

## **CHAPTER 4:**

### **ANALYSIS AND INTERPRETATION OF DATA**

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"Data analysis is the process of bringing order, structure and meaning to the mass of collected data. It is a messy, ambiguous, time consuming, creative, and fascinating process. It does not proceed in a linear fashion; it is not neat. Data analysis is a search for answers about relationships among categories of data."

- **Marshall and Rossman, 1990**

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#### **4.1 Introduction**

After the collection of data, analysis and interpretation is the foremost and essential step of the research work. So, it is the necessary duty of the investigator to turn her full attention to analysis and interpretation of the accumulated data. In fact, the raw scores are of no value unless they are analyzed and interpreted. Without interpreting the data collected through the tools, the investigator can't be able to achieve her objectives. Therefore, it is necessary to get a meaningful picture out of the raw data collected by the investigator for the present study.

Analysis of data means studying the tabulated material in order to determine inherent facts or meanings (Koul, 1997). The analysis and interpretation of data involve the objective material in the possession of the researcher and his subjective reaction and desires to derive from the data the inherent meanings in their relation to the problem (Best and Khan, 2003).

#### **4.2 Analysis of Data**

The main objective of the present study is to determine the effectiveness of Art-Integrated Learning based Instructional Strategies on Academic Achievement in Science of students at Upper Primary Level. The investigator adopted experimental method for the collection of data. For experimentation, the investigator selected two groups, each consists of 20 pupils, i.e., one Experimental Group and one Control Group. The Experimental Group (EXP) was taught using Art-Integrated Learning based Instructional Strategy and the Control Group (CON) using Traditional Method.

Data were collected by the administration of tool i.e., self-made achievement test in science, which was used as a pre-test for comparing the Experimental Groups and Control Group before introducing the experimental treatment and as post-test to determine the effectiveness of AIL on students' academic achievement. To accomplish this, pre-test-post-test experimental group design was used, and t-test was computed to see the significant difference between the mean scores of experimental and control groups. The data obtained from the control and experimental group students i.e., their achievement scores in the pre and post-tests were classified, tabulated, and analyzed using relevant statistical techniques i.e., t-test and have been presented below in the form of tables, preceded by the null hypotheses, and followed by suitable interpretation and discussions, under the following sections:

4.2.1 Analysis of data collected before the experimental treatment.

4.2.2 Analysis of data collected after the experimental treatment.

#### **4.2.1 Analysis of data collected before the experimental treatment.**

Comparison of the students in the Experimental Groups and Control Group with regard to their initial achievement (pre-test scores) in science (to be taught).

Before the experimental treatment, an achievement test was administered as pre-test to the Experimental Groups and Control Group in order to understand their initial achievement in science (to be taught). The scores obtained were analyzed by computing Mean and S.D and by testing the significance of difference between means using two-tailed 't' test.

**Null Hypothesis 1 (H01):** There is no significant difference in the pre-test mean scores of the achievement of the control and experimental group students in science.

In the order to find out whether there is any significant difference between the pre-test mean scores of achievement of the Control Group and Experimental group students in science, the above null hypothesis was formulated, and the t-test was attempted to test the same. The data and result of analysis are given in the table below.

The Table 4.1 shows the results of test of significance between the pre-test mean scores of students in the Experimental Group and Control Group with respect to their initial achievement in science.

**Table No: 4.1**

**Data and Result of Test of Significance of Difference between the Pre-test Mean Scores of Class 8 students in the Experimental and Control Group with regard to Achievement in Science before the experimental treatment**

Group	No. of Students	Mean	Diff. between Mean		S. D	dF	Calculated t- value	Table t- value	Level of Significance
Experimental (AIL)	20	14.2	0.3	6.13	38	0.15	2.02	0.05	
Control (Traditional)	20	14.5							

From the above table 4.1 it is evident that the pre-test mean scores of experimental and control groups are found to be 14.2 and 14.5 respectively with S.D 6.13. The t-value between the two groups comes out to be 0.15. Thus, the difference between the total mean scores of two groups was not statistically significant at 0.05 level. Hence, the null hypothesis is not rejected, and it is concluded that the control and experimental group students do not differ significantly in their pre-test achievement scores in science. It denotes that academic achievement level of students of experimental group was almost equal to the academic achievement level of students of control group of class VIII in science at Pre-test stage as both the groups possess similar level of attainment measured through self-made achievement test. This indicate that both the groups of Standard VIII students did not have any previous input or knowledge of the topics of study chosen for the treatments.

#### **4.2.2 Analysis of data collected after the experimental treatment.**

After completing the experimental treatment, the same Achievement test was administered as post-test to the Experimental Groups and Control Group and the analysis was done. The effectiveness of Art-Integrated Learning method (AIL) over Traditional method (TM) on learners' science achievement was found out by comparing through testing the post-test mean scores on science achievement of experimental and control groups using paired 't' test. The scores obtained were analyzed by computing Mean and Standard Deviation (S.D) and subjected to test of significance of difference between uncorrelated means using a two-tailed test.

**Null Hypothesis 2 (H02):** There is no significant difference between the post-test mean scores of the achievement of the control and experimental group students in science.

In the order to find out whether there is any significant difference between the mean achievement score of the Experimental Group and Control Group students, as measured by the post-test in science, the above null hypothesis was formulated, and the t-test was attempted to test the same.

The Table 4.2 shows the data and results of test of significance of difference between the post-test mean scores on Achievement in science of students in the Experimental Groups and Control Group.

**Table No: 4.2**

**Data and Result of Test of Significance of Difference between the Post-test Mean Scores of Class 8 students in the Experimental (AIL Approach) and Control Group (Traditional Approach) with regard to Achievement in Science after the experimental treatment**

Group	No. of Students	Mean	Diff. between Mean	S. D	dF	Calculated t-value	Table t-value	Level of Significance
Experimental (AIL)	20	37.4	6.6	4.19	38	4.99	2.02	0.05
Control (Traditional)	20	30.8						

The above table 4.2 reveals that the post-test mean scores of the achievement of the experimental and control group students in science are 37.4 and 30.8, respectively. It is clear from the above table that, the calculated 't' value of 4.99 is greater than the table value of 2.02 at 0.05 level of significance indicating that there is a significant difference between the post-test mean scores of the achievement of the experimental group students, taught by Art-Integrated Learning method and control group students, taught by Traditional Method. Moreover, the higher post-test mean score of the experimental group, taught through the Art-Integrated Learning (AIL) method than that of the control group students, taught through the Traditional Method is an indicator of the greater effectiveness of the Art-Integrated Learning. In other words, Art-Integrated learning method is found to be more effective in raising the achievement of students.

Thus, the above-mentioned hypothesis is rejected. Hence, it can be said that achievement of class VIII students exposed to AIL approach of teaching in science is greater than that of students exposed to traditional method of teaching.

### **4.3 Major findings**

Following major findings were derived from the analysis and interpretations of data.

- The intervention programme on Art-Integrated Learning (AIL) was found to be significantly effective in terms of enhancing Academic Achievement of Class 8 students in science.
- The Science achievement of the students learned Science through Art-Integrated Learning (AIL) was equal or more in comparison to the achievement the students of the control group in science. It showed that AIL had no negative impact on the achievement of students in science at upper primary level.

### **4.4 Conclusion**

The analysis of quantitative data thus reported in the chapter enabled the investigator to understand the effectiveness of AIL method of teaching science to Class 8 students. On the basis of the analysis, the findings that emerged, the conclusions that were drawn are presented in the next chapter along with suitable suggestions and recommendations.