



TABLE OF CONTENTS

| | |
|--------------------|---|
| Certificate | 1 |
| Acknowledgement | 2 |
| Table of Contents | 3 |
| List of Contents | 3 |
| List of Tables | 6 |
| List of Appendices | 8 |

LIST OF CONTENTS

Chapter 1 Introduction

| | | |
|----------|---|----|
| 1.0 | Introduction | 1 |
| 1.1 | Science Instruction in the Classroom | 2 |
| 1.1.1 | Objectives of Teaching Science at High School level | 3 |
| 1.1.2 | Status of Science Instruction | 3 |
| 1.2 | Learning Styles | 5 |
| 1.2.1 | Felder-Silverman Model of Learning Styles | 6 |
| 1.2.2 | Other Popular Learning Style Models | 11 |
| 1.2.2(a) | VAK Model of Learning Styles | 11 |
| 1.2.2(b) | Mayer-Briggs type of Indicator | 12 |
| 1.2.2(c) | Kolb's Learning Styles Model | 13 |
| 1.2.2(d) | Herrmann's Brain Dominance Instrument | 14 |
| 1.3 | Review of Related Literature | 15 |
| 1.3(a) | Studies Related to Learning Styles and Its' Effectiveness in Teaching Learning Process | 16 |
| 1.3(b) | Studies Related to Instructional Strategies Adopted by the Teachers for Teaching of Science | 20 |
| 1.3(c) | Studies Related to Learning Styles in Science | 22 |
| 1.3.1 | An Overview of the Reviewed Literature | 25 |

| | | |
|-------|---|----|
| 1.3.2 | Implication for the Present Study | 26 |
| 1.4 | Rationale of the Study | 27 |
| 1.5 | Research Questions | 29 |
| 1.6 | Statement of the Problem | 29 |
| 1.7 | Objectives of the Study | 29 |
| 1.8 | Hypotheses | 30 |
| 1.9 | Operational Definitions of the Terms Used | 30 |
| 1.10 | Delimitations of the Study | 30 |

Chapter 2 Plan and Procedure

| | | |
|----------|---|----|
| 2.0 | Introduction | 31 |
| 2.1 | Research Design of the Study | 31 |
| 2.2 | Nature and Source of the Data | 32 |
| 2.3 | Population | 32 |
| 2.4 | Sample | 33 |
| 2.5 | Tools | 33 |
| 2.5.1 | Index of Learning Styles (ILS) | 34 |
| 2.5.1(a) | Preparation of ILS | 35 |
| 2.5.1(b) | Scoring of ILS | 35 |
| 2.5.1(c) | Validity and Reliability of ILS | 39 |
| 2.5.2 | Science Attitude Scale (SAS) | 39 |
| 2.5.2(a) | Construction of SAS | 39 |
| 2.5.2(b) | Identification of the Components of SAS | 40 |
| 2.5.2(c) | Format and Nature of the Statements | 41 |
| 2.5.2(d) | Tryout of SAS | 43 |
| 2.5.2(e) | Scoring Procedure of SAS | 45 |
| 2.5.2(f) | Selection of the Statements for SAS | 45 |
| 2.5.2(g) | Validity and Reliability of SAS | 50 |
| 2.5.3 | Achievement Test (Post-Test) | 50 |
| 2.6 | Data Collection | 51 |
| 2.7 | Data Analysis | 53 |

Chapter 3 Designing and Implementation of Strategies

| | | |
|----------|--|----|
| 3.0 | Introduction | 54 |
| 3.1 | Concept of Strategies | 54 |
| 3.2 | Strategies Catering to the Learning Styles | 55 |
| 3.2.1(a) | Teaching Styles Congruent to the Learning Styles | 55 |
| 3.2.1(b) | Strategies to Match Diverse Learning Styles with Teaching Styles | 56 |
| 3.2.2 | Scope of Matching Learning Styles and Teaching Styles through Technology | 57 |
| 3.3 | Integration of Designed Strategies in the Instruction | 58 |
| 3.3.1 | Selection of the Content | 59 |
| 3.3.2 | Objectives | 61 |
| 3.4 | Methods and Media | 64 |
| 3.5 | Programme Planning | 64 |
| 3.6 | Sessions Planning | 72 |
| 3.7 | Validating Designed Sessions Plan | 73 |

Chapter 4 Data Analysis, Interpretations and Discussion

| | | |
|-------|---|-----|
| 4.0 | Introduction | 74 |
| 4.1 | Analysis of Demographic Data | 74 |
| 4.2 | Learning Styles Profile of the Students | 78 |
| 4.2.1 | Summary and Interpretations of the Learning Styles Profile of the Students | 80 |
| 4.3 | Effectiveness of Designed Instructional Strategies In terms of Students' Achievement | 86 |
| 4.4 | Effectiveness of Designed Instructional Strategies In terms of Students' Attitude towards Science Subject | 94 |
| 4.4 | Discussion | 102 |

Chapter 5 Summary, Conclusion and Suggestions

| | | |
|------|---|-----|
| 5.0 | Introduction | 104 |
| 5.1 | Felder-Silverman Model of Learning Styles | 105 |
| 5.2 | Status of Science Instruction in the Classroom | 110 |
| 5.3 | Rationale of the Study | 111 |
| 5.4 | Statement of the Problem | 113 |
| 5.5 | Objectives of the Study | 113 |
| 5.6 | Operational Definitions of the Terms Used | 113 |
| 5.7 | Hypotheses | 114 |
| 5.8 | Delimitations of the Study | 114 |
| 5.9 | Nature of the Study | 114 |
| 5.10 | Designing Instructional Strategies catering to the Learning Styles | 114 |
| 5.11 | Population and Sample | 115 |
| 5.12 | Tools | 115 |
| 5.13 | Data Collection | 128 |
| 5.14 | Data Analysis and Findings | 129 |
| 5.15 | Implications of the Study | 132 |
| 5.16 | Conclusion | 133 |
| 5.17 | Suggestions for Future Studies. | 134 |
| | BIBLIOGRAPHY | 135 |

LIST OF THE TABLES

| | | |
|-----|---|----|
| 2.1 | Scoring Procedure(Keys) of ILS | 35 |
| 2.2 | Summary of Scoring Procedure(Keys) | 37 |
| 2.3 | Distribution of the Statements of SAS according to Components and Polarity | 41 |
| 2.4 | Summary of the Statements of SAS | 43 |
| 2.5 | Distribution of the Sample Considered for the Selection of the Statements | 44 |

| | | |
|------|--|-----|
| 2.6 | The 'Mean', 'SD' and 't Value' of the Statements of SAS | 47 |
| 2.7 | Marking Scheme of Achievement Test | 51 |
| 3.1 | Dimensions of Learning Styles and Teaching Styles | 55 |
| 3.2 | Content Analysis of the Selected Chapters of Std. VIII Science and Technology Textbook | 60 |
| 3.3 | Programme Planning | 64 |
| 4.1 | Distribution of Gender | 75 |
| 4.2 | Comparison of Tuition Status | 76 |
| 4.3 | Comparison of Parents Literacy in Science | 77 |
| 4.4 | Learning Styles Profile | 78 |
| 4.5 | Summary and Interpretation of Sensing and Intuitive Learning Styles | 81 |
| 4.6 | Summary and Interpretation of Visual and Verbal Learning Styles | 82 |
| 4.7 | Summary and Interpretation of Active and Reflective Learning Styles | 83 |
| 4.8 | Summary and Interpretation of Sequential and Global Learning Styles | 84 |
| 4.9 | Achievement of Experimental group in Post Test and Marks of Science in Std. VII | 86 |
| 4.10 | Achievement of Control group in Post Test and Marks of Science in Std. VII | 89 |
| 4.11 | Summary of ANCOVA for Achievement on the Selected Topics in Std. VIII Science and Technology of the Experimental and Control group | 92 |
| 4.12 | Significance of Difference between the Adjusted Mean Scores of Experimental and Control group | 93 |
| 4.13 | Attitude Scores of Experimental group | 94 |
| 4.14 | Attitude Scores of Control group | 97 |
| 4.15 | Significance of Difference between Attitude Scores of Experimental group and Control group towards the Science Subject | 100 |

| | | |
|-----|---|-----|
| 5.1 | Distribution on the Components of ILS | 120 |
| 5.2 | Distribution of the Statements of SAS according to Components and Polarity | 124 |
| 5.3 | Summary of the Achievement Test | 127 |

LIST OF APPENDICES

| | | |
|------------|------------------------------------|-----|
| Appendix 1 | Forwarding Letter | 141 |
| Appendix 2 | Demographic Data Sheet | 142 |
| Appendix 3 | Learning Styles Inventory (ILS) | 143 |
| Appendix 4 | Answer sheet for ILS | 150 |
| Appendix 5 | Science Attitude Scale (SAS) | 152 |
| Appendix 6 | Achievement Test (Post Test) | 157 |
| Appendix 7 | Sessions Planning | 161 |
| Appendix 8 | List of the Experts for Validation | 203 |