

Effect of Constructivist Approach on Mathematical Anxiety among Class Seventh Students

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Abstract: *The study investigated the effect of the constructivist approach on mathematical anxiety among class seventh students. The students of class seventh were the population of the study. The students of class seventh of Lucknow city of Upper Primary School Alambagh Lucknow were selected school by purposive Sampling for conducting the experiment. There were selected the 20 students from the selected school by purposive - cum - random sampling. There were considered two intact groups, one was an experimental group including 10 students and the other was a control group including 10 students. The posttest - only design was used to conduct the experiment. The experimental group was taught through the teaching module, which was the instructional material of the study based on constructivist approach. In the period of 40 minutes till 6 working days and control group was taught through traditional teaching methods. In the next period of 40 minutes till the same 6 working days. After conducting the experiment, the researcher applied a posttest on both groups. The finding of the study was that the students of the experimental group were found to have low mathematical anxiety than the students of the control group. The students of the experimental group of high Socio - Economic - Status (S. E. S.) were found low mathematical anxiety than the students of the control group of high Socio - Economic - Status (S. E. S.). The students of the experimental group of low Socio - Economic - Status (S. E. S.) were found to have low mathematical anxiety than the students of the control group of low Socio - Economic - Status (S. E. S.). The female students of the experimental group were found to have low mathematical anxiety than the female students of the control group. The male students of the experimental group were found to be low mathematical anxiety than the male students of the control group.*

Keywords: mathematical anxiety, constructivist approach, instructional material, teaching module

1. Introduction

Students face many difficulties in learning through school or we can say in formal education that student can learn the concept of all subjects but according to their opinion to learn mathematics, subject is very difficult task for student formal Mathematics fails to learn through education, so the researcher has tried to teach mathematics easily by using constructivist teaching techniques. Aksu Zeki (2016) examined in his study that there are positive associations of learning error, mathematical self - efficacy, and mathematical anxiety. Students' ability to deal with mistakes in learning and self - efficacy in mathematics was considered a predictor of mathematical anxiety to convey important details of students' mathematical anxiety. Kamil Akbar (2016) in his study found that Mathematical anxiety was lower in Class 10 students and no significant difference was found between the mathematical anxiety of boys and girls. We can say that if the student's learning and mathematical self - efficacy ability is better at handling error then the student's mathematical anxiety will be down. Sometimes it has happened that class 10th students do not have any mathematical concern and there is no significant difference in mathematical concern of male and female students.

1.1 Objectives

- 1) To study the effect of constructivist approach on mathematical anxiety among class seventh students of experimental and control group.
- 2) To study the effect of constructivist approach on mathematical anxiety among class seventh students on the basis of their Socio - Economic Status (S. E. S.).

- 3) To study the effect of constructivist approach on mathematical anxiety among class seventh students on the basis of gender.

1.2 Research Hypothesis

- 1) There is a significant difference in the mathematical anxiety among class seventh students of experimental and control group.
- 2) There is a significant difference in mathematical anxiety of the experimental group and the controlled group of students on the basis of their Socio - Economic Status (S. E. S.).
- 3) There is a significant difference in mathematical anxiety of the experimental group and the controlled group of students on the basis of gender.

1.3 Population

The students of class seventh of U. P. Board were the population of the study.

1.4 Selection of Sample

The upper Primary School Alambagh, Lucknow was selected by purposive sampling and the 20 students of class seventh from the school were the sample of the study selected by random sampling.

1.5 Variables of the Research

Constructivist approach taken as independent variable and mathematical anxiety considered as dependent variable in the study. Teacher and student attributes were the controlled

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variable. Anxiety, interest and motivation were intervening variables of the study.

1.6 Tools of the Study

The researcher used the Mathematical Anxiety Scale (MAS - I) developed by Dr. Ayatollah Karimi to examine students' mathematical anxiety, and the Socio - economic Status Scale (SESS) developed by Dr. Sunil Kumar Upadhyay to determine the students' socio - economic status.

1.7 Research Method

The experimental method was used in the study.

1.8 Research Design

The posttest - only control group design was used in the study.

1.9 Instructional Material

The researcher made the teaching module which is based on 7E constructivist model for the treatment of the experimental group.

1.10 Procedure of the experiment

The researcher taught the students of class VII for 15 days. After completing the experiment, the researcher made a post on the students of the experimental and control group. Using instructional material based on a constructivist approach, the experimental group was first taught research for a duration of 40 minutes, then the control group was taught a selected math unit through a traditional teaching method for a duration of 40 minutes for 15 days.

1.11 Administration of Posttest

After conducting the experiment, the researcher applied the selected test on the experimental and control group of students of the class seventh alternatively.

1.12 Scoring and Analysis

The scoring of the study was accomplished according to the manual of the used tools. The IBM SPSS - 28 version was used to analyze the collected and scored data on the scale.

1.13 Statistical Technique

The researchers used two tailed significance t - test, mean, standard deviation, Kolmogorov - Smirnov test, Shapiro Wilk test and Levene's test mainly.

1.14 Analysis of Data

$1.H_0^I$: There is no significant difference in the mathematical anxiety among class seventh students of experimental and control group.

To test the above null hypothesis, investigator verified the assumptions of t - test normality and homogeneity of variance. Since, the p values (0.387 and 0.815) of Shapiro - Wilk Test for experimental and control group are greater

than 0.05, then the null hypothesis of normal distribution of data in both groups is accepted, which indicates that the data are normal in both groups at 0.05 level of significance. Also, for homogeneity of variance the p value (0.579) of Levene's Test is greater than 0.05, then the null hypothesis of equal variance is accepted, which indicates that the variance between the both groups are equal at 0.05 level of significance.

Table 1.3: t - test between Experimental group and Control group of Mathematical Anxiety

Group	Mean	SD	N	df	t - value	Significance
Experimental group of Mathematical Anxiety	53.9	6.5645	10	18	21.2101	Significant 0.05 level & 0.01 level
Control group of Mathematical Anxiety	122.43	3.1151	10			

$2.H_0^2$: There is no significant difference in mathematical anxiety of the experimental group and the controlled group of students on the basis of their Socio - Economic Status (S. E. S.).

1.14.1 To study the mathematical anxiety of the experimental group of high S. E. S. and the controlled group of high S. E. S.

To test the above null hypothesis, investigator verified the assumptions of t - test normality and homogeneity of variance. Since, the p values (0.401 and 0.826) of Shapiro - Wilk Test for experimental and control group are greater than 0.05, then the null hypothesis of normal distribution of data in both groups is accepted, which indicates that the data are normal in both groups at 0.05 level of significance. Also, for homogeneity of variance the p value (0.486) of Levene's Test is greater than 0.05, then the null hypothesis of equal variance is accepted, which indicates that the variance between the both groups are equal at 0.05 level of significance.

Table 2.1.3: t - test between Experimental group and Control group of Mathematical Anxiety

Group	Mean	SD	N	df	t - value	Significance
High S. E. S. Experimental group of Mathematical Anxiety	67.7	4.2877	10	18	21.7292	Significant 0.05 level & 0.01 level
High S. E. S. Control group of Mathematical Anxiety	115.50	2.3334	10			

1.14.2 To study the mathematical anxiety of the experimental group of low S. E. S. and the controlled group of low S. E. S.

To test the above null hypothesis, investigator verified the assumptions of t - test normality and homogeneity of variance. Since, the p values (0.593 and 0.826) of Shapiro - Wilk Test for experimental and control group are greater than 0.05, then the null hypothesis of normal distribution of

data in both groups is accepted, which indicates that the data are normal in both groups at 0.05 level of significance. Also, for homogeneity of variance the p value (0.443) of Levene's Test is greater than 0.05, then the null hypothesis of equal variance is accepted, which indicates that the variance between the both groups are equal at 0.05 level of significance.

Table 2.2.3: t - test between Low S. E. S. Experimental group and Low S. E. S. Control group of Mathematical Anxiety

Group	Mean	SD	N	df	t - value	Significance
Low S. E. S. Experimental group of Mathematical Anxiety	55.93	7.9773	10	18	21.1422	Significant 0.05 level & 0.01 level
Low S. E. S. Control group of Mathematical Anxiety	134.78	3.2112	10			

3. H_0^3 : There is no significant difference in mathematical anxiety between the experimental group and the controlled group of students on the basis of gender.

1.14.3 To study the mathematical anxiety of the female experimental group and the female controlled group.

To test the above null hypothesis, investigator verified the assumptions of t - test normality and homogeneity of variance. Since, the p values (0.943 and 0.868) of Shapiro - Wilk Test for experimental and control group are greater than 0.05, then the null hypothesis of normal distribution of data in both groups is accepted, which indicates that the data are normal in both groups at 0.05 level of significance. Also, for homogeneity of variance the p value (0.474) of Levene's Test is greater than 0.05, then the null hypothesis of equal variance is accepted, which indicates that the variance between the both groups are equal at 0.05 level of significance.

Table 3.1.3.: t - test between Female Experimental group and Female Control group of Mathematical Anxiety

Group	Mean	SD	N	df	t - value	Significance
Female Experimental group of Mathematical Anxiety	54.28	5.1056	10	18	23.4469	Significant 0.05 level & 0.01 level
Female Control group of Mathematical Anxiety	143.45	6.3396	10			

1.18 To study the mathematical anxiety of the male experimental group and the male - control group.

To test the above null hypothesis, investigator verified the assumptions of t - test normality and homogeneity of variance. Since, the p values (0.474 and 0.820) of Shapiro - Wilk Test for experimental and control group are greater than 0.05, then the null hypothesis of normal distribution of data in both groups is accepted, which indicates that the data are normal in both groups at 0.05 level of significance. Also, for homogeneity of variance the p value (0.573) of Levene's

Test is greater than 0.05, then the null hypothesis of equal variance is accepted, which indicates that the variance between the both groups are equal at 0.05 level of significance.

Table 3.2.3: t - test between Male Experimental group and Male Control group of Mathematical Anxiety

Group	Mean	SD	N	df	t - value	Significance
Male Experimental group of Mathematical Anxiety	58.1	6.9891	10	18	9.1816	Significant 0.05 level & 0.01 level
Male Control group of Mathematical Anxiety	104.99	8.3316	10			

2. Findings

- 1) The mathematical anxiety of the experimental group was found to be significantly low than the mathematical anxiety of the control group of students.
- 2) The mathematical anxiety of the experimental group students of high Socio - Economic Status (S. E. S.) and of low Socio - Economic Status (S. E. S.) was found to be significantly low than the mathematical anxiety of the control group of high Socio - Economic Status (S. E. S.) Students and of low Socio - Economic Status (S. E. S.) students.
- 3) The mathematical anxiety of the female students and male students of experimental group was found to be significantly low than the mathematical anxiety of the female students and male students of control group.

3. Interpretation and Discussion

- The mathematical Society of the control group significantly higher than the mathematical and Society of the experimental group since, the experimental group of a student where taught through constructivist approach by using and instructional material and using different activities while the Student of the control group were taught through the traditional teaching method and they have not given any treatment therefore due to the effect of constructivist approach the mathematical anxiety of the experimental group of the students was found to be low.
- Mathematical anxiety of high S. E. S. students of the control group and Mathematical anxiety of low S. E. S. students of the control group was significantly higher than the mathematical anxiety of the experimental group students of high S. E. S and the mathematical anxiety of the experimental group of students because low S. E. S respectively. Students of experimental group had taught through the constructivist approach in which they interact with each other and they exchange their ideas with each other due to do this they have the low mathematical anxiety. Whereas the control group was taught through the traditional teaching method in the class they were unable to exchange their ideas with each other. They have not performed any activity in the class so they have high mathematical anxiety.

- The female students of the experimental group and the male students of the experimental group have significantly low mathematical anxiety than the female students of the control group and the male students of the control group respectively. The reason for this is that the students of the experimental group were taught through the constructivist approach, in this the students performed various activities and interacted with each other through this they exchanged their ideas with each other on the taught mathematical concept so their mathematical anxiety found to be low. The students of the control group were taught through the traditional teaching method, so they have high mathematical anxiety because they had not exchanged their ideas and had not interacted with each other.

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4. Conclusion

The students who were taught through Instructional material based on the constructivist approach have low mathematical anxiety and the student who was taught through the traditional teaching method have high mathematical anxiety. Therefore, the constructivist approach was found very effective in the mathematical learning of the class seventh students.

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