TABLE OF CONTENT

DECLARATION OF ORIGINALITY ..... **iii**

THESIS PUBLICATION APPROVAL FOR ACADEMIC PURPOSE ..... **iv**

BIOGRAPHY ..... **v**

ABSTRACT ..... **vi**

PREFACE ..... **vii**

TABLE OF CONTENT ..... **ix**

LIST OF FIGURES ..... **xiii**

LIST OF TABLES ..... **xv**

LIST OF APPENDICES ..... **xvi**

CHAPTER I **1**

INTRODUCTION **1**

1.1. BACKGROUND **1**

1.2 PROBLEM IDENTIFICATION **8**

1.3. PROBLEM LIMITATION **8**

1.4. PROBLEM FORMULATION **9**

1.5. RESEARCH PURPOSE **9**

1.6. BENEFIT OF RESEARCH **9**

CHAPTER II **10**

LITERATURE REVIEW **10**

2.1 Learning Definition **10**

2.2. Definition of Learning Model **10**

2.3. Cooperative Learning Model **13**

2.3.1. Understanding the definition of Jigsaw Cooperative Learning Model 15
2.2.2. Characteristics of the Jigsaw Cooperative Learning Model 16
2.2.3. Syntax of the Jigsaw Cooperative Learning Model 16
2.2.4. Strength of Jigsaw Cooperative Learning Model 18
2.2.5. Weakness of the Jigsaw Cooperative Learning Model 19
2.2.6. The Implementation of the Jigsaw Cooperative Learning Model to Enhance Mathematical Communication Skills 19
2.3. Mathematics Communication Skills 21
2.3.1. Indicators of Mathematical Communication Skills 23
2.4 Mathematical Content: Cylinder, Cone and Sphere 27
2.5 Relevant Research 30
2.6 Conceptual Framework 32
2.7 Research Hypotheses 35
CHAPTER III 37
RESEARCH METHOD 37
3.1. Location and Time of the Study 37
3.2. Population and Sample 37
3.2.1. Population 37
3.2.2. Sample 37
3.3. Research Design and Variables 38
3.3.1. Research Design 38
3.3.2. Research Variables 39
3.4. Operational Definition 39
3.5 Data Collection Techniques 40
3.6. Research Instrument 40

3.6.1. Validity 43
3.6.2. Reliability 44
3.5.4 Difficulty Level 45
3.6 Research Procedure 45
3.8 Data Analysis Technique 48
3.8.1 Normality Test 48
3.8.2. Homogeneity Test 48
3.8.3. Hypothesis Testing 48
3.8.4. Normal Gain (N-Gain) 51
CHAPTER IV 52
RESEARCH RESULT AND DISCUSSION 52
4.1. Research Result 52
4.1.1. Instrument Analysis 52
4.1.1.1. Instrument Validity 52
4.1.1.2. Instrument Reliability 55
4.1.1.3. Instrument Difficulty Level 56
4.1.2. Research Data Analysis 56
4.1.2.1. Normality Tets 58
4.1.2.2. Homogeneity Test 59
4.1.2.3. Hypothesis Testing: T-test 59
5.2.3.4. N-Gain Result 61
4.2. Discussion 63
4.2.1. Result Analysis 63
4.2.2. The Influence Jigsaw Cooperative Learning Model on Students' Mathematical Communication Skills 65
4.2.3. Student Reflection 74

CHAPTER V 79

CLOSING 79

5.1. Conclusion 79

5.2. Suggestion 79

BIBLIOGRAPHY 81