

**Study the Efficacy of the Constructivist Approach on the Performance of Learners in Mathematics through Regular Assessment at Primary Level**

**Ruchi Sharma**

*IASE, Research Scholar*

**Dr. (Ms) Sarwat Ali**

*Associate Professor, Jamia Millia Islamia, New Delhi (New Delhi) India*

**Abstract**

In this paper **it is** tried to make mathematics learning an active process through implementing constructivist approach and regular assessment. The teaching learning instructions are developed on 5E instructional model of education that is based on constructivism. A pre class test was conducted before intervention. Then strategies were implemented in the class of 30 students of grade 5. Their performance was regularly assessed using worksheets. The total scores of worksheets were compared with the scores of pre class test using ‘t’ test which was found significant.

**Key Words:** Efficacy, Constructivist Approach, Performance of Learners, Primary Level

**Introduction**

Constructivist approach is a most appreciated and recommended approach in present scenario. It visualise learners as active agent in knowledge acquisition by discovering and transforming information (Bada, 2015). Classroom teaching become more effective when teaching strategies focuses on knowledge construction rather than knowledge transformation (Kaur, J. & Raman 2017).

On the other hand Mathematics has the ability to confuse, frustrate and frighten the learners (Kaur, J. & Raman 2017). Position paper on Teaching of Mathematics, state that “if any subject taught in school plays a significant role in alienating children and causing them to stop attending school perhaps mathematics which aspires so much dread, must take a big part of the blame”.So

if the pedagogy of mathematics is intertwined with constructivist approach than it can reduce the frightening and frustrating ability and make learning more meaningful (NCF 2005). This is further supported by researches Anthony G and Walshaw M (2005), Kushwaha M and Srivastava S (2007), Kaur J and Raman (2016). Bhutto, S. and Chhappar, I.U. (2013), Chakraborty S (2008).

Making only pedagogy effective won't help in making mathematics teaching effective. The assessment and term end evaluation practice also created a lot of stress, anxiety and humiliation among children needs a paradigm shift (Position Paper 1.2). To overcome this situation both pedagogy and assessment need to be worked out simultaneously. For continuous and comprehensive evaluation emerges. By evaluating children continuously and

comprehensively we can direct the learner in proper direction of overall development. With the implementation of RTE 2009 Act assessment through CCE become compulsory and effective in Constructivism on the one hand shift the focus from memory based learning to higher level competencies, the need the school system. The objective of introducing CCE was to lay emphasis on thought process and to use evaluation for improvement of students' achievement and teaching-learning strategies on the basis of regular diagnosis (CCE, 2010). Thus the objectives of CCE can be easily achieved by implementing constructivist approach as both focuses on the development of the learner.

### **Objectives of the Study**

1. To develop teaching learning strategies in constructivist perspective for selected unit of mathematics.
2. To assess the efficacy of the constructivist approach on students' performance by comparing scores of worksheets with scores of pre class test.
3. To evaluate students on regular basis through worksheets.

### **Hypotheses of the study**

**H<sub>0</sub>: There is no significant difference between the scores of Pre Class Test and scores of worksheets of Multiplication and Division**

### **Design of the Study**

This study was conducted to assess the efficacy of constructivist approach on the performance of learners in Mathematics at primary level. It was an intervention study.

As the sample was selected non-randomly so it is a quasi experimental design.

### **Sample of the Study**

Non random sampling was used to select the sample. The sample of the study was grade 5 students of a government school which consist of 36 students. From 36 students only 30 were considered for the study on the bases of regularity.

### **Research Tool**

The tools used in the study are:

- teaching learning strategies
- class test for pre assessment
- Worksheets

### **Statistical Techniques**

The statistical techniques used in the study for analyzing the data are 't' test and frequency polygon.

't' test is used to compare the performance of students before and during intervention. Frequency polygon is used to assess the performance of the class worksheet wise.

### **Analysis and Interpretation**

The teaching learning strategies were developed in constructivist paradigm using 5E instructional model with assessment worksheets. It was implemented in the classroom and the data was collected for the study and was analyzed to assess the effectiveness of teaching learning strategies. Students were assessed on regular bases. To analyze collected from worksheets 't' test between scores of class test and scores of worksheets of Multiplication and Division were compared.

**T-test between Scores of Pre Class Test and scores of worksheets of Multiplication and Division**

The percentage scores of worksheets of unit “Multiplication & division” were obtained and compared with students scores on class test conducted before the intervention, in order to assess the efficacy of the evolved teaching learning strategies based on 5E instructional model plans viz -a viz related

concept: Multiplication & division. The null hypothesis is stated below.

$H_0$  There is no significant difference between the scores of students obtained in worksheets of intervention ( Unit - Multiplication and Division) and pre class test.

The t value obtained is illustrated in table 1.1

**Table 1.1- t test between pre Class Test and scores of worksheets of Multiplication and Division**

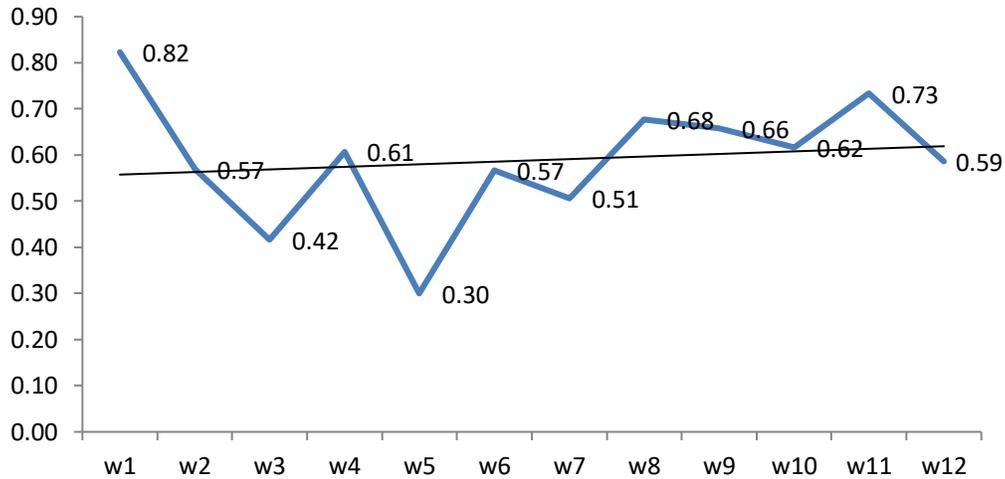
| <b>t test: Class test and Unit III Multiplication and Division</b> |                              |                        |
|--|------------------------------|------------------------|
|  | <b>Pre Class Test scores</b> | <b>Unit III scores</b> |
| <b>Mean</b>  | 51.89                        | 55.45                  |
| <b>Variance</b>  | 278.68                       | 218.55                 |
| <b>Observations</b>  | 30.00                        | 30                     |
| <b>Pearson Correlation</b>   | 0.78                         |                        |
| <b>Hypothesized Mean Difference</b>                                | 0.00                         |                        |
| <b>Df</b>  | 29.00                        |                        |
| <b>t Stat</b>  | -1.86                        |                        |
| <b>P(T&lt;=t) one-tail</b>   | 0.04                         |                        |
| <b>t Critical one-tail</b>   | 1.70                         |                        |
| <b>P(T&lt;=t) two-tail</b>   | 0.07                         |                        |
| <b>t Critical two-tail</b>   | 2.05                         |                        |

\*Significant at .01 level

The above table reflects that the mean score of pre test is 51.89 and post test is 58.38 whereas variance has skewed from 278.68 to 218.55. There was a gain of 6.49% in mean scores. The’ ratio for the difference in mean is 4.39 which are significant at .01 levels. The null hypothesis that, “there will be no significant difference between the performance of students in pre Class Test

and scores of worksheets of Multiplication and Division.” is rejected. It can thus be inferred that constructivist approach was effective in teaching learning process in Multiplication and division.

On analyzing the graph below which reflect the continuum of class performance reveals that



### Findings of the study

Following were the findings of the study.

- 1) Significant difference was found between the mean scores of tests pre and post intervention, which suggests that teaching learning strategies were effective for learning mathematical concepts at elementary level.
- 2) The assessment through worksheet shows that with respect to change of sub-concept the performance of students change. Still the overall performance of the students was better.

### Suggestions for further study

- The study can be conducted with higher classes.
- The study can be conducted in large groups and in different schools.
- For regular assessment only one tool was used. Other tools like observation, checklist, anecdotes etc can be used.