with a Mean of 1.3.
57.6% students “strongly agreed” and the remaining 42.4% students “agreed” with the statement that on the whole, they liked the method and its outcome. Thus, there was no student who disagreed or remained neutral. The Impact of this question was found to be Positive with a Mean of 4.6.
81.8% students “strongly disagreed” and the remaining 18.2% students “disagreed” to the statement that on the whole, they did not like the method and its outcome. The overall reaction to this statement was found to be Negative with a Mean of 1.2.

Conclusion

On the basis of the above data analysis **(Evaluate)**, it was found that majority of the students liked the group discussion method as it made the content more comprehensible and was enjoyable they felt that they could respond to questions better as it helped them to connect to their past knowledge. There were very few students who did not find this method effective. 100 % of the students agreed with the statement that on the whole, they liked the method and its outcome.

5.5 Major Findings of the Study

Major Findings from the analysis of Section 1:

The Mean Achievement Scores obtained by the Experimental Group (13.12) was significantly higher than that of the Control Group (12.03). The p-Value is less than 0.05 (actual value: 0.002). Thus, Mean Scores achieved by the Experimental Group is significantly higher than that of the Control Group. Hence, it may be construed that the intervention used based on the Constructivist teaching approach for Lesson 1 was found to be effective for Social Science Standard IX CBSE English medium students.

Major Findings from the analysis of Section 2:

Mean Scores achieved by the Experimental Group (13.71) was s significantly higher than that of the Control Group (11.67). The p-Value is less than 0.05 (actual value: 0.000). In other words, Mean Scores achieved by the Experimental Group is significantly higher than that of the Control Group. Thus, it can be concluded that the intervention based on the Constructivist teaching approach for Lesson 2 was found to be effective for Social Science of Standard IX CBSE English Medium students.

Major Findings from the analysis of Section 3:

Based on the Mean Score obtained by the two groups in Post-Test 3 - Experimental group (11.09) and Control group (11.17), it was found that there was no significant difference between the two groups. The p-Value is more than 0.05 (actual value: 0.900). In other words, the intervention used based on the Constructivist teaching approach for Lesson 3 for Social Science of Standard IX CBSE English Medium students did not have much differential effect on the results of the Experimental Group.

Major Findings from the analysis of Section 4:

Mean Achievement Scores achieved by the Experimental Group (12.85) was significantly higher than that of the Control Group (11.22). The p-value is less than 0.05 (actual value: 0.004). In other words, scores achieved by the Experimental Group was significantly higher than that of the Control Group implying that the intervention based on the Constructivist approach was indeed beneficial in the understanding of Social Science concepts.

Major Findings from the analysis of Section 5:

Observation of student participation and responses in the various stages of the 5E model of teaching showed that students were able to make the required connections between the present, past and future.

In the ‘Exploration’ stage, students were found to be investigating and arriving at conclusions by observing patterns, seeing connections and recognizing new situations, technologies and procedures.

The stage of ‘Explanation’ revealed their ability to explain their concepts with clarity and good communication skills. Not only this; their ability for negotiation, interpretation, collaborative learning and the ability to convey ideas via other media too had improved.

In the stage of Elaboration, students were able to extend and apply their knowledge to other situations and were able to transfer their learning.

While observation of the earlier phases helped the researcher to evaluate the ‘process’ aspects, the final phase of ‘Evaluation’ helped the researcher to evaluate the ‘learning outcomes’ which showed that students’ understanding of Social Science concepts was found to be better in comparison with the control group students.

Major Findings from the analysis of Section 6:

The major reactions of the students are summarized as below:

Introduction

81.8% students “Strongly Agreed” and 9.1% students “Agreed” that Social Science teaching has been teacher centric.

66.7% students “Strongly Agreed” and 30.3% “Agreed” that the way SS was taught can make the subject interesting.

Stage I: Engage

54.5% students “Strongly Agreed” and 45.5% students “Agreed” that learning through Group Discussion was fun and enjoyable.

33.3% students “Strongly Agreed” and 42.4% students “Agreed” that they liked this method as it connected to their past knowledge.

63.6% students “Strongly Agreed” and 36.4% students “Agreed” that teacher offered effective support and guidance.

48.5% students “Strongly Agreed” and another 48% “Agreed” that the questions posed by the teacher forced them to think independently.

Stage II: Explore

- 57.6% students “Strongly Agreed” and 42.4% students “Agreed” that it was interesting to learn through group activities and project making.
- 57.6% students “Strongly Agreed” and 42.4% students “Agreed” that this method has helped them to organize their concepts of Social Science.
- 39.4% students “Strongly Agreed” and 60.6% students “Agreed” that this method has them to develop Analytical skill.

Stage III: Explain

- 18,2% students “Strongly Agreed” and 81.2% students “Agreed” that this teaching method was student centric.
- 48.5% students “Strongly Agreed” and another 48.5% students “Agreed” that they could listen and question ideas.
- 48.5% students “Strongly Agreed and 42.4% “Agreed” that they could learn at their own pace.
- 69.7% students “Strongly Agreed” and the remaining 30.3% students “Agreed” that this teaching method made them more confident.
- 57.6% students “Strongly Agreed” and remaining 42.4% students “Agreed” that they were encouraged to explain in their own words.
- 36.4% students “Strongly Agreed” and 54.5% students “Agreed” that it was clear what they were expected to learn after completing each unit of Social Science.
- 42.4% students “Strongly Agreed” and 57.6% students “Agreed” that working in a team made learning more interesting and effective.

Stage IV: Elaborate

- 45.5% students “Strongly Agree” and 54.5% students “Agreed” that this method of teaching created a conducive environment of learning.
- 57.6% students “Strongly Agreed” and 42.4% students “Agreed” that this approach helped them to apply what they have learned to new situations.
- 42.4% students “Strongly Agreed” and 51.5% students “Agreed” that they liked this method as it explored their creativity in studying SS in class.

Stage V: Evaluate

- 39.4% students “Strongly Agreed” and 60.6% students “Agreed” that evaluation was simple because concepts were clear.
- 39.4% students “Strongly Agreed” and 54.5% students “Agreed” that retention of SS knowledge has improved.

- 57.6% students “Strongly Agreed” and the remaining 42.4% students “Agreed” that they, overall, liked the method and its outcome.

5.6 Discussion

Students found the teaching, based on Constructivist teaching philosophy, to be very effective in terms of connecting to their previous knowledge and experience while constructing new knowledge. This has been reflected in the results of the study, especially in Post-Test 1, Post-Test 2 and Comprehensive Post-Test. In each of these tests, students of Experimental Group have scored significantly higher compared to the students of Control Group.

While most of the students were interactive during the group activities, a few of them were a bit hesitant initially to speak up. But, with the support of the group and the Researcher, they became participative. Students worked in a group as they felt comfortable. In today’s changing and interconnected world, collaborative or group working is a very powerful tool to address any challenge. Result of the study suggests that if there is an effective leader or guide or a facilitator, collaborative working could be very effective and efficient.

The above positive findings match with those conducted in this field by various researchers. There have been several studies conducted in the area of Social Science. Chackko (2012) studied the ‘Effectiveness of Constructivist Approach in Teaching of Social Studies at Upper Primary Level’. The Constructivist approach was found to be effective in critical thinking. Robert (2006), reviewed whether Constructivist teaching improves Social Studies learning of Eighth Grade in American History. The Study found positive results with respect to achievement and attitude towards the subject. Mishra (2014) in his Study titled ‘Social Constructivism and teaching of Social Science’, concluded that learners’ engagement and ownership in classroom pedagogic process, culture of enquiry had significantly improved, students were able to defend their ideas and authority had shifted from teacher to students, the whole class benefited from collective learning. According to Akanwa et al (2014), Srinivasalu, (2013) constructivist approach had a significant effect on achievement and interest of students in the Social Sciences.

This study corroborates the findings with the studies conducted earlier. Quantitative analysis proves the superiority of the Experimental Group students in academic achievement through the Post-Tests 1, 2 and Comprehensive Post-Test. Reaction

feedbacks of the Experimental group students have also revealed positive impacts of the constructivist teaching on the teaching-learning process. More than 80% students strongly liked the student-centric teaching while more than 40% strongly agreed that they could connect previous knowledge to the present ones. 46% students strongly agreed that this teaching methodology could create a very conducive learning environment. About 50% students strongly agreed that they could learn at their own pace. 55% students strongly agreed that learning through group discussion was easy to comprehend, fun and enjoyable. More than 40% students strongly agreed working in a team made the learning more effective. Around 40% students strongly agreed that their retention of Social Science knowledge improved. While about 70% students strongly agreed that their confidence level had improved, around 40% students strongly agreed that this method helped to improve their analytical skills. This Study found that Questions posed by teacher forced students to think independently – nearly 50% students strongly agreed with the statement. Nearly, 70% students expressed that constructivist method of teaching can make Social Science an interesting subject. On the whole, about 60% students strongly liked the method and its outcome.

Though on the face of it, it might appear that the Lesson Plans (LP) for Lesson 3 were not effective based on scores in Post-Test 3, it points out to the complex ground realities that, at times, the environment may not be ideal for conducting such studies. It could happen due to several reasons. Students' interest on a specific topic may vary significantly. For example, Lesson 3 was about Electoral System in India. This topic has become a very interesting topic to one and all, including children, thanks to media, e.g. TV, Newspaper, etc. Students, irrespective of whether they belong to Experimental or Control Group, they are very much interested in this topic. This study, being a quasi-experimental study, was conducted in real life situation that may not provide a 100%ideal condition for such study. Many other environmental and physical factors, stress level of students, varying energy level of the teacher, etc. can have impact on the outcome. In fact, such aberrations make the study realistic, authentic and support the overall findings of the study. In this context, it may be worthwhile to recall the study of Kim (2005), entitled 'Effects of a Constructivist Teaching Approach on Students' of Mathematics, in elementary school in Korea. While constructivist teaching was found to be more effective in terms of academic achievement of the students, it was not effective in terms of concept enhancement, but had some effect on motivation to learn.

Thus, the outcome of the experiment may not always match fully with what was expected. Another important aspect is that Social Science is not an exact science, it is influenced by many socio-political, academic, influence, subjectivity and other factors. Thus, in order to establish generic characteristics of constructivist teaching method and its benefits, it is essential to conduct many more research studies in Social Science. It had been a huge learning for the Researcher. Fundamental shift in the approach – from a totally teacher-centric and teacher-controlled environment to a student-centric environment initially made the Researcher a bit apprehensive about the outcome. It was a mixed feeling of excitement of embarking on a new approach and an air of uncertainty of the students' reactions played in the mind of the Researcher.

This study confirmed that Constructivist approach enables students to learn through problem solving, group learning and independent decision making. They learn by constructing their own knowledge via meaningful facilitation and guidance of the teacher. Findings of some other studies mentioned in the report also experienced positive impact of Constructivist approach. While Constructivist teaching has a possibility of improving the teaching-learning process, as mentioned earlier, many more researches are required, especially on teaching of Social Science in Secondary School considering the critical importance of the subject and the ground realities.

The qualitative analysis of the data related to the reactions of students towards the methods used, classroom environment, evaluation and role of teacher in the Constructivist approach found to suggest that all students hugely liked the Constructivist approach in their learning process. Overall, the study carried out shows that the Constructivism as pedagogy or as an approach to learning was effective in improving learning of the students. The effectiveness of the Constructivist approach is due to the students' active participation during the learning process. Learning occurred by doing, exploring and constructing. This helps students to retain knowledge for a longer time. It is apparent that the Constructivist approach has contributed to the successful outcome.

5.7 Suggestions to Various Stakeholders

Constructivist thinking-teaching-learning philosophy has been gaining ground in the recent past. The present study also showed that Constructivism as a pedagogy or as an approach to learning is effective in improving learning outcome of the students. Researcher's conclusion is that Social Science subject can be made interesting by

teaching through Constructivist approach. To make Constructivist method of teaching Social Science more impactful, following suggestions are being made to the various stakeholders involved in the education system.

Policy Makers

NCERT has recommended use of Constructivist method of teaching-learning methods and textbooks are undergoing changes to make them more student-friendly. Constructivist approach may be introduced into the curriculum at all levels of Secondary education to enhance the purpose and quality of education. Policy makers may set up a detailed plan of implementation of this learning philosophy including development of pedagogy, textbooks, work assignments, technologies to be used, method of assessment, training of teachers and staff with a definite timeline. Guidelines for a robust pre-service and in- service Social Science teacher training program needs to be developed along with a policy framework and mechanism to monitor as how the schools are implementing it.

Teachers

If the quality of education needs to improve, it needs to begin with the improved quality of teachers' education. Shift from teacher-centric to student-centric classroom poses a huge challenge to any teacher irrespective of his/her length of experience. The very thought that the absolute and unilateral control the teachers were enjoying on the class and students would go away in a student-centric classroom can unnerve any teacher. Moreover, the student-centric approach, flow of discussion can lead to an unstructured and unknown territory. Teacher must have the tact, skills, courage and presence of mind to steer it back on the track.

Teachers should be self-motivated to develop innovative and newer knowledge, use of technology and skills to make the teaching-learning of Social Science interesting, effective and meaningful, by engaging he students in the class. Continuous competency building needs to be the motto of the teachers. They must continuously strive to be aware of the emerging trends and practices in the field of Social Science education.

School Management

While teachers will have to take initiatives and interest for their own development, School Management must take proactive actions towards this objective. Schools must ensure that each Social Science teacher goes through a 2-3 days training cycle twice a year. School should take care of the expenses and grant leave to the teachers for this purpose. School Management should monitor the progress of the teachers to make

them more knowledgeable, skilled and versatile. Both CBSE Board and School Management should take interest in it. In addition, School Management should encourage and arrange teacher exchange program wherever possible, with overseas educational institutions of developed countries. This will provide great opportunities to the teachers in acquiring knowledge of the foreign education system and newer methods of teaching practiced in developed countries. Last, but not the least, school should take initiative to apprise the parents, guardians and other related stakeholders on the job opportunities that Social Science discipline offers, through yearly seminars/workshops.

Research Students

It is slowly but steadily emerging that Constructivist approach of teaching-learning is gaining grounds in various disciplines including Social Science. Few research studies including this one bear testimony to that. However, it is needless mention that a good number of studies are necessary in use of Constructivist approach in Social Science to review various aspects of this philosophy and come out cause-effect and other nuances of it. In view of this, Social Science research students are encouraged to take up research studies on application of Constructivist approach in teaching Social Science. Good quality researches have always enriched the discipline and will continue to do so, in future, as well.

5.8 Suggested Future Studies

- Development of Lessons based on the Constructivist approach for all the lessons of Social Science covered under the syllabus of CBSE Standard IX English Medium.
- Development of Lessons based on the Constructivist approach for all the lessons of Social Science covered under the syllabus of CBSE Standard X English Medium.
- Development of Lessons based on the Constructivist approach for other subjects in Primary and Secondary Grades of CBSE English Medium.
- A qualitative study can be taken up to observe and analyze student learning in the different stages of the 5E Model.