

## CONTENT

	<b>Page</b>
<b>SHEET OF LEGITIMATION.....</b>	<b>i</b>
<b>DECLARATION.....</b>	<b>ii</b>
<b>ABSTRACT.....</b>	<b>iii</b>
<b>PREFACE.....</b>	<b>v</b>
<b>ACKNOWLEDGEMENT.....</b>	<b>vi</b>
<b>CONTENTS.....</b>	<b>viii</b>
<b>LIST OF TABLES.....</b>	<b>x</b>
<b>LIST OF FIGURES.....</b>	<b>xii</b>
<b>LIST OF APPENDIX.....</b>	<b>xiii</b>
<b>CHAPTER I INTRODUCTION.....</b>	<b>1</b>
A. Background.....	1
B. Research Problem.....	4
C. Research Objectives.....	4
D. Research Benefit.....	4
E. Organization Structure of Research Paper.....	5
F. Limitation of Problem.....	6
<b>CHAPTER II LITERATURE REVIEW.....</b>	<b>7</b>
A. Inquiry based Laboratory Activity.....	7
B. Conceptual Understanding.....	10
C. Understanding about Nature of Science (NOS).....	13
D. Lights and Optics.....	16
<b>CHAPTER III RESEARCH METHODOLOGY.....</b>	<b>25</b>
A. Research Method and Research Design.....	25
B. Population and Sample.....	26
C. Assumption.....	26
D. Hypothesis.....	27

E. Operational Definition .....	27
F. Research Instrument.....	28
G. Instrument Development and Analysis .....	30
H. Instrument Development and Analysis Result.....	32
I. Data Analysis .....	34
J. Research Procedure.....	37
<b>CHAPTER IV RESULT AND DISCUSSION.....</b>	<b>44</b>
A. Students' Conceptual Mastery .....	44
B. Students' Understanding about NOS .....	52
<b>CHAPTER V RESEARCH METHODOLOGY.....</b>	<b>65</b>
A. Conclusion .....	65
B. Recommendation.....	65
<b>REFERENCE .....</b>	<b>67</b>
<b>APPENDIX .....</b>	<b>73</b>
<b>AUTOBIOGRAPHY .....</b>	<b>190</b>

## LIST OF TABLES

Table 2.1 Analysis of Core and Basic Competence on Lights and Optics .	16
Table 3.1 Pretest and Posttest Design .....	25
Table 3.2 The Percentage of Students' Gender.....	26
Table 3.3 The Blue Print of Objective Test Item before Revision .....	29
Table 3.4 The Recapitulation of Objective Test Analysis Result .....	33
Table 3.5 Blue Print of Objective Test after Analyzed.....	34
Table 3.6 The Summary of Observation Sheet .....	39
Table 4.1 The Recapitulation of Conceptual Mastery Statistic Result .....	45
Table 4.2 N-Gain for Each Cognitive Domain in Each Class.....	50
Table 4.3 The Recapitulation of Nature of Science Statistic Result.....	53
Table 4.4 The Score of Each Aspects of NOS in Each Class .....	57
Table 4.5 The Categorization Result of NOS .....	59

## LIST OF FIGURES

Figure 3.1 Research Flowchart of Research Procedure .....	43
Figure 4.1 The Posttest Score of Experiment and Control Class .....	47
Figure 4.2 N-Gain Comparison of Experiment and Control Class .....	48
Figure 4.3 Comparison of Pretest and Posttest Score in Each Topic .....	49
Figure 4.4 Comparison of Pretest and Posttest Score in Each Cognitive .....	51
Figure 4.5 N-Gain NOS Comparison of Experiment and Control Class .....	55
Figure 4.6 Comparison of Pretest and Posttest Score in Each Aspects .....	58

## LIST OF APPENDIX

Appendix A.1 Lesson Plan of Experiment and Control Class .....	75
Appendix A.2 Student Worksheet .....	92
Appendix B.1 Observation Sheet.....	107
Appendix B.2 SUSSI Questionnaire .....	126
Appendix B.3 Instrument Test before Validation .....	128
Appendix B.4 Instrument Test Validation Result .....	150
Appendix B.5 Instrument Test after Validation .....	158
Appendix C.1 Score Recapitulation of Conceptual Understanding.....	164
Appendix C.2 Score Recapitulation of NOS.....	174
Appendix C.3 Data Processing Result of Conceptual Understanding. ....	180
Appendix C.4 Data Processing Result of NOS.....	182
Appendix D.1 Documentation .....	185
Appendix D.2 Research Permission Letter .....	187
Appendix D.3 Instrument Judgement Form.....	188