LIST OF CONTENTS

	Page
Ratification Sheet	i
Biography	ii
Abstract	iii
Acknowledgement	iv
List of Contents	vi
List of Tables	Х
List of Figures	xi
List of Appendix	xii
CHAPTER I INTRODUCTION	
1.1 Background	1
1.2 Identification of Problems	4
1.3 The Scope of Problems	5
1.4 The Problem of the Research	5
1.5 Research Objectives	5
1.6 Research Significances	5

CHAPTER II LITERATURE STUDY

2.1 Theoritical Framework	7
2.1.1 Teaching and Learning Concept	7
2.2 Problem-based Learning Model	8
2.2.1 Characteristics of Problem Based Learning	10
2.2.2 Comparison between Problem Based Learning and Other	
Learning Model	11

2.3 Direct Instruction	14
2.3.1 The Phases of Direct Instruction	15
2.4 Learning Media	17
2.5 Computer Based Media	19
2.5.1 Macromedia Flash	20
2.5.2 Virtual Laboratory	22
2.5.3 Virtual Laboratory in Chemistry	23
2.6 Description of Study Materials	24
2.6.1 Solubility and Solubility Product	24
2.6.1.1 Solubility Equilibria	25
2.6.1.2 Solubility Rules	27
2.6.1.3 Solubility Product	28
2.6.1.4 The Relationship Between K_{sp} And the Solubility of a Salt	30
2.6.1.5 The Role of the Ion Product (Q_{sp}) In Solubility	
Calculations	32
2.6.1.6 The Common-Ion Effect	36
2.7 Conceptual Framework	37
2.8 Hypothesis	38
CHAPTER III RESEARCH METHODOLOGY	
3.1 Overview of the Research	39
3.2 Research Location and Research Object	40
3.3 Population and Sample	41
3.4 Research Variable and Instrument	41
3.4.1 Research Variables	41
3.4.2 Research Instrument	42

3.5 Research Type and Procedures	44
3.5.1 Research Type	44
3.5.2 Research Procedures	44
3.6 Data Collection Technique	46
3.6.1 Validity of Test	47
3.6.2 Reliability of Test	47
3.6.3 Discrimination Index of Test	48
3.6.4 Level of Difficulty Test	49
3.7 Data Analysis	49
3.7.1 Normality Test	49
3.7.2 Homogeneity Test	50
3.7.3 Normalized Gain	50
3.7.4 Hypothesis Testing	50
3.8 Research Time Table	52

CHAPTER IV RESULTS AND DISCUSSION

4.1 Research Results	53
4.1.1 Data Analysis of Research Instrument	53
4.1.1.1 Validity of Test	53
4.1.1.2 Reliability of Test	53
4.1.1.3 Difficulty Index of Item Test	54
4.1.1.4 Discrimination Index of Test	54
4.1.1.5 Learning Media Validation	54
4.1.2 Data Description of Research Results	55
4.1.3. Data Analysis of Research Results	56
4.1.3.1 Normality Test	56

4.1.3.2. Homogeneity Test	58
4.1.3.3. Normalized Gain	59
4.1.3.4 Hypothesis Testing	60
4.2 Discussion	60
CHAPTER V CONCLUSION AND SUGGESTION	
5.1 Conclusion	63
5.2 Suggestion	63
REFERENCES	65

