Data Analysis
and
Interpretation

Chapter - 4 : Data Analysis And Interpretation

4.1 Introduction

Data analysis is important for research because it makes studying data much easier and more accurate. It helps researchers to interpret data directly so that researchers do not leave anything out that can help them gain insight into it.

Data analysis is a method of reading and analyzing large amounts of data. Research usually involves a huge amount of data, which researchers are able to capture every minute.

Therefore, data analytical knowledge is a major limitation for researchers in the present era, which makes them more efficient and productive

Quantitative analysis involves any type of analysis performed on numbers. From basic analysis techniques to the most advanced, quantitative analysis techniques cover a wide range of strategies. No matter what level of research you need to do, if it is based on numerical data, you will always have effective analytical methods to use.

After analysing the data, it needs to be interpreted. Interpretation of the data is the last step of the process in which the researcher interprets and does a careful and logical examination. Critically viewing the data is important here.

Chapter 4 presents the results of testing research hypotheses using a quantitative method and the answers to interviews with relevant students.

The following hypothesis was proposed in the study:

1. There is no significant difference between learners' cognitive skills of the experimental group and the control group.
2. There is no significant difference between learners' mathematical achievement in the experimental group and the control group.

For the purpose of testing experimental research was conducted. Pre-test and post-test were conducted to check the cognitive skills of the students. And the class test was conducted to see the academic achievement of the control group and experimental group.
A total of 50 students participated in the activity including the experimental group and control group.
The following table shows the valid frequency, percentage, and cumulative percentage of the whole group pre-test and post-test and also of the achievement test.

4.2 Scheme of Analysis

Numerical data collected by the researcher in the experimental and control group was organized, analysed, and interpreted using a variety of tools and mathematical methods. Statistical data describes a group behaviour or group characteristics derived from the number of observations that were combined to make a normal occurrence.
In the present study, data were collected from 50 students of class VII out of which 28 students were in the control group and 22 students were in the experimental group. Their performance was compared to find the effectiveness of using online games in the classroom.
The data collected was analyzed using mathematical methods to arrive at sound conclusions. The data collected were subjected to an appropriate mathematical process to test the hypothesis with which the study was started. Descriptive analysis is performed. Provides information about the nature of a particular group to

compare two groups of children who were taught in two different ways in terms of their success, average and standard deviations are calculated. The researchers found it important to determine the climate that differences between the samples were significant. The test of the significance of the difference between the two methods is known as the T-test. In the present study, the T-test was used to assess the significance of the differences between the two samples methods taught in different ways. Details of the mathematical method used to analyze the data and the result obtained by analysis regarding the acceptance and rejection of the hypothesis are presented below.

4.3 Testing of Hypothesis

A structured hypothesis has examined the important relationships that existed between the two chosen groups. The purpose of the current study is to learn the effectiveness of using online games on student achievement and student cognitive skills.

Frequency Table

Group

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	50	100.0	100.0	100.0

The following shows the demographics of the students participating in the activity and the standard deviation of pre-test, post-test, and achievement test.

Hypothesis – 1

There is no significant difference between learners' cognitive skills of the experimental group and the control group.

The mean and standard deviation of scores of 50 participants across two groups which is the experimental group and the control group is given in the above graph. The mean score of the students in the experimental group in the pre-test is 13.41 and the post-test is 18.95, and that of the control group is 13.11 and 15.63 which is higher than those of the control group. Also the t-value of pre test is -.225 that of post test is -2.508.

It shows the significant difference between the pre-test and post-test scores of the students.

Cognitive Skills

	Group	N	Mean	Std. Deviation	t-value
Pretest	1	27	13.11	4.264	-.225
	2	22	13.41	5.021	
Posttest	1	27	15.63	4.040	-2.508
	2	22	18.95	5.242	

Hypothesis - 2

There is no significant difference between learners' mathematical achievement in the experimental group and the control group.

To test the research hypotheses analysis t-test is applied. t-test is a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which may be related in certain features. The mean score of the students in the experimental group in the pre-test is 13.36 and the post-test is 19.5, and that of the control group is 12.74 and 15.67 which is higher than those of the control group. Also the t-value of pre test is --.517 the post test is -.957.
That means their academic achievement has increased.

Math's achievement

	Group	N	Mean	Std. Deviation	t-value
Achievement pre	1	27	12.74	3.426	-.517
	2	22	13.36	4.981	
Achievement post	1	27	17.67	4.315	-.957
	2	22	19.05	5.769	

4.4 Interpretation

As the calculated value of t is increased in both cognitive tests and the achievement it shows that a positive change has come by using online computer games. Therefore, it can be stated that there is a significant difference in the achievement of two groups i.e., the control group and the experimental group which is the traditional method and through online gaming.

4.5 Discussion and Conclusion

Thus game-based teaching strategy is found to be more effective while teaching students in class VII. The researcher found that the finding of this research show similar to the previous research.
Game-based learning makes learning and teaching fun and focused. Games provide self-explanatory meaning, providing a set of boundaries within a safe environment, exploration, thinking, and experimentation. They provide inspiration for success and reduce the dose of failure.
The addition of game elements integrated into a regular learning environment is a way to increase engagement and thinking capacity. Game-based learning gives students a sense of belonging, a quick response, a sense of accomplishment, and success in fighting and overcoming a challenge.
In game-based learning strategies activities, opportunities are provided to encourage metacognition, analysis, and reflection. Thus, interest and motivation might have contributed to the result presented. In the implementation of game-based learning strategies, so many games are employed.
It is concluded that using online games is very effective for teaching students in the classroom.