

**A STUDY OF MATHEMATICS ACHIEVEMENT  
IN RELATION TO ABILITY IN FUNDAMENTAL  
OPERATIONS**

**A DISSERTATION**

*Submitted in Partial Fulfillment of the  
Requirement for the Degree of  
MASTER OF EDUCATION  
(Elementary Education)*

**2007-2008**

**TO**

**BARKATULLAH UNIVERSITY, BHOPAL**

— Submitted By :

**Jyoti Varshney**

**M.Ed. (Ele. Edu.), RIE, Bhopal.**

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी  
**NCERT**

**REGIONAL INSTITUTE OF EDUCATION  
(NCERT)**

**Shyamla Hills, Bhopal (M.P.)**

**A STUDY OF MATHEMATICS ACHIEVEMENT  
IN RELATION TO ABILITY IN FUNDAMENTAL  
OPERATIONS**

D-270

**A DISSERTATION**  
*Submitted in Partial Fulfillment of the  
Requirement for the Degree of*  
**MASTER OF EDUCATION**  
*(Elementary Education)*

**2007-2008**

**TO**

**BARKATULLAH UNIVERSITY, BHOPAL**

Investigator

**Jyoti Varshney**  
M.Ed. (Ele. Edu.), RIE, Bhopal

Supervisor

**Dr. U. Lakshmi Narayna**  
Reader in Education  
RIE, Bhopal.

Co-supervisor

**Dr. M.K. Shrivastava**  
Lecturer in Education  
RIE, Bhopal.

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी  
NCERT

**REGIONAL INSTITUTE OF EDUCATION (NCERT)**  
Shyamla Hills, Bhopal (M.P.)


# **DECLARATION**

I do hereby declare that this study entitled "**A Study of Mathematics Achievement in Relation to Ability in Fundamental Operations**" has been carried out by me during the academic year 2007-08 in partial fulfillment of the requirement for the Degree of Master of Education (Elementary Education) of Barkatullah University, Bhopal.

This study has been conducted under the guidance and supervision of Dr. U. Lakshmi Narayana, Reader in Education, R.I.E., Bhopal and Dr. M.K. Shrivastav, Lecturer in Education, R.I.E., Bhopal

I further declare that this dissertation has not been submitted earlier by me or by any other for the award of any other degree, in any university.

**Place : Bhopal**  
**Date : 21/04/08**


 21/04/08  
**Mrs. Jyoti Varshney**  
**M.Ed. (El. Edu.)**  
**R.I.E. Bhopal**

# CERTIFICATE

This is to certify that **Mrs. Jyoti Varshney**, a student of M.Ed. (El. Edu.) course in the year 2007-08 of Regional Institute of Education, Bhopal has worked under our guidance. Her dissertation "**A Study of Mathematics Achievement in Relation to Ability in Fundamental Operations**" is original and worthy of presentation in partial fulfillment of the requirement of Degree of Master of Education (Elementary Education) of Barkatullah University, Bhopal M.P. The present study is an outcome of her sincere efforts.

Place : Bhopal

Date : 21-4-08

  
Supervisor 21/4/08

**U. Lakshmi Narayna**  
Reader in Education  
RIE, Bhopal.

  
Co-supervisor 21/04/08

**M.K. Shrivastava**  
Lecturer in Education ( Adhoc)  
RIE, Bhopal.

## ACKNOWLEDGEMENT

On the first and foremost position, it gives me great pleasure to express my deepest gratitude to my Guide Dr. U. Lakshmi Narayana, Reader, Department of Education, R.I.E., Bhopal whose support & encouragement led me to plan & complete the present study. I thank him for valuable advice, continuous help and inspiring guidance in the completion of the study.

I also express my indebtedness to Honourable Prof. Anand Bihari Saxena, Principal; Prof. S.A. Shaffi, Dean of Instruction and Prof. G.N.P. Shrivastava, Head of the Education Department, R.I.E., Bhopal for providing enough learning facilities and guidance.

I extend my gratitude to Dr. Ramesh Babu, Incharge of M.Ed. and Reader, Department of Education R.I.E. Bhopal whose intellectual suggestions and creative mind helped me to complete this work successfully.

My sincere regards and thanks to Dr. M.K. Shrivastava my co-guide and all the faculty members of Educational Department, R.I.E., Bhopal.


I am thankful to Librarian P.K. Tripathi and all the library staff of the R.I.E., Bhopal for extending the library facilities during my research work.

I also thank my all classmates who remained as a source of inspiration to me at all the time, without whom I could not get accelerated time to time for completion of this work.

I am also thankful to the Heads, Teacher and students of the various schools for the cooperation in collecting data.

Last but not the least I owe my sincere gratitude to my parents, my husband, son Daksh Gupta and other family members for being perennial source of inspiration to me.

Place : Bhopal  
Date : 21/04/08

  
21/04/08  
Mrs. Jyoti Varshney  
M.Ed. (El. Edu.)  
R.I.E. Bhopal

## LIST OF TABLES

Table No.	Name of the Table	Page No.
1	Population of the Study	28
2	Sample of the Study	29
3	Distribution of Items as per the Properties for Awareness Test	30
4	Distribution of Items as per the Properties for Application Test.	31
5	Scheme for Conducting the Tests	31
6	Scoring Scheme for Awareness Test.	32
7	Scoring Scheme for Application Test	33
8	Significance of 'F' between categories of mathematics Achievements in respect of Ability of fundamental operations	36
9	Significance of mean difference between categories of Achievement in mathematics in respect of Ability in fundamental operations	37
10	Significance of 'F' between categories of mathematics Achievement in respect of Awareness of fundamental operations	38
11	Significance of mean difference between categories of Achievement in mathematics in respect of Awareness in fundamental operations	38
12	Value of 'F' between Achievement categories in respect of Awareness of different properties of fundamental operations	39
13	Significance of 'F' between categories of mathematics Achievement in respect of Application of fundamental operations	40
14	Significance of mean difference between categories of Achievement in mathematics in respect of Application in fundamental operations	40
15	Value of 'F' between Achievement categories in respect of Application of different properties of fundamental operations	41
16	Comparison of Properties	42
17	Comparison of Achievement and Ability	43

<b>Table No.</b>	<b>Name of the Table</b>	<b>Page No.</b>
18	Significance of 'r' between Achievements in mathematics and Ability in fundamental operations	44
19	Significance of 'r' between Achievements in mathematics and Awareness in fundamental operations	45
20	Significance of 'r' between Achievement in mathematics and Application of properties of fundamental operations	45
21	Significance of 'r' between Awareness and Application of properties of fundamental operations	46
22	Correlation matrix between Awareness of properties of fundamental operations	47
23	Correlation matrix between Application of properties of fundamental operations	47
24	Significance of 't' between boys and girls in respect of Achievement	48
25	Significance of 't' between boys and girls in respect of Ability	49
26	Significance of 't' between boys and girls in respect of Awareness	49
27	Significance of 't' between boys and girls in respect of Application	49
28	Significance of 't' between government and private schools in respect of Achievement	50
29	Significance of 't' between govt. and private schools in respect of Ability	50
30	Significance of 't' between govt. and private schools in respect of Awareness	51
31	Significance of 't' between govt. and private schools in respect of Application	51

# INDEX

Sl.No.	Contents	Page No.
1	THE PRELIMINARIES <ul style="list-style-type: none"><li>▪ Title Page</li><li>▪ Declaration</li><li>▪ Certificate</li><li>▪ Acknowledgement</li><li>▪ List of Tables</li><li>▪ Index</li></ul>	i – viii
2	CHAPTER-I : INTRODUCTION <ul style="list-style-type: none"><li>▪ 1.1 Background of the study</li><li>▪ 1.2 What is Mathematics?</li><li>▪ 1.3 Fundamental Operations</li><li>▪ 1.4 Basic Laws Governing Fundamental Operations</li><li>▪ 1.5 Mathematics Achievement</li><li>▪ 1.6 Ability</li><li>▪ 1.7 Role of Awareness in Mathematics Education</li><li>▪ 1.8 Role of Application in Mathematics Education</li><li>▪ 1.9 Significance of Study</li><li>▪ 1.10 Objectives</li><li>▪ 1.11 Hypotheses</li><li>▪ 1.12 Statement of the Problem</li><li>▪ 1.13 Definition of Key Terms</li><li>▪ 1.14 Delimitations</li></ul>	1-11
3	CHAPTER-2 : REVIEW OF RELATED LITRATURE <ul style="list-style-type: none"><li>▪ 2.1 Reviews</li><li>▪ 2.2 An Overall View</li></ul>	12-26



Sl.No.	Contents	Page No.
4	CHAPTER-3 : METHODOLOGY <ul style="list-style-type: none"> <li>▪ 3.1 Introduction</li> <li>▪ 3.2 Population</li> <li>▪ 3.3 Sample</li> <li>▪ 3.4 Variables</li> <li>▪ 3.5 Tools</li> <li>▪ 3.6 Administration of Tools</li> <li>▪ 3.7 Scoring</li> <li>▪ 3.8 Statistical Techniques</li> </ul>	27-34
5	CHAPTER-4 : ANALYSIS AND INTERPRETATION OF DATA <ul style="list-style-type: none"> <li>▪ 4.1 Introduction</li> <li>▪ 4.2 Results Pertaining to Influence of Achievement</li> <li>▪ 4.3 Descriptive Statistics</li> <li>▪ 4.4 Results Pertaining to Relationships</li> <li>▪ 4.5 Results Pertaining to Background Variables</li> </ul>	35-51
6	CHAPTER-5 : SUMMARY AND FINDINGS <ul style="list-style-type: none"> <li>▪ 5.1 Introduction</li> <li>▪ 5.2 Objectives</li> <li>▪ 5.3 Major Findings</li> <li>▪ 5.4 Educational Implications</li> <li>▪ 5.5 Suggestions for Further Study</li> </ul>	52-57
7	REFERENCES	ix-xi
8	APPENDICES <ul style="list-style-type: none"> <li>▪ Appendix (I) – Awareness Test</li> <li>▪ Appendix (II) – Application Test</li> <li>▪ Appendix (III) – Scoring Key for Awareness Test</li> <li>▪ Appendix (IV) – Scoring Key for Application Test</li> </ul>	xii-xxviii