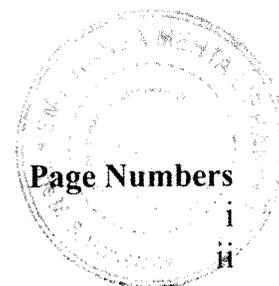


TABLE OF CONTENTS



Content	Page Numbers
Certificate	i
Acknowledgment	ii
Table of Contents	v
List of Tables	viii
List of Graphs	ix
List of Frames	ix
List of Figures	x
List of Plates	x
List of Annexure	xi
Acronyms	xii
Chapter One: Conceptual Framework	01-36
1.0 Introduction	01
1.1.1 Science, Technology and Development	02
1.1.2 Impact of science and technology on society	03
1.1.3 Importance of science as a school subject	04
1.2.1 Meaning and nature of science	05
1.2.2 Science as a product	06
1.2.3 Science as a process	07
1.3.1 Science Education in India	07
1.3.2 Science Education in Ancient Period in India	08
1.3.3 Science Education in medieval & pre independence period in India	09
1.3.4 Efforts to vitalize Science Education in post independent India	10
1.4.1 Objective of science teaching at secondary level	13
1.4.2 Status of Science Teaching in India	13
1.4.3 National Science Teaching Standards (United States of America)	16
1.5.1 Teacher Education in India	18
1.5.2 Secondary Pre-service Teacher Education in India	21
1.5.3 Innovative Programmes for Secondary Teacher Education	22
1.5.4 Status of Teaching of Science at B.Ed. Level	26
1.6.1 Activity Based Learning	28
1.6.2 Activity Based Science Teaching	29
1.6.3 Activity Based Science Teaching at B.Ed. level	30
1.7.1 The Maharaja Sayajirao University of Baroda, Vadodara	31
1.7.2 Faculty of Education and Psychology	31
1.7.3 Department of Education (CASE)	32
1.7.4 Bachelors of Education programme at CASE	32
1.7.4.1 Objectives of Bachelors of Education Programme	33
1.7.4.2 Admission criteria for the B.Ed.	33
1.7.5 The course 'Teaching of science'	34

Chapter Two: Review of Related Literature	37-66
2.0 Introduction	37
2.1.1 Studies related to science teaching at secondary level	38
2.1.2 Observations and implications	43
2.2.0 Studies related to Teacher Education for secondary Level	45
2.2.1 Studies conducted on teacher education programmes and in-service teachers.	45
2.2.2 Studies conducted on Teaching of Science at pre service teacher education level.	49
2.2.3 Observations and implications	54
2.3.1 Studies related to Activity Based Teaching at various levels.	57
2.3.2 Observations and Implications	62
2.4 Implications of the related literature on the present study	63
Chapter Three: Research Methodology	67-91
3.0 Introduction	67
3.1 Rationale	67
3.2 Research questions	73
3.3 Title of the Study	73
3.4 Objectives of the study	73
3.5 Hypotheses	74
3.6 Operationalization of the terms	74
3.7 Delimitation of the study	75
3.8 Limitation of the study	75
3.9 Methodology	75
3.9.1 Design of the study	75
3.9.2 Population	79
3.9.3 Sample	79
3.9.4 Data required for the study	80
3.9.5 Sources of Data	80
3.9.6 Tools and techniques of Data Collection	81
3.9.7 Development of tools	82
3.9.8 Data collection	87
3.10 Data Analysis	91
Chapter Four: Data Analysis and Interpretation	92-165
4.0 Introduction	92
4.1 Data Analysis and interpretation	92
4.2 Development of an Activity Based Science Teaching Programme	92
4.3 Implementation of an ABST Programme	98
4.4 Effectiveness of an Activity Based Science Teaching Programme	129
4.4.1 Difference between the achievement score of student teachers' before and after the treatment	129
4.4.2 Difference between the mean score of performance test of student teachers' before and after the treatment	130

4.4.3	Difference between the mean score of nature of science Scale obtained by student teachers' before and after the treatment	131
4.4.4	Difference between the mean score obtained by student teacher on STQ scale before and after the treatment	132
4.4.5	Analysis of student teachers' responses on a Science Pedagogy Questionnaire	133
4.4.6	Student teachers immediate responses about each of the activities during the implementation of ABSTP	136
4.4.7	Student teachers' responses about each of the activities at the end of the Implementation of ABSTP	158

Chapter Five: Findings and Discussion **166 -176**

5.0	Introduction	166
5.1	Major Findings	166
5.2	Discussion	170

Chapter Six: Summary and Implications **177-192**

6.0	Introduction	177
6.1	Title of the study	178
6.2	Objectives of the study	178
6.3	Hypotheses	179
6.4	Operational Definition of the Terms	179
6.5.1	Delimitation of the study	180
6.5.2	Limitation of the study	180
6.6.0	Methodology	181
6.6.1	Design of the study	181
6.6.2	Population	181
6.6.3	Sample	181
6.6.4	Tools and Techniques of Data Collection	182
6.6.5	Data collection	183
6.6.6	Data analysis	185
6.7	Major findings	186
6.8	Implications of the study	189
6.9	Suggestions for further studies	190
6.10	Conclusion	191

Bibliography

Annexure