CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

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4.1.0 INTRODUCTION

The methods used and the procedure adopted for the present study was discussed in detail in the chapter III. The present chapter deals with the analysis and interpretation of data. The data analysis is a procedure of building sense out of the acquired data. It involves consolidation, reduction and interpretation what sample experienced and what the researcher had seen and interpreted on the basis of data analysis. For the reason of interpretation, it is essential to identify appropriate and proper analysis techniques which can help to make the data simpler for the understanding of the others. Interpretation of the analyzed data further aims to explore widespread meaning of these solutions. The fundamental idea of analysis and interpretation of data is to measure and find out the extent of attainment of objectives of the present study. Analysis of data also directs the researcher to test the hypotheses underlying the research. Data analysis and interpretation process leads to the conclusion and helps to make resolution for the researcher to draw up a theory. Research study cannot be done without data analysis and interpretation.

The quasi experimental research design was used in the present study to achieve the objectives. Data were collected with the help of the tools viz. intelligent test, achievement tests in Social Science and reaction scale. Achievement tests in Social Science includes the components like, the testing of content knowledge, logic, divergent thinking along with the overall achievement.

Intelligence test was administered on both the experiment and the control group in the beginning of the study for making groups equivalent. At the end of every semester, achievement test in Social Science was administered on both experiment group and control group. Further the achievement test was scored in terms of content knowledge, logic, divergent thinking and achievement. At the end of the year, reaction scale was administered on the experiment group to know their reaction about the experiment. As the collected data was quantitative in nature, the quantitative statistical techniques were used for data analysis. Mean, Standard Deviation (SD), Standard Error of Mean (SE), Mann–Whitney U-test and Intensity Index (II) were used as statistical

techniques to achieve different objectives of the present study. As the selection of the sample was done purposive, the assumption for non-parametric statistics was used for the present data analysis. Thus the researcher used Mann- Whitney U-Test for the data analysis which is quite identical of t-test of the parametric group. The detail data analysis is presented objective-wise as follow.

4.2.0 EFFECTIVENESS OF DEVELOPED OPEN BOOK ENVIRONMENT

An open book environment was designed and implemented in the present study to facilitate standard VIII students to face Open Book Examination in Social Science and to achieve the objective 2 of the present study i.e. "To implement the developed Open Book Environment to facilitate standard VIII students to face Open Book Examination in Social Science.". The experimental group was taught in an open book environment and the control group was taught in the traditional close book environment. The effectiveness of the open book environment was measured by the achievement of standard VIII students in Social science in terms of the content knowledge, logic, divergent thinking and achievement along with the reaction of the students towards open book environment.

To achieve the objective 3 of the present study i.e. "To study the effectiveness of the developed Open Book Environment in terms of the achievement of standard VIII students in Social science." and to test these stated null hypothesis **$H_0$1**, **$H_0$2, $H_0$3 and $H_0$4**, the data analysis is done as follow. The detailed data analysis is presented through tables 4.1 to table 4.8 as follow.

4.2.1 Effectiveness of Open Book Environment in terms of Content Knowledge.

In this analysis the mean scores of the experimental group that was taught in an open book environment and control group that was taught in the traditional close book environment were compared through mean, standard deviations and standard errors of means. The detailed data analysis is done through tables 4.1 and table 4.2.

Table 4.1 represent the means, standard deviations and standard errors of means of the experimental group and control group examined through OBT for the achievement in Social Science in terms of content knowledge.

Table 4.1: Distribution of Mean, Standard Deviation (SD) and Standard Error of Mean (SE) of the Experimental Group with Open Book Environment (OBEn) and Control group with Traditional Environment in Social Study in terms of its Content Knowledge.

ENVIRONMENTS	N	CONTENT KNOWLEDGE IN SOCIAL SCIENCE		
		Mean	SD	SE
Open Book Environment	36	79.97	13.16	2.19
Traditional Environment	36	52.28	14.88	2.48

From the table 4.1, it was found that the mean score of content knowledge in Social Science of the experimental group those were studied in an open book environment was 79.97 out of total score of 110. The standard deviation from the mean for the content knowledge in Social Science of the same group was found to be 13.16 with standard error of mean of 2.19. From the same table, it was found that the mean score of content knowledge in Social Science of the control group those were studied in traditional Environment was 52.28. The standard deviation from the mean for the content knowledge in Social Science of the same group was found to be 14.88 with standard error of mean of 2.48. It can be said that the group studied with open book environment did very well in comparison to their traditional environment counterpart with more or less similar standard deviation and equally low level of standard error of mean. The better result of the experimental group in the content knowledge in Social Science in comparison to the control group may be due to the effect of the open book environment. To find whether the difference in the means was significant and to test the null hypothesis i.e. $H_0$1"There will be no significant difference between the mean achievement scores of the standard VIII students in the content knowledge in Social Science studied in open book environment and those studied in traditional environment", Mann-Whitney U-test was used and the summary of the Mann-Whitney U-test is given in table 4.2 which is followed by analysis.

Table 4.2: Distribution of Sum of the Ranks (SR), U-Value (U), Z-Value (Z) and Indicator of Significance of the Experimental Group and Control group in Social Study in terms of its Content Knowledge.

ENVIRONMENTS	N	CONTENT KNOWLEDGE IN SOCIAL SCIENCE			
		SR	U	Z	Probability(P)
Open Book Environment	36	1857	105.00	-6.12	0.00003
Traditional Environment	36	783.0			

From table 4.2, it was observed that the sum of ranks of groups studied in open book environment and traditional environment in Social Science content knowledge were 1857 and 783.0 respectively with 36 students in each group. The U-value and z-value were found to be 105.00 and -6.12 respectively. Referring Table for normal probability (Table A of Siegel, 1956) under null hypothesis (H_o) of z, for $z \leq -6.12$ the two tailed probability was found to be 0.00003 which is less than the decided significance level (α) i.e. 0.01. Hence, the null hypothesis $H_0 1$ i.e. "There will be no significant difference between the mean achievement scores of the standard VIII students in the content knowledge in Social Science studied in open book environment and those studied in traditional environment" was rejected and it could be believed that the group studied in open book environment and the group studied in traditional environment differ stochastically (significantly) in terms of their content knowledge in Social Science and the difference found in the means was due to the effect of open book environment. Further referring to table 4.1 where the mean of the experiment group is more than the mean of the control group, it can be said that students' studies through open book environment scored significantly higher in Social Science content knowledge than the students studied through traditional environment.

4.2.2 Effectiveness of Open Book Environment in terms of Logic.

In this analysis the mean scores of the experimental group that was taught in an open book environment and control group that was taught in the traditional close book environment were compared through mean, standard deviations and standard errors of means. The detailed data analysis is done through tables 4.3 and table 4.4.

Table 4.3 depicts the comparison of mean, standard deviation and standard error of means of the experimental group with open book environment and examined through open book test and control group without open book environment for the achievement in Social Science in terms of logic and table 4.4 shows whether there is any significance different between the stated means or not.

Table 4.3: Distribution of Mean, Standard Deviation (SD) and Standard Error of Mean (SE) of the Experimental Group with Open Book Environment (OBEn) and Control group with Traditional Environment in Social Study in terms of its Logic.

ENVIRONMENTS	N	LOGIC IN SOCIAL SCIENCE		
		Mean	SD	SE
Open Book Environment	36	62.61	13.63	2.27
Traditional Environment	36	30.31	15.46	2.58

From the table 4.3, it was found that the mean score of logic in Social Science of the experimental group those were studied in an open book environment was 62.61out of total score of 110. The standard deviation from the mean for the logic in Social Science of the same group was found to be 13.63 with standard error of mean of 2.27. From the same table, it was found that the mean score of logic in Social Science of the control group those were studied in traditional environment was 30.31. The standard deviation from the mean for the logic in Social Science of the same group was found to be 15.46 with standard error of mean of 2.58. It can be said that the group studied with open book environment did very well in comparison to their traditional environment counterpart with more or less similar standard deviation and equally low level of standard error of mean. The better result of the experimental group in the logic in Social Science in comparison to the control group may be due to the effect of the open book environment. To find whether the difference in the means were significant and to test the null hypothesis i.e. "There will be no significant difference between the mean achievement scores of the standard VIII students in the logic in Social Science studied in open book environment and those studied in traditional environment", Mann-Whitney U-test was used. The summary of the Mann-Whitney U-test is given in table 4.4 which is followed by analysis.

Table 4.4: Distribution of Sum of the Ranks (SR), U-Value (U), Z-Value (Z) and Indicator of Significance of the Experimental Group and Control group in Social Science in terms of its Logic.

ENVIRONMENTS	N	LOGIC IN SOCIAL SCIENCE			
		SR	U	Z	Probability(P)
Open Book Environment	36	1874	88.00	- 6.31	0.00003
Traditional Environment	36	767.0			

From table 4.4, it was observed that the sum of ranks of groups studied in open book environment and traditional environment in Social Science logic were 1874 and 767.0 respectively with 36 students in each group. The U-value and z-value were found to be 88.00 and -6.31 respectively. Referring Table for normal probability (Table A of Siegel, 1956) under null hypothesis (H1) of z, for $z \leq -6.31$ the two tailed probability was found to be 0.00003 which is less than the decided significance level (α) i.e. 0.01. Hence, the null hypothesis i.e. "There will be no significant difference between the mean achievement scores of the standard VIII students in the logic in Social Science studied in open book environment and those studied in traditional environment" was rejected and it could be believed that the group studied in open book environment and the group studied in traditional environment differ stochastically (significantly) in terms of their logic in Social Science and the differences found were due to the effect of open book environment. Hence, it can be said that students' studies through open book environment scored significantly higher in Social Science logic than the students studied through traditional environment.

4.2.3 Effectiveness of Open Book Environment in terms of Divergent Thinking.

In this analysis the mean scores of the experimental group that was taught in an open book environment and control group that was taught in the traditional close book environment were compared through mean, standard deviations and standard errors of means. The detailed data analysis is done through tables 4.5 and table 4.6.

Table 4.5 depicts the comparison of mean, standard deviation and standard error of means of the experimental group with open book environment and control group without open book environment for the achievement in Social Science in terms of

divergent thinking and table 4.6 shows whether there is any significance different between the stated means or not.

Table 4.5: Distribution of Mean, Standard Deviation (SD) and Standard Error of Mean (SE) of the Experimental Group with Open Book Environment (OBEn) and Control group with Traditional Environment in Social Science in terms of its Divergent Thinking.

ENVIRONMENTS	N	DIVERGENT THINKING IN SOCIAL SCIENCE		
		Mean	SD	SE
Open Book Environment	36	42.22	17.01	2.84
Traditional Environment	36	13.83	9.26	1.54

From the table 4.5, it was found that the mean score of divergent thinking in Social Science of the experimental group those were studied in an open book environment was 42.22 out of total score of 110. The standard deviation from the mean for the divergent thinking in Social Science of the same group was found to be 17.01 with standard error of mean of 2.84. From the same table, it was found that the mean score of divergent thinking in Social Science of the control group those were studied in traditional environment was 13.83. The standard deviation from the mean for the divergent thinking in Social Science of the same group was found to be 9.26 with standard error of mean of 1.54. It can be said that the group studied with open book environment did very well in comparison to their traditional environment counterpart with more or less similar standard deviation and equally low level of standard error of mean. The better result of the experimental group in the divergent thinking in Social Science in comparison to the control group may be due to the effect of the open book environment. To find whether the difference in the means were significant and to test the null hypothesis i.e. H_0 "There will be no significant difference between the mean achievement scores of the standard VIII students in the divergent thinking in Social Science studied in open book environment and those studied in traditional environment", Mann-Whitney U-test was used. The summary of the Mann-Whitney U-test is given in table 4.6 which is followed by analysis.

Table 4.6: Distribution of Sum of the Ranks (SR), U-Value (U), Z-Value (Z) and Indicator of Significance of the Experimental Group and Control group in Social Study in terms of its Divergent Thinking.

ENVIRONMENTS	N	DIVERGENT THINKING IN SOCIAL SCIENCE			
		SR	U	Z	Probability (P)
Open Book Environment	36	1907	55.00	-6.68	0.00003
Traditional Environment	36	740.0			

From table 4.6, it was observed that the sum of ranks of groups studied in open book environment and traditional environment in Social Science divergent thinking were 1907 and 740.0 respectively with 36 students in each group. The U-value and z-value were found to be 55.00 and -6.68 respectively. Referring Table for normal probability (Table A of Siegel, 1956) under null hypothesis (H3) of z, for $z \leq -6.68$ the two tailed probability was found to be 0.00003 which is less than the decided significance level (α) i.e. 0.01. Hence, the null hypothesis i.e. "There will be no significant difference between the mean achievement scores of the standard VIII students in the divergent thinking in Social Science studied in open book environment and those studied in traditional environment" was rejected and it could be believed that the group studied in open book environment and the group studied in traditional environment differ stochastically (significantly) in terms of their divergent thinking in Social Science and the differences found were due to the effect of open book environment. Hence, it can be said that students' studies through open book environment scored significantly higher in Social Science divergent thinking than the students studied through traditional environment.

4.2.4 Effectiveness of Open Book Environment in terms of Achievement.

In this analysis the mean scores of the experimental group that was taught in an open book environment and control group that was taught in the traditional close book environment were compared through mean, standard deviations and standard errors of means. The detailed data analysis is done through tables 4.7 and table 4.8.

Table 4.7 depicts the comparison of mean, standard deviation and standard error of means of the experimental group with open book environment and control group without open book environment for the achievement in Social Science in terms of its achievement and table 4.8 shows whether there is any significance different between the stated means or not.

Table 4.7: Distribution of Mean, Standard Deviation (SD) and Standard Error of Mean (SE) of the Experimental Group with Open Book Environment (OBEn) and Control group with Traditional Environment in Social Study in terms of its Achievement.

ENVIRONMENTS	N	ACHIEVEMENT IN SOCIAL SCIENCE		
		Mean	SD	SE
Open Book Environment	36	48.11	10.49	1.75
Traditional Environment	36	28.92	10.20	1.70

From the table 4.7, it was found that the mean score of achievement in Social Science of the experimental group those were studied in an open book environment was 48.11 out of total score of 110. The standard deviation from the mean for the achievement in Social Science of the same group was found to be 10.49 with standard error of mean of 1.75. From the same table, it was found that the mean score of achievement in Social Science of the control group those were studied in traditional Environment was 28.92. The standard deviation from the mean for the achievement in Social Science of the same group was found to be 10.20 with standard error of mean of 1.70. It can be said that the group studied with open book environment did very well in comparison to their traditional environment counterpart with more or less similar standard deviation and equally low level of standard error of mean. The better result of the experimental group in the achievement in Social Science in comparison to the control group may be due to the effect of the open book environment. To find whether the difference in the means were significant and to test the null hypothesis i.e. “There will be no significant difference between the mean achievement scores of the standard VIII students in the achievement in Social Science studied in open book environment

and those studied in traditional environment", Mann-Whitney U-test was used. The summary of the Mann-Whitney U-test is given in table 4.8 which is followed by analysis.

Table 4.8: Distribution of Sum of the Ranks (SR), U-Value (U), Z-Value (Z) and Indicator of Significance of the Experimental Group and Control group in Social Study in terms of its Achievement.

ENVIRONMENTS	N	ACHIEVEMENT IN SOCIAL SCIENCE			
		SR	U	Z	Probability(P)
Open Book Environment	36	1831	131.00	-5.82	0.00003
Traditional Environment	36	810.0			

From table 4.8, it was observed that the sum of ranks of groups studied in open book environment and traditional environment in Social Science achievement were 1831 and 810.0 respectively with 36 students in each group. The U-value and z-value were found to be 131.00 and -5.82 respectively. Referring Table for normal probability (Table A of Siegel, 1956) under null hypothesis (H0) of z, for $z \leq -5.82$ the two tailed probability was found to be 0.00003 which is less than the decided significance level (α) i.e. 0.01. Hence, the null hypothesis i.e. "There will be no significant difference between the mean achievement scores of the standard VIII students in the achievement in Social Science studied in open book environment and those studied in traditional environment" was rejected and it could be believed that the group studied in open book environment and the group studied in traditional environment differ stochastically (significantly) in terms of their achievement in Social Science and the differences found were due to the effect of open book environment. Hence, it can be said that students' studies through open book environment scored significantly higher in Social Science achievement than the students studied through traditional environment.

4.3.0 EFFECTIVENESS OF THE OPEN BOOK ENVIRONMENT IN TERMS OF THE REACTION OF STUDENT

To achieve objective 4 i.e. "To study the effectiveness of the developed open book environment in terms of the reaction of students towards the developed open book environment", data were collected from the experimental group after the implementation of the experiment through a Likert type five point reaction scale. These collected data were analyzed using percentage and Intensity Index (II) which is given in table 4.9 as follow.

Table 4.9: Summary of the Reactions of the Students towards the Statements related to the Open Book Environment in terms of Percentage Response against different Responses i.e. SA-Strongly Agree, A-Agree, UD-Undecided, DA- Disagree, SDA-Strongly Disagree and Intensity Index (II).

Sl. No	Statements	SA	A	UD	DA	SDA	II
		%	%	%	%	%	
1	I liked the teaching of SS by our teacher in Open Book Environment (OBEn).	36.36	51.52	6.06	0	6.06	4.12
2	Teaching of SS in Open Book Environment helped me in understanding the concepts of SS better.	33.33	42.42	18.18	6.06	0	4.03
3	Teaching of SS in Open Book Environment helped me in better learning of the subjects.	30.30	51.52	12.12	6.06	0	4.06
4	Teaching of SS through Open Book Environment was quite interesting.	36.36	33.33	18.18	12.12	0	3.94
5	I like to work with Cognitive questions given in the group.	30.3	48.49	15.15	6.06	0	4.03
6	Cognitive questions given in different chapter of SS were interesting.	36.36	39.39	15.15	9.09	0	4.03
7	Cognitive questions helped me and my group to think divergently.	36.36	51.52	12.12	0	0	4.24
8	It was interesting to find answers of the Cognitive questions.	45.46	42.42	3.03	6.06	3.03	4.21

Sl. No	Statements	SA	A	UD	DA	SDA	II
9	It liked the group activities as it helped to stimulate my mind.	33.33	36.36	24.24	6.06	0	3.97
10	Solving cognitive questions and presenting that in the whole class helped to develop my level of confidence.	42.42	48.48	6.06	0	3.03	4.27
11	Solving cognitive questions in group helped me to develop my communication skills.	33.33	48.48	9.09	9.09	0	4.06
12	I liked the way my teacher and friends appreciate our group work.	33.33	48.48	12.12	3.03	3.03	4.06
13	Power Point Presentation in SS during OBE was interesting to us.	27.27	39.39	27.27	3.03	3.03	3.85
14	Power Point Presentation in SS during OBE helped us to understand the concepts easily.	21.21	42.42	27.27	9.09	0	3.76
15	We came to know about many more facts about SS through Power Point Presentation during OBE.	33.33	45.46	15.15	3.03	3.03	4.03
16	There was a proper coordination between Power Point Presentation and the explanation by the teacher during OBE.	30.3	39.39	21.21	9.09	0	3.91
17	I liked the way freedom was given to us during the teaching through OBE.	33.33	39.39	21.21	6.06	0	4
18	Freedom given to us during the teaching through OBE helped us to increase our confidence level.	33.33	36.36	24.24	6.06	0	3.97
19	Freedom given to us during the teaching through OBE helped us to be self-disciplined.	21.21	54.54	15.15	6.06	3.03	3.85
20	Learning through OBE developed our decision making skills.	39.39	42.42	12.12	6.06	0	4.15
21	Concept mapping during OBE helped use to remember things easily.	27.27	42.42	21.21	9.09	0	3.88
22	Learning in an OBE would help in minimizing rote learning.	36.36	36.36	15.15	12.12	0	3.97

Sl. No	Statements	SA	A	UD	DA	SDA	II
23	Learning in an OBE will help me to realize my own capacity.	27.27	54.54	12.12	6.06	0	4.03
24	Working with groups in OBE helped me to be cooperative.	30.3	51.52	15.15	0	3.03	4.06
25	Learning in an OBE is better than our traditional learning Environment	36.36	36.36	21.21	3.03	3.03	4
26	I liked answering questions during the Open Book Examination	45.46	36.36	9.09	3.03	6.06	4.12
27	Answering questions in the Open Book Examination helped to reduce my fear for examination.	42.42	27.27	21.21	6.06	3.03	4
28	I got the answers of the questions from my notes and books asked during the examination of OBE.	18.18	39.39	18.18	12.12	12.12	3.39
29	I liked the whole concept of OBE starting from teaching to the Examination.	30.3	36.36	33.33	0	0	3.97
30	The system of OBE is a better alternative to our traditional system of examination.	30.3	42.42	21.21	9.09	3.03	3.91
						Over all Reaction	4.0

SA-Strongly Agree**, A**-Agree**, UD**-Undecided**, DA**- Disagree**, SDA**-Strongly Disagree**, II**- Intensity Index

In terms of reaction of student's towards the statement 1 i.e. "I liked the teaching of SS by our teacher in Open Book Environment (OBEn)", 36.36 %, 51.52 %, 6.06 % and 6.06 % of them reacted strongly agree, agree, undecided and strongly disagree respectively. The intensity index of 4.12 showed favorable reaction of students towards their liking for the open book environment.

For the statement 2 i.e. "Teaching of SS in Open Book Environment helped me in understanding the concepts of SS better." 33.33 %, 42.42 %, 18.18 % and 6.06 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity

index of 4.03 showed favorable reaction of students towards the open book environment that helped them for enhancing their understanding the concepts of SS in a better way.

For the statement 3 i.e. “Teaching of SS in Open Book Environment helped me in better learning of the subjects”, 30.30 %, 51.52 %, 12.12 % and 6.06 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 4.06 showed favorable reaction of students towards the Open book environment in terms of better learning of the subjects.

In terms of reaction of student’s towards the statement 4 i.e. “Teaching of SS through Open Book Environment was quite interesting”, 36.36 %, 33.33 %, 18.18 % and 12.12 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 3.94 showed favorable reaction of students towards the open book environment which was implemented throughout the year with lots of group activities with great interest while the students were performing various interesting tasks.

For the statement 5 i.e. “I liked to work with cognitive questions given in the group”, 30.3 %, 48.49 %, 15.15 % and 6.06 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 4.03 showed favorable reaction of the student towards the cognitive questions which were given to them for group activity.

In terms of reaction of student’s towards the statement 6 i.e. “Cognitive questions given in different chapter of SS were interesting”, 36.36 %, 39.39 %, 15.15% and 9.09 % of them reacted strongly agree, agree, undecided, and disagree respectively. The intensity index of 4.03 showed favorable reactions of students regarding the cognitive questions of different chapter of Social Science and these questions were interesting to them.

In terms of reaction of student’s towards the statement 7 i.e. “Cognitive questions helped me and my group to think divergently”, 36.36 %, 51.52 % and 12.12 % of them reacted strongly agree, agree and undecided respectively. The intensity index of 4.24 showed favorable reaction of students towards the cognitive questions which helped them and their group to think divergently.

In terms of reaction of student's towards the statement 8 i.e. "It was interesting to find answers of the cognitive questions", 45.45 %, 42.42 %, 3.03 %, 6.06 % and 3.03 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 4.21 showed favorable reaction of students regarding the finding answer of the cognitive questions of SS with interest.

For the statement 9 i.e. "I liked the group activities as it helped to stimulate my mind", 33.33 %, 36.36 %, 24.24 % and 6.06 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 3.97 showed favorable reaction of students towards the group activities, ability to think logically and the power of imagination on a specific topic.

In terms of reaction of student's towards the statement 10 i.e. "Solving cognitive questions and presenting that in the whole class helped to develop my level of confidence", 42.42 %, 48.48 %, 6.06 % and 3.03 % of them reacted strongly agree, agree, undecided and strongly disagree respectively. The intensity index of 4.27 showed favorable reaction of students towards the development of their level of confidence due to solving cognitive questions and presenting that in front of the whole class by the representative of all group.

For the statement 11 i.e. "Solving cognitive questions in group helped me to develop my communication skills", 33.33 %, 48.48 %, 9.09 % and 9.09 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 4.06 showed favorable reaction of students towards group work solving cognitive questions in the open book environment they developed their communication skills while discussing in the group.

For the statement 12 i.e. "I liked the way my teacher and friends appreciate our group work", 33.33 %, 48.48 %, 12.12 %, 3.03 % and 3.03 % of them reacted strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index of 4.06 showed favorable reaction of the student towards group works which were appreciated by their peers and teacher.

In terms of reaction of student's towards the statement 13 i.e. "Power Point Presentation in SS during OBE was interesting to us", 27.27 %, 39.39 %, 27.27%, 3.03 % and 3.03 % of them reacted strongly agree, agree, undecided, disagree and

strongly disagree respectively. The intensity index of 3.85 showed favorable reaction of students towards the power point presentation and discussion of the topic of SS by the teacher.

In terms of reaction of student's towards the statement 14 i.e. "Power Point Presentation in SS during OBE helped us to understand the text easily", 21.21 %, 42.42 %, 27.27 % and 9.09 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 3.76 showed favorable reaction of students regarding the use of technological aids by their teacher during the teaching process in the Open Book Environment that made their learning better and very effectively.

In terms of reaction of student's towards the statement 15 i.e. "We came to know about many more facts about SS through Power Point Presentation during OBE", 33.33 %, 45.46 %, 15.15 %, 3.03 % and 3.03 % of them reacted strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index of 4.03 showed favorable reaction of students towards the detail discussion regarding the facts about SS through power point in an open book environment during OBE.

In terms of reaction of student's towards the statement 16 i.e. "There was a proper coordination between power point presentation and the explanation by the teacher during OBE", 30.3 %, 39.39 %, 21.21 % and 9.09 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 3.9 showed favorable reaction of students towards the discussion and presentation by the teacher in front of whole class in the OBEn that helped them to inculcate the content knowledge properly.

In terms of reaction of student's towards the statement 17 i.e. "I liked the way freedom was given to us during the teaching through OBEn", 33.33 %, 39.39 %, 21.21 % and 6.06 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 4 showed favorable reaction of students towards the OBEn in terms of their freeness that helped them to think freely whatever they want to think about the topic.

For the statement 18 i.e. "Freedom given to us during the teaching through OBE helped us to increase our confidence level", 33.33 %, 36.36 %, 24.24 %, and 6.06 %

of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 3.97 showed favorable reaction of students towards the OBEn in terms of increasing confidence level and which help them to performed better.

In terms of reaction of student's towards the statement 19 i.e. "Freedom given to us during the teaching through OBEn helped us to be self-disciplined.", 21.21 %, 54.54 %, 15.15 %, 6.06 % and 3.03 % of them reacted strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index of 3.85 showed favorable reaction of students towards the self disciplined that was maintained in ther group work, sharing the new ideas with their peers and teacher.

In terms of reaction of student's towards the statement 20 i.e. "Learning through OBEn developed our decision making skills", 39.39 %, 42.42 %, 12.12 % and 6.06 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 4.15 showed favorable reaction of students towards the different attitude and behavior in the Open Book Environment (OBEn) as they were capable of making decision in any type of situation.

For the statement 21 i.e. "Concept mapping during OBEn helped us to remember things easily", 27.27 %, 42.42 %, 21.21 % and 9.09 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 3.88 showed favorable reaction of students towards the concept mapping techniques in the OBEn which makes the whole content in image like diagrammatic forms.

For the statement 22 i.e. "Learning in an OBEn would help in minimizing rote learning", 36.36 %, 36.36 %, 15.15 % and 12.12 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 3.97 showed favorable reaction of the student towards the changing nature of the learning in an OBEn helped them to understand the concepts of Social Science rather than memorizing the answers of the subject questions.

For the statement 23 i.e. "Learning in an OBEn will help me to realize my own capacity", 27.27 %, 54.54 %, 12.12 % and 6.06 % of them reacted strongly agree, agree, undecided and disagree respectively. The intensity index of 4.03 showed favorable reaction of students towards the OBEn that helped the students to realize their weakness and capabilities in terms of learning the subject Social Science.

For the statement 24 i.e. “Working with groups in OBEn helped me to be cooperative”, 30.3 %, 51.52 %, 15.15 % and 3.03 % of them reacted strongly agree, agree, undecided and strongly disagree respectively. The intensity index of 4.06 showed favorable reaction of students towards the OBEn that helped them to work in group which is very effective for their life.

For the statement 25 i.e. “Learning in an OBEn is better than our traditional learning environment”, 36.36 %, 36.36 %, 21.21 %, 3.03 % and 3.03 % of them reacted strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index of 4 showed favorable reaction of students towards the advantages of OBEn as it minimize the examination stress to students in comparison to their traditional examination system.

For the statement 26 i.e. “I liked answering questions during the open book testing”, 45.46 %, 36.36 %, 9.09 %, 3.03 % and 6.06 % of them reacted strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index of 4.12 showed favorable reaction of students towards the activities of OBEn that prepared them for the Open Book Examination.

For the statement 27 i.e. “Answering questions in the Open Book Examination helped to reduce my fear for examination”, 42.42 %, 27.27 %, 21.21 %, 6.06 % and 3.03 % of them reacted strongly agree, agree, undecided, disagree and strongly disagree respectively. The intensity index of 4 showed favorable reaction of students towards the Open Book Examination that reduces fear and anxiety of the examination by the OBEn that prepared the students for better understanding.

For the statement 28 i.e. “I got the answers of the questions from my notes and books asked during the examination of OBE”, 18.18 %, 39.39 %, 18.18 %, 12.12 % and 12.12 % of them reacted strongly agree, agree, undecided, disagree and strongly disagree in that order. The intensity index of 3.39 showed that they have undecided reaction of students towards the statement. It is obvious that the answer of the questions asked in the open book testing will not be found from their books and notes. This undecided reaction supported the nature of the open book testing.

For the statement 29 i.e. “I liked the whole concept of OBE starting from teaching to the Examination”, 30.3 %, 36.36 % and 33.33 %, of them reacted strongly agree,

agree and undecided in that order. The intensity index of 3.97 showed favorable reaction of students towards the OBEn and OBE.

For the statement 30 i.e. “The system of OBE is a better alternative to our traditional system of examination”, 30.3 %, 42.42 %, 21.21 %, 9.09 % and 3.03 % of them react strongly agree, agree, undecided, disagree and strongly disagree correspondingly. The intensity index of 3.91 shows favorable reaction of students towards the OBE and OBEn. It showed the changes in the attitude of students towards their own teaching learning process.

The average intensity index of 4.00 showed favorable reaction of students towards the whole Open Book Examination and it showed that students liked both OBEn and OBT.

In terms of overall reaction of the students towards the open book examination, it was found that all the statements were favourable towards different aspects of the Open Book Environment and Open Book Testing. Hence, it can be concluded that students have favorable reaction towards the developed Open Book Environment (OBEn) and also it was found to be effective in terms of student’s reaction.