

**RELATIONSHIP BETWEEN MATHEMATICAL ACHIEVEMENT  
AND MATHEMATICAL INTEREST OF STUDENTS WITH  
MATHEMATICAL DIFFICULTIES DUE TO MASTERY  
LEARNING APPROACH**

**Ms. Pankaj Bala**

Research Scholar

Department of Community Education and Disability Studies,  
Panjab University, Chandigarh

**ABSTRACT**

In the present study, an innovative and activity-oriented Mastery Learning Approach based teaching method was used. The sample of sixty fifth class students with Mathematical difficulties was selected randomly. The One group Pretest – Posttest Experiment design was used in the study. The tools used for data collection were Mathematical Achievement test and Mathematical Interest Inventory. The statistical techniques used for the analysis of data were Mean, correlation and graphical representation of correlation. The results revealed that there was significant positive correlation between Mathematical Achievement and Mathematical Interest. Further after Mastery Learning Approach based Interventions the degree of significant positive correlation was increased.

**KEYWORDS:** Mathematical Achievement (MA), Mathematical Interest (MI), Mathematical Difficulties (MD), Mastery Learning Approach (MLA)

**INTRODUCTION**

Mathematics nurtures in us certain qualities as the power of reasoning, abstract thinking, creativity, and critical thinking. It also plays an important role in understanding other subjects like science, social studies, and even music and art. Learning Mathematics can be made easier and enjoyable; if our teaching methods include mathematical activities and games. Therefore for an innovative and activity oriented Mastery Learning Approach based teaching method was used in the present study.

## OPERATIONAL DEFINITIONS

- **Mastery Learning Approach (MLA)** is based on the idea that all students can learn and attain mastery if, sufficient time, adequate instructions and timely help is provided to them according to their needs, interest and ability. For the present study, Mastery Learning Approach, which was acted as independent variable, means use of Mastery Learning based teaching modules containing (Remedial/Enrichment Activities and Formative tests) for providing interventions to the students.
- **Mathematical Achievement**, Achievement may be defined as “a measure of knowledge or understanding of skills in a specified subject or group of subjects” Charles (2001). In this study Mathematical Achievement, which was acted as dependent variable means gain of knowledge in the content “Area and its Boundary” which was measured by Mathematical Achievement Test.
- **Mathematical Interest** which was acted as dependent variable in this study means the liking of the students to learn mathematics, which is indicated by solving sums, practicing and getting involved in mathematics activity as a leisure-time pursuit. It was measured by Mathematical Interest Inventory.
- **Mathematical difficulties**, for the present study fifth class students having problem in doing calculations, ordering the steps of math problem, feeling tiredness while doing mathematics sums and difficulty in understanding Mathematical problems were considered as the students with Mathematical difficulties.

## REVIEW OF LITERATURE

Ely, L.L. (2019) conducted a study with title Mastery Learning of Chemistry competencies through the Spiral Progression Approach in Curriculum. Students from public, science and city schools had significantly higher mastery learning and overall performance. Correlation results indicate school classification, school type and school location as factors affecting mastery learning.

Cheta, W. & Chidinma, O.A. (2018) both the investigators carried out a study that aimed to compare the impact of two learning approaches, mastery learning approach

and constructivist-based learning approach on senior secondary school student's academic achievement in biology. The results of the study revealed that students who were taught by Mastery learning approach had higher academic achievement scores than those taught using constructivist-based learning approach.

Filgona, J., Filgona, J. & Sababa, L. K. (2017) The study was focused to investigate the effects of Mastery Learning Strategy and Learning Retention on Achievement in Physical Geography among senior secondary school students in Ganye Educational Zone, Nigeria. After analysis of results it was revealed that Mastery Learning Strategy proved better to improve student's learning retention and achievement in Physical Geography than the Conventional Method of teaching.

Zamfara, S. (2017) investigated a study titled Effects of Mastery Learning and Problem Solving Methods of Teaching on Student's Academic Performance in Mathematics in, Zamfara State. The results showed that mastery learning and problem solving methods were more efficient than conventional teaching method.

Hussain, I. & Suleman, Q. (2016) researchers investigated a study that was focused to find the effect of Bloom's Mastery Learning Approach on Students' Academic Achievement in English at Secondary Level. Results concluded that Bloom's mastery learning approach had a positive effect on students' academic achievement and retention. The Experimental group also performed better as compared to the control group on retention test.

### **RATIONALE OF THE STUDY**

Most of the students have fear for Mathematics. Students with Mathematical Difficulties also have this fear with higher intensity. The study provides remedial actions in the form of activity oriented Mastery Learning Approach based modules, to overcome this fear for Mathematics. Mastery Learning Approach also develops the positive attitude and interest towards mathematics in students, by providing them platform, to learn with their own pace and abilities. Moreover study evaluates the relationship between Mathematical Achievement and Mathematical Interest, which shows the ways to enhance both Mathematical Achievement and Mathematical Interest

at the same time. Study is also helpful to understand the concept of Mathematical Difficulties and Mathematical Interest.

### **OBJECTIVES**

- a) To examine the Mathematical Achievement in of fifth class students with mathematical difficulties.
- b) To examine the Mathematical Interest of fifth class students with mathematical difficulties.
- c) To study the relationship between Pre Mathematical Achievement and Mathematical Interest scores of fifth class students with mathematical difficulties.
- d) To study the relationship between Post Mathematical Achievement and Mathematical Interest scores of fifth class students with mathematical difficulties.

### **HYPOTHESIS**

1. There will be no relationship between Pre Mathematical Achievement and Mathematical Interest scores of fifth class students with mathematical difficulties.
2. There will be no relationship between Pre Mathematical Achievement and Mathematical Interest scores of fifth class students with mathematical difficulties.

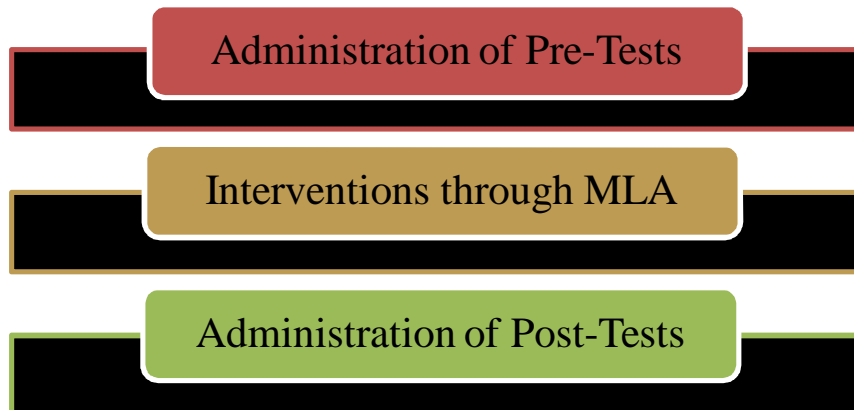
### **DELIMITATIONS**

1. The study was delimited to five Government model schools of Chandigarh.
2. The study was delimited to 60 fifth class students with Mathematical Difficulties.
3. The study was delimited to four variables i.e. Mastery Learning Approach, Mathematical Achievement, Mathematical Interest, and Mathematical Difficulties.

## METHODOLOGY

In the present study one group pretest-posttest design was used, to find the relationship between Mathematical Achievement and Mathematical Interest of students with Mathematical Difficulties due to Mastery Learning Approach Interventions.

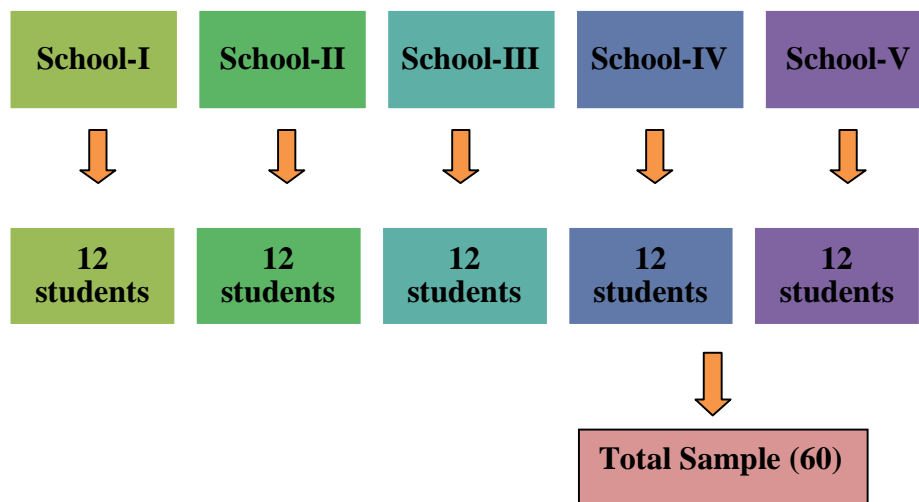
## DESIGN OF THE STUDY



## SAMPLE

The sample of the study was selected from five purposively selected Govt. Model schools of Chandigarh. Then 12 students of fifth class with mathematical difficulties were selected randomly from each School. Therefore, in this way total sample of 60 fifth class students with Mathematical Difficulties was selected. The students with Mathematical Difficulties were selected on the basis of previous two years mathematical academic record and teacher referral form.

## DIVISION OF SAMPLE



## TOOLS

- Mathematical Achievement Test (Post-MAT) developed by researcher.
- Mathematical Interest Inventory by L.N. Dubby adapted by researcher.
- Teacher Referral Form developed by researcher.
- Teaching Modules based on Mastery Learning Approach developed by researcher.

## DATA COLLECTION

The researcher personally visited the five Government Model schools of Chandigarh to collect the data from sixty fifth class students with Mathematical Difficulties. First of all rapport was build with the students and the teachers. The information collected from the teachers as previous two year mathematical academic record of the students. Further teacher referral forms were distributed to teachers for the selection of students with Mathematical Difficulties. Then pre-tests were administered on the students. Further interventions were provided by using MLA based modules. At last, post-tests were administered.

## STATISTICAL TECHNIQUES

Descriptive statistics such as mean, median, standard deviation was used to ascertain the nature of the scores. Graphical representation was done wherever necessary. Correlation was used to find the relationship between Mathematical Achievement and Mathematical Interest of students with Mathematical Difficulties.

## RESULTS AND DISCUSSIONS

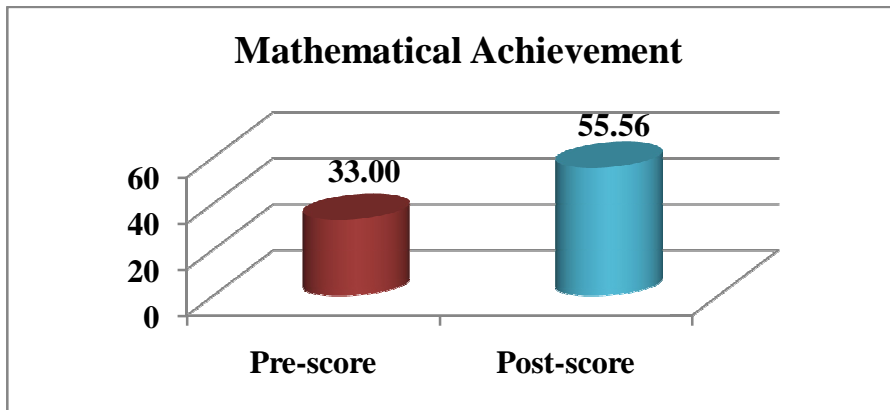
**Objective (a) To examine the Mathematical Achievement in of fifth class students with mathematical difficulties.**

**Table-I Mathematical Achievement scores**

Variable	Scores	Mean	Median	S.D.
Mathematical Achievement	Pre-test	33.00	34.00	4.96
	Post-test	55.56	53.50	10.12

Table-I shows the Pre (33.00) and Post (55.56) mean scores of Mathematical Achievement. Further table-I shows the values of Median and standard deviation for both pre and post test scores of Mathematical Achievement. As the Median values were close to means, which shows that data was normally distributed.

**Figure-I Mean scores of Mathematical Achievement**



The difference in pre (33.00) and post (55.56) Mathematical Achievement scores is clearly visible with the help Figure-I.

**Objective (b) To examine the Mathematical Interest in of fifth class students with mathematical difficulties.**

**Table-II Mathematical Interest scores**

Variable	Scores	Mean	Median	S.D.
Mathematical Interest	Pre-test	11.81	12.00	2.52
	Post-test	23.65	23.00	3.63

**Figure-II Mean scores of Mathematical Interest**

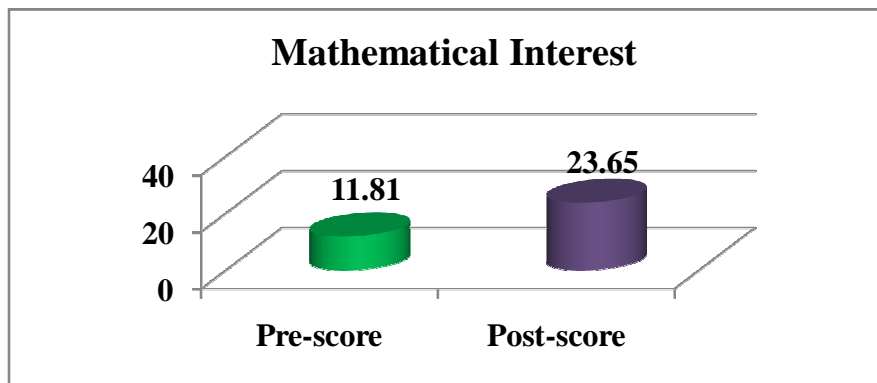


Table-II represents the Pre (11.80) and Post (23.65) mean scores of Mathematical Interest. Further table-I shows the values of Median and standard deviation for both pre and post test scores of Mathematical Interest. As the Median values were close to means, which shows that data was normally distributed.

In Figure-II the difference between pre (11.80) and post (23.65) Mathematical Interest scores is distinctly noticeable.

**Objective (c) To study the relationship between Pre Mathematical Achievement and Mathematical Interest scores of fifth class students with mathematical difficulties.**

**Table-III Relationship between Mathematical Achievement and Mathematical Interest before MLA Interventions**

Scores	Variable	Mean	'r' value	'p'-value
Pre-scores	Achievement in Mathematics	33.00	0.464	0.000**
	Mathematical Interest	11.81		

There was positive and significant relationship at 0.01 level ( $p < 0.01$ ) before MLA



**Figure-III Relationship between Achievement and Interest before Interventions**

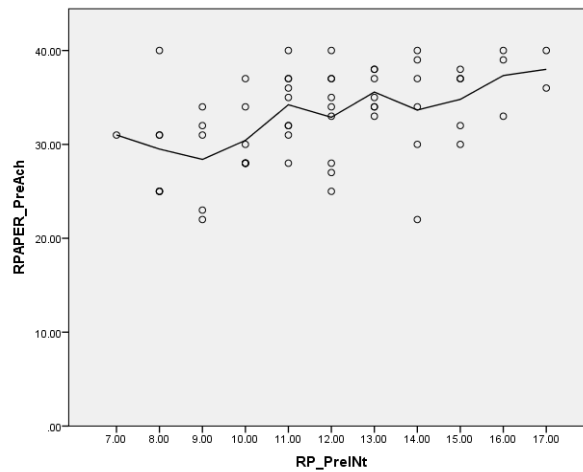


Table-III exhibits the relationship between pre-test scores of Mathematical Achievement and Mathematical Interest before using Mastery Learning Approach interventions and the correlation is shown in Figure-III.

The correlation between Mathematical Achievement and Mathematical Interest before Mastery Learning Approach interventions was calculated as 0.464. The respective p-value was 0.000 which showed the positive and significant correlation between the variables at 0.01 level of significance, which means Achievement in Mathematics and Mathematical Interest scores, has a positive correlation.

Hence,  $H_{01}$  “There will be no relationship between Pre Mathematical Achievement and Mathematical Interest scores of fifth class students with mathematical difficulties” stands rejected.

**Objective (d) To study the relationship between Post Mathematical Achievement and Mathematical Interest scores of fifth class students with mathematical difficulties.**

**Table-IV Relationship between Mathematical Achievement and Mathematical Interest after MLA Interventions**

Scores	Variable	Mean	'r' value	'p'-value
Post-scores	Achievement in Mathematics	55.56	0.354	0.006**
	Mathematical Interest	23.65		

There was positive and significant relationship at 0.01 level ( $p < 0.01$ ) after MLA

**Figure-IV Relationship between Achievement and Interest after Interventions**

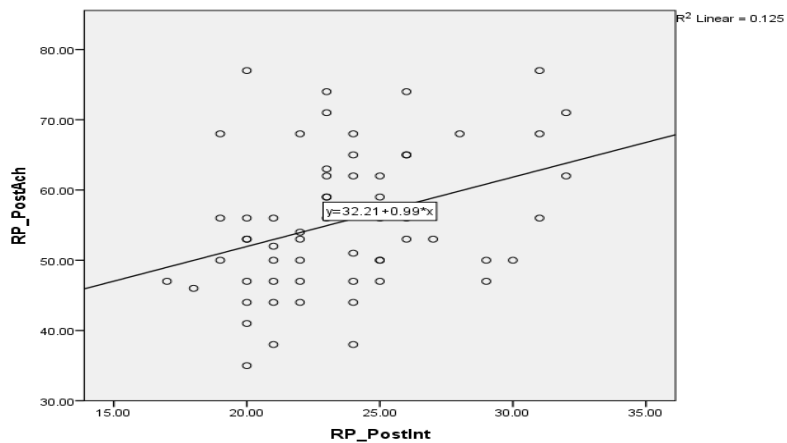


Table-IV exhibits the relationship between pre-test scores of Mathematical Achievement and Mathematical Interest before using Mastery Learning Approach interventions and the correlation is shown in Figure-IV.

The correlation between Mathematical Achievement and Mathematical Interest before Mastery Learning Approach interventions was calculated as 0.354. The respective p-value was 0.006 which showed the positive and significant correlation between the variables at 0.05 level of significance, which means Achievement in Mathematics and Mathematical Interest scores has a positive correlation.

Hence,  $H_{02}$  “There will be no relationship between Post Mathematical Achievement and Mathematical Interest scores of fifth class students with mathematical difficulties” stands rejected. This disclosed that Achievement in Mathematics and Mathematical

Interest positively affects each other. This result might be due to MLA interventions which makes learning realistic and interesting. Further this helps in arousing the Mathematical interest among students and when students learn with interest they score better.

### **FINDINGS OF THE STUDY**

1. The Mathematical Achievement of students with Mathematical difficulties enhanced after Mastery Learning Interventions.
2. More Interest in Mathematics aroused in students after getting Mastery Learning Interventions.
3. Mathematical Achievement and Mathematical Interest were positively correlated.

### **EDUCATIONAL IMPLICATIONS**

1. Mastery Learning Approach type activity oriented approaches could be promoted specially for subjects like Mathematics. Because it provides equal opportunities to all the learners to learn with their own pace and ability.
2. By using innovative and student centered teaching methods we can enhance both achievement and interest at the same time.
3. New education policy (2020) emphasizes on Holistic, Integrated, Enjoyable, and Engaging Learning. Approaches MLA will definitely be helpful to achieve this goal.

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