

**A STUDY OF LEARNING PROGRESSION IN
SCIENCE OF CLASS IX STUDENTS OF
BALANGIR DISTRICT, ODISHA**

**Dissertation Submitted to Barkatullah University in Partial Fulfilment
of the Requirements for the Degree**

of

3 Year Integrated B.Ed.-M.Ed.

Session: 2018-21

Under the supervision of

Dr. N.C Ojha

Associate Professor

Department of Education

Research Scholar

Amiya Ranjan Parida

3 Year Integrated B.Ed.-M.Ed.

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी
NCERT

REGIONAL INSTITUTE OF EDUCATION

(National Council of Educational Research and Training)

BHOPAL-462013, M.P.

A STUDY OF LEARNING PROGRESSION IN SCIENCE OF CLASS IX STUDENTS OF BALANGIR DISTRICT, ODISHA


**Dissertation Submitted to Barkatullah University in Partial Fulfilment of the
Requirements for the Degree**

of

3 Year Integrated B.Ed.-M.Ed.

Session: 2018-21

.10 DEC 2021

Under the supervision of
Dr. N.C Ojha 
Associate Professor
Department of Education

Research Scholar
Amiya Ranjan Parida
3 Year Integrated B.Ed.-M.Ed.

D 527



REGIONAL INSTITUTE OF EDUCATION
(National Council of Educational Research and Training)
BHOPAL-462013, M.P.



Department of Education

Regional Institute of Education, Bhopal

(A Constituent Unit of National Council of Educational Research and Training, New Delhi)

DECLARATION

I, **Amiya Ranjan Parida**, student of Integrated B.Ed.-M.Ed., Department of Education, Regional Institute of Education Bhopal, hereby declare that dissertation entitled “**A Study of Learning Progression in Science of Class IX Students of Balangir District, Odisha**” is the outcome of the original research undertaken and carried out by me during the session (2018-2021) under the supervision of **Dr. N.C Ojha**, Associate Professor, Department of Education, Regional Institute of Education Bhopal (M.P.) in the partial fulfilment of the requirement for the degree of Integrated B.Ed.-M.Ed., Barkatullah University, Bhopal.

I further declare that I or anyone else has not previously submitted this dissertation for this or any other degree/ diploma either in this or in other any form to this or any other university from the country or abroad.

Date:

Place:

Amiya Ranjan Parida



Department of Education

Regional Institute of Education, Bhopal

(A Constituent Unit of National Council of Educational Research and Training, New Delhi)

CERTIFICATE

This is to certify that **Amiya Ranjan Parida** student of Integrated B.Ed.-M.Ed., RIE Bhopal during the session 2018-2021 has completed his dissertation entitled “**A Study of Learning Progression in Science of Class IX Students of Balangir District, Odisha**” under my guidance and supervision.

This is further certified that the dissertation in his present form is fit for the submission to Barkatullah University for the degree of Integrated B.Ed.-M.Ed.

Date: 22/07/2021

Place: Bhopal

Dr. N.C Ojha

Associate Professor
Department of Education,
Regional Institute of Education,
Bhopal, Madhya Pradesh

ACKNOWLEDGEMENTS

Although, I have done my best efforts on this project; however, it was not possible without the kind support and help of many individuals. I would like to extend my sincere thanks to all of them.

I am highly indebted to my supervisor **Dr. N.C Ojha**, Associate Professor, Department of Education, Regional Institute of Education Bhopal (M.P.) for his constant supervision as well as for providing intellectual suggestions and facilities during my dissertation work which brought my dissertation in the present form successfully. His unique guidance, uninterrupted help, constant and timely supervision made me able to produce this research in time.

I am deeply indebted to **Prof. N. Pradhan**, Former Principal, Regional Institute of Education, Bhopal and **Prof. V.K. Kakaria**, In-charge Principal, Regional Institute of Education, Bhopal, for their kind cooperation and giving valuable suggestions at the time of need.

I am very thankful to **Prof. B. Ramesh Babu**, Dean of Research, Department of Education, Regional Institute of Education, Bhopal for providing inputs for my investigation.

My sincere thanks to **Prof. Ratnamala Arya**, Head, Department of Education, Regional Institute of Education, Bhopal for providing guidance and other official support for preparing this report.

I am very grateful to **Dr. S.K Pandagale**, Associate professor, Department of Education, Regional Institute of Education, Bhopal for providing research support, technical support and bringing this shape to this manuscript.

Furthermore, I would also like to extend my sincere regards to my teachers **Prof. LB Chughtai** and **Dr. Saurabh Kumar** who enlightened my path with their valuable knowledge during my work period.

I am very much grateful to **Dr. P.K Tripathy**, Deputy librarian and other Library staff of RIE Bhopal for providing reference materials and reading support for preparing this dissertation.

Last but not least, my sincere thanks to all those, who provided either direct or indirect support and help to complete this manuscript.

I am very much indebted to my parents who provided me all those sorts of financial and psychological support for my upbringing and developing academic career.

CONTENTS

INTRODUCTION.....	1
1.0.0 INTRODUCTION	1
1.1.0 LEARNING PROGRESSION.....	2
1.1.1 COMPONENTS OF LEARNING PROGRESSION.....	3
1.1.2 DEVELOPMENT OF LEARNING PROGRESSION	4
1.1.3 USES OF LEARNING PROGRESSION	5
1.2.0 LEARNING ANALYTICS.....	5
1.2.1 KEY USES OF LEARNING ANALYTICS.....	6
1.2.2 METHODOLOGIES OF LEARNING ANALYTICS	7
1.2.3 BENEFITS OF LEARNING ANALYTICS	8
1.2.4 ETHICS OF DATA, ANALYTICS & AI.....	8
1.3.0 CONSTRUCTIVIST LEARNING	9
1.3.1 IMPORTANCE OF CONSTRUCTIVISM IN SCIENCE.....	10
1.3.2 CONSTRUCTIVISM AND SCIENCE TEACHING	11
1.3.3 ROLE OF CONSTRUCTIVIST APPROACH IN SCIENCE CLASS.....	12
1.4.0 ATTITUDE.....	13
1.4.1 SCIENTIFIC ATTITUDE	13
1.4.2 THE CHARACTERISTICS OF SCIENTIFIC ATTITUDE	14
1.4.3 DEVELOPMENT OF SCIENTIFIC ATTITUDE.....	14
1.4.4 ATTITUDE TOWARDS SCIENCE.....	14
1.4.5 CHARACTERISTICS OF A PERSON WITH ATTITUDE TOWARDS SCIENCE..	15
1.4.6 IMPORTANCE OF SCIENCE ATTITUDE	15
1.4.7 RELATIONSHIP BETWEEN SCIENTIFIC ATTITUDE AND ATTITUDE TOWARDS SCIENCE	16
1.5.0 SCIENCE EDUCATION AT SECONDARY LEVEL	16
1.5.1 ROLE OF SCIENCE AT SECONDARY LEVEL	17
1.5.2 RECOMMENDATIONS OF COMMITTEE AND COMISSIONS ON SCIENCE EDUCATION	18
1.6.0 ROLE OF LEARNING PROGRESSION IN SCIENCE.....	19
1.7.0 NEED AND JUSTIFICATION OF THE STUDY	20
1.8.0 STATEMENT OF THE PROBLEM	22
1.9.0 OBJECTIVES OF THE STUDY	22
1.10.0 HYPOTHESIS OF THE STUDY	22
1.11.0 OPERATIONAL DEFINITIONS OF THE TERMS USED	22

1.12.0	SCOPE OF THE STUDY	23
1.13.0	DELIMITATIONS OF THE STUDY	23
	REVIEW OF RELATED LITERATURE	24
2.0.0	INTRODUCTION	24
2.1.0	IMPORTANCE OF REVIEW OF RELATED LITERATURE	24
2.2.0	STUDIES RELATED TO LEARNING PROGRESSION	25
2.3.0	STUDIES RELATED TO CONSTRUCTIVISM.....	31
2.4.0	STUDIES RELATED TO SCIENTIFIC ATTITUDE.....	34
2.5.0	CONCLUSION.....	36
	METHOD AND DESIGN OF THE STUDY	37
3.0.0	INTRODUCTION	37
3.1.0	ORIGIN OF THE STUDY	37
3.2.0	SELECTION OF RESEARCH METHOD.....	38
3.2.1	Experimental design of the present study	38
3.3.0	POPULATION	38
3.4.0	SAMPLE.....	38
3.5.0	TOOLS DEVELOPMENT FOR THE STUDY	40
3.5.1	Development of Constructivist teaching model.....	40
3.5.2	Implementation of Traditional Teaching Model	41
3.5.3	Construction of Achievement Test.....	41
3.5.4	Measure of Attitude towards Science	41
3.6.0	PROCEDURE OF DATA COLLECTION.....	42
3.7.0	STATISTICAL TECHNIQUE	43
3.8.0	CONCLUSION.....	44
	ANALYSIS OF DATA AND INTERPRETATION OF RESULTS AND FINDINGS	45
4.0.0	INTRODUCTION	45
4.1.0	LEARNING PROGRESSION IN SCIENCE OF CLASS IX STUDENTS	45
4.2.0	ATTITUDE TOWARDS SCIENCE OF CLASS IX STUDENTS	48
4.3.0	EFFECT OF TREATMENT, GENDER AND THEIR INTERACTION ON ACHIEVEMENT IN SCIENCE OF CLASS IX STUDENTS.....	50
4.3.1	Effect of Treatment on Achievement in Science of Class IX Students.....	51
4.3.2	Effect of Gender on Achievement in Science of Class IX Students	52
4.3.3	Interaction of Treatment and Gender on Achievement in Science of Class IX Students 53	
	FINDINGS, DISCUSSIONS, SUMMARY, IMPLICATION, SUGGESTIONS AND CONCLUSION.....	55
5.0.0	INTRODUCTION	55
5.1.0	FINDINGS OF THE STUDY.....	55
5.2.0	LEARNING PROGRESSION IN SCIENCE OF CLASS IX STUDENTS	55

5.3.0	ATTITUDE TOWARDS SCIENCE OF CLASS IX STUDENTS	56
5.4.0	EFFECT OF TREATMENT ON ACHIEVEMENT IN SCIENCE OF CLASS IX STUDENTS	57
5.4.1	Effect of Gender on Achievement in Science of Class IX Students	58
5.4.2	Interaction of Treatment and Gender on Achievement in Science of Class IX Students	58
5.5.0	TO SUM UP	59
5.5.1	INTRODUCTION	59
5.5.2	STATEMENT OF THE PROBLEM	59
5.5.3	RATIONAL OF THE STUDY	59
5.5.4	OBJECTIVES	61
5.5.5	HYPOTHESIS	61
5.5.6	METHODOLOGY.....	61
5.5.7	DESIGN.....	62
5.5.8	SAMPLE.....	62
5.5.9	TOOL	62
5.5.10	PROCEDURE OF DATA COLLECTION.....	62
5.5.11	STATISTICAL TECHNIQUE	63
5.5.12	FINDING	63
5.6.0	IMPLICATIONS	64
5.7.0	SUGGESTIONS FOR FURTHER STUDIES	64
5.8.0	CONCLUSION.....	65
	REFERENCES.....	67
	APPENDIX - 1.....	70
	APPENDIX - 2.....	73

LIST OF TABLES

Table No.	Details of table	Page
Table 3.1	Sample School of the Study	40
Table.3.2	Scoring Scheme of the Science Attitude Scale	42
Table 4.1	Mean, SD, Range, N and Percentiles for Achievement in Science and Attitude towards Science of Class IX Students of Experimental and Control Group	45
Table.4.2	Mean, SD, Range, N and Percentiles for Attitude towards Science of Class IX Students of Experimental and Control Group	48
Table.4.3	Summary of 2 X 2 Factorial Design ANCOVA for Achievement in Science of Class IX Students by Taking Pre-test Scores of Achievement in Science of as Covariate	50
Table 4.4	Mean and SD for Achievement in Science of Experimental and Control Group	51

LIST OF FIGURES

Figure No.	Details of figure	Page
Fig 3.1	Population and Sample of the Study	39
Fig. 3.2	Procedure of Data Collection	43
Fig. 4.1:	Achievement in Science of Class IX Students of Experimental and Control Group	47
Fig. 4.2:	Attitude towards Science of Class IX Students of Experimental and Control Group	49
Fig. 4.3	Interaction of Treatment and Gender on Achievement in Science	54