

CHAPTER-IV
ANALYSIS AND
INTERPRETATION OF
THE DATA

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4.0.0 INTRODUCTION

This chapter deals with the presentation of data and their analysis to draw the results. It also deals with testing of hypothesis. The objective wise results also form the part of this chapter under different headings.

4.1.0 EFFECTIVENESS OF CONSTRUCTIVIST APPROACH

The first objective of the study was to study the effectiveness of constructivist approach in achievement in mathematics of students' of class VII. The effectiveness of constructivist approach was studied in terms of the achievement of students' in mathematics and reaction of students' towards the approach

4.1.1 EFFECTIVENESS OF CONSTRUCTIVIST APPROACH IN TERMS OF ACHIEVEMENT OF STUDENTS' IN MATHEMATICS

An achievement test consisting of 25 questions were developed by the investigator to measure the achievement of students' in mathematics. The maximum marks of the achievement test were 25. The marks scored by the students' were converted in 100 for the analysis purposes. The test was administered to both the groups after completion of 05 classes. The duration of the test was 30 minutes.

To study the effectiveness of constructivist approach in terms of achievement of students' in mathematics, the scores of experimental group were taken into consideration. The scores were analyzed with the help of mean and standard deviation. The results are presented in the table 4.2.

Findings: Teaching by constructivist approach was effective interms of students' achievement in mathematics.

4.1.2 EFFECTIVENESS OF CONSTRUCTIVIST APPROACH IN TERMS OF REACTION OF THE STUDENT TOWARDS THE STRATEGY

The reaction scale was developed by the investigator was administered to the experimental group only after completion of 05 classes. The data was analyzed with the help of percentages.

There were ten statements in the reaction scale. The statements were related to the constructivist approach. It shows that the constructivist approach was found more effective than the traditional approach.

The results show positive influence of the constructivist approach on the students' learning. Thus, on the basis of the favourable reaction of the majority of the students' it can be said that the constructivist approach was liked by the student's. The results were supported by the Arya (1999); Ojha (2000); Kilavuz (2005); Ceyla (2008); Ozsevgec (2006); Pulat (2009).

4.2.0 EFFECT OF TREATMENT, GENDER AND THEIR INTERACTION ON STUDENTS' ACHIEVEMENT IN MATHEMATICS

The second objective of the investigation was to study the effect of treatment and gender and their interaction on students' achievements in mathematics by taking their pre-test scores as covariate. The scores of pre-test were collected by giving pre-test to both the groups. The achievement in mathematics was measured by an achievement test developed by the investigator. The test was administered to both the group after the completion of the five lessons. The treatment had two levels one with constructivist approach and other with lecture method. Pre-test was taken as covariate. The data was analyzed with the help of 2×2 Factorial Design ANCOVA of unequal cell size. The results are presented in table 4.3 and 4.2. The interpretations related to this are given in caption 4.2.1, 4.2.2 and 4.2.3.

4.2.1 EFFECT OF TREATMENT IN THE ACHIEVEMENT IN MATHEMATICS

Table 4.3 reveals that the F- value of 7.191 for the treatment is significant at 0.05 level with the degree of freedom equal to 1/48. It indicates that the treatment produced a significant differential effect on the achievement in mathematics.

TABLE 4.2: MEAN AND SD FOR ACHIEVEMENT IN MATHEMATICS OF BOYS AND GIRLS

| GROUP | GENDER | MEAN | SD | N |
|---------------------------|---------------|-------------|-----------|----------|
| Experimental Group | Boys | 73.429 | 19.4609 | 14 |
| | Girls | 78.000 | 13.9427 | 11 |
| | Total | 75.440 | 17.0736 | 25 |
| Control Group | Boys | 65.538 | 12.8881 | 13 |
| | Girls | 68.500 | 12.2859 | 10 |
| | Total | 66.826 | 12.4340 | 23 |
| Total | Boys | 69.630 | 16.7978 | 27 |
| | Girls | 78.000 | 13.7391 | 21 |
| | Total | 71.312 | 15.4963 | 48 |

In other words, it can be said that the constructivist approach was effective in enhancing the achievement in mathematics of the students' taught through the constructivist approach. Therefore, the null hypothesis, namely, "there is no significant effect of treatment on the achievement in mathematics of class VII students' when their scores of pre-test were taken as covariate" is rejected. Therefore, it can be said that the achievement in mathematics is dependent upon the method of teaching - learning process. The results were supported by findings of Ginsburg – Block and Fantuzzo, (1998); Gravemeijer, (1993); Ames and Ames, (1989); Kim (2005); Grifpin, (1997); Kroesbergen and Van Luit, (2012); Cekolin, (2001); P. Zubair, M. Gayathri (2012); Surya Vasan, Abdul Gafoor (2014); Kadem S. (2013) where they all revealed that constructivist-based

approach to be promising and its positive effects have been found for student's performance. This may be due fact that the constructivist instruction appears to motivate students' because they find it more pleasant to learn and more challenging to study in the constructivist classroom and it enable all the learners to construct valid knowledge by connecting new ideas on the basis of materials/ activities presented to them (experience) and also enable them to transmit it in different contexts.

Further, table 4.2 shows that the mean achievement scores in mathematics of the students' taught through the constructivist approach (77.920) is higher than those taught through the lecture method (67.652). Therefore, it can be said that the constructivist approach was found to be more effective in terms of achievement of students' in mathematics than the lecture method.

Findings: The treatment produced a significant differential effect on the achievement of students' in mathematics

4.2.2: EFFECT OF GENDER ON THE ACHIEVEMENT IN MATHEMATICS

TABLE 4.3: F-VALUE FOR TREATMENT, GENDER AND THEIR INTERACTION ON THE ACHIEVEMENT IN MATHEMATICS.

| SOURCES OF VARIANCE | SUM OF SQUARES | DF | MEAN SQUARE | F |
|---------------------|----------------|----|-------------|--------|
| TREATMENT | 822.577 | 1 | 822.577 | 7.191* |
| GENDER | 5.897 | 1 | 5.897 | 0.052 |
| TREATMENT X GENDER | 93.376 | 1 | 93.376 | 0.816 |
| ERROR | 4918.83 | 45 | 114.391 | |
| TOTAL | 5840.68 | 48 | | |

*Significant at 0.05 level

Table 4.2 reveals that the F-value of 0.052 for the gender is not significant with the df equal to 1/48. It indicates that the gender did not produce any significant

differential effect on the achievement in mathematics and it is independent of treatment. Therefore, the null hypothesis, namely, “there is no significant effect of gender on the achievement in mathematics of class VII students’ when their scores of pre-test were taken as covariate,” is accepted. The findings were supported by Patrick, Ajaja, Urihievwejire, Eravwoke (2012); Padamnabhan (2005); Zubair, Gayathri (2012); Vasan, Gafoor (2014); Kadem (2013)

Further, table 4.2 also indicates that the mean achievement scores in mathematics of boys of experimental group and control group 73.429 and 65.538 respectively. The mean achievement scores of girls of experimental group and control group 78.00 and 68.500 respectively.

Findings: There was significant differential effect of gender on the achievement of students’ in mathematics.

4.2.3: INTERACTION OF TREATMENT AND GENDER ON ACHIEVEMENT IN MATHEMATICS

Graph -1: Graph showing interaction of the treatment and gender for Pre-test and Post-test scores of achievement in mathematics

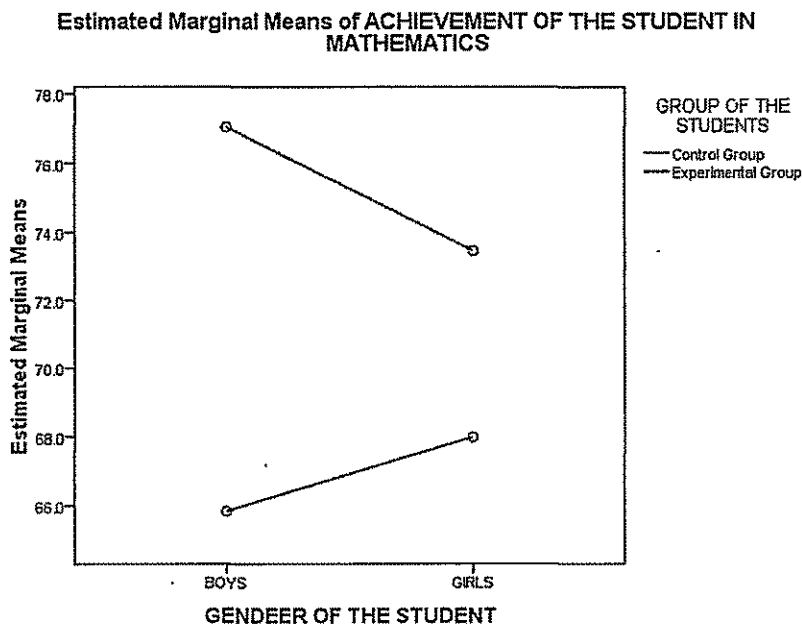


Table 4.3 reveals that the F- value of 0.816 for the interaction between treatment and gender did not produced any significant differential effect on the achievement n mathematics. In other words, “there were no interactional effect of treatment and gender of students’ on achievement in mathematics of class VII students’ when their scores of pre-test were taken as covariate” is accepted. It indicates that the students’ of both the groups were equally benefited on the measure of achievement