A STUDY OF EFFECT OF VIRTUAL LABORATORY ON ACHIEVEMENT IN SCIENCE OF CLASS IX STUDENTS OF GOVERNMENT INTER COLLEGES OF KOTDWARA

A Dissertation Submitted To the Barkatullah University Bhopal In Fulfillment
Of the Requirement of the Award of the Degree Of

Three year Integrated B.Ed.-M.Ed.

2018-2021



Supervisor:

Prof. Ratanamala Arya.

Head, Department Of Education

Regional Institute of Education, Bhopal

submitted by:

Miss Himani Naithani

scholar

3 year Int. B.Ed.-M.Ed.

Department Of Education

Regional Institute of Education, NCERT, Bhopal

A STUDY OF EFFECT OF VIRTUAL LABORATORY ON ACHIEVEMENT IN SCIENCE OF CLASS IX STUDENTS OF GOVERNMENT INTER COLLEGES OF KOTDWARA

A Dissertation Submitted To the Barkatullah University Bhopal In Fulfillment
Of the Requirement of the Award of the Degree Of

Three year integrated B.Ed.-M.Ed.

2018-2021



1 0 DEC 2021

D-549

-		-	
Real SECTION	May Company	TERROR WINDS	notification.
- FEE	THE R	P RESERVE	10 a

Prof. Ratamamala Arya

Head, Department Of Education

Regional Institute of Education, Bhopal

submitted by:

Mess Himani Naithani

scholar

3 year last B.Ed.-M.Ed.

Department Of Education

Regional Institute of Education, NCERT, Bhopal

DECLARATION

I hereby declare that the present dissertation entitled "A study of effect

of virtual laboratory on achievement in science of class IX students of

Government Inter Colleges of Kotdwara" is the outcome of original research

work undertaken and carried out by me, under the valuable guidance and

supervision of Prof. Ratanamala Arya professor of Regional Institute of

Education (NCERT) Bhopal, Madhya Pradesh.

I also declare that neither the thesis nor a part of it has formed in any

way the basis of the award of any degree/diploma previously of this

university or of any other university.

Place: Bhopal

Date:

Himani Naithani

Kimani'

Investigator

Acknowledgement

I express my deep and sincere gratitude to my research guide Prof.

Ratanamala Arya Regional Institute of Education (NCERT) Bhopal for

giving me an opportunity to conduct this study and providing me guidance,

encouragement and benevolence during this course of study.

I am grateful to Professor Nityanand Pradhan, former Principal RIE

Bhopal and also grateful to Principal in-charge Dr. V.K. Kakaria and all the

faculty member of RIE, Bhopal for their direction and guidance throughout

the research work.

I sincerely thanks to Principal of Government Inter College Lalpur,

Science teacher and the students of M.Ed. final year for their cooperation and

help offered to me during the collection of data for the study .I am indeed

grateful to them .I express my deepest feeling of gratitude to my parents and

siblings for their moral support throughout the research work.

I express my sincere gratitude to all other who helped directly and

indirectly in the successful completion of this dissertation.

Place: Bhopal

Date:

Himani Naithani

Himan'

Investigator

Certificate

This is to certified that **Himani Naithani** student of 3 year Integrated B.Ed.-M.Ed. course of Regional Institute of Education, Bhopal, year 2020-21 has conducted a research work entitled 'A STUDY OF EFFECT OF VIRTUAL LABORATORY ON ACHIEVEMENT IN SCIENCE OF CLASS IX STUDENTS OF GOVERNMENT INTER COLLEGES OF KOTDWARA' under my supervision.

It is her genuine work and I consider it worthy of submission for the award of degree.

Date-

Place- Bhopal

Professor Ratanamala Arya

Department of Education

RIE Bhopal

Table of Contents

T .	1	
Dec	lara	tion

Acknowledgement

Certificate

L	List of tables and figures iii				
1	1 Chapter 1: Introduction				
	1.1	Introduction			
	1.2	Rationale of the study			
	1.3	Title of the study			
	1.4	Laboratory3			
	1.5	Integration of laboratory work with classroom			
	1.6	Limitations of traditional labs-			
	1.7	Importance of laboratory work experience			
	1.8	Virtual lab8			
	1.9	Objectives of virtual lab8			
	1.10	Advantages of Virtual Labs9			
	1.11	O- Labs9			
2	Cl	napter 2: Review of related literature			
	2.1	Introduction			
	2.2	Conclusion			
3	Cl	napter 3: Methodology			
	3.1	Introduction			
	3.2	Design of the study			
	3.3	Operational definition			
	3.4	Objectives of the research			
	3.5	Hypothesis			
	3.6	Sampling			
	3.6	.1 Sampling Technique-			
	3.7	Tool selected for the study			
	3.8	Data Collection Procedure- 24			
	3.8	.1 Phase 1 Pre testing			

	3.8	.2 Phase II Teaching	ļ
	3.8	3 Phase III Post-test)
	3.8.	4 Phase IV: Retention Test	,
	3.8.	5 Phase V: Feedback- 25	,
	3.9	Data Collection, Entry and Analysis	,
	3.10	Conclusion- 26)
4	Ch	napter 4: Data Analysis and Interpretation	7
	4.1	Introduction- 27	7
	4.2	Hypothesis in null form	3
	4.3	Statistics used in study-	3
	4.4	Descriptive Statistics-	3
	4.5	Inferential statistics	2
	4.6 An	alysis of feedback form)
	4.6	Result and Discussion-)
	4.7	Conclusion	
5	Cł	napter 5: Summary, Findings and Conclusion	2
	5.1	Introduction- 42	2
	5.2	Restatement of the problem-	2
	5.3	Need for the present study-	2
	5.4	Objectives of the study	3
	5.5	Sample-	3
	5.6	Tool of the research-	3
	5.7	Administration of the Pre-test-	3
	5.8	Administration of the Post-test-	1
	5.9	Administration of the retention test-	1
	5.10	Research Design-	1
	5.11	Data Analysis	1
	5.12	Delimitation of the study44	1
	5.13	Major findings of the study-	5
	5.14	Educational Implications45	5
	5.15	Suggestion for further research-	5
	5.16	Conclusion4	7
6	Bi	bliography4	7

List of tables and figures-

Figure 4.1: Comparison of mean and SD scores obtained by class IX students in
pre-test and post-test34
Figure 4.2: Comparison of mean and SD scores obtained by boys and girls of
class IX in pre-test35
Figure 4.3: Comparison of mean and SD post-test scores of boys and girls of
class IX students
Figure 4.4: Comparison of Mean and SD scores of Post-test and retention test
achieved by students
Table 1-Arithmetic mean of Pre-test, Post-test and retention test scores of
students29
Table 2-Descriptive statistics of pre-test scores achieved by boys and girls29
Table 3-Descriptive statistics of scores of Post-test achieved by boys and girls 30
Table 4-: Descriptive statistics of scores achieved by students in post-test and
retention test31
Table 5-Computation of paired t-test between pre-test and post-test stages32
Table 6-Result of paired t-test to compare pre-test scores of boys and girls34
Table 7-Result of paired t-test of post test scores of boys and girls separately36
Table 8-Result of paired t-test of scores of post-test and retention test
Table 9-Analysis of feedback form