

TABLE OF CONTENTS

List of Abbreviations	viii
List of Tables	ix-xi
List of Figures	xii-xiii
CHAPTER 1 : INTRODUCTION	1
1.1 School Education in India: A timeline	1
1.2 Significance of the present study: With reference to the NEP, 2020	4
1.3 Sikkim: The study area	6
1.4 School education in Sikkim	8
1.5 Brain hemispheric dominance	11
1.5.1 The Brain: Basic structure	11
1.5.2 Brain hemispheric dominance: Evolution, Meaning and Definitions	12
1.5.3 Synonyms of Brain hemispheric dominance	15
1.5.4 Brain dominance theory: Left brain vs Right brain	15
1.5.5 Why lateralization of functions?	17
1.5.6 Models based on Brain hemispheric dominance	17
1.5.6.1 McCarthy's 4MAT teaching style model	17
1.5.6.2 Herrmann's Whole brain model	19
1.5.7 Determination of Brain hemispheric dominance in the present study	20
1.6 Metacognitive awareness	20
1.6.1 The concept: Meaning and definitions	20
1.6.2 Metacognition v/s Cognition	23
1.6.3 Theoretical foundations on Metacognitive awareness	23
1.6.3.1 John Flavell's Model of Metacognition (1979)	23
1.6.3.2 Ann Lesley Brown's Model of Metacognition (1987)	25
1.6.3.3 Nelson and Naren's Model of Metacognition (1990)	27
1.6.3.4 Schraw and Dennison's model of Metacognitive Awareness (1994)	28
1.6.3.5 Efklide's components of metacognition (2006)	30
1.6.4 Determination of Metacognitive Awareness in the present study	30

1.7 Perceptual learning style preferences	31
1.7.1 What are learning styles?	31
1.7.2 Characteristics of learning styles	32
1.7.3 Perceptual learning styles: Meaning and definitions	34
1.7.3.1 Visual Learners	34
1.7.3.2 Auditory Learners	35
1.7.3.3 Kinesthetic Learners	35
1.7.4 Theoretical foundations on Perceptual learning styles	36
1.7.5 Determination of Perceptual learning style preferences in the present study	39
1.8 Significance of the present study	39
1.9 Statement of the problem	41
1.10 Rationale of the study	41
1.11 Objectives of the study	43
1.12 Hypotheses of the study	44
1.13 Operational definitions of the terms used	45
1.14 Delimitations of the study	46
1.15 Organization of the thesis	46
<i>CHAPTER 2 : REVIEW OF RELATED LITERATURE</i>	48
2.1 Studies on Brain hemispheric dominance and Academic achievement	48
2.1.1 Studies conducted in other countries	48
2.1.2 Studies conducted in India	57
2.2 Metacognitive awareness and Academic achievement	59
2.2.1 Studies conducted in other countries	59
2.2.2 Studies conducted in India	72
2.3 Perceptual learning style preferences and Academic achievement	74
2.3.1 Studies conducted in other countries	74
2.3.2 Studies conducted in India	82
2.4 Research gaps emerging from review of literature	83
<i>CHAPTER 3 : RESEARCH METHODOLOGY</i>	86
3.1 Research method adopted	86
3.2 Area of the study	86
3.3 Population of the study	87

3.4 Sample and Sampling technique	87
3.5 Research Instruments	92
3.5.1 Brain Dominance Inventory (BDI)	92
3.5.1.1 Internal consistency of the BDI	92
3.5.1.2 Test-Retest reliability	93
3.5.2 Metacognitive awareness inventory	93
3.5.2.1 Internal consistency of the MAI	94
3.5.2.2 Test-Retest reliability	96
3.5.3 Perceptual learning style preference scale for Biology students	96
3.5.3.1 Preparation of first draft of the scale	97
3.5.3.2 Face validity and Content validity of the scale	97
3.5.3.3 Preparation of final draft of the scale	97
3.5.3.4 First pilot testing	99
3.5.3.5 Internal consistency of the PLSPS	99
3.5.3.6 Test-Retest reliability	100
3.5.3.7 Exploratory Factor Analysis	101
3.5.4 Achievement test in Biology	102
3.5.4.1 Blueprint of the Achievement test	102
3.5.4.2 Development of preliminary draft	103
3.5.4.3 Face validity and Content validity of the test	103
3.5.4.4 First pilot testing	104
3.5.4.5 Discrimination index and Difficulty value of the items	104
3.5.4.6 Preparation of final draft of the test	106
3.5.4.7 Test-Retest reliability	108
3.6 Data collection procedure	108
3.7 Data analysis	108
<i>CHAPTER 4 : ANALYSIS AND INTERPRETATION</i>	<i>110</i>
4.1 Findings related to Objective 1	110
4.2 Findings related to Objective 2	126
4.3 Findings related to Objective 3	132
4.4 Findings related to Objective 4	138
4.5 Findings related to Objective 5	140
4.5.1 Assumptions of Regression Analysis	140
4.5.2 Hierarchical Regression Analysis	142

CHAPTER 5 : DISCUSSION OF THE FINDINGS	145
5.1 Discussion on the findings of Objective 1	145
5.2 Discussion on the findings of Objective 2	151
5.3 Discussion on the findings of Objective 3	157
5.4 Discussion on the findings of Objective 4	160
5.5 Discussion on the findings of Objective 5	163
CHAPTER 6 : SUMMARY AND CONCLUSION	167
6.1 Objectives of the study	167
6.2 Hypotheses of the study	168
6.3 Operational Definitions	169
6.4 Delimitations of the study	171
6.5 Research methodology	171
6.6 Major findings of the study	171
6.7 Educational implications of the study	174
6.8 Recommendations for further research	177
6.9 Conclusion	179
<i>Bibliography</i>	180
<i>Appendices</i>	214
Appendix-1	214
Appendix-2	215
Appendix-3	219
Appendix-4	222
Appendix-5	224

List of Abbreviations

4MAT	Four Modes Application Techniques
AA	Academic Achievement
AK	Auditory-Kinesthetic
AL	Auditory Learning
ANOVA	Analysis of Variance
AR	Abstract Random
AS	Abstract Sequential
BD	Brain Dominance
BDI	Brain Dominance Inventory
BHD	Brain Hemispheric Dominance
CBSE	Central Board of Secondary Education
CGPA	Cumulative Grade Points Average
DI	Discrimination Indices
DK	Declarative Knowledge
DV	Difficulty values
EFL	English as a Foreign Language
ESL	English as a Second Language
GPA	Grade Points Average
HRDD	Human Resource Development Department
ICT	Information and Communication Technology
ISC	Indian School Certificate
KL	Kinesthetic Learning
KMO	Kaiser-Meyer-Olkin
MA	Metacognitive Awareness
MK	Metacognitive Knowledge
MR	Metacognitive Regulation
MAI	Metacognitive Awareness Inventory
MORE	Model–Observe–Reflect–Explain
NCERT	National Council of Educational Research and Training
NCF	National Curriculum Framework
NEP	National Education Policy
NOS	Nature Of Science
NUEPA	National University of Educational Planning and Administration
PK	Procedural Knowledge
PLSPS	Perceptual Learning Style Preference Scale
POE	Predict–Observe–Elaborate
SPSS	Statistical Package for Social Sciences
STEM	Science, Technology, Engineering & Mathematics
TOEFL	Test Of English as a Foreign Language
VA	Visual-Auditory
VAK	Visual-Auditory-Kinesthetic
VARK	Visual-Auditory-Read-Kinesthetic
VIF	Variance inflation factor
VK	Visual-Kinesthetic
VL	Visual Learning