

TABLE OF CONTENT

APPROVAL SHEET	i
BIOGRAPHY	ii
ORIGINAL STATEMENT SHEET	iii
PUBLICATION APPROVAL SHEET	iv
ABSTRACT.....	v
PREFACE.....	vi
TABLE OF CONTENT.....	ix
LIST OF FIGURES	xii
LIST OF TABLES	xiii
LIST OF APPENDIX	xiv
CHAPTER I INTRODUCTION	1
1.1 Background of the Problem	1
1.2 Identification of Problem	5
1.3 Scope of Problem	6
1.4 Problem of Limitation	6
1.5 Problem Formulation	6
1.6 Research Purposes.....	6
1.7 Benefits of Research	7
CHAPTER II LITERATURE REVIEW.....	8
2.1 Project Based Learning (PjBL) Model.....	8
2.1.1 Defenition of PjBL Model.....	8
2.1.2 Characteristics of PjBL Model	8
2.1.3 Principles of PjBL Model.....	9
2.1.4 Advantages and Weakness of PjBL Model	10
2.1.5 PjBL Model Syntax	10
2.2 STEM (Science, Technology, Engineering, and Mathematics) Approach	12
2.2.1 Definition of STEM Approach.....	12
2.2.2 Characteristics of STEM Approach.....	13
2.2.3 Steps of STEM Approach.....	14
2.2.4 Advantages and Weakness of STEM Approach	15
2.3 PjBL Model with STEM Approach	15

2.3.1 Syntax of PjBL Model with STEM Approach	16
2.3.2 Strengths and Weaknesses of PjBL-STEM Model	17
2.4 Critical Thinking Skills	18
2.4.1 Definition of Critical Thinking Skills.....	18
2.4.2 Critical Thinking Indicators	18
2.5 Human Excretion System.....	19
2.5.1 Structure and Function of the Human Excretion System	20
2.5.2 Disorders of the Human Excretion System	25
2.5.3 Technologies to Treat Disorders of the Human Excretion System	26
2.6 Relevant Research.....	27
2.7 Framework of Thinking and Hypothesis.....	28
CHAPTER III RESEARCH METHODOLOGY	30
3.1 Research Location and Time.....	30
3.2 Types of Research	30
3.3 Population and Sample.....	30
3.4 Research Variable	31
3.5 Operational Definition	31
3.6 Research Design.....	32
3.7 Data Collection Techniques	32
3.7.1 Critical Thinking Skills Test	32
3.7.2 Interview	33
3.7.3 Observation.....	33
3.7.4 Documentation	33
3.8 Research Instruments	33
3.8.1 Critical Thinking Skills Test	33
3.9 Research Procedures	39
3.9.1 Preparing Stage.....	39
3.9.2 Implementation Stage.....	39
3.9.3 Final Stage	39
3.10 Data Analysis	41
3.10.1 Sample Feasibility Test (Pretest).....	41
3.10.2 Prerequisite Test	41
3.10.3 Hypothesis Test (Posttest)	42

3.10.4 Treatment Effect Size Test	42
CHAPTER IV RESULT AND DISCUSSION	44
4.1 Research Result	44
4.1.1 Research Result Descriptions	44
4.1.2 Pretest and Posttest Data on Critical Thinking Skill	44
4.1.3 Data Analysis of Critical Thinking Skill	45
4.2 Discussion	49
4.2.1 The Effect of PJBL-STEM on Critical Thinking Skill	49
4.2.2 The Influence of (<i>Cohen's d Effect Size</i>) the PJBL-STEM Model on Students' Critical Thinking Skill	65
CHAPTER V CONCLUSION AND SUGGESTION	67
5.1 Conclusion	67
5.2 Suggestion	67
REFERENCES	68

