## TABLE OF CONTENTS

	Page
LEGITIMATION SHEET	i
BIOGRAPHY	ii
ABSTRACT	iii
PREFACE	iv
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	X
LIST OF APPENDIXES	xi
	B = B
CHAPTER I INTRODUCTION	
1.1 Background	1
1.2 Problem Identification	6
1.3 Problem Limitation	6
1.4 Problem Formulation	6
1.5 Research Objective	7
1.6 Research Benefit	7
CHAPTER II LITERATURE REVIEW	
2.1 Theoretical Framework	
2.1.1 Definition of Learning	8
2.1.2 Definition of Teaching	9
2.1.3 Phase of Physical Learning	10
2.1.4 Project Based Learning Model (PBL)	12
2.1.4.1 Definition of Project Based Learning Mode (PBL)	12
2.1.4.2 Characteristics of PBL Model	15
2.1.3.3 Learning Theoretical Basis of PBL	17
2.1.4.4 Steps in Project Based Learning	18
2.1.4.5 The Advantage of Using Project Based Learning	22
2.1.4.6 The Weakness of Project Based Learning	22
2.1.5 Critical Thinking Skill of Student	23
2.1.5.1 Definition of Critical Thinking	23
2.1.5.2 Core Critical Thinking Skills	25
2.1.5.3 PBL and Critical Thinking	30
2.1.6 Learning Material	33
2.1.6.1 Electric Current	33
2.1.6.2 Conventional and Electron Flow	33
2.1.6.3 Voltage Source	34
2.1.6.4 DC Current and AC Current	35
2.1.6.5 Resistivity	36
2.1.6.6 Electrical Resistance Circuit	38

2.1.6.7 Kirchhoff's Law	40
2.1.6.8 DC Voltmeters and Ammeters	40
2.1.6.9 Electric Energy and Electric Power	42
2.2 Conceptual Framework	42
2.3 Hypothesis	49
CHAPTER III METHOD OF RESEARCH	
3.1 Location and Time of Research	44
3.2 Population and Sample	44
3.3 Variable	44
3.4 Operational Definition	44
3.5 Types and Design of Research	45
3.5.1 Types of Research	45
3.5.2 Design of Research	46
3.6 Procedure of Research	46
3.7 Instrument of Research	50
3.8 Regulation of Instrument	52
3.8.1 Item Difficulty Level	52
3.8.2 Item Discrimination	53
3.8.3 Validity Test	54
3.8.4 Reliability Test	55
3.9 Technique of Data Analysis	56
3.9.1 N-gain Analysis	56
3.9.2 Normality Test	57
3.9.3 Homogeneity Test	57
3.9.4 Hypothesis Test	58
3.9.4.1 Mean Equality Test of Pretest	58
3.9.4.2 Mean Difference Test between Pretest	
and Posttest of Experiment	59
3.9.4.3 Mean Differences Test of Posttest	60
3.9.4.4 Mean Difference of N-gain	62
CHAPTER IV RESULT AND DISCUSSION	
4.1 Result of Research	63
4.1.1 Result of Critical Thinking of Student	63
4.1.2 Student Activity in Experiment Class	67
4.1.3 Normality and Homogeneity Test Result	68
4.1.4 Hypothesis Test Result	68
4.1.4.1 Mean Equality Test of Pretest	68
4.1.4.2 Mean Difference Test between Pretest	
and Posttest of Experiment	69
4.1.4.3 Mean Difference of Posttest and N-gain	69
4.2 Discussion	70
4.2.1 PBL and Critical Thinking of Student	70
4.2.2 PBL and Student Activity	74

5.1 Conclusion	LT AND DISCUSSION	77
5.2 Suggestion		77
REFERENCE		78