CHAPTER-IV

DATA ANALYSIS AND INTERPRETATION

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4.1. INTRODUCTION

This chapter deals with analysis and interpretation of the data collected. The collected data was subjected to appropriate statistical procedures. Based on these results the hypotheses are accepted or rejected. What is thus done in this chapter is analysing the data, testing the hypothesis and then interpreting the results, that is taking decisions regarding the rejection or acceptance of the hypotheses.

4.2. SCHEME OF ANALYSIS

The numerical data gathered by the investigator from the experimental and the control group was organised, analysed and interpreted using various statistical methods. Statistical data describes group behaviour or group characteristics abstracted from a number of individual observations that are combined to make generalizations possible.

In the present study the data was collected from 40 students of class-VI. Among them 20 students in control group and 20 students in experimental group. Their performances were also compared to find the effectiveness of toy-based pedagogy.

The collected data was analysed by employing statistical methods to arrive at meaningful conclusions. The data collected was subjected to appropriate statistical procedure to test the hypotheses with which the study was initiated.

Descriptive Analysis was done. It provided information about the nature of a particular group. To compare the two groups of children who were taught in two different methods in terms of their achievement, mean and standard deviations were calculated.

Researchers find it important to determine whether the difference between two means is known as t-test. In the present investigation, T-test was used to test the significance of the difference between the means of two samples taught by different methods. The details of the statistical technique employed for the analysis of data, result obtained through the analysis regarding the acceptance and rejection of hypotheses is presented below.

4.2.1. Testing of Hypotheses

The Hypotheses formulated was tested for significant relationship that existed in the mean difference in scores of the children taught by toy-based pedagogy and traditional method.

4.2.2. Statistical Presentation of Data

Objective-1: To compare the mean achievement scores in mathematics of students taught through Toy-based pedagogy and traditional method.

Ho: There is no significant difference between the mean achievement scores in Mathematics of students taught through Toy-based pedagogy and traditional methods.

Table No. 4.1: Mean, S.D, and t-value of experimental and control group student on pre-test and post-test scores on achievement in mathematics taught through Toy-based pedagogy and traditional methods.

Group	N	Mean score		Gain mean	SD		df	t value	p value	Remarks
		Pre	Post		pre	post				
Exp.	20	10.3	21.05	10.75	3.6143	3.17017	38	2.024	2.78E-07	P<0.05
Con.	20	8.1	15.75	7.65	3.43205	4.29044				

Interpretation

The mean gain score of the students in the experimental group is 10.75, which is higher than those of the mean gain score of the students in the control group i.e., 7.65. As the calculated value of 't' i.e., 2.024 is greater than table value at 0.05 level of significance for degree of freedom 38 i.e., 2.024, therefore, 't' value is **significant** and null hypothesis is **rejected.** Thus, it can be stated that there is a **significant difference** in the achievement scores of two groups i.e., taught by traditional method and toy-based pedagogy.

Conclusion

It is evident from the table that experimental group has mean gain scores more than that of control group. Therefore, it can be concluded that Toy Based pedagogy effective than the traditional method.

GRAPH SHOWING DIFFERENCE IN PRE-TEST AND POST-TEST SCORES OF EXPERIMENTAL AND CONTROL GROUP i.e., STUDENTS ACHIEVEMENT IN MATHEMATICS TAUGHT THROUGH TOY-BASED PEDAGOGY AND TRADITIONAL METHOD
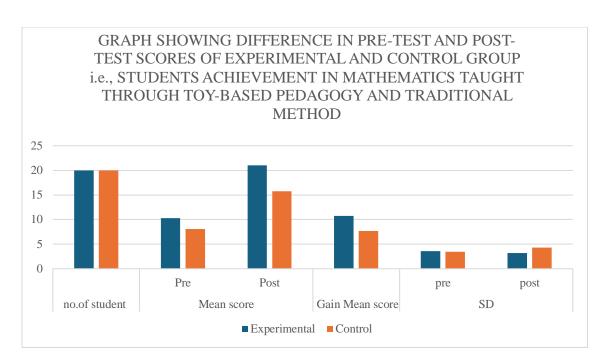
Figure 4.1 Graph showing difference in pre-test and post-test scores of experimental and control group i.e., student's achievement in mathematics taught through toy-based pedagogy and traditional methods.

Objective-2: To compare the mean achievement scores in mathematics of students taught through Toy-based pedagogy and traditional method on the basis of gender.

Ho: There is no significant difference between the mean achievement scores in Mathematics of students taught through Toy-based pedagogy and traditional method on the basis of gender.

Table No.4.2: Mean, S.D, and t-value on pre-test and post-test scores on achievement in mathematics taught through Toy-based pedagogy and traditional method on the basis of gender.

Gender	N	Mean		Gain mean score	SD		df	t value	p value	Remark
		pre test	post test		pre test	post test				
Male	23	9.956522	20.13043	10.17391	3.509445	3.817476	38	2.015368	4.55E-06	P<0.05
Female	17	8.176471	16.05882	7.882353	3.695188	4.602589		2.036933		

Interpretation

The mean gain score of the male students is 10.173, which is higher than those of the mean gain score of the female students 7.882. As the calculated value of 't' i.e., 2.015 is greater than table value at 0.05 level of significance for degree of freedom 38 i.e., 2.015, therefore, 't' value is **significant** and null hypothesis is **rejected.** Thus, it can be stated that there is a **significant difference** in the achievement scores on the basis of gender taught by traditional method and toy-based pedagogy.

Conclusion

It is evident from the table that Male has gain mean scores more than that of Female. Therefore, it is concluded that toy-based pedagogy and traditional method affect achievement score on the basis of gender.
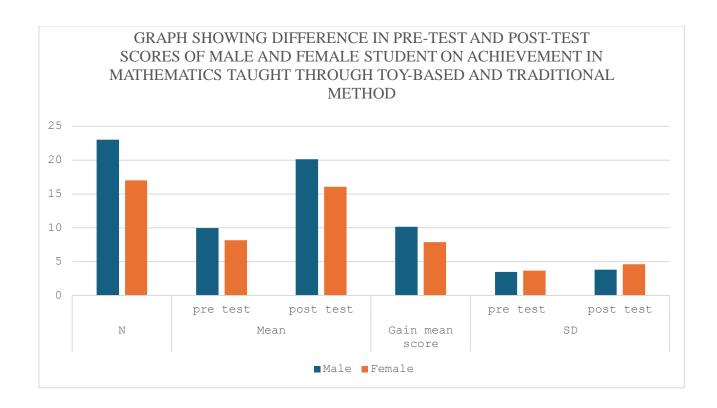

Figure 4.2 Graph showing difference in pre-test and post-test scores of male and female students on achievement in mathematics taught through toy-based pedagogy and traditional methods.

4.3.   DISCUSSION AND CONCLUSION

The present study aimed to examine the effectiveness of toy-based pedagogy in enhancing the achievement of Class 6 students in mathematics as compared to the traditional method. The analysis of data revealed that the students who were taught using toy-based pedagogy showed significantly higher gains in achievement scores than those taught through traditional methods. The study provides strong evidence that toy-based pedagogy is a more effective instructional strategy than traditional methods for teaching mathematics to Class 6 students. The experimental group outperformed the control group in terms of achievement scores, indicating that integrating educational toys and play-based strategies significantly enhances students' understanding and performance in mathematics. Additionally, the findings suggest that while gender-based differences exist, toy-based pedagogy benefits all learners and promotes equity in learning outcomes. The study reinforces the need for educators to adopt innovative and student-centered teaching approaches, particularly in subjects like mathematics that often pose learning challenges. It also highlights the importance of incorporating toy-based activities into the curriculum, training teachers in activity-based learning strategies, and providing institutional support for the implementation of such pedagogies. Overall, the study concludes that toy-based pedagogy not only improves academic achievement but also makes learning enjoyable, inclusive, and meaningful.