CHAPTER-IV

DATA ANALYSIS & INTERPRETATION

4.1   **INTRODUCTION:**

Analysis means a critical examination of the collected and grouped data for studying the characteristics of the problems. The data after collection, has to be processed and analyzed in accordance with the outline laid down for the purpose at the time of developing the research plan, this is essential for the scientific study and for ensuring that we have all relevant data for making contemplated comparisons and analysis. Analysis is all about editing, coding, classification and tabulation of collected data. The term analysis refers to the computation of certain measures along with the searching patterns of relationship that exist among the data groups.

The present study was experimental in nature. A strategy for value inculcation using integrated approach through teaching of Mathematics was developed for the secondary level students. The developed strategy was implemented on one division of class VIII students for one academic session of one year. This has been described in Chapter III. According to the used pre-test and post-test equivalent control group design in the present study, control group was taken which consisted of the students of another division of class VIII of the same school. The ten different values of class VIII students were measured in four different dimensions. These dimensions included value conceptual knowledge, value perception, value practice and achievement in Mathematics. The three dimensions viz. value conceptual knowledge, value perception and achievement in Mathematics were measured through pre-test and post-test from both control and experimental groups. To find the effectiveness of the integrated approach the collected data were analyzed quantitatively and qualitatively. In the quantitative analysis mean of gain scores, standard deviation, standard error of mean, Mann Whitney U-test and Intensity Indices were used. The qualitative data was analysed using content analysis. The analysis and interpretation is given under the caption 4.1.0. The reaction of experimental group towards different components of the integrated approach for value inculcation through teaching of Mathematics was taken

with the help of a reaction scale. Analysis and interpretation of data related to reaction scale is given under the caption 4.2.0. The effectiveness of the integrated approach was also measured with the help of students' value based behavior which was observed in different occasions throughout the year. The observations related to different values practices were noted from experimental group which is given under the caption 4.1.3.3.   Mostly data are presented in tables which are followed by analysis and interpretation. The details about the analysis and interpretation of data are given as follows.

4.2   DATA ANALYSIS AND INTERPRETATION :

The analysis of data and interpretation were done objective wise. In the present study, the focus of the study is teaching Mathematics through integrated approach for value inculcation. The objectives are related to the development of strategies, to implement these strategies, to check the effectiveness of these strategies and to collect the reaction of students on the teaching of mathematic through integrated approach.

4.2.1   *Data Analysis Pertaining To Objective 1*

 "To develop strategies for teaching of Mathematics through integrated approach for the inculcation of values like Equality, Co-operation, Simplicity, Dignity of Labor, Determination, Honesty, Regularity, Discipline, Loyalty, and Team Work"

There were no statistics used for this objective and has been described in Chapter III

4.2.2.   *Data Analysis   Pertaining To Objective 2*

"To implement the strategies for teaching of Mathematics through integrated approach for the inculcation of the values."

There were no statistics used for this objective and has been described in Chapter III

4.2.3. *Data Analysis Pertaining To Objective 3*

"To study the effectiveness of the value integrated approach of teaching Mathematics in terms of value conceptual knowledge, value perception and value practice along with the achievement in Mathematics." All the components i.e. value conceptual knowledge, value perception, value practice and achievement in Mathematics are taken separately for analysis.

4.2.3.1 *Data Analysis Related To Value Conceptual Knowledge*

With the help of value knowledge test prepared by the researcher, the gain scores were calculated. It was calculated by taking the difference of the pre-test scores and post-test scores of value conceptual knowledge of the students for both the experimental group and the control group in the taken values like equality, honesty, co-operation, determination, and dignity of labor, loyalty, discipline, teamwork, regularity and simplicity. In this segment, the analysis for the value conceptual knowledge of both the groups is taken separately for each value and all the values as a whole. These analyses are presented with tables and interpretation as follows.

TABLE 4.1: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF CONTROL GROUP AND EXPERIMENTAL GROUP FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE HONESTY

Value Conceptual Knowledge in Honesty	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-1.27	2.201	0.432
Experimental Group	26	1.77	1.608	0.315

From the table 4.1 it was found that the mean gain score of the students in the conceptual knowledge of the value of honesty of the control group and the experimental group were -1.27 and 1.77 respectively. The standard deviation from the gain scores for the conceptual knowledge of the value honesty in students was found to be 2.201 and 1.608 respectively for the control group and the experimental group. The standard error of mean was 0.432 and 0.315 for the respective groups. Comparing the means it was found that mean of the experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous than the experimental group. The higher mean score of the experimental group in the conceptual knowledge of the value honesty in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value honesty.", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.2, which is followed by interpretation.

TABLE 4.2: SUMMARY OF MANN-WHITNEY U-TEST FOR CONCEPTUAL KNOWLEDGE OF THE VALUE HONESTY FOR CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	448.00			
Experimental Group	26	938.00	89.0	-4.605	0.000

From the table 4.2 it was found that the sum of ranks of the control group and the experimental group students in the conceptual knowledge of the value honesty were 448.00 and 938.00 respectively with 26 students in each group. The U-value and z-value were found to be 89.00 and -4.605 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -4.605, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value honesty." was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value honesty. From table 4.1 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that the value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.3: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEANOF CONTROL AND EXPERIMENTAL GROUPS FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE CO- OPERATION.

Value Conceptual Knowledge in Co-operation	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.69	1.955	0.383
Experimental Group	26	2.12	1.966	0.386

From the table 4.3 it was found that the mean gain score of students in the conceptual knowledge of the value of co-operation of the control group and the experimental group were -0.69 and 2.12 respectively. The standard deviations from the gain scores for the conceptual knowledge of the value co-operation in the students were found to be 1.955 and 1.966 respectively for the control group and the experimental group. The standard error of mean was0.383 and 0.386 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the experimental group and control group were nearly same. The higher mean score of experimental group in value conceptual knowledge of the value co-operation in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value co-operation.", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.4, which is followed by interpretation.

TABLE 4.4: SUMMARY OF MANN-WHITNEY U-TEST FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE CO-OPERATION OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	462.50		-4.177	0.000
Experimental Group	26	915.50	111.50		

From table 4.4 it was found that the sum of ranks of the control group and the experimental group students in the conceptual knowledge of the value co-operation were 462.50 and 915.50 respectively with 26 students in each group. The U-value and z-value were found to be 111.50 and -4.177 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -4.177, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the mean gain score of the students of control and experimental group of class VIII in the conceptual knowledge of the value co-operation." was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value co-operation. From table 4.3 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.5: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF CONTROL AND EXPERIMENTAL GROUPS FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE DETERMINATION

Value Conceptual in Determination	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-1.08	2.513	0.493
Experimental Group	26	3.15	1.933	0.379

From the table 4.5 it was found that the gain mean scores of students in the conceptual knowledge of the value determination in the control group and the experimental group were -1.08 and 3.15 respectively. The standard deviations from the gain scores for the conceptual knowledge of the value determination in the students were found to be 2.513 and 1.933 respectively for the control group and the experimental group respectively. The standard error of means was 0.493 and 0.379 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous in terms of the value conceptual knowledge of determination than the counterpart experimental group. The higher mean score of experimental group in conceptual knowledge of the value determination in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value determination.", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.6, which is followed by analysis.

TABLE 4.6: SUMMARY OF MANN-WHITNEY U-TEST FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE DETERMINATION FOR THE CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	403.00	52.00	-5.273	0.000
Experimental Group	26	975.00			

From table 4.6 it was observed that the sum of ranks of the control group and the experimental group students in the conceptual knowledge of the value determination were403.00 and 975.00 respectively with 26 students in each group. The U-value and z-value were found to be 52.00 and -5.273 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -5.273, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value determination." was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge of the value determination. From table 4.5 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.7: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN FOR THE CONTROL GROUP AND THE EXPERIMENTAL GROUP ON THE CONCEPTUAL KNOWLEDGE OF THE VALUE SIMPLICITY

Value Conceptual in Simplicity	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-1.62	2.174	0.426
Experimental Group	26	2.00	1.939	0.380

From the table 4.7it was found that the gain mean scores of students in the conceptual knowledge of the value simplicity of the control group and the experimental group were -1.62 and 2.00 respectively. The standard deviations from the gain scores for the conceptual knowledge of the value simplicity in students were found to be 2.174 and 1.939 respectively for the control and the experimental group.. The standard error of mean was 0.426 and 0.380 for the respective groups. Comparing the means it was found that mean of the experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous than the experimental group. The higher mean score of the experimental group in conceptual knowledge of the value simplicity in comparison to the control group may be due to the integrated approach in inculcating the values through the teaching of Mathematics. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value simplicity.", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.8, which is followed by interpretation.

TABLE 4.8: SUMMARY OF MANN-WHITNEY U-TEST FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE SIMPLICITY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	421.50			
Experimental Group	26	956.50	70.50	-4.947	0.000

From table 4.8 it was observed that the sum of ranks of the control group and the experimental group students in the conceptual knowledge of the value simplicity were 421.50 and 956.50 respectively with 26 students in each group. The U-value and z-value were found to be 70.50 and -4.947 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -4.947, the two tailed probability was found to be 0.000 which was lesser than our decided $\alpha = 0.05$. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value simplicity" was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value simplicity. From table 4.7 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation through teaching of Mathematics. Hence it can be concluded that the value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.9: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN FOR THE CONTROL AND THE EXPERIMENTAL GROUPS FOR CONCEPTUAL KNOWLEDGE OF THE VALUE EQUALITY.

Value Conceptual Knowledge in Equality	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.73	2.051	0.402
Experimental Group	26	2.00	1.386	0.272

From table 4.9 it was found that the mean gain score of students in the conceptual knowledge of the value equality of the control group and the experimental group were -0.73 and 2.00 respectively. The standard deviations from the gain scores for the conceptual knowledge in the value equality of students were found to be 2.051 and 1.386 respectively for the control group and the experimental group. The standard error of mean was 0.402 and 0.272 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous than the experimental group. The higher mean score of experimental group in conceptual knowledge of the value equality in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of the control and the experimental group of class VIII in the conceptual knowledge of the value equality" Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.10, which is followed by interpretation.

TABLE 4.10: SUMMARY OF MANN-WHITNEY U-TEST FOR CONCEPTUAL KNOWLEDGE OF THE VALUE EQUALITY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	448.50	97.50	-4.460	0.000
Experimental Group	26	929.50			

From table 4.10 it was observed that the sum of ranks of the control group and the experimental group students in the conceptual knowledge of value equality were448.50 and 929.50 respectively with 26 students in each group. The U-value and z-value were found to be 97.50 and -4.460 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -4.460, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group students of class VIII students in the conceptual knowledge of the value equality." was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value equality. From table 4.9 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.11: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR CONCEPTUAL KNOWLEDGE OF THE VALUE DIGNITY OF LABOUR.

Value Conceptual Knowledge in Dignity of Labour	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-2.19	2.191	0.430
Experimental Group	26	3.92	2.096	0.411

From the table 4.11 it was found that the mean gain score of students in the conceptual knowledge for the value dignity of labour of the control group and the experimental group were -2.19 and 3.92 respectively. The standard deviations from the gain scores for the conceptual knowledge in the value dignity of labour of students were found to be 2.191 and 2.096 respectively for the control group and the experimental group. The standard error of mean was0.430 and 0.411 for the respective groups. Comparing the means it was found that the mean of the experimental group was higher than the control group. From the standard deviations it was also observed that the control group was more heterogeneous than the experimental group. The higher mean score of the experimental group in the conceptual knowledge of the value dignity of labour in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value dignity of labour" Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.12, which is followed by interpretation.

TABLE 4.12: SUMMARY OF MANN-WHITNEY U-TEST FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE DIGNITY OF LABOUR OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	364.50	13.50	-5.965	0.000
Experimental Group	26	1013.50			

From table 4.12 it was observed that the sum of ranks of the control group and the experimental group students in the conceptual knowledge of the value dignity of labour were 364.50 and 1013.50 respectively with 26 students in each group. The U-value and z-value were found to be 13.50 and -5.965 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z $\leq$ -5.965, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII students in the conceptual knowledge of the value dignity of labour" was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value dignity of labour. From table 4.11 it was also established that the mean gain score of the experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.13: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS ON CONCEPTUAL KNOWLEDGE OF THE VALUE REGULARITY

Value Conceptual knowledge in Regularity	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.31	2.558	0.502
Experimental Group	26	2.73	2.255	0.442

From table 4.13 it was found that the mean gain score of students in the conceptual knowledge of the value regularity of the control group and the experimental group were -0.31 and 2.73 respectively. The standard deviations from the gain scores for the conceptual knowledge of the value regularity of students were found to be 2.558 and 2.255 respectively for control group and experimental group. The standard error of mean was 0.502 and 0.442 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous than the experimental group. The higher mean score of experimental group in conceptual knowledge of the value regularity in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics.. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value conceptual knowledge of regularity", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.14, which is followed by interpretation.

TABLE 4.14: SUMMARY OF MANN-WHITNEY U-TEST FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE REGULARITY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	480.50	129.50	-3.844	0.000
Experimental Group	26	897.50			

From table 4.14 it was found that the sum of ranks of the control group and the experimental group students in conceptual knowledge of the value regularity were 480.50 and 897.50 respectively with 26 students in each group. The U-value and z-value were found to be 129.50 and -3.844 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -3.844,the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group in the value conceptual knowledge of regularity for Class VIII students," was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value regularity. From table 4.13 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.15: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR CONCEPTUAL KNOWLEDGE OF THE VALUE TEAM WORK.

Value Conceptual Knowledge in Team Work	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.35	2.134	0.419
Experimental Group	26	1.88	1.751	0.343

From the table 4.15it was found that the mean gain score of the students in the conceptual knowledge of the value team work of the control group and the experimental group were -0.35 and 1.88 respectively. The standard deviations from the gain scores for the conceptual knowledge of the value team work in students was found to be 2.134 and 1.751 respectively for the control group and the experimental group. The standard error of mean was 0.419 and 0.343 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous than the experimental group. The higher mean score of experimental group in the conceptual knowledge of the value team work in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value conceptual knowledge of team- work", Mann-Whitney U-test was used as the sample was taken by convenience

sampling technique. The summary of the Mann-Whitney U-test is given in table 4.16, which is followed by interpretation.

TABLE 4.16: SUMMARY OF MANN-WHITNEY U-TEST FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE TEAM WORK OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	498.00	147.00	-3.531	0.000
Experimental Group	26	880.00			

From table 4.16 it was found that the sum of ranks of the control group and experimental group students in the conceptual knowledge of the value team work were 498.00 and 880.00 respectively with 26 students in each group. The U-value and z-value were found to be 147.00 and -3.531 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -3.531, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value team work," was rejected Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value team work. From table 4.15 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was

stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.17: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR CONCEPTUAL KNOWLEDGE OF THE VALUE LOYALTY.

Value Conceptual Knowledge in Loyalty	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-1.65	1.573	0.309
Experimental Group	26	2.81	1.812	0.355

From table 4.17 it was found that the mean gain score of the students in the conceptual knowledge of the value loyalty of the control group and the experimental group were -1.65 and 2.81 respectively. The standard deviations from the gain scores for the conceptual knowledge of the value loyalty of students were found to be 1.573 and 1.812 respectively for control group and experimental group. The standard error of mean was 0.309 and 0.355 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the experimental group was more heterogeneous than the control group. The higher mean score of the experimental group in the conceptual knowledge of the value loyalty in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group in the value conceptual knowledge of loyalty of class VIII students.", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The

summary of the Mann-Whitney U-test is given in table 4.18, which is followed by interpretation.

TABLE 4.18: SUMMARY OF MANN-WHITNEY U-TEST FOR VALUE CONCEPTUAL FOR LOYALTY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	365.50	14.50	-5.971	0.000
Experimental Group	26	1012.50			

From table 4.18 it was found that the sum of ranks of the control group and the experimental group students in the conceptual knowledge of the value loyalty were 365.50 and 1012.500 respectively with 26 students in each group. The U-value and z-value were found to be 14.50 and -5.971 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -5.971, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05 Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value loyalty" was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value loyalty. From table 4.17 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.19: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR THE CONCEPTUAL KNOWLEDGE OF THE VALUE DISCIPLINE.

Value Conceptual Knowledge in Discipline	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.38	1.768	0.347
Experimental Group	26	2.12	1.774	0.348

From the table 4.19 it was found that the mean gain score of students in conceptual knowledge of the value discipline of the control group and the experimental group were -0.38 and 2.12 respectively. The standard deviations from the mean gain score for the value conceptual knowledge in discipline of students were found to be 1.768 and 1.774 respectively for control group and experimental group. The standard error of mean was0.347 and 0.348 for the respective groups. Comparing the means it was found that the mean of the experimental group was higher than the control group. From the standard deviations it was also observed that the experimental group and the control group were similar. The higher mean gain score of experimental group in value conceptual knowledge of discipline in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value discipline" Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.20, which is followed by interpretation.

TABLE 4.20: SUMMARY OF MANN-WHITNEY U-TEST FOR CONCEPTUAL OF THE VALUE DISCIPLINE OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	552.50	101.50	-4.392	0.000
Experimental Group	26	825.50			

From table 4.20 it was found that the sum of ranks of the control group and experimental group students in conceptual knowledge of the value discipline were 552.500 and 825.500 respectively with 26 students in each group. The U-value and z-value were found to be 101.50 and -4.392 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -4.392, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of the value discipline" was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in the value discipline. From table 4.19 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.21: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR CONCEPTUAL KNOWLEDGE OF ALL THE TEN VALUES AS A WHOLE.

Value Conceptual Knowledge on all the ten values as a whole	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-9.96	9.049	1.775
Experimental Group	26	21.77	8.420	1.651

From the table 4.21 it was found that the mean gain score of students in the conceptual knowledge of all the values as a whole of the control group and the experimental group were -9.96 and 21.77 respectively. The standard deviations from the mean gain score for the value conceptual knowledge for values as a whole of students were found to be 9.049 and 8.420 respectively for control group and experimental group. The standard error of mean was1.775 and 1.651 for the respective groups. Comparing the means it was found that the mean of the experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous than the experimental group. The higher mean gain score of experimental group in value conceptual knowledge as a whole in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of all the values as a whole", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.22, which is followed by interpretation.

TABLE 4.22: SUMMARY OF MANN-WHITNEY U-TEST FOR CONCEPTUAL KNOWLEDGE ON ALL THE TEN VALUES AS A WHOLE OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	352.50	1.50	-6.164	0.000
Experimental Group	26	1025.50			

From table 4.22 it was found that the sum of ranks of the control group and experimental group students in the conceptual knowledge of all the values as a whole were 352.500 and 1025.500 respectively with 26 students in each group. The U-value and z-value were found to be 1.50 and -6.164 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -6.164, the two tailed probability was found to be 0.000 which was lesser than our decided $\alpha = 0.05$. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the conceptual knowledge of all the values as a whole" was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their conceptual knowledge in all the value as a whole. From table 4.21 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value conceptual knowledge of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

4.2.3.2 *Data Analysis Related To Value Perception.*

With the help of value perception scale prepared by the researcher, the gain scores were calculated. It was calculated by taking the difference of the pre-test scores and post-test scores of value perception of the students for both the experimental group and the control group in the taken values like equality, honesty, co-operation, determination, dignity of labor, loyalty, discipline, teamwork, regularity and simplicity. In this segment, the analysis for the value perception of both the groups is taken separately for each value and all the values as a whole. These analyses are presented with tables and interpretation as follows.

TABLE 4.23: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF CONTROL GROUP AND EXPERIMENTAL GROUP FOR PERCEPTION OF THE VALUE HONESTY

Value Perception in Honesty	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	0.12	2.286	0.448
Experimental Group	26	1.77	3.374	0.662

From the table 4.23 it was found that the mean gain score of students in the perception of the value honesty of the control group and the experimental group were 0.12 and 1.77 respectively. The standard deviation from the gain scores for the perception of the value honesty in students was found to be 2.286 and 3.374 for control group and the experimental group respectively. The standard error of mean was 0.448and 0.662for the respective groups. Comparing the means it was found that the mean of the experimental group was higher than the control group. From the standard deviations it was observed that the experimental group was more heterogeneous than the control group. The higher mean score of experimental group in value perception of

honesty in comparison to the control group may be due to the integrated approach in inculcating values. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of honesty." Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.24, which is followed by interpretation.

TABLE 4.24: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE HONESTY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	566.00	215.0	-2.272	0.023
Experimental Group	26	812.00			

From table 4.24 it was found that the sum of ranks of the control group and the experimental group students in the perception of the value honesty were 566.00 and 812.00 respectively with 26 students in each group. The U-value and z-value were found to be 215.00 and -2.272 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -2.272, the two tailed probability was found to be 0.023 which was lesser than our decided $\alpha = 0.05$. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of honesty," was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their value perception of honesty. From table 4.23 it was also established that the mean gain score

of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach for value inculcation. Hence it can be concluded that value perception of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.25: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF THE VALUE CO-OPERATION.

Value Perception in Co-operation	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-1.15	2.880	0.565
Experimental Group	26	2.08	3.212	0.630

From the table 4.25 it was found that the mean gain score of students in the perception of the value co-operation of the control group and the experimental group were -1.15 and 2.08 respectively. The standard deviations from the mean gain score for the value perception in the value co-operation in students were found to be 2.880 and 3.212 respectively for the control group and experimental group. The standard error of mean was0.565 and 0.630 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the experimental group was more heterogeneous from the control group. The higher mean score of experimental group in value perception of the value co-operation in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between

the gain scores of the students of control and experimental group of class VIII in the Value Perception of the value co-operation", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.26, which is followed by interpretation.

TABLE 4.26: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUECO-OPERATION OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY VALUE(P)

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	504.50	153.50	-3.394	0.001
Experimental Group	26	873.50			

From table 4.26 it was found that the sum of ranks of the control group and the experimental group students in the perception of the value co-operation were504.50 and 873.50 respectively with 26 students in each group. The U-value and z-value were found to be 153.50 and -3.394respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -3.394, the two tailed probability was found to be 0.001 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of Co-operation," was rejected .Therefore it was clear that the control group and the experimental group students differed significantly in terms of their perception in the value co-operation. From table 4.25 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value perception of the

students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.27: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF THE VALUE DETERMINATION

Value Perception in Determination	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-2.04	2.778	0.545
Experimental Group	26	1.38	2.531	0.496

From the table 4.27 it was found that the mean gain score of students in the perception of the value determination of the control group and the experimental group were-2.04 and 1.38 respectively. The standard deviations from the gain scores for the perception in the value determination in students were found to be 2.778 and 2.531 respectively for controls group and experimental group. The standard error of mean was 0.545 and 0.496for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous than the experimental group. The higher mean score of experimental group in value perception of determination in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of determination" Mann-Whitney U-test was used as the sample was

taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.28, which is followed by interpretation.

TABLE 4.28: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE DETERMINATION OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	478.00	127.00	-3.885	0.000
Experimental Group	26	900.00			

From table 4.28 it was found that the sum of ranks of the control group and the experimental group students in the perception of the value determination were 478.00 and 900.00 respectively with 26 students in each group. The U-value and z-value were found to be 127.00 and -3.885 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -3.885, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of determination," was rejected. Therefore it was clear that the control group and the experimental group students differed significantly in terms of their perception in the value determination. From table 4.27 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value perception of the students in the experimental group was stochastically higher than the students in the

control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.29: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF THE VALUE SIMPLICITY

Value Perception in Simplicity	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-3.08	2.965	0.582
Experimental Group	26	2.19	4.364	0.856

From table 4.29 it was found that the mean gain score of students in the perception of the value simplicity of the control group and the experimental group were -3.08 and 2.19 respectively. The standard deviations from the gain scores for the value perception of the value simplicity of students were found to be 2.965and 4.364 respectively for control group and experimental group. The standard error of mean was0.582and 0.856for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the experimental group was more heterogeneous than the control group. The higher mean score of experimental group in value perception of simplicity in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group in the Value Perception of Simplicity of Class VIII students." Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.30, which is followed by interpretation.

TABLE 4.30: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE SIMPLICITY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	452.00			
Experimental Group	26	925.50	101.50	-4.343	0.000

From table 4.30 it was found that the sum of ranks of the control group and the experimental group students in the perception of the value simplicity were452.00 and 925.00 respectively with 26 students in each group. The U-value and z-value were found to be 101.50 and -4.343 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -3.885, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group in the Value Perception of Simplicity of Class VIII students," was rejected .Therefore it was clear that the control group and the experimental group students differed significantly in terms of their perception in the value simplicity. From table 4.29 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value perception of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.31: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEANOF THE CONTROL AND EXPERIMENTAL GROUPS ON PERCEPTION OF THE VALUE EQUALITY.

Value Perception in Equality	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.81	2.191	0.430
Experimental Group	26	1.69	3.095	0.607

From table 4.31 it was found that the mean gain score of students in the perception of the value equality of the control group and the experimental group were-0.81 and 1.69 respectively. The standard deviations from the gain scores for the perception of the value equality of students were found to be 2.191 and 3.095 respectively for the control group and the experimental group. The standard error of mean was0.430 and 0.607 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was also observed that the experimental group was more heterogeneous than the control group. The higher mean score of experimental group in value perception of equality in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of equality" Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.32, which is followed by interpretation.

TABLE 4.32: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE EQUALITY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	521.00			
Experimental Group	26	857.00	170.00	-3.115	0.002

From table 4.32 it was found that the sum of ranks of the control group and the experimental group students in value perception of equality were521.00 and 857.00 respectively with 26 students in each group. The U-value and z-value were found to be 170.00 and -3.115 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for $z <= -3.115$, the two tailed probability was found to be 0.002 which was lesser than our decided $\alpha = 0.05$. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of equality" was rejected .Therefore it was clear that the control group and the experimental group students differed significantly in terms of their perception in the value equality. From table 4.31 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value perception of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.33: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF THE VALUE DIGNITY OF LABOUR.

Value Perception in Dignity of Labour	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-2.51	3.379	0.663
Experimental Group	26	2.46	4.510	0.884

From the table 4.33 it was found that the mean gain score of students in perception of the value dignity of labour of control group and experimental group were -2.51 and 2.46 respectively. The standard deviations from the gain scores for the value perception in dignity of labour of students were found to be 3.379 and 4.510 for the control group and the experimental group respectively. The standard error of mean was0.663and 0.884 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the experimental group was more heterogeneous than the counterpart control group. The higher mean score of experimental group in value perception of Dignity of labour in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group in the Value Perception of Dignity of labour of Class VIII students.", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.34, which is followed by interpretation.

TABLE 4.34: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE DIGNITY OF LABOUR OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	493.00	142.00	-3.597	0.000
Experimental Group	26	885.00			

From table 4.34 it was found that the sum of ranks of the control group and experimental group students in the perception of the value dignity of labour were 493.00 and 885.00 respectively with 26 students in each group. The U-value and z-value were found to be 142.00 and -3.597 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis   of z, for z <= -3.597, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of dignity of labour" was rejected .Therefore it was clear that the control group and the experimental group students differed significantly in terms of their perception in the value dignity of labour. From table 4.33 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value perception of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.35: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEANOF THE CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF THE VALUE REGULARITY

Value Perception in Regularity	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.58	3.349	0.657
Experimental Group	26	2.00	2.713	0.532

From table 4.35 it was found that the mean gain score of students in the perception of the value regularity of the control group and the experimental group were -0.58 and 2.00 respectively. The standard deviations from the mean gain score for the value perception in Regularity of students were found to be 3.349 and 2.713 of the control group and the experimental group respectively. The standard error of mean was 0.657 and 0.532 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was also observed that the control group was more heterogeneous than the experimental group. The higher mean score of experimental group in value perception of regularity in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group in the Value Perception of Regularity of Class VIII students." Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.36, which is followed by interpretation.

TABLE 4.36: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE REGULARITY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	536.00	185.00	-2.816	0.005
Experimental Group	26	842.00			

From table 4.36 it was found that the sum of ranks of the control group and the experimental group students in value perception of the value regularity were 536.00 and 842.00 respectively with 26 students in each group. The U-value and z-value were found to be 185.00 and -2.816 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -2.816,the two tailed probability was found to be 0.005 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of Regularity" was rejected .Therefore it was clear that the control group and the experimental group students differed significantly in terms of their perception in the value regularity. From table 4.35 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value perception of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.37: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF THE VALUE TEAM WORK.

Value Perception in Team Work	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.65	4.698	0.921
Experimental Group	26	1.65	3.346	0.956

From table 4.37 it was found that the mean gain score of students in the perception of the value team work of the control group and the experimental group were -0.65 and 1.65 respectively. The standard deviations from the mean scores for the value perception in team work of students were found to be 4.698 and 3.346 respectively for control group and experimental group. The standard error of mean was0.921 and 0.956 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the control group was more heterogeneous than the experimental group. The higher mean score of experimental group in value perception of team work in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group in the value perception of team work of class VIII students." Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.38, which is followed by interpretation.

TABLE 4.38: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE TEAM WORK OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	587.00			
Experimental Group	26	791.00	236.00	-1.876	0.061

From table 4.38 it was found that the sum of ranks of the control group and the experimental group students in value perception of the value team work were 587.00 and 791.00 respectively with 26 students in each group. The U-value and z-value were found to be 236.00 and -1.876 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -2.816, the two tailed probability was found to be 0.061 which was more than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group in the Value Perception of Team Work for Class VIII students," was accepted .Therefore it was clear that the control group and the experimental group students did not differed significantly in terms of their perception of the value team work. From table 4.39 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that was by chance. Hence it can be concluded that the integrated approach used in the teaching of Mathematics did not have any impact in terms of development of perception of the value team work in the students of the experimental group.

TABLE 4.39: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEANOF THE CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF THE VALUE LOYALTY.

Value Perception in Loyalty	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.54	3.252	0.638
Experimental Group	26	0.19	3.522	0.691

From the table 4.39 it was found that the mean gain score of students in the perception of the value loyalty of the control group and the experimental group were -0.54 and 0.19 respectively. The standard deviations from the mean gain score for the value perception in loyalty of students were found to be 3.252 and 3.522 respectively for control group and experimental group. The standard error of mean was0.638 and 0.691 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the experimental group was more heterogeneous than the control group. The higher mean score of experimental group in value perception of loyalty in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group in the Value Perception of loyalty of Class VIII students." Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.40, which is followed by interpretation.

TABLE 4.40: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE LOYALTY OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	655.50	304.50	-0.617	0.537
Experimental Group	26	722.50			

From table 4.40 it was found that the sum of ranks of control group and experimental group students in the perception of the value loyalty were 655.500 and 722.500 respectively with 26 students in each group. The U-value and z-value were found to be 304.50 and -0.617 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for $z <= -0.617$, the two tailed probability was found to be 0.537 which was more than our decided $\alpha = 0.05$. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group in the value perception of loyalty for class VIII students," was accepted. Therefore it was clear that the control group and the experimental group students did not differed significantly in terms of their perception of the value loyalty. From table 4.39 it was also established that the mean gain score of experimental group were more than the mean gain score of control group and that was by chance. Hence it can be concluded that the integrated approach used in the teaching of Mathematics did not have any impact in terms of development of perception of the value loyalty in the students of the experimental group.

TABLE 4.41: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEANOF THE CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF THE VALUE DISCIPLINE.

Value Perception in Discipline	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-0.88	3.626	0.711
Experimental Group	26	1.31	3.728	0.731

From table 4.41 it was found that the mean gain score of students in the perception of the value discipline of control group and experimental group were -0.88 and 1.31 respectively. The standard deviations from the gain scores for the value perception in discipline of students were found to be 3.626 and 3.728 respectively for control group and experimental group.The standard error of mean was0.711 and 0.731 for the respective groups. Comparing the means it was found that the mean of experimental group was higher than the control group. From the standard deviations it was observed that the experimental group was slightly more heterogeneous than the control group. The higher mean score of the experimental group in the value perception of discipline in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII students in the value perception of discipline" Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.42, which is followed by interpretation.

TABLE 4.42: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF THE VALUE DISCIPLINE OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	552.50	201.50	-2.515	0.012
Experimental Group	26	825.50			

From table 4.42 it was found that the sum of ranks of the control group and the experimental group students in the perception of the value discipline were 552.500 and 825.500 respectively with 26 students in each group. The U-value and z-value were found to be 201.50 and -2.515 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -2.515, the two tailed probability was found to be 0.012 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the value perception of discipline," was rejected .Therefore it was clear that the control group and the experimental group students differed significantly in terms of their perception in the value discipline. From table 4.41 it was also established that the mean gain score of experimental group were more than the mean gain score of control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value perception of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

TABLE 4.43: MEAN, STANDARD DEVIATION, STANDARD ERROR OF MEAN OF THE CONTROL AND EXPERIMENTAL GROUPS FOR PERCEPTION OF ALL THE TEN VALUES AS A WHOLE.

Value Perception in As a whole	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	-11.77	18.388	3.606
Experimental Group	26	16.73	19.122	3.750

From table 4.43 it was found that the mean gain score of students in perception of all the values as a whole of the control group and the experimental group were -11.77 and 16.73 respectively. The standard deviations from the mean gain score for the value perception for all the values as a whole of students were found to be 18.388 and 19.122 respectively for the control group and the experimental group with standard error of means of 3.606 and 3.750 for the respective groups. Comparing the means it was found that the mean of the experimental group was higher than the control group. From the standard deviations it was observed that the experimental group was more heterogeneous than the control group. The higher mean score of experimental group in perception of all the values as a whole in comparison to the control group may be due to the integrated approach in inculcating values through the teaching of Mathematics in this intervention. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the gain scores of the students of control and experimental group in the Value Perception as a whole of Class VIII students.", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.44, which is followed by interpretation.

TABLE 4.44: SUMMARY OF MANN-WHITNEY U-TEST FOR PERCEPTION OF ALL THE TEN VALUES AS A WHOLE OF CONTROL AND EXPERIMENTAL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	443.50	92.50	-4.495	0.000
Experimental Group	26	934.50			

From table 4.44 it was found that the sum of ranks of the control group and the experimental group students in perception of all the values as a whole were 552.500 and 825.500 respectively with 26 students in each group. The U-value and z-value were found to be 201.50 and -4.495 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -4.495, the two tailed probability was found to be 0.000 which was lesser than our decided α = 0.05. Hence the null hypothesis i.e. "There will be no significant difference between the gain scores of the students of control and experimental group in the Value Perception as a whole for Class VIII students," was rejected .Therefore it was clear that the control group and the experimental group students differed significantly in terms of their perception in all the values as a whole. From table 4.43 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that value perception of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

4.2.3.3. *Data Analysis Of Value Practice.*

The data pertaining to different values practiced by the experimental group students have been analyzed qualitatively using content analysis. The researcher noted down their actions or any noticeable behavior related to values in a diary.

The researcher observed the behavior of the students related to values. The observation was done on the value practices exhibited by the students during the school hours and even outside the school hours such as during field trips.

The students were observed by the researcher in the school hours during the pre-assembly, assembly; break time viz. short break and long break i.e. lunch break, dispersal time and during the Mathematics class.

Students participated and conducted assembly effectively, but a few chatted during the assembly. The students had conducted assembly with good team work and co-operation using better co-ordination during this academic session.

The hostel students displayed good disciplined life in the hostel. They woke up early in the morning and did exercise morning prayers and showed the value of dignity of labour. They used to wash their clothes, kept their room clean and kept their uniform and shoes neat and clean. These students also exhibited better team work with each other and other hostel students. In spite of all these values in them the researcher observed that there were two separate groups in the class viz. the hostel students group and the day border students group (local students). These groups were dissolved in the midst of the academic year. In the later stage, while performing group activities, there were no issues of group formation.. There were no problems in having boys and girls together in one group. This could be due to the integrated approach of value inculcation through the teaching of Mathematics.

While teaching a chapter on practical geometry, the researcher tried to inculcate the value of discipline. He found that most of the students who lacked discipline earlier developed good neat and clean work during the experimentation phase. They maintained proper date and headings in their note books by the end of three periods..

While correcting the note books, the researcher found that mostly all the students were able to do their work neatly and with cleanliness. As the time passed, the students were found wishing all the teachers on regular basis. They were rarely found reporting late to the school. Hence value of discipline and regularity was observed in students which can be attributed to the integrated approach.

Again it was a noteworthy behavior exhibited by one student who initially lacked discipline in class but bagged first prize for being best NCC cadet in his camp.

During the break time, snacks were given to students. It was given outside the class room near the assembly stage to the students. There were supporting staff assigned for this duty along with the teachers around. These snacks were given to students in plates. A group of students played football, whereas some girls in a group helped the staff in collecting plates of students after they left it here and there. They were asking the students to finish the food completely without wasting any of it. Here the students exhibited a very good value of dignity of labour and helping nature of students was seen.

During the lunch break the students used to go to the dining hall in their groups and they ate food together. Once the researcher went and sat with them and the students ensured that the researcher got his plate and he got all the food items present on the table, whereas researcher had experienced a different situation when seated with another group of students. A few students of the experimental group never complained about the food provided to them and ate whatever was provided. When enquired about them from other fellow teachers, it was found that they were all in praise of these students. Here the researcher observed the different values of co-operation, simplicity and loyalty towards elders (teachers)in those students.

During teacher's day, the students were actively involved in the celebration. The students collectively made hand-made cards and distributed to all teachers. These cards were really very beautiful cards which showed the contribution of each and every student. Each cards made were unique. This was the effort put by the

experimental group students. In this the value of good team work was seen, simplicity was exemplified in the best way.

During the field trip, the students exhibited the value of good team work in various places, they enjoyed being in their group, they fought with the event organizer and requested teachers that entire class should be allowed to sit in the same bus. Despite fewer seats they all adjusted themselves in one bus and enjoyed the whole journey singing and dancing. In the resort also they managed to be in their group and enjoyed each and every moment. Few girls of this group gave their eatables like biscuits, chips to few poor children whom they met outside a historical place and they did it whole heartedly. It showed the value of equality in them and they considered helping mankind in whatsoever condition they were.

In the regular class of Mathematics it was observed that the good students used to help the weak students in their difficulties. It showed that the students developed a good value of co-operation. The students showed a good value of determination through the practice shown by students in doing sums, few students started with solving ten sums per day and finally ended up solving 50 sums per day and the number of question increased as the days progressed.

The girls of experimental group participated in inter-school Gita Recitation competition during the academic year and they emerged as the winners in that competition and the students who took part had participated for the first time. They won because of the synchronization amongst the four students. Here the good team work exhibited by students fetched them wonderful results.

During the examinations, the researcher once happened to be the supervisor of the class and he observed none of the students indulged in any false means and they wrote their exams honestly which was remarkable.

These were the noteworthy observations made by the researcher. From these observations it can be said that all these value practices exhibited by the students

could have been due to the integrated approach used for value inculcation during the teaching of Mathematics.

4.2.3.4   *Data Analysis Related To Achievement In Mathematics*

To achieve objective 3 of the present study i.e. "To study the effectiveness of the value integrated approach of teaching Mathematics in terms of value conceptual knowledge , value perception and value practice along with the achievement in Mathematics." With the help of question paper prepared by the researcher, the gain scores were calculated. It was calculated by taking the difference of the pre-test scores and post-test scores of achievement test of the students for both the experimental group and the control group. The analysis of achievement in Mathematics is presented with tables and interpretation as follows.

TABLE 4.45:MEAN, STANDARD DEVIATION AND STANDARD ERROR OF STUDENTS OF EXPERIMENTAL AND CONTROL GROUPS ON ACHIEVEMENT IN MATHEMATICS.

Achievement in Mathematics	N	Mean	Standard Deviation	Standard Error of Mean
Control Group	26	29.23	17.512	3.434
Experimental Group	26	47.50	14.451	2.834

From the table 4.45 it was found that the mean achievement of students in Mathematics of the control group and the experimental group were 29.23 and 47.50 respectively. The standard deviations of the achievement of students in Mathematics were found to be 17.512 and 14.451 respectively for the control group and the experimental group. The standard error of mean was 0.82and 1.71 for the respective groups. Comparing the means it was found that the mean of the experimental group was higher than the control group. From the standard deviations, it was also observed

that the control group was more heterogeneous than the experimental group. The higher mean achievement score of the experimental group in Mathematics in comparison to the control group may be due to the integrated approach in inculcating values. To find whether the difference in the mean was significant or by chance and to test the null hypothesis i.e. H_0, "There will be no significant difference between the mean gain score of the students of control and experimental group in the achievement test of Mathematics of class VIII students.", Mann-Whitney U-test was used as the sample was taken by convenience sampling technique. The summary of the Mann-Whitney U-test is given in table 4.46, which is followed by interpretation.

TABLE 4.46: SUMMARY OF MANN-WHITNEY U-TEST FOR ACHIEVEMENT IN MATHEMATICS OF EXPERIMENTAL AND CONTROL GROUP STUDENTS WITH THE NUMBER OF SAMPLE, SUM OF RANKS, U-VALUE, Z-VALUE AND PROBABILITY

Students	N	Sum of Ranks	U-value	z-value	Probability (p)
Control Group	26	491.50			
Experimental Group	26	886.50	140.5	-3.616	0.000

From table 4.46 it was observed that the sum of ranks of the control group and the experimental group students in Mathematics achievement were 491.50 and 886.50 respectively with 26 students in each group. The U-value and z-value were found to be 140.5 and -3.616 respectively. Referring the table for normal probability (Table A of Siegel, 1956) under null hypothesis of z, for z <= -3.616, the two tailed probability was found to be 0.000 which was lesser than our decided $\alpha = 0.05$. Hence the null hypothesis i.e., "There will be no significant difference between the gain scores of the students of control and experimental group of class VIII in the

achievement test of Mathematics" was rejected .Therefore it was clear that the control group and the experimental group students differ significantly in terms of their achievement in Mathematics. From table 4.45 it was also established that the mean gain score of the experimental group were more than the mean gain score of the control group that could be attributed to the integrated approach of value inculcation while teaching Mathematics. Hence it can be concluded that achievement in Mathematics of the students in the experimental group was stochastically higher than the students in the control group which was due to the integrated approach used in the teaching of Mathematics.

4.2.4   *Data Analysis Pertaining To Objective 4 :*

"To study the reaction of students towards the value integrated approach."

To study the reaction of students towards the integrated approach reaction scale was used and data were analyzed.

4.2.4.1   *Data Analysis Of The Reaction Scale*

The data pertaining to the reaction of all the students of experimental group on the integrated approach of teaching Mathematics for value inculcation was collected. Each statement had five alternatives mentioned in the scale. The five alternatives ranged from strongly agree, agree, undecided, disagree and strongly disagree. The scores were as follows: Strongly agree (5), agree (4), undecided (3) and disagree (2) and strongly disagree (1).

The percentage of the responses for each statement and the intensity index were calculated and are given in the table below.

Intensity Index for each statement in the reaction scale was calculated using the formula given below:

Intensity Index= ———————————————

f_1 = frequency of Strongly Agree; f_2 = frequency of Agree;

f_3 = frequency of Undecided; f_4 = frequency of Disagree

f_5 = frequency of Strongly Disagree   N = Number of respondents

TABLE : 4.47 : INTENSITY INDEX OF REACTION SCALE

SA : Strongly Agree ; **A :** Agree ; **UD :** Undecided ; **DA :** Disagree ; **SD :** Strongly Disagree

Sr. No.	Statements	SA %	A %	UD %	DA %	SD %	Intensity Index
1	The value integrated approach for teaching Mathematics was different from other methods.	65	35	0	0	0	4.7
2	The integrated approach made the learning of Mathematics joyful.	38	62	0	0	0	4.4
3	This integrated approach was helpful to increase my knowledge about the different values of life.	38	42	19	0	0	4.2
4	This integrated approach helped me to understand the basics of Mathematics clearly.	38	46	12	4	0	4.2
5	The examples used to understand mathematical concepts integrated with values were effective.	31	46	23	0	0	4.1
6	The value integrated approach gave equal importance to Mathematics and values	31	54	15	0	0	4.2
7	We always felt that it was Mathematics class and not just a value education class	12	38	38	12	0	3.5
8	The integrated approach helped me to increase my perception of values.	31	62	8	0	0	4.3
9	A sense of curiosity was developed to know new ways of learning Mathematics	54	27	19	0	0	4.3
10	This integrated approach in studying Mathematics reduces the burden of Mathematics learning	38	46	8	4	4	4.1
11	The Mathematics syllabus was completed on time.	77	23	0	0	0	4.8
12	The activities conducted to understand the concepts were interesting.	58	35	8	0	0	4.5
13	The classroom management was effective even with the participation of students in various activities.	31	58	12	0	0	4.2
14	The class was very participative in the discussion on values.	46	38	12	4	0	4.3
15	The explanation on values were ideal and enriching.	46	50	4	0	0	4.4
16	The stories used during the interaction was very interesting and value based.	62	23	15	0	0	4.5
17	The games played were very interesting and taught us values.	69	31	0	0	0	4.7
18	I like to practice values taught in my daily life.	12	35	42	12	0	3.5
19	The stories were linked perfectly with mathematical concepts.	38	50	8	4	0	4.2
20	I was very much interested in participating in all activities done in class.	62	27	12	0	0	4.5

Average Intensity Indices of reaction

$$= \underline{\hspace{6cm}}$$

$$= \underline{\hspace{1cm}}$$

=4.28

4.2.4.2   *Data Interpretation of Reaction Scale:*

1) 65% of the student strongly agreed, 35% agreed on statement No.1, that the value integrated approach for teaching Mathematics was different from other methods. The Intensity Index of 4.7 showed that their reaction was favourable.

2) 38% of the student strongly agreed, 62% agreed on statement No.2, that the integrated approach made the learning of Mathematics joyful. The Intensity Index of 4.4 showed that their reaction was favourable.

3) 38% of the student strongly agreed, 42% agreed and 19 % were undecided on statement No.3, that the integrated approach was helpful to increase their personal knowledge about the different values of life. The Intensity Index of 4.2 showed that their reaction was favourable.

4) 38% of the student strongly agreed, 46% agreed, 12 % were undecided and 4 % disagreed on statement No.4, that the integrated approach has helped them to understand the basics of Mathematics clearly. The Intensity Index of 4.2 showed that their reaction was favourable.

5) 31% of the student strongly agreed, 46% agreed and 23 % were undecided on statement No.5 that the examples used to understand mathematical concepts integrated with values were effective. The Intensity Index of 4.1 showed that their reaction was favourable..

6) 31% of the student strongly agreed, 54% agreed and 15 % were undecided on statement No.6, that this value integrated approach gave equal importance to Mathematics and values. The Intensity Index of 4.2 showed that their reaction was favourable.

7) 12% of the student strongly agreed, 38% agreed, 38 % were undecided and 12 % disagreed on statement No.7, that they always felt that it was Mathematics class and not just a value education class. The Intensity Index of 3.5 showed that their reaction was favourable.

8) 31% of the student strongly agreed, 62% agreed and 8 % were undecided on statement No.6, that the integrated approach helped them to increase their perception of values. The Intensity Index of 4.3 showed that their reaction was favourable.

9) 54% of the student strongly agreed, 27% agreed and 19% were undecided on statement No.9, that there was a sense of curiosity developed to know new ways of learning Mathematics. The Intensity Index of 4.3 showed that their reaction was favourable.

10) 38% of the student strongly agreed, 46% agreed, 8% were undecided, 4 % disagreed and 4 % strongly disagreed on statement No.10, that this integrated approach in studying Mathematics reduced the burden of Mathematics learning. The Intensity Index of 4.1 showed that their reaction was favourable.

11) 77% of the student strongly agreed and 23% agreed on statement No.11, that Mathematics syllabus was completed on time. The Intensity Index of 4.8 showed that their reaction was favourable.

12) 58% of the student strongly agreed, 35% agreed and 8 % were undecided on statement No.12 that the activities conducted to understand the concepts were interesting. The Intensity Index of 4.5 showed that their reaction was favourable.

13) 31% of the student strongly agreed, 58% agreed and 12 % were undecided on statement No.13 that the classroom management was effective even with the participation of students in various activities. The Intensity Index of 4.2 showed that their reaction was favourable.

14) 46% of the student strongly agreed, 38% agreed, 12 % were undecided and 4 % disagreed on statement No.14, that the class was very participative in the discussion on values. The Intensity Index of 4.3 showed that their reaction was favourable.

15) 46% of the student strongly agreed, 50% agreed and 4% were undecided on statement No.15, that the explanation on values were ideal and enriching. The Intensity Index of 4.4 showed that their reaction was favourable.

16) 62% of the student strongly agreed, 23% agreed and 15 % were undecided on statement No.16. that the stories used during the interaction were very interesting and value based. The Intensity Index of 4.5 showed that their reaction was favourable.

17) 69% of the student strongly agreed and 31% agreed on statement No.17, that the games played were very interesting and taught them values. The Intensity Index of 4.7 showed that their reaction was favourable.

18) 12% of the student strongly agreed, 35% agreed, 42 % were undecided and 12 % disagreed on statement No.18, that that he/she liked to practice values taught in their daily life. The Intensity Index of 3.5 showed that their reaction was favourable.

19) 38% of the student strongly agreed, 50% agreed, 8 % were undecided and 4 % disagreed on statement No.19, that the stories were linked perfectly with mathematical concepts. The Intensity Index of 4.2 showed that their reaction was favourable.

20) 62% of the student strongly agreed, 27% agreed and 12% were undecided on statement No.20, that he/she was very much interested in participating in all activities done in the class. The Intensity Index of 4.5 showed that their reaction was favourable.

Average Intensity Index Score was 4.26

Average intensity index score was 4.26. Therefore, it can be said that the students agreed with the above statements.