

CONTENTS

Legitimation Sheet	i
Biography	ii
Abstract	iii
Preface	iv
Contents	vi
List of Table	ix
List of Figure	x
List of Appendices	xi
CHAPTER I :	
INTRODUCTION	
1.1 Background.....	1
1.2 Problem Identification	4
1.3 Limitation Problem.....	4
1.4 Formulation of Problem	5
1.5 Objective of Research	5
1.6 Benefit of Research	5
CHAPTER II :	
LITERATURE REVIEW	
2.1 Theoretical Framework	7
2.1.1 Definition of Learning	7
2.1.2 Learning Outcomes	7
2.2 Problem Based Learning	8
2.2.1 Definition of Problem Based Learning	8
2.2.2 Characteristics of problem-based learning	9
2.2.3 The purpose of problem-based learning	10
2.2.4 Stages of problem-based learning	10
2.2.5 Advantages of Problem Based Learning	12
2.2.6 Disadvantages of problem-based learning	12

2.3 Conventional model	12
2.3.1 work In Different Process Thermodynamics	13
2.3.2 The First Law of Thermodynamics and Type of Heat Gas	15
2.3.3 Second Law of Thermodynamics	17
2.4 Learning Experiment Material	18
2.5 Framework	19
2.6 Research Hypothesis	19

CHAPTER III :

RESEARCH METHOD

3.1 Research Location	20
3.2 Population and Sample Research	20
3.2.1 Population of Research	20
3.2.2 Sample of Research	20
3.3 Research Variable	20
3.3.1 Independent Variable	20
3.3.2 Dependent Variable	20
3.4 Type and Research Design	20
3.4.1 Type of Research	20
3.4.2 Design of Research	20
3.5 Research Instrument	21
3.5.1 Instrument of Students' Learning Outcome at Experiment	21
3.5.1.1 Instrument of Cognitive Domain	21
3.5.1.2 Instrument of Affective Domain	22
3.5.1.3 Instrument of Psychomotor Domain	24
3.5.2 Validity Test	27
3.6 Research Procedure	27
3.7 Data Analysis Techniques	28
3.7.1 Validity Test	28
3.7.2 Determine Average Value	29
3.7.3 Determine The Standard Deviation	29
3.7.4 Normality Test	29

3.7.5 Homogeneity Test	30
3.7.6 Hypothesis Test	30
3.7.7 Contributions Activity Against Student Learning Outcomes	31

CHAPTER IV :

RESULT OF RESEARCH

4.1 Result of Research	32
4.1.1 Description of Research Data	32
4.1.2 Testing Data Analysis	34
4.1.2.1 Average and Standard Deviation	34
4.1.2.2 Result of pretest data	35
4.1.2.3 Result of posttest data	35
4.2 Obsevation	36
4.3 Student's Affective Result	36
4.4 Hypothesis Results	37
4.5 Discussion	38

CHAPTER V :

CONCLUSION AND SUGGESTION

5.1 Conclusion	39
5.2 Suggestion	39

REFERENCES	40
-------------------------	----

