EFFECT OF BRAIN BASED LEARNING PROGRAMME ON STUDENT ACADEMIC ACHIEVEMENT AND ANXIETY IN MATHEMATICS

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Abstract

This study sought to investigate the Effect of Brain Based Learning Programme on Mathematics Anxiety and Academic Achievement of IX graders in Fazilka district. A total number of 76 students participated in the study. Random sampling technique was used to select the sample. The study was experimental in nature. Data was collected by administering achievement test and Mathematics Anxiety scale. Data was analyzed quantitatively using the SPSS. Independent t test was conducted to compare mean gain scores of experimental and control groups on the variables of achievement and mathematics anxiety. The study revealed that Brain based learning programme has drawn great impact in increasing academic achievement and reducing anxiety in mathematics of students.

Index Terms- Achievement in Mathematics, Brain Based Learning, Mathematics anxiety.

INTRODUCTION

Mathematics is mainly challenging as it requires a level of accurate, clear thinking and problem-solving abilities which are quite different from other subjects. Learning mathematics is different from learning other subject because math follows an ordered learning pattern. Many students face problems in mathematics. Mathematics anxiety is one of them. It is not an intellectual disability but an emotional response to mathematics. A development phase of mathematics anxiety is avoidance of mathematics by pupil. If a student is avoiding mathematics there is a greater chance that he/she has mathematics anxiety. Poor teaching method, poor learning styles, social pressure and high expectation can increase mathematics anxiety. The skill such as problem solving and reading ability in mathematics are very multifarious and it requires a range of neural path ways to work properly. So for this brain based learning approach can be helpful.

Learning in accordance with how the brain is naturally designed to learn is known as brain based learning. It is focused with completely comprehending how the brain works and applying that knowledge to improve learning capacity. The use of brain-based learning in mathematics instruction may have two significant effects on students and the learning process. First of all, students understand the idea of how learning takes place as they are actively involved in the learning process. Secondly they realize that learning depends on their capacity to channelize their knowledge rather than focusing on grades they get in their exams.

In order to drag out problems in understanding mathematics and to have joyful learning in fear free atmosphere, researcher considered the brain based learning programme in teaching mathematics that may help the students in reducing anxiety and enhancing achievement in mathematics and finally the process of education will become enjoyable and interesting to attain mastery level in mathematics.

RESEARCH QUESTION

1. What is difference between academic achievement in mathematics of IX grade students taught through Brain Based Learning Programme and Traditional Method?
2. What is difference between mathematics anxiety of IX grade students taught through Brain Based Learning Programme and Traditional Method?

HYPOTHESES

1. There will be no significant difference between academic achievement in mathematics of IX grade students taught through Brain Based Learning Program and Traditional Method.
2. There will be no significant difference in mathematics anxiety of IX grade students taught through Brain Based Learning Programme and Traditional Method.
3.

METHODOLOGY

In the present study, pre-test-post-test experimental and control group design was used. There was one experimental group and one control group. There were 38 children in each group. The groups were assessed before and after the treatment. The treatment was given to Experimental group for 30 sessions of 40 minutes each. In the study, investigator has used the experimental method to explore the effect of Brain Based Learning Programme on Mathematics Anxiety and Academic Achievement in Mathematics of IX Graders.

TOOLS USED

- An Achievement Test on Mathematics for 9^{th} Class was developed by researcher himself.
- Lesson Plans based on Brain Based Learning Programme was developed by researcher himself.
- Mathematics Anxiety Rating Scale by Karimi and Venkatesan (2011) was used.

PROCEDURE OF DATA COLLECTION

In the first phase after selecting the sample for experimental and control group, self made Mathematics Achievement Test and Mathematics Anxiety Rating scale was taken. The scores of these tests will act as pre-test.

In the second phase self made Lesson Plans of subject mathematics, based on the principles of Brain Based Learning Programme and Traditional Method was taught to the experimental group and control group respectively for 30-40 sessions.

In the third phase investigator re-administered the achievement test, Mathematics anxiety rating scale to see the effect of Brain Based Learning Programme. This will provide the scores of post-test.

DATA ANALYSIS AND RESULTS

Table 1. Matching of Experimental Group (Group taught through Brain Based Learning Programme) and Control Group (Group taught through Traditional Method) on the basis of Academic Achievement (Pre-Test) in Mathematics (N=76)

Groups	N	Mean	S.D.	SEM	t-value	p-value
Control Group/Traditional Method	38	28.89	5.881	0.954	-0.557	0.580 (N.S.)
Experimental Group/Brain Based Learning Programme	38	29.71	6.861	1.113		

N.S. means non-significant

Table 1.Reveals that mean scores of the experimental group in Mathematics Academic Achievement is 29.71 and standard deviation for the same is 6.861 whereas mean scores of the controlled group in Mathematics Academic Achievement is 28.89 and standard deviation for the same is 5.881. The t-value came out to be -0.557 and p-value came out to be 0.580 which is non-significant at 0.05 level of significance. So there exists no significant difference in both the groups with respect to Academic Achievement (Pre-test) in Mathematics and both the groups were thus matched on the basis of Academic Achievement.

The relative effectiveness of two methods of teaching mathematics i.e. Brain Based Learning Programme and Traditional Method of teaching mathematics in terms of academic achievement in mathematics and mathematics anxiety in relation to learning styles was determined on the basis of gain

scores (the difference in post-test scores and pre-test scores). Appropriate statistical techniques were employed to test various hypotheses pertaining to the study.

H.1 There will be no significant difference between academic achievement in mathematics of IX grade students taught through Brain Based Learning Program and Traditional Method.

To find out the significance of difference in the achievement in mathematics of class IX students taught through Brain Based Learning Program and Traditional method, t-test was employed on gain scores (= Post-test scores - Pre-test scores) of academic achievement in mathematics of class IX students taught through Brain Based Learning Program and Traditional Method.

The summary of t-test employed on the gain scores of academic achievement of class IX students taught through Brain Based Learning Programme and Traditional Method is presented in Table 2.

Table 2. Showing t-test on Gain Scores of Academic Achievement in Mathematics of class IX Students taught through Brain Based Learning Programme and Traditional Method(N=76)

Groups	N	Mean	S.D.	SEM	t-value	p-value
Control Group/Traditional Method	38	7.08	2.487	0.403	-18.645	0.00
Experimental Group/Brain Based Learning Programme	38	20.16	3.538	0.574		

Table 2. Reveals that mean gain scores of the experimental group in Mathematics Academic Achievement is 20.16 and standard deviation for the same is 3.538 whereas mean gain scores of the controlled group in Mathematics Academic Achievement is 7.08 and standard deviation for the same is 2.487. The t-value came out to be -18.645 and p-value came out to be 0.0 which is significant at 0.05 level of significance. So there exists significant difference in both the groups with respect to Academic Achievement in Mathematics. Students taught through Brain Based Learning Programme achieved higher than the students taught through Traditional Method. The above result is also matched with the findings of Awolola and Adejare (2011), Godse (2016), Mahdi, H., Reza, D., & Majid, P. (2016), Mekarina and Ningsih (2017).

H.2 There will be no significant difference in mathematics anxiety of IX grade students taught through Brain Based Learning Programme and Traditional Method.

To find out the significance of difference in the mathematics anxiety of class IX students taught through Brain Based Learning Programme and Traditional method, t-test was employed on gain scores

(= Post-test scores - Pre-test scores) of mathematics anxiety of class IX students taught through Brain Based Learning Programme and Traditional Method.

The summary of t-test employed on the scores of mathematics anxiety of class IX students taught through Brain Based Learning Programme and Traditional Method is presented in Table 3.

Table 3. Showing t-test on Gain Scores of Mathematics Anxiety of class IX Students taught through Brain Based Learning Program and Traditional Method(N=76)

Groups	N	Mean	S.D.	SEM	t-value	p-value
Control Group/Traditional Method	38	2.82	2.513	0.408	-14.416	0.00
Experimental Group/Brain Based Learning Programme	38	12.89	3.501	0.568		

Table 3. Reveals that mean gain scores of the experimental group in Mathematics Anxiety is 12.89 and standard deviation for the same is 3.501 whereas mean gain scores of the controlled group in Mathematics Anxiety is 2.82 and standard deviation for the same is 2.513. The t-value came out to be -14.416 and p-value came out to be 0.0 which is significant at 0.05 level of significance. So there exists significant difference in both the groups with respect to Anxiety in Mathematics. Students taught through Brain Based Learning Programme achieved higher in reducing mathematics anxiety than the students taught through Traditional Method. The above result is also matched with the findings of Mathew (2015), Puteh, M., & Khalin, S.Z. (2016), Shreedevi, T. (2015)

CONCLUSION

The study found that Brain based learning programme has drawn great impact in increasing academic achievement and reducing anxiety in mathematics of students. Thus by using on brain based learning programme teachers can improve their teaching, students can improve their achievement by externalise their knowledge and ultimately society will be the greatest beneficiary.

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