A Study of Effect of Art-integrated Learning on Academic Achievement in Mathematics of 10th Grade Students of Government Secondary School Students of Laxmipur

A Dissertation Submitted to

BARKATULLAH UNIVERSITY, BHOPAL

In Partial Fulfilment of the Requirement for the Degree of

Three Year Integrated B.Ed.-M.Ed.

Session (2018-2021)



RESEARCH SUPERVISOR:

Dr. Saurabh Kumar Assistant Professor Department of Education RIE Bhopal

RESEARCH SCHOLAR:

Jagmohan Bagh Integrated B.Ed. - M.Ed. Roll No: 190660617

REGIONAL INSTITUTE OF EDUCATION, BHOPAL

(National Council of Educational Research and Training) Shyamla Hills, Bhopal – 462013, Madhya Pradesh

(NAAC Accredited A+ Grade Institute)

A Study of Effect of Art Integrated Learning on Academic Achievement in Mathematics of 10th Grade Students of Government Secondary School Students of Laxmipur

A Dissertation Submitted to

BARKATULLAH UNIVERSITY, BHOPAL

In Partial Fulfilment of the Requirement for the Degree of

Three Year Integrated B.Ed.-M.Ed.

Session (2018-2021)





11 0 DEC 2021

RESEARCH SUPERVISOR:

RESEARCH SCHOLAR:

Dr. Saurabh Kumar Assistant Professor

Department of Education

RIE Bhopal

Jagmohan Bagh

Integrated B.Ed. - M.Ed.

Roll No: 190660617

D 531

REGIONAL INSTITUTE OF EDUCATION, BHOPAL (National Council of Educational Research and Training)
Shyamla Hills, Bhopal – 462013, Madhya Pradesh

(NAAC Accredited A+ Grade Institute)

DECLARATION

Name: Jagmohan Bagh

Student number: 190660617

Degree: Three Year Integrated B.Ed.-M.Ed.

I do hereby declare that this study entitled "A Study of Effect of Art Integrated Learning on Academic Achievement in Mathematics of 10th Grade Students of Government Secondary School Students of Laxmipur" has been undertaken by me in partial fulfillment of the requirement for the degree of Three Year Integrated B.Ed. – M. Ed.

I declare that the above dissertation is my work and that all the sources that I have used or quoted have been indicated and acknowledged using complete references.

I further declare that I submitted the dissertation to originality checking software and that it falls within the accepted requirements for originality.

Tagmohan Bagh

I further declare that I have not previously submitted this work, or part of it, for examination at any University/Institute for another qualification or at any other higher education institution.

Place: RIE, Bhopal

Date: 19/07/2021 Signature

CERTIFICATE

This is to certify that Jagmohan Bagh student of Three Year Integrated B.Ed.-M.Ed. Regional Institute Education, Bhopal during the session 2018-2021 bearing the roll number- 190660617 has completed his dissertation entitled "A Study of Effect of Art Integrated Learning on Academic Achievement in Mathematics of 10th Grade Students of Government Secondary School Students of Laxmipur" under my guidance and supervision.

This is further certified that the dissertation in its present form is fit for submission to Barkatullah University for the award of the degree of Three Year Integrated B.Ed-MEd.

Place: RIE Bhopal

Date: 19/07/202

Dr. Saurabh Kumar
Assistant Professor
Department of Education,
Regional Institute of Education, Bhopal

ACKNOWLEDGEMENTS

I would like to thank God the Almighty for giving me the strength, courage, and health

to complete this dissertation. I would like to thank my supervisor, Dr. Saurabh

Kumar for his commitment, patience, guidance, encouragement, and support

throughout this academic journey. His unique guidance, uninterrupted help, constant

and timely supervision made me able to produce this research in time.

I am grateful to the Principal of Laxmipur Government High School for

allowing me to conduct my research study at their school.

I am deeply indebted to Prof. V.K.Kakaria, Principal, Regional

Institute of Education, Bhopal, for his kind cooperation and for giving

valuable suggestions at the time of need.

I express my deep thanks to Prof. Ratnamala Arya, Head,

Department of Education, for providing permission and departmental facility

for my dissertation work.

Furthermore, I would also like to extend my sincere regards to my teachers

Prof. B. Ramesh Babu, Prof. N. Pradhan, Prof. I.B. Chughtai Dr. N. C. Ojha, Dr.

S.K Pandagale, who enlightened my path with their valuable knowledge during my

work period.

Above all, I am thankful to my family members, friends, seniors, and

teachers from other universities for giving me the required resources, strength, and

wisdom to accomplish the task.

Place: Bhoapl

Date: 19/07/2021

Jagmohan Bagh

Tagmohan Bagh

Integrated B.Ed.- M.Ed.

iv

Contents

DECLARATION	ii
CERTIFICATE	iii
ACKNOWLEDGEMENTS	iv
LIST OF FIGURES	viii
LIST OF TABLES	viii
LIST OF ABBREVIATIONS	ix
KEY TERMS	ix
CHAPTER 1: INTRODUCTION AND BACKGROUND	1
BACKGROUND OF THE STUDY	1
1.1 STATEMENT OF THE PROBLEM	2
1.2 PURPOSE OF THE STUDY	3
1.4 Research questions	4
1.5 SIGNIFICANCE OF THE STUDY	4
1.6 LIMITATIONS OF THE STUDY	5
1.7 DELIMITATION	5
1.8 Definition of Key Terms	5
1.9 ORGANISATION OF THE STUDY	6
1.10 CONCLUSION	7
CHAPTER 2: REVIEW OF RELATED LITERATURE	8
2.1. INTRODUCTION	8
2.2. CONCEPTUAL UNDERSTANDING OF MATHEMATICS	8
2.3 CHALLENGES WITH MATHEMATICS	9
2.4. INTERTWINED STRANDS OF PROFICIENCY	11
2.5 ART INTEGRATED LEARNING	12
2.6 THEORETICAL GROUNDINGS OF ART INTEGRATED LEARNING	14
2.7 IMPORTANCE OF ART INTEGRATED LEARNING	15

	2.8 ADVANTAGES OF ART INTEGRATED LEARNING	. 16
	2.9 ART INTEGRATED LEARNING IN A AIL CLASSROOM SETUP	. 17
	2.10 BENEFITS OF ART INTEGRATED LEARNING	. 18
	2.11 THEORETICAL FRAMEWORK	. 19
	2.12 CONCLUSION	. 20
C	HAPTER 3: RESEARCH DESIGN AND METHODOLOGY	. 21
	3.1 INTRODUCTION	. 21
	3.2 RESEARCH QUESTIONS	. 21
	3.3 RESEARCH METHODOLOGY	. 21
	3.4 RESEARCH DESIGN	. 22
	3.5 RESEARCH APPROACH	. 23
	3.5.1 QUANTITATIVE RESEARCH APPROACH	. 24
	3.5.2 QUALITATIVE RESEARCH APPROACH	. 24
	3.6 RESEARCH PHILOSOPHY	. 25
	3.7 POPULATION AND SAMPLING TECHNIQUES	. 25
	3.7.1 Research site	. 25
	3.8 SAMPLING	. 27
	3.9 DATA COLLECTION TOOLS	. 27
	3.9.1 Interviews.	. 27
	3.9.2 Experiments.	. 28
	3.10 INTERVENTION	. 28
	3.11 DATA ANALYSIS	. 29
	3.12 ETHICAL CONSIDERATIONS	. 29
	3.13 CONCLUSION	. 30
C	CHAPTER 4: DATA PRESENTATION, ANALYSIS, AND DISCUSSION	. 31
	4.1 INTRODUCTION	. 31
	4.1.1 RESEARCH OUESTION 1	. 31

	4.1.2 Art Integrated Learning in teaching mathematics	32
	4.1.3 Summary to research question 1	33
	4.2 RESEARCH QUESTION 2	33
	4.2.1 ORGANISING AND SUMMARISING DATA	33
	4.2.2 Control group histograms	34
	4.2.3 Experimental group histograms	35
	4.3 HYPOTHESIS-BY-HYPOTHESIS ANALYSIS OF DATA	AND
	INTERPRETATION OF RESULTS	36
	4.3.1 A paired samples dependent t-test	36
	4.3.2 one way ANOVA Test	38
	4.4 SUMMARY TO RESEARCH QUESTION 2	39
	4.5 CONCLUSION	39
Cŀ	HAPTER5: SUMMARY OF THE STUDY, RECOMMENDATIONS,	AND
C	ONCLUSION	40
	5.1 INTRODUCTION	40
	5.2 SUMMARY OF FINDINGS	40
	5.2.1 The main findings under research question 1	40
	5.2.2 The main finding for research question 2	41
	5.2.4 Difficulties in learning and understanding mathematics	43
	5.3. IMPLICATIONS	43
	5.4 RECOMMENDATIONS	44
	5.4.1 Teacher training	44
	5.4.2 Curriculum advisors.	44
	5.5 RECOMMENDATIONS FOR FUTURE RESEARCH	45
	5.6 LIMITATION OF THIS STUDY	45
	5.7 CONCLUSION	45
RF	FFERENCES	47

APPENDICES	48
Appendix A: Semi-structured interview questions for learners	48
Appendix B: Semi-structured interview questions for the teacher	49
Appendix C: Permission letter to the principal	49
Appendix D Interview guide: the use of Art Integrated Learning a mathem classroom	
Appendix E Table 4.1: A paired-samples dependent pre-test and post-test the control group.	
Appendix F Table 4.2: a paired samples dependent pre and post-tests man	ks for the
experimental group.	53
LIST OF FIGURES Figure 1: Intertwined strands of proficiency	11
Figure 2: Benefits of Art Integrated Learning (Mcgraw - Hill, 1977)	
Figure 3: Internal and external validity	
Figure 4: The control group's pre-test marks (n = 30)	
Figure 5: Control group's post-test marks (n= 30)	35
Figure 6: The experimental group's pre-test marks (n= 30)	35
Figure 7: Experimental group's post-test marks (n=30)	36
LIST OF TABLES	
Table 1: THE TEACHER'S DEMOGRAPHIC DATA	26
Table 2: SUMMARY OF SELECTION CRITERIA OF THE PARTIC	
Table 3: t-Test for Controlled Group	
Table 4: t-Test for Experimental Group	
Table 5: ANOVA for Controlled and Experimental Group	38

LIST OF ABBREVIATIONS

CAPS Curriculum Assessment Policy Statement

AIL Art Integrated Learning

LTSM Learning and Teaching Support Materials

FET Further Education and Training

NCF National Curriculum Framework

SMK Subject Matter Knowledge

STAD Student Teams-Achievement Divisions

KEY TERMS

Art Integrated Learning, Mathematics, Constructivism, Curriculum, Pedagogy, Grade 10 mathematics learners, enhance, conceptual understanding