

**THE USE OF CROSSWORD PUZZLE GAME AND
CLUSTERING TECHNIQUE ON EXTROVERT AND
INTROVERT STUDENTS' VOCABULARY SIZE**

(A Thesis)

**By
BAGUS ALGHANI**



**ENGLISH EDUCATION POSTGRADUATE STUDY PROGRAM
ARTS AND LANGUAGE EDUCATION DEPARTMENT
FACULTY OF TEACHER TRAINING AND EDUCATION
UNIVERSITY OF LAMPUNG
2017**

ABSTRACT

THE USE OF CROSSWORD PUZZLE GAME AND CLUSTERING TECHNIQUE ON EXTROVERT AND INTROVERT STUDENTS' VOCABULARY SIZE

By

Bagus Alghani

The objective of this research was to investigate the difference of vocabulary size between extrovert and introvert students who were taught through crossword puzzle game and clustering technique at the first year of SMA Negeri 1 Purbolingo in 2016/2017 academic year. The research took two classes in the school as the sample. In determining the sample, the classes were selected randomly by using lottery. The researcher used two classes as experimental classes. The samples were X MIA 3 and X MIA 4, which consisted of 36 students for each. The research used factorial design. Based on the findings of the data analysis, it could be drawn that there was an interaction between the techniques and the personalities in students' vocabulary size. In this case, the interpretation would be that the H_0 of no difference between the two techniques could be rejected. The techniques differed significantly with the students performing better in clustering technique. The H_0 of no difference for personality could also be rejected. Extroverts did better than introverts regardless of the techniques. Therefore, using crossword puzzle game and clustering technique was a perfect way for extrovert students to improve their vocabulary size since their score increased through those techniques.

**THE USE OF CROSSWORD PUZZLE GAME AND
CLUSTERING TECHNIQUE ON EXTROVERT AND
INTROVERT STUDENTS' VOCABULARY SIZE**

By

Bagus Alghani
1523042028

A Thesis

Submitted in a Partial Fulfillment of
The requirement for S-2 Degree



**ENGLISH EDUCATION POSTGRADUATE STUDY PROGRAM
LANGUAGE AND ARTS EDUCATION DEPARTMENT
FACULTY OF TEACHER TRAINING AND EDUCATION
UNIVERSITY OF LAMPUNG
2017**

Research Title : **THE USE OF CROSSWORD PUZZLE GAME AND CLUSTERING TECHNIQUE ON EXTROVERT AND INTROVERT STUDENTS' VOCABULARY SIZE**

Student's Name : **Bagus Alghani**

Student's Number : **1523042028**

Study Program : **Master in English Language Teaching**

Department : **Language and Arts Education**

Faculty : **Teacher Training and Education**

APPROVED BY
Advisory Committee

Advisor

Prof. Dr. Cucu Sutarsyah, M.A.
NIP 19570406 198603 1 002

Co-Advisor

Dr. Ari Nurweni, M.A.
NIP 19630302 198703 2 001

The Chairperson of
The Department of Language and Arts Education

Dr. Mulyanto Widodo, M.Pd.
NIP 19620203 198811 1 001

ADMITTED BY

1. Examination Committee

Chairperson : **Prof. Dr. Cucu Sutarsyah, M.A.**

Secretary : **Dr. Ari Nurweni, M.A.**

Examiners : I. **Ujang Suparman, M.A., Ph.D.**

II. **Mahpul, M.A., Ph.D.**

2. The Dean of Teacher Training and Education Faculty

Dr. Muhammad Fuad, M.Hum.

NIP. 19590722 198603 1 003

3. Director of Postgraduate Program

Prof. Dr. Sudjarwo, M.S.

NIP. 19530528 198103 1 002

4. Graduated on : January 17th, 2017

LEMBAR PERNYATAAN

Dengan ini saya menyatakan dengan sebenarnya bahwa:

1. Tesis dengan judul “The Use of Crossword Puzzle Game and Clustering Technique on Extrovert and Introvert Students’ Vocabulary Size” adalah hasil karya sendiri dan saya tidak melakukan penjiplakan atau pengutipan atas karya penulis lain dengan cara tidak sesuai tata etika ilmiah yang berlaku dalam masyarakat akademik atau yang disebut plagiatisme
2. Hal intelektual atas karya ilmiah ini diserahkan sepenuhnya kepada Universitas Lampung

Atas pernyataan ini, apabila dikemudian hari ternyata ditemukan adanya ketidakbenaran, saya bersedia menanggung akibat dan sanksi yang diberikan kepada saya, saya bersedia dan sanggup dituntut sesuai hukum yang berlaku.

Bandar lampung, 17 Januari 2017

Yang membuat pernyataan,



Bagus Alghani
NPM 1523042028

CURRICULUM VITAE

Bagus Alghani was born in Raman Utara on March 13rd, 1994. He is the oldest son of a lovely couple Drs. Bambang Udara and Dra. Dewi Asiah. He has one sister and one brother, Linda Mayasari and Dimas Trio Saputra.

He was enrolled at TK Aisiyah Taman Fajar, Purbolinggo in 1997. Then he was registered at elementary school in SDN 3 Tanjung Inten in 1999 and graduated in 2005. After that, he continued his study at SMPN 1 Purbolinggo and graduated in 2008. For the next step, he continued his study at SMAN 1 Purbolinggo and graduated in 2011. In the same year, he was admitted as the student of S1 English Department of the Teacher Training and Education Faculty (FKIP) in University of Lampung and graduated in 2015.

DEDICATION

All praises and gratitude are only to Alloh SWT, for the abundant mercy and blessing
to the writer,

I'd proudly dedicate this thesis to:

1. My beloved parents, Drs. Bambang Udara and Dra. Dewi Asiah
2. My beloved sister and brother, Linda Mayasari and Dimas Trio Saputra
3. My beloved spouse, Kurnia Anggraini
4. My fabulous friends of English Department
5. My almamater, University of Lampung

MOTTO

I am excited when someone beats me.

-The writer-

ACKNOWLEDGMENTS

All praises are only to Alloh SWT, the Almighty God, for the abundant mercy and blessing that enables the writer to finish his thesis. This thesis entitled “The Use of Crossword Puzzle Game and Clustering Technique on Extrovert and Introvert Students’ Vocabulary Size” is submitted as a compulsory fulfillment of the requirement for S-2 Degree at the Language and Arts Education Department of Teacher Training and Education Faculty of University of Lampung.

Gratitude and honor are addressed to all people who have helped the writer to complete this research. Since it is necessary to be known that this research will never have come into its existence without any supports, encouragements and assistances by several outstanding people and institutions, the writer would like to express his sincere gratitude and respect to:

1. Dr. Muhammad Fuad, M.Hum., as the dean of faculty of teacher training and education faculty who has supported and given his invaluable evaluations, comments, and suggestions during the completion of this thesis.
2. Prof. Sudjarwo M.S., as the director of post-graduate program of Lampung University for his contribution and attention.
3. Prof. Dr. Cucu Sutarsyah, M.A., as the first supervisor who has contributed and given his invaluable evaluations, comments, and suggestions during the completion of this thesis.
4. Dr. Ari Nurweni, M.A., as the second advisor, for her assistance, ideas, guidance and carefulness in correcting the writer’s thesis, and as the Chief of English Education Study Program and all lecturers of English Education Study Program who have contributed their guidance during the completion process until accomplishing this thesis.
5. Ujang Suparman, M.A., Ph.D., as the first examiner for his support encouragement, ideas, suggestion and in supporting the writer.
6. Mahpul, M.A., Ph.D., as the second examiner for his support encouragement, ideas, and suggestion.
7. Dr. Flora, M.Pd., as the Chief of English Education Postgraduate Study Program who has contributed her guidance during the completion process until accomplishing this thesis.
8. Dr. Mulyanto Widodo, M.Pd., as the chairperson of Language and Art Education Department for his contribution and attention.
9. Drs. Sutrisno, M.Si, as the Headmaster of SMAN 1 Purbolinggo for giving the writer permit to conduct the research.
10. The writer’s parents (Drs. Bambang Udara and Dra. Dewi Asiah), my sister (Linda Mayasari), and my brother (Dimas Trio Saputra) for their love, support, motivation, and prayer.

11. The writer's beloved spouse (Kurnia Anggraini), for her love, support, motivation, and prayer.
12. My friends, Irawati, Flory, Habibi, Habi, Fadli, and all of the members of ED 2015 and all my friends that I cannot mention one by one.

Finally, the writer believes that this thesis might be still far from perfect. There may be weakness in this research. Thus, comments and suggestions are always welcome for better research. Somehow, the writer hopes that this research can give a positive contribution to the educational development, the readers and those who want to accomplish further research.

Bandar Lampung, January 2017

The writer,

Bagus Alghani

LIST OF CONTENTS

	Page
ABSTRACT	i
CURRICULUM VITAE	iv
DEDICATION	v
MOTTO	vi
ACKNOWLEDGEMENTS	vii
LIST OF CONTENTS	ix
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF APPENDICES	xi
I. INTRODUCTION	1
1.1. Background of the Problems.....	1
1.2. Research Questions.....	9
1.3. Objectives of the Research.....	10
1.4. Uses.....	11
1.5. Scope.....	12
1.6. Definition of Terms.....	12
II. LITERATURE REVIEW	14
2.1. Concept of Vocabulary.....	14
2.1.1. Aspects of Vocabulary.....	15

2.1.2. Types of Vocabulary.....	16
2.2. Concept of Teaching Vocabulary.....	19
2.3. Concept of Crossword Puzzle Game.....	20
2.4. Concept of Clustering Technique.....	22
2.5. Characteristics of Introvert and Extrovert Personality.....	24
2.6. Advantages and Disadvantages of Crossword Puzzle Game	27
2.7. Advantages and Disadvantages of Clustering Technique.....	28
2.8. Teaching Vocabulary through Crossword Puzzle Game.....	29
2.9. Teaching Vocabulary through Clustering Technique.....	30
2.10. Theoretical Assumption.....	32
2.11. Hypothesis.....	34
III. METHOD.....	36
3.1. Research Design.....	36
3.2. Population and Sample.....	37
3.3. Normality Test.....	37
3.4. Homogeneity Test.....	38
3.5. Data Collecting Technique.....	38
3.5.1. Questionnaire.....	38
3.5.1.1. Validity of the Questionnaire.....	39
3.5.2. Vocabulary Size Test.....	41
3.5.2.1. Validity of the Vocabulary Size Test.....	41
3.5.2.2. Reliability of the Vocabulary Size Test.....	42

3.5.2.3. Level of Difficulty of the Vocabulary Size Test.....	44
3.5.2.4. Discrimination Power of the Vocabulary Size Test....	45
3.5.2.5. Scoring System of the Vocabulary Size Test.....	46
3.6. Research Procedure.....	47
3.7. Data Analysis.....	49
3.8. Hypothesis Testing.....	50
IV. RESULTS AND DISCUSSIONS.....	52
4.1. Interaction between the Techniques and Personality of the Students.....	52
4.1.1. The Result of Questionnaire of Personality Students.....	52
4.1.2. Result of Post Test.....	53
4.1.3. Improvement of Students' Vocabulary Size.....	57
4.2. Difference of Vocabulary Size between Introvert and Extrovert Students Using Crossword Puzzle Game.....	62
4.3. Difference of Vocabulary Size between Introvert and Extrovert Students Using Clustering Technique.....	63
4.4. Difference of Vocabulary Size of Introvert Students both in Crossword Puzzle Game and Clustering Technique.....	65
4.5. Difference of Vocabulary Size of Extrovert Students both in Crossword Puzzle Game and Clustering Technique.....	66
4.4. Discussions.....	68
4.4.1. Improvement of Students' Vocabulary Size.....	69
4.4.1.1. Improvement of Students' Vocabulary Size through Crossword Puzzle Game.....	69
4.4.1.2. Improvement of Students' Vocabulary Size through	

Clustering Technique.....	75
4.4.2. First Hypothesis Testing.....	78
4.4.3. Second Hypothesis Testing.....	79
4.4.4. Third Hypothesis Testing.....	80
4.4.5. Fourth Hypothesis Testing.....	81
4.4.6. Fifth Hypothesis Testing.....	83
V. CONCLUSION AND SUGGESTIONS.....	85
5.1. Conclusions.....	85
5.2. Suggestions.....	87
REFERENCES.....	89
APPENDICES.....	92

LIST OF TABLES

		Page
1	Table 2.1 Work Styles.....	27
2	Table 3.1 Research Design in Table.....	37
3	Table 3.2 Questionnaire to Measure Students' Personality of Introvert and Extrovert.....	39
4	Table 3.3 Table of Specification (Questionnaire).....	40
5	Table 3.4 The Number of Sample in Each Level of Vocabulary Test.....	42
6	Table 3.5 Discrimination Power of Vocabulary Size Try-out Test...	45
7	Table 4.1 Result of Vocabulary Size Test in Crossword Puzzle Game Class.....	54
8	Table 4.2 Result of Vocabulary Size Test in Clustering Technique Class.....	55
9	Table 4.3 Research Design Result.....	56
10	Table 4.4 Mean Scores of Pre-test and Post-test of Crossword Puzzle Game.....	57
11	Table 4.5 Result of Students' Vocabulary Size of Crossword Puzzle Game.....	58
12	Table 4.6 Mean Scores of Pre-test and Post-test of Clustering Technique.....	58
13	Table 4.7 Result of Students' Vocabulary Size of Clustering Technique.....	59
14	Table 4.8 Difference of Mean Score for Introvert and Extrovert Students Using Crossword Puzzle Game.....	62
15	Table 4.9 Result of Students' Vocabulary Size of	

	Crossword Puzzle Game.....	63
16	Table 4.10 Difference of Mean Score for Introvert and Extrovert Students Using Clustering Technique.....	64
17	Table 4.11 Result of Students' Vocabulary Size of Clustering Technique.....	64
18	Table 4.12 Difference of Mean Score for Introvert Students Using Crossword Puzzle Game and Clustering Technique.....	65
19	Table 4.13 Result of Introvert Students' Vocabulary Size of Crossword Puzzle Game and Clustering Technique.....	66
20	Table 4.14 Difference of Mean Score for Extrovert Students Using Crossword Puzzle Game and Clustering Technique.....	67
21	Table 4.15 Result of Introvert Students' Vocabulary Size of Crossword Puzzle Game and Clustering Technique.....	68
22	Table 4.16 Mean Scores of Pre-test and Post-test of Crossword Puzzle Game.....	69
23	Table 4.17 Mean Scores of Pre-test and Post-test of Clustering Technique.....	75

LIST OF FIGURES

		Page
1	Figure 2.1. The Example of Words Cluster.....	23
2	Figure 2.2. Types of Personality.....	25
3	Figure 4.1. Result of Students' Vocabulary Size Test in Crossword Puzzle Game Class.....	54
4	Figure 4.2. Result of Students' Vocabulary Size Test in Clustering Technique Class.....	54
5	Figure 4.3. Graph of Interaction between Techniques and Personalitiy in Vocabulary Size.....	60

LIST OF APPENDICES

Appendices	Page
Appendix I	Vocabulary Size Test..... 93
Appendix II	Lembar Jawaban Vocabulary Size Test..... 99
Appendix III	Key Answers of Vocabulary Size Test 100
Appendix IV	Questionnaire to Measure Students Personality..... 101
Appendix V	Lesson Plan..... 103
Appendix VI	Result of Students' Vocabulary Size 118
Appendix VII	Reliability of Vocabulary Size Test Try Out..... 126
Appendix VIII	The Computation of Reliability Vocabulary Size Test Try Out (X MIA 3)..... 128
Appendix IX	Discrimination Power of Vocabulary Size Test (Try Out)..... 129
Appendix X	Students' Personality..... 135
Appendix XI	Score of the Students..... 137
Appendix XII	Normality Test..... 145
Appendix XIII	Homogeneity Test.....146

I. INTRODUCTION

This chapter is concerned with the introduction of the research which deals with several points consisting of the background of the problems, research questions, objectives of the research, uses, scope and definition of terms as elaborated in the following sections.

1.1 Background of the Problems

The purpose of teaching English as a foreign language in Indonesia is to enable students to master the aspects of language, i.e., structure and vocabulary, in order to reach a high degree of competence in English. In relation to this, the most important aspect of language learning is vocabulary. Because it has complicated components to be mastered, such as meaning, form, and the use of the word itself, it also becomes an important thing to choose a good technique when a teacher teaches vocabulary in the class. As supported by Richards and Renandya (2002:255), vocabulary is a core component of language proficiency and provides much of the basis of how well learners speak, listen, and write. It points out that, without adequate knowledge of vocabulary, language learners are generally impeded in their academic activities. Tarigan (1984:2) states that the quality of one's language depends upon the quantity and quality of his or her knowledge of vocabulary, the richer one's vocabulary is the more one masters a language. Due

to that matter, vocabulary can be used as one of the best estimates of language proficiency at school. It is obviously true that vocabulary takes a crucial role in language learning process since vocabulary can support all of the four skills in language learning, i.e., speaking, listening, reading and writing.

In most cases (Namaghi & Malekpour, 2015:235), students fall short of professors' expectations and cannot fulfill the requirements of the courses because of their limited knowledge of vocabulary. Cheung (2004:6) highlights that vocabulary represents a serious dilemma for most EFL students and there is still debate on how students could learn vocabulary effectively. To overcome the problems mentioned, learners take a lot of time to develop their vocabulary. However, their efforts seem to be futile since they do not know how to master vocabulary. With reference to this matter, how students learn vocabulary effectively is a fundamental problem. In another word, to investigate how the students master vocabulary is also the primary reason to the interpretation of the discovery in vocabulary learning. Learning vocabulary in the foreign language requires the use of vocabulary teaching techniques which have been receiving much attention in the field of foreign language learning. Schmitt (2000) states that understanding of the nature and significance of vocabulary knowledge in a second language therefore needs to play a much more central role in the knowledge base of language teachers.

Over the past two decades, Lai (2005) affirms that vocabulary learning strategies have appeared to be of much concern in that the pressing need of building up a

repertoire of lexical words at hand is readily seen by L2 learners and vocabulary acquisition has revived to play a central role in the language classroom. Due to the paramount role of vocabulary mentioned above, it is important to find the effective ways to teach vocabulary. Consequently, it is the teacher's task to create and determine the technique that can be used to teach and improve students' vocabulary. The technique should be able to encourage and motivate them to learn. As affirmed by Serna & Ajour (2011), they state that the use of educational games can help to generate more positive feelings about the subject matter and to enhance learning outcome. The lesson is more easily digested by the students and they are involved in the activities directly because games give a pleasant variation in learning. Therefore, the researcher proposed two interesting techniques, i.e., crossword puzzle game and clustering technique.

One of the games for students studying English is crossword puzzle game. According to Orawiwanakul (2013:417), crossword puzzle is a puzzle filled in all the blank squares with letters that form words. The words are based on the clues provided, which can be complete sentences, phrases, or words. In addition to the process of students solving puzzles, Jaramillo, et al (2012:213) proposes that another important consideration is their involvement in the design process. It means that crossword puzzles can be used for teaching a specific subject especially since they can be adapted and tailored in limitless ways.

Talking about crossword puzzle, it is a part from the word "games", because crossword puzzle itself is a kind of games that can be used in language teaching.

As a kind of games, crossword puzzle has become a popular wordplay until nowadays. Wright, et al (1979:2) states that games have gained a new importance in language teaching and created contexts in which the language is very useful and meaningful. Games also provide one way of helping the learners to experience the language rather than merely study it.

By completing the crossword puzzle, the students try to find the new vocabularies and keep remember them. Besides, Bryant (2016:346) expounds different kinds of benefits for using crossword puzzles. Since it is fun, inexpensive, and easy way, it can quickly summarize and emphasize the important facts delivered during the lecture. Then, apart from motivating students' learning, Orawiwatnakul (2013:417) says that puzzles can help students to extend their vocabulary knowledge. Crosswords can be used to teach terminology, definitions, spelling, and pairing key concepts. It can also be easily made by the teacher and even the students themselves to encourage the use of dictionary and can be used for different types of classroom activities.

On the other hand, Baleghizadeh & Naeim (2011:12) proclaim that a good example of a meaningful technique, is "inference" or "guessing" techniques where learners are asked to infer, or at other time guess, the meaning of a certain word in a context, using any clues provided before or after that word in the context or even any other strategies (e.g. examining the root, prefixes, or suffixes) which might be helpful to arrive at the meaning of the unknown word or techniques that allows the students to find their own word to be learned. Teacher just leads them by using

a word as a core-word then asks the students to develop it based on their knowledge.

Clustering technique is a good way to turn a broad subject into a limited and more manageable way in teaching vocabulary. It is also called mapping, webbing, looping, or diagramming. It is another productive way to gather information for an essay in writing skill and also in teaching vocabulary. Clustering uses free association. Clustering is a prewriting technique used by writers to produce ideas. To cluster ideas, it begins with a blank sheet of paper. It starts by writing the topic in a circle in the middle of your paper. As set of related ideas, then write the ideas in smaller circles around the first circle. The related idea in each small circle may produce even more ideas, and therefore more circles, around it (Oshima, et al, 1999:48). Thus, a vocabulary cluster is an approach to learning words by associating them into different related groups (KhaliliSabet, 2015:209).

In addition, according to Fulwiler (2002:37), cluster starts by writing out a general topic area in the center of a sheet of paper and putting a circle around it. Then, it can be seen how many possibilities one can think of and cluster them around the central idea in smaller circles. It points out that the students can add a new word based on their own creativity as long as the word still has a relation with the central word. It is beneficial to see the relationship between details, in organizing information in an orderly fashion, and developing specific support for the main ideas.

A number of studies have been conducted in the past to investigate the usage of vocabulary teaching techniques (Arbainaya, 2012; Franklin, et al, 2003; Hapsari, 2013; Putra, 2012; Davis, et al, 2009; Tumanggor, 2013; Utami, 2014). Arbainaya (2012) found in her research, that the students' vocabulary achievement taught through clustering technique was significantly different from students who were taught through translation technique. As a result, the students could increase their vocabulary achievement to understand vocabulary through clustering technique. It is in line with Davis, et al's finding (2009:8), showing that crossword puzzle game affected the success of students' learning. The results of this study varied in how the use of crossword puzzles, when used as an exam review, affected the success of student learning. The students in one class showed improvement in their exam scores when given crossword puzzles to use for review, but only one exam pair out of two was shown to have significant difference. As Franklin, et al (2003:79) also stated that crossword puzzle game could significantly increase students' motivation and students' interest in the topic at hand. The results indicated that there was a positive response to the use of crossword puzzle, which may reflect the voluntary nature of the activity and that they may appeal to the more motivated students. Consequently, they considered crossword puzzles useful to their learning.

Putra's finding (2012) additionally proved that teaching vocabulary through crossword puzzle game was very effective, which game as one considered being able to give students great motivation. This is the same as Utami's finding (2014) at junior high school in Yogyakarta, which concluded that there were

improvements of students' vocabulary mastery. It could be seen from the result of the classroom observation that elicited the students' better performance of using vocabulary during the teaching and learning process.

On the other hand, Hapsari (2013:8) claimed that clustering technique was appropriate to increase students' vocabulary achievement. As the findings concluded that there was a significant increase on students' vocabulary achievement of real object, sport, and occupation after being taught through clustering technique. It was evidence that there was an improvement from the students' average score in pre-test to the post-test. Moreover, this technique was able to trigger students' background knowledge to help them memorize, recall, and use new vocabulary based on the situation they face. In Tumanggor's finding (2013:15), which the research was conducted for junior high school students, his research demonstrated that clustering technique could also improve students' vocabulary achievement and make them feel more enjoyable in learning vocabulary.

What works for one learner might not work for others. This fact is called individual differences that influence language acquisition in various instructional contexts. But, a teacher should not teach in abstracto, without taking into consideration differences in memory ability, preferred learning strategy, or even age, and visual or auditory capacities (Zimmerman & Schunk, 2003:75). Dealing with psychological factor, personality is the first facet of the intrinsic side. It is within a person that contributes in some way to one's success in language

learning. In this category, personality is the identification to identify individual differences. As mentioned by Eysenck (1981), it can be classified into two types, they are extroversion and introversion. Jung (1921:2) states that the introvert's attitude to the object is an abstracting one; at bottom, he is always facing the problem of how libido can be withdrawn from the object, as though an attempted ascendancy on the part of the object that must be continually frustrated. The extrovert, on the contrary, maintains a positive relation to the object. Thus, the researcher tries to look over which personality type is suitable for which technique, i.e., crossword puzzle game and clustering technique, in order for each personality type students can improve their vocabulary size.

Much of the research into vocabulary teaching has been aimed at determining the most effective vocabulary memorization techniques, developing taxonomies of strategy usage, and at identifying the vocabulary learning strategy (VLS) usage that distinguishes good and poor language learners. Nonetheless, little research has been aimed to find out the correlation between the vocabulary teaching techniques and students' vocabulary size within their personality in senior high school. As known that from all of the previous studies, they investigated vocabulary mastery, but, in this research, the researcher tried to see the students' vocabulary size. Since most of the teachers might not know the students' vocabulary size, in term of how many vocabularies the students have, it is better for them to recognize the students' vocabulary size as an assessment of the teaching learning process. Moreover, the primer reason is to investigate which one of the two techniques, crossword puzzle game and clustering technique, is suitable

for extrovert and introvert students. Because of that, from senior high school, it should be accentuated that it is vital to gain more insights into how senior high school students perceive the use of techniques to help them learn vocabulary.

Considering the individual differences, senior high school students might use different vocabulary teaching techniques. The appropriate vocabulary teaching technique selection affects the learning process to be acquired successfully. The effective techniques have an important role to make the learners get better achievement and better understanding about the vocabulary. With reference to the explanation above, it is essential to find teaching techniques that the students be easy to have a lot of vocabularies. Consequently, it can be assumed that different learners may employ different techniques in acquiring vocabulary and the difference of the techniques may influence their vocabulary size.

Based on the statements above, this study is employed to look into whether there is a significant difference between introvert and extrovert students' vocabulary size after being taught through crossword puzzle game and clustering technique. This research may give the information for teacher and also students about the techniques which are truly useful to assist vocabulary teaching for each individual in order to find the most effective vocabulary teaching technique for them.

1.2 Research Questions

Based on the background above, the problems arouse are:

1. Is there any interaction between the techniques and personality of students?

2. Is there any significant difference in vocabulary size of introvert and extrovert students who use crossword puzzle game?
3. Is there any significant difference in vocabulary size of introvert and extrovert students who use clustering technique?
4. Is there any significant difference in vocabulary size of introvert students taught through crossword puzzle game and clustering technique?
5. Is there any significant difference in vocabulary size of extrovert students taught through crossword puzzle game and clustering technique?

1.3 Objectives of the Research

Formulated from the research questions above, the objectives of this research are:

1. To find out whether there is an interaction between the techniques and personality of the students.
2. To find out whether there is a significant difference in vocabulary size of introvert and extrovert students who use crossword puzzle game.
3. To find out whether there is a significant difference in vocabulary size of introvert and extrovert students who use clustering technique.
4. To find out whether there is a significant difference in vocabulary size of introvert students taught through crossword puzzle game and clustering technique.
5. To find out whether there is a significant difference in vocabulary size of extrovert students taught through crossword puzzle game and clustering technique.

1.4 Uses

The researcher hopes that this research can be used theoretically and practically, in the field of :

a. Theoretically :

- 1) To strengthen and verify the previous theories dealing with vocabulary size between extrovert and introvert students who are taught through crossword puzzle game and clustering technique.
- 2) To be used as a reference for further research in relation to the relationship between vocabulary size, extrovert and introvert students, crossword puzzle game, and clustering technique.

b. Practically :

- 1) As information for teachers to raise their awareness concerning with their own learning and teaching techniques.
- 2) As guidance for teachers to publicize the empowering teaching techniques and help the learners do away with the techniques.
- 3) As information to help curriculum developers and syllabus designers improve the quality of their textbooks by accommodating learners' views.
- 4) As information for other researchers who are interested in the research related to this topic.

1.5 Scope

The problem of this research is particularly focused on investigating the difference of vocabulary size between extrovert and introvert students who are taught through crossword puzzle game and clustering technique. The participants of this study were the first grade students of SMAN 1 Purbolinggo in 2016/2017 academic year.

1.6 Definition of Terms

In order to specify the topic of the research, the researcher provides some definitions of terms related to the research. These are the definition of some terms which are related to this research :

- 1) **Vocabulary** is one of the basic terms to understand the language skills in English. It is a set of lexeme including a single word, compound word, and idiom that can be arranged for making up the language.
- 2) **Vocabulary size** is a number of words that a person knows.
- 3) **Crossword puzzle** is one of the games that uses some empty blocks to be filled in with a letter which makes a word based on the questions provided.
- 4) **Clustering technique** is a technique where the students produce words by doing free associated listing which is started with a core-word and followed with related words.
- 5) **Extrovert** is the extent to which a person has self esteem from other people.
- 6) **Introvert** is the extent to which a person derives a sense of wholeness apart from other people.

7) Interaction is the effect of two or more independent variables.

That was the introduction of this research. In this chapter, several points have been discussed consisting of the background of the problems, research questions, objectives of the research, uses, scope and definition of terms. Then, the next chapter discusses about the literature review of this research.

II. LITERATURE REVIEW

This chapter provides several points of theories and previous studies which should be reviewed, such as concept of vocabulary, aspects of vocabulary, types of vocabulary, concept of teaching vocabulary, concept of crossword puzzle game, concept of clustering technique, characteristics of introvert and extrovert personality, advantages and disadvantages of crossword puzzle game, advantages and disadvantages of clustering technique, teaching vocabulary through crossword puzzle game, teaching vocabulary through clustering technique, teaching procedure, theoretical assumption, and hypothesis. They are elaborated in the following sections.

2.1 Concept of Vocabulary

Every language in this world has a list of words. These words are used to express human feelings or ideas in oral and written form. Meanwhile, vocabulary can be considered as a set of words which is used in a context. As stated by Raphael (1985:2), vocabulary, broadly defined, is knowledge about words and word meanings. However, this definition is inadequate, as it sweeps over some important distinctions. First of all, words come in both oral and written forms, and the words typically used in speech are less precise and of a more limited variety than the words used in print. Every word has a specific meaning; both literal and

semantic meaning and people use suitable vocabularies to express their feeling or ideas in order to be understood by other people.

Schmitt (2000) verifies vocabulary and lexical units are at the core of learning and communication. No amount of grammatical or other type of linguistic knowledge can be employed in communication or discourse without the mediation of vocabulary. Indeed, vocabulary and lexical expressions can sustain a great deal of rudimentary communication without much support from other aspects of the language system. In light of vocabulary as one of the critical components in learning a language that should be mastered, someone is still able to communicate although other components are still needed. The interlocutor can understand the language even if he or she knows nothing about grammar. The language also tells us nothing if one knows nothing about vocabulary. It points out that that vocabulary contains more information than carried out by grammar.

A vocabulary usually develops with age, and serves as a useful and fundamental tool for communication and acquiring knowledge. According to Soukhanov (1980), vocabulary is the aggregate of words a person understands or uses. Therefore, vocabulary is a list of words which has meaning when it is used to construct a sentence to express ideas in a context.

2.1.1 Aspects of Vocabulary

The learner's vocabulary acquisition always grows along with learner's learning. Tarigan (1984:2) states that the quality of one's language depends upon the

quantity and quality of his or her knowledge of vocabulary, the richer one's vocabulary is the more one masters a language. Learning vocabulary is not only learning the word, but, learning vocabulary is more sophisticated about the word. As stated by Schmitt (2000), vocabulary is shown to include much more than knowledge of single words. It figures out that learning vocabulary is more complex than just learning the word. In addition, Thornbury (2002:15) affirms that knowing a word (vocabulary) means knowing about its form and meaning. To be more specific, there are some aspects of knowing a word :

1) Knowing the form

Knowing the form means knowing their grammatical contexts. It looks at how the suffixes and the prefixes work, such as *happiness* for the adding -ness for suffix and *improper* for prefix with the adding *im-*.

2) Knowing the meaning

Knowing the meaning about the word means knowing the meaning in sense relation. For instance the word *hiss* means to insult someone but it also refers to a noise made by a snake. Word meaning is also influenced by metaphors and idioms. For instance, idioms *keep in touch* which means stay having a connection.

2.1.2 Types of Vocabulary

One very important dimension of vocabulary knowledge is receptive vs. productive vocabulary knowledge. Receptive vocabulary knowledge refers to the ability to understand a word when it is heard or seen while productive knowledge

is the knowledge to produce a word when one writes or speaks. It is generally believed that words are known receptively first and only after intentional or incidental learning become available for productive use. Thus, vocabulary knowledge should be regarded as a continuum on which a word grows from receptive to productive status (Zhou, 2010:15). The types of vocabulary will be discussed below.

1. Receptive Vocabulary

Receptive vocabulary is learners' words that are generally understood when heard or read or seen. Receptive vocabulary is used passively in either listening or reading.

a) Listening vocabulary

A person's listening vocabulary is all the words he or she can recognize when listening to speech or communication. People may still understand words they are not exposed to before using clues such as tone, gesture, the topic of the discussion, and the social context of the conversation.

b) Reading vocabulary

A learned person's reading vocabulary is all the words he or she can identify when reading.

2. Productive vocabulary

Productive vocabulary refers to words which can be produced within an appropriate context and match the intended meaning of the speaker or signer.

Productive vocabulary is used actively either in speaking or writing.

a) Speaking vocabulary

Speaking vocabulary is every word that is used by people in speech. It is likely to be a subset of the listening vocabulary. Due to the spontaneous nature of speech, words are often misused. This misuse may be compensated by facial expressions, tone of voice, or hand gesture.

b) Writing vocabulary

Writing vocabulary is every word that is used in numerous forms of writing from formal essays to twitter feeds. Many written words do not commonly appear in speech.

Learning vocabulary is a process that leads a learner to master all the four skills, i.e., listening, speaking, reading, writing. To be good at a language, a learner should start learning the language by retaining receptive vocabulary first, then productive vocabulary. Going to be implemented in the classroom, teacher should understand how to make the students master all the types of vocabulary. Therefore, the choice of the techniques is badly needed in order for them not to go to the wrong steps, meaning that leading them to study receptive to productive vocabulary.

2.2 Concept of Teaching Vocabulary

Learning a foreign language especially English is very important because language can increase the capability of communication. Teaching vocabulary should be integrated since vocabulary takes a crucial role in language learning process since vocabulary can support all of the four skills in language learning, i.e., speaking, listening, reading and writing. Due to the paramount role of vocabulary, it is important to find the effective ways to teach vocabulary. Schmitt (2000) states that understanding of the nature and significance of vocabulary knowledge in a second language therefore needs to play a much more central role in the knowledge base of language teachers. Due to the paramount role of vocabulary mentioned above, it is important to find the effective ways to teach vocabulary. Consequently, it is the teacher's task to create and determine the technique that can be used to teach and improve students' vocabulary. The technique should be able to encourage and motivate them to learn. As affirmed by Serna & Ajor (2011), they state that the use of educational games can help to generate more positive feelings about the subject matter and to enhance learning outcome. Thus, the lesson is more easily digested by the students and they are involved in the activities directly because games give a pleasant variation in learning.

The appropriate vocabulary teaching technique selection affects the learning process to be acquired successfully. The effective techniques have an important role to make the learners get better achievement and better understanding about the vocabulary. With reference to this, it is essential to find teaching techniques

that the students be easy to have a lot of vocabularies. Consequently, as known that what works for one learner might not work for others, it can be assumed that different learners may employ different techniques in acquiring vocabulary and the difference of the techniques may influence their vocabulary size. Due to that matter, this study is employed to look into whether there is a significant difference between introvert and extrovert students' vocabulary size after being taught through crossword puzzle game and clustering technique.

2.3 Concept of Crossword Puzzle Game

Crossword puzzle has been proposed as one of the alternative games in teaching-learning. It is also very useful to improve cognitive skill. As proposed by Moursund (2007:8), he confirms that crossword puzzle is a popular puzzle game which in every case, the puzzle-solver's goal is to solve a particular mentally challenging problem or accomplish a particular mentally challenging task. Besides, Jaramillo, et al (2012:215) defines a crossword puzzle as a puzzle with developing knowledge of the related vocabulary accompanied by some capability to combine selected words with other words and acronyms. Synonyms or definitions of words are given with number corresponding to numbers in the squares. Letters/ words are fitted into a pattern of numbered squares to answer to clues. Instead of using only one type of crossword puzzle, actually there are variations of crossword puzzle that can be used and adjusted to the students' needs.

In relation to this technique, it is very effective and efficient to enhance students' vocabulary size. Jaramillo, et al (2012:217) claims that crossword puzzle is encouraging for those interested in employing a non-traditional teaching strategy for the purpose of improving learning and concept retention. So, it can be made out of the words which have been covered in the class. Using definitions and pictures, students can guess these words and place them in the designated boxes. Therefore, to retain a lot of vocabulary, students can rely on this interesting technique to improve their vocabulary size.

Moreover, Coticone (2013:33) proposes a type of crossword puzzle that is suitable for students. Students are asked to design their crossword puzzles in a period of the course offered. Students are provided study guides for each chapter that contain important terms and comparisons sections. These can be used to construct the "across" and "down" clues to solve the crossword puzzle. The result from his research verified that constructing crosswords contributes to a positive experience by allowing the students to better engage in the learning experience. In addition, multiple-choice questions using clues from the crossword puzzles are also incorporated into the final examinations. Therefore, self-made crossword puzzles offer a simple and creative way to incorporate active learning into a number of courses.

In such a way, sentences can become one of the best ways to help the students find out word meaning. It can be used as clues in crossword puzzle game. According to Johnson (2008:43), students use the context of the sentence or

paragraph to identify the missing or unknown word. He also adds contextual sentence types named cloze sentences. It is a sentence with one word missing. For very low level readers, it provides one letter clue. For instance, “At school I sit in my ____.” or “ At school I sit in my d ____.”

2.4 Concept of Clustering Technique

Clustering technique is a technique which is often used to elaborate a topic or an idea. This technique is actually adapted from mathematical concept. When using any form of clustering technique, the fundamental requirement is some ways to measure similarity or, conversely, distance between any two points. Brody (2005:12) adds that the clustering uses proximity relations rather than sentence structure, and the patterns they seek are of a specific nature – common phrases. Using a hierarchal clustering method could provide with more precise generalization, and suggested as a possible improvement.

With reference to this, Oshima & Hogue (1999:48) say that clustering is a prewriting technique used by writers to produce ideas. It starts by writing your topic in a circle in the middle of a paper. As of related ideas, write these ideas in smaller circles around the first circle. The related idea in each small circle may produce even more ideas, and therefore more circles, around it.

In language learning, clustering technique is used to make learners easier to memorize vocabulary. According to Fulwiler (2002:37), cluster starts by writing out a general topic area in the center of a sheet of paper and putting a circle

around it. Then, it can be seen how many possibilities one can think of and cluster them around the central idea in smaller circles. It points out that the students can add a new word based on their own creativity as long as the word still has a relation with the central word. The students effortlessly remember the word they add because they are actively included in thinking. Here is one of the examples of clustering word.

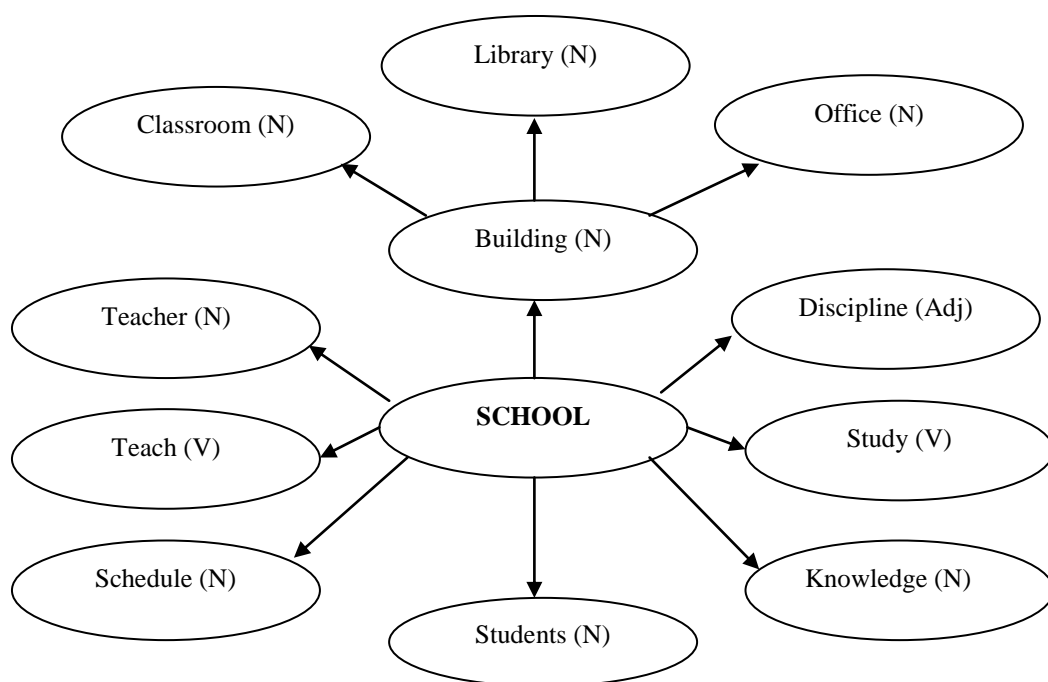


Figure 2.1 The Example of Word Cluster

From the diagram above, it can be seen that the core-word “school” has many related words, both physic and activity which exist in the school. Some words that have been mentioned above can be defined into three word classes, such as, noun (building, teacher, schedule, students, and knowledge), verb (teach and study) and adjective (discipline). In addition, the word “building” which has relation with the core-word “school” also can be a core word for related words which describe

more specific term from building, i.e., classroom, library, and office, which also still have relation with the main core-word “school”. These words can be used by the students to make a sentence. For example “The teacher teaches Physics to the students in the classroom”. So, the students can combine some words into a good sentence and it makes the students easier to understand the context of the word.

By using the words in the diagram, the students can make some sentences. For example “The school makes some rules to make the students discipline.”, “There are some kinds of building in my school such as, classroom, teacher, office, library, etc.”, and “The teacher teaches the students based on the schedule.” This sentence is easily made by the students because they understand the context of the sentences in order that they easily memorize it.

From the example above, it indicates that the students memorize a high number of vocabularies with only one word as a core to trigger the students to find out another word related to the core-word. It helps the students to be easier to memorize the vocabulary because they found it based on their own experience.

2.5 Characteristics of Introvert and Extrovert Personality

In case of social life, perhaps extrovert people are considered more desirable. Extroverts are more open with other and introverts usually keep themselves and sometimes difficult to open themselves. However, this does not necessarily signify that introverts tend to be least person to converse with, since they are bad people for instance. It is just the way they express themselves different from those

who are extrovert. Furthermore, Jung (1921:2) states that the introvert's attitude to the object is an abstracting one; at bottom, he is always facing the problem of how libido can be withdrawn from the object, as though an attempted ascendancy on the part of the object that must be continually frustrated. The extrovert, on the contrary, maintains a positive relation to the object.

In line with these terms, Eysenck (1981:8) divides individuals' personality through the classification of typology. Personality types can be divided into two types, i.e., extrovert and introvert. Each type has its own indication, such as sociality, activity, and expansiveness. Here are the types of personality depicted on the figure below:

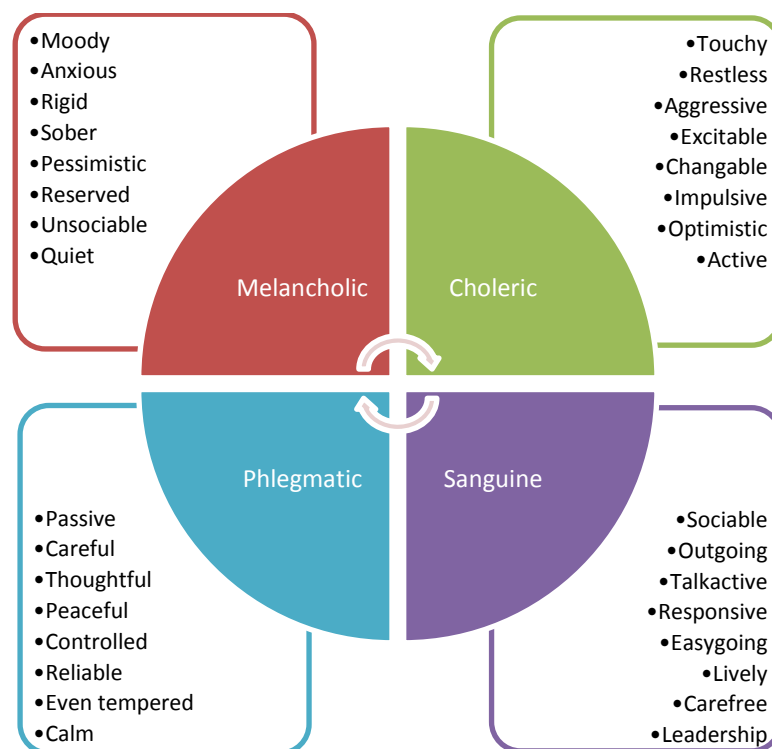


Figure. 2.2 Types of Personality (Eysenck, 1981)

The two dimensions, extroversion-introversion, and emotional stability-instability, define those four quadrants. These are made up of:

1. *Sanguine* is one of the types in extrovert people who have stable emotional, such as –sociable, outgoing, talkative, responsive, easygoing, lively, carefree, leadership.
2. *Choleric* is one of the types in extrovert people who have unstable emotional, such as –touchy, restless, excitable, changeable, impulsive.
3. *Phlegmatic* is one of the types in introvert people who have stable emotional, such as –calm, even-tempered, reliable, controlled, peaceful, thoughtful, careful, passive.
4. Melancholic is one of the types in introvert people who have unstable emotional, such as –quiet, reserved, unsociable, pessimistic, moody.

He also adds that a person belongs to one of these four groups; he cannot change his position, and there are no intermediate degrees. The type of personality may change from one pole to another. In order to see the personality of a person, one only needs to see the dominant type, whether the type is extrovert or introvert. Meanwhile, Burruss & Kaenzig (1999:4) claim that extroverts and introverts need different kinds of instruction. Therefore, the preference of the two techniques provided was investigated. The characteristics of extrovert and introvert personality can be seen from their style of work below (Burruss & Kaenzig, 1999:3).

Table 2.1 Work Styles

Extroverts	Introverts
<ol style="list-style-type: none"> 1. Are social - they need other people 2. Demonstrate high energy and noise 3. Communicate with excitement and enthusiasm with almost anyone in the vicinity 4. Draw energy from people; love parties 5. Are lonely and restless when not with people 6. Establish multiple fluid relationships 7. Engage in lots of activities and have many interest areas 8. Have many best friends and talk to them for long periods of time 9. Are interested in external events not internal ones 10. Share personal information 	<ol style="list-style-type: none"> 1. Are territorial - desire private space and time 2. Are happy to be alone - they can be lonely in a crowd 3. Become drained around large groups of people; dislike attending parties 4. Need time alone to recharge 5. Prefer to work on own rather than do group work 6. Act cautiously in meeting people 7. Are reserved, quiet and deliberate 8. Do not enjoy being the center of attention 9. Do not share private thoughts with just anyone 10. Form a few deep attachments

2.6 Advantages and Disadvantages of Crossword Puzzle Game

Crossword puzzle game is one of the interesting techniques for teaching vocabulary. As seen that the students need to think over before deciding the suitable word on the squares provided, it challenges the students to be cognitively trained, meaning that it can uphold their vocabulary size. Moursund (2007:8) sustains that it is understandable by solving crossword puzzle since it helps maintain and improve one's vocabulary, spelling skills, and knowledge of many miscellaneous tidbits of information. Moreover, answering crossword puzzles tends to contribute to one's self esteem. It also plays a role in their social interaction with other people when doing this kind of game. Students must be able to know and understand the terminology of a particular subject in order to solve a

related crossword puzzle. According to Jaramillo, et al (2012:214), crossword puzzles help students in language learning as follows:

1. Acquiring new vocabulary or terminology
2. Making differentiations between similar words
3. Correctly spelling terms
4. Practicing dictionary-search and/or pronunciation skills
5. Making inferences
6. Evaluating choices
7. Developing logical thinking
8. Drawing conclusions
9. An appeal to their individual learning styles

Crossword puzzle game is considered useful in teaching-learning because it can maintain and enrich students' vocabulary size. It is also helpful to improve their spelling knowledge of information, and encouraging for the use of dictionary. Additionally, it provides fun learning that can be used for different classroom management of students. On the other hand, crossword puzzle is the most difficult and time consuming to prepare. One thing that is uninteresting is a grid filled with letters, in which some words have to be found in it, because this game appeals solely to recognition and not to definition or memorization.

2.7 Advantages and Disadvantages of Clustering Technique

From the process of clustering, there are some advantages of using clustering technique. As stated by Baroudy (2008:7) that, clustering can be defined as a

prewriting technique that enables student-writer to choose an encircled nucleic topic around which whatever may be found in relationship with will be chosen to be jotted down in tree-branch like relationship. The student-writer can select the ones that can be found most crucial or potent enough to develop the topic he/she aims at. It can be used as an outline or list of sub-topics he/she wishes to cover as scaffolding that leads him/her to the issue he/she wants to focus on within the larger topic in preparing a cluster diagram. Therefore, it allows them to confirm the status of their understanding and determines where they have deficiencies in their potential knowledge.

Since it is one of the brainstorming techniques, it is also called as the natural way in developing the vocabulary. It is only the surface of technique in teaching vocabulary and not always a good technique when it is used to explore other skills.

2.8 Teaching Vocabulary through Crossword Puzzle Game

Crossword puzzle game has been one of the popular games in language teaching. As a kind of games, the use of crossword puzzle is interesting and challenging that gains more attention from the learners. This technique is learner-center and needs little intervention from the teacher. It is suitable for many different types/levels of learners, because, Bryant (2016:346) expounds different kinds of benefits for using crossword puzzles. Since it is fun, inexpensive, and easy way, it can quickly summarize and emphasize the important facts delivered during the lecture. In addition to the process of students solving puzzles, another important

consideration is their involvement in the design process. Crossword puzzles can be used for teaching a specific subject especially since they can be adapted and tailored in limitless ways (Jaramillo, et al, 2012:213).

In line with this technique, then, Orawiwatnakul (2013:417) says that puzzles can help students to extend their vocabulary knowledge. Crosswords can be used to teach terminology, definitions, spelling, and pairing key concepts. It can also be easily made by the teacher and even the students themselves to encourage the use of dictionary and can be used for different types of classroom activities. For example, when the students fill in the crossword puzzle in a group, each student contributes new vocabulary to each other. It proves that crossword puzzle is a facilitator to improve students' vocabulary size. The more the students do the exercises of crossword puzzle, the more they can memorize the vocabulary. It points out that this fitting technique can improve students' vocabulary size.

2.9 Teaching Vocabulary through Clustering Technique

Quite a few teachers use clustering technique to teach vocabulary although some suggest this is set up for writing skill. Everyone has different criteria to cluster their subject. Sometimes, the teacher clusters the word by categorizing it in different part of speech, such as verb, noun, adjective, and adverb. Other teachers might categorize the word based on the topic which is being discussed, from the general one to the more specific one, such as, sport that has relation with football, basketball, health, sweat, etc.

From the concept stated above, it is true that clustering is a strategy that can be used to generate a concept. This technique is very helpful for students who like to think in a visual way. Here are some steps to make a clustering (Oshima & Hogue, 1999:49):

1. Choose one of the topics, and write it in a large circle in the center of a piece of paper. Think about the topic for one or two minutes. Then write each new idea that comes into your mind in smaller circles around the large circle. Next, think about the idea in each smaller circle for one or two minutes. Write any new ideas in even smaller circles.
2. After you have finished, tell a classmate about your topic. Save your clustering paper. You will use it later to write a paragraph.

Furthermore, the application of clustering in teaching begins with a key word or central idea placed in the center of a page (or on the blackboard) around with the students (or teacher using students-generated suggestions) jots down in few minutes. All of the free associations triggered by the subject matter use simple words or short phrase. Unlike listing, the words or phrases generated are put on the page or board in a pattern which takes shape from the connections. It seems like new thoughts emerging. Clusters accomplished can look like spokes on a wheel or any other patterns of connected lines, depending on how the individual associations are drawn to relate each other. By having students shared their cluster patterns with other students in the class, the teacher allows the students to expose to a wide variety of approaches to the subject matter, which might further generate materials.

2.10 Theoretical Assumption

The researcher assumed that the two vocabulary teaching techniques were supportive for learners in learning English as foreign language, especially for vocabulary retention, because the success of learning a foreign language might depend on what and how teaching techniques were applied by teachers. A number of studies had been conducted in the past to investigate the usage of vocabulary teaching techniques (Arbainaya, 2012; Davis, et al, 2009; Franklin, et al, 2003; Hapsari, 2013; Putra, 2012;; Tumanggor, 2013; Utami, 2014). Davis, et al (2009:8) showed that crossword puzzle game affected the success of students' learning. The results of this study varied in how the use of crossword puzzles, when used as an exam review, affected the success of student learning. The students in one class showed improvement in their exam scores when given crossword puzzles to use for review, but only one exam pair out of two was shown to have significant difference. As Franklin, et al (2003:79) also stated that crossword puzzle game could significantly increase students' motivation and students' interest in the topic at hand. The results indicated that there was a positive response to the use of crossword puzzle, which may reflect the voluntary nature of the activity and that they may appeal to the more motivated students. Consequently, they considered that crossword puzzles were useful aids to their learning.

On the other side, Putra's finding (2012) additionally proved that teaching vocabulary through crossword puzzle game was very effective, which game as one considered being able to give students great motivation. This is the same as

Utami's finding (2014) at junior high school in Yogyakarta, which concluded that there were improvements of students' vocabulary mastery. It could be seen from the result of the classroom observation that elicited the students' better performance of using vocabulary during the teaching and learning process.

On the other hand, Arbainaya (2012) found in her research, that the students' vocabulary achievement taught through clustering technique was significantly different from students who were taught through translation technique. As a result, the students could increase their vocabulary achievement to understand vocabulary through clustering technique. It is in line with Hapsari's finding (2013), which claimed that clustering technique was appropriate to increase students' vocabulary achievement. As the findings concluded that there was a significant increase on students' vocabulary achievement of real object, sport, and occupation after being taught through clustering technique. It was evidence that there was an improvement from the students' average score in pre-test to the post-test. Moreover, this technique was able to trigger students' background knowledge to help them memorize, recall, and use new vocabulary based on the situation they face. In Tumanggor's finding (2013), which the research was conducted for junior high school students, his research demonstrated that clustering technique could also improve students' vocabulary achievement and make them feel more enjoyable in learning vocabulary.

From the previous studies above, it could be concluded that the two techniques could increase the students' vocabulary achievement. As was clearly

understandable, each student had individual differences. From the individual differences, the researcher felt that personality was an interesting aspect that held very essential role to hold up someone's success in learning a foreign language which similarly contributed whether the language component was acquired quickly or not.

Based on the assumption mentioned above, the researcher believed that one of the techniques between crossword puzzle game and clustering technique gave a good impact for students' understanding in learning vocabulary. It also made the students improve their vocabulary size within their personality. Besides, the techniques had different way to be used in teaching vocabulary in the classroom. Therefore, the writer assumed that one of the techniques was easier to teach vocabulary and improved their vocabulary size while other was more complicated between introvert and extrovert students.

2.11 Hypothesis

Concerning to the concept and theoretical assumption above, the researcher would like to formulate the hypotheses as follows :

- H₁: 1. There is an interaction between the techniques and personality of the students.
2. There is a significant difference in vocabulary size of introvert and extrovert students who use crossword puzzle game.
3. There is a significant difference in vocabulary size of introvert and extrovert students who use clustering technique.

4. There is a significant difference in vocabulary size of introvert students taught through crossword puzzle game and clustering technique.
5. There is a significant difference in vocabulary size of extrovert students taught through crossword puzzle game and clustering technique.

This chapter already discussed the literature review of this research which deals with several points of theories. The next chapter discusses about the method of this research.

III. METHOD

This chapter provides an overview of research design, population and sample, data collecting technique, validity of the instrument, reliability of the instrument, level of difficulty, discrimination power, scoring system, research procedure, data analysis, and hypothesis testing that were applied in this research.

3.1 Research Design

This research used quantitative approach. The design of this research was factorial design. According to Hatch & Lazaration (1991:369), factorial designs are those where more than one independent variable is involved in the design. Since factorial design was the most common way to study the effect of two or more independent variables and focused on the design that had only two independent variables that combined all levels of the other independent variables to produce all possible conditions, this research was suitable with this design. As seen that there were two independent variables from the techniques (crossword puzzle game and clustering technique) and it had an upshot to the levels (extrovert and introvert), this design was implemented.

In this research, the design included two variables and each variable had two levels. The independent variables were the techniques i.e. crossword puzzle game and clustering technique, and personality had two levels i.e introvert and extrovert personalities. This would be called a 2x2 (two-by-two) factorial design because

there were two independent variables, each of which had two levels.

One way to represent a factorial design is with a design table. The table below represents a 2x2 factorial design in which two independent variables are the type of the technique in teaching vocabulary (crossword puzzle game and clustering technique) and personality of the students (introvert and extrovert).

Table 3.1 Research Design in Table

Variable Technique (A) Variable Personality (B)		Techniques	
		Crossword Puzzle Game (A1)	Clustering Technique (A2)
Personality	Introvert (B1)	A1B1	A2B1
	Extrovert (B2)	A1B2	A2B2

3.2 Population and Sample

The population of this research was the first grade students at SMAN 1 Purbolingo in 2016/2017 academic year. The research took two classes in the school as the sample. In determining the sample, the class was selected randomly by using lottery. It was applied based on the consideration that every student in the population had the same chance to be chosen (Setiyadi, 2006: 39). The researcher used two classes as experimental class. The samples were X MIA 3 and X MIA 4 as experimental classes, which consisted of 36 students for each.

3.3 Normality Test

Normality test of the data was conducted to determine whether the sample in this research was normally distributed or not. The calculation used was One sample Kolmogorov-Sminov formula through SPSS. The results showed that crossword

puzzle game (introvert) 0.677, crossword puzzle game (extrovert) 0.990, clustering technique (introvert) 0.943, clustering technique (extrovert) 0.707 (See Appendix 12). It indicated that the data were normally distributed since the significance was higher than 0.05.

3.4 Homogeneity Test

This test was used to test the assumption that the variances were homogen. The test of the variances was implemented to determine the data significances. If the Sig. < 0.05, the data are not homogen and vice versa. The criterion is that H_0 is rejected if the value Sig. < 0.05 and accepted if the value Sig. > 0.05.

Based on the data obtained, the value of the homogeneity was 0.491 with probability value (Sig.) > 0.05 (See Appendix 13). It was clearly seen that the data were homogen, meaning that the requirement of Anova was fulfilled and could continue to the next analysis.

3.5 Data Collecting Technique

3.5.1 Questionnaire

After deciding the subject, the researcher gave the questionnaire to the sample. Questionnaire is an instrument which is very effective to measure aspects and variables associated with personality, psychology aspect or sociology (Setiyadi, 2006:54). In relation to the personality, the result of the students' answer in questionnaire separated them into introvert and extrovert students.

The questionnaire was in Indonesian in order to minimize the misinterpretation by the students which was adapted from Eysenck's theory (1981). The questionnaire

consisted of 30 items, 15 questionnaire items of introvert personality and 15 questionnaire items of extrovert personality. Questionnaire of introvert personality was at even number and extrovert questionnaire was at odd number. The questionnaire had 2 options that was “YES” or “NO” in each question. If the answer of the students were “yes” in introvert question, it indicated that the students had introvert personality, but if the answer were “no”, it proved that the students had extrovert personality and vice versa. If the answer of the students were “yes” in extrovert question, the students had extrovert personality. But if the answer were “no”, it showed that the students had introvert personality and vice versa.

By using the result of the questionnaire, the researcher classified the students into introvert and extrovert personalities. If the answer of the students in extrovert question were more than introvert question, then, it figured out that the students had extrovert personality. However, if the answer in introvert questions were more than extrovert questions, it was factual that the students had introvert personality. Therefore, all the five research questions were answered when getting accomplished of the classification.

3.5.1.1 Validity of the Questionnaire

The underlying theoretical construct in a test was concerned in this validity. The term “construct validity” refers to the overall construct or trait being measured (O’Neill, 2009:26). The term construct validity has been used both for correspondence at the element level and at the relation level (Brinberg & McGrath, 1985:115). If a test is supposed to be testing the construct of speaking, it should indeed be testing speaking, rather than listening, reading, writing, vocabulary, and grammar.

The validity of questionnaire was also measured to find if the components were suitable and related to the relevant theories of introvert and extrovert personalities. The questionnaire was in Indonesian in order to minimize the misinterpretation by the students adapted from Eysenck's theory (1981). The questionnaire consisted of 30 items, 15 questionnaire items of introvert personality and 15 questionnaire items of extrovert personality. Questionnaire of introvert personality was at even number and extrovert questionnaire was at odd number. The questionnaire had 2 options that was "YES" or "NO" in each question.

Table 3.2 The Questionnaire to Measure Students' Personality of Introvert and Extrovert

No	Level of Personality	Item Numbers	Total
1	Introvert	2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30	15 items
2	Extrovert	1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29	15 items

Table 3.3 Table of Specification (Questionnaire)

Items Number	Personality				Total Items	Percentage of Items
	Extrovert		Introvert			
	Sanguine	Choleric	Phlegmatic	Melancholic		
1, 3, 5, 7, 11, 13, 17, 21, 23	√				9	30%
9, 15, 19, 25, 29		√			5	18%
2, 4, 12, 16, 22, 27, 28, 30			√		8	24%
6, 8, 10, 14, 18, 20, 24, 26				√	8	28%

3.5.2 Vocabulary Size Test

The researcher gave the word-definition-matching format (WDMF) which was constructed by Sutarsyah (2006). The vocabulary test consisted of four levels and each level consisted of 40 items. This level was derived from word level (1st 1000 words, 2nd 1000 words, 3rd 1000 words) which was basically derived from the list of frequency word order of *General Service List* (GSL) and 800 words of University Word List (UWL). Thus, up to the 3rd level word levels consisted of 1000 base words and UWL consisted of 800 base words.

The scoring was based on the correct answer. One correct answer was scored 1 and the wrong answer was scored 0. The students' vocabulary size was gained by counting the number of correct answers to be divided by the number of items in every vocabulary level test. Then, it estimated the students' vocabulary population. At last, to get the final score, the total vocabulary size of the four levels was divided by 38, because the maximum vocabulary size for all levels is 3800. Consequently, after all the students had conducted the test, the result depicted their vocabulary size and answered all the research questions.

3.5.2.1 Validity of the Vocabulary Size Test

Validity refers to the extent to which the test measures and to what is intended to measure. A test can be considered to be valid if it can precisely measure the quality of the test. Content validity represents the correlation between the test and exact materials, in terms of construction. Its validity depends on a careful analysis of the language being tested and of the particular course objectives. The test should be so constructed as to contain a representative sample of the course, the relationship between the test items and the course objectives always being apparent (Heaton, 1975:160). In the case of semester test, of course, there are no test specifications, and the teachers may simply need to check the teaching

syllabus or the course textbook to see whether each item is appropriate for that examination.

Thus, WDMF was prepared with a balance proportion of the levels that were going to be used. The content validity was concerned whether the vocabulary size test was sufficiently representative for the test or not. Since the test of this research included some word lists based on the word frequency, the content validity of this test was achieved.

Construct validity deals with the extent to which the test is based on theory of the trait under consideration. The WDMF test was designed based on the frequency count that classified vocabulary levels and it was also used to make sure if learners of English had mastered the threshold level of vocabulary (Sutarsyah, 2006:193). The following table describes the construct validity of the test.

Table 3.4 The Number of Sample in Each Level of Vocabulary Test

Level	Population	Item	Proportion of item	Proportion of Sample
1 st 1.000	1.000	40	25%	4.0%
2 nd 1.000	1.000	40	25%	4.0%
3 rd 1.000	1.000	40	25%	4.0%
UWL	800	40	25%	5.0%
Total	3.800	160	100%	4.2%

3.5.2.2 Reliability of the Vocabulary Size Test

A test is called reliable if the score gained by the examiners is constant whenever and by whomever the test is conducted. According to Heaton (1975:162), reliability is a necessary characteristic of any good test. Also, reliability is of primary importance in the use of both public achievement and proficiency tests

and classroom test. A test would not be a good parameter unless the test is suitable or constant. To measure the reliability of the test, the researcher used the split-half method to find out the reliability of the vocabulary size test by dividing the number of the test items into two groups for each test, odd and even. Based on *Pearson Product Moment* formula, the formula could be seen as follows:

$$r = \frac{\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{\left[\Sigma X^2 - \frac{(\Sigma X)^2}{n}\right] \left[\Sigma Y^2 - \frac{(\Sigma Y)^2}{n}\right]}}$$

r = coefficient reliability between odd and even number

X = odd number

Y = even number

n = numbers of students who take part in the test

X^2 = square of X

Y^2 = square of Y

ΣX = total score of odd items

ΣY = total score of even items

(Arikunto, 2010:226)

After the reliability of the half test was calculated, the researcher used Spearman Brown's Prophecy formula to measure the reliability of the test as a whole as follows:

$$r_{tt} = \frac{2r_{AB}}{1 + r_{AB}}$$

r_{tt} = the reliability of the whole test

r_{AB} = the reliability of half test (Hatch and Lazarton, 1991:535)

After conducting the try-out test, the researcher used split-half method to estimate the reliability of the test to make sure whether the test was appropriate for testing or not. In using the split-half method, the researcher classified the test items into two similar parts (usually the odd- numbered items and the even-numbered items). By splitting the test into two similar parts, it was supposed as if the whole tests had been taken twice.

The calculation showed that the reliability coefficient of the test was 0.933 (See Appendix 8). It could be assumed that, this instrument had very high reliability and proper to be used in the research since the range of very high criteria in the criteria of reliability was 0.80 – 1.00. It was interpreted that the test could be used as an instrument to get the data for the research.

3.5.2.3 Level of Difficulty of the Vocabulary Size Test

Level of difficulty relates to how easy or difficult the particular item proved in the test. It is simply the proportion (or percentage) of students taking the test who answered the item correctly (Heaton, 1975:178). This value is generally reported as a proportion (rather than percentage), ranging from 0.0 to 1.0. A value of 0.0 would indicate that no one answered the item correctly. A value of 1.0 would indicate that everyone answered the item correctly. Since the vocabulary test was the measurement of how many vocabularies the students had, the level of difficulty of the test was not calculated. Due to the process of omitting the items if the test items are very easy or very difficult, the vocabulary size test has four stages, meaning that the upper the students do the stage, the more difficult the test is. Therefore, level of difficulty was not investigated.

3.5.2.4 Discrimination Power of the Vocabulary Size Test

Discrimination power refers to the extent to which the item can discriminate between the more knowledgeable from the less knowledgeable students. It tells that those students who performed well on the whole test tended to do well or badly on each item in the test (Heaton, 1975:179). The size of the discrimination index is informative about the relation of the item to the total domain of knowledge or ability, as represented by the total test score (Haladyna, 2004: 211). To calculate the discrimination power (DP) of the test items, the researcher used the following formula:

$$DP = \frac{U - L}{\frac{1}{2}N}$$

In which,

DP = Discrimination Power

U = the total of correct answer of the higher group

L = the total of correct answer of the lower group

N = total number of students (Heaton, 1975:180)

The criteria are:

0.40 - 1.00 = Satisfactory (accepted)

0.30 - 0.39 = No revision

0.20 - 0.29 = Needs revision

0.19 - 0.00 = Needs dropping

(Crocker & Algina, 1986: 315)

Based on the try out test analysis, the discrimination power of the vocabulary size test would be explained as follows. In the test, there were 125 satisfactory items,

and 35 no-revision items (See Appendix 9). The following table presents the distribution of discrimination power of this instrument.

Table 3.5 Discrimination Power of Vocabulary Size Try-out Test

Classification	Items	%
Satisfactory (accepted)	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,18,19,20,21,22,23,24,25,26,27,28,29,30,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,63,64,65,67,68,69,70,71,72,73,74,75,76,77,79,80,81,82,83,85,86,87,88,90,91,92,93,95,96,97,100,101,102,104,105,106,108,109,110,111,115,116,120,121,122,123,124,125,127,128,129,130,132,133,136,138,140,142,143,144,145,146,147,148,149,152,153,157,158,160	78%
No revision	17,62,66,78,84,86,87,89,94,95,98,99,103,104,107,112,113,114,118,119,126,131,134,135,137,139,141,150,151,154,156,159	22%
Need revision	-	0%
Need dropping	-	0%
Total	160 Items	100%

3.5.2.5 Scoring System of the Vocabulary Size Test

Since the purpose of the test was to measure students' vocabulary size, the scoring was based on the correct response, i.e., one correct answer was scored 1; one wrong answer was scored 0. As already explained, the students' vocabulary size was obtained by counting the number of correct answers to be divided by the number of items (sample) in every vocabulary level test. From this calculation, it found the proportion of correct answers. Then, it could also estimate the students' vocabulary size by multiplying it with the population; 1.000 words or each level with additional 800 words from UWL. For example, the WDMF test was used 40 items for every level. In order to know the students' vocabulary size in vocabulary level test, the students' score were computed by doing these activities:

- 1) Scoring the vocabulary test
- 2) Calculating the result of the vocabulary test

$$SS = \frac{\sum s}{SMPL} \times 1000$$

SMPL = Subject's Vocabulary size at a given level

SS = A subject's score on the Levels Test at the relevant level

$\sum s$ = Total students' vocabulary score

For instance, if a student can answer 20 items correctly in the first level (1st 1000 words), it proves that the student is estimated to have vocabulary of 500 words in the first level. That is by calculating the correct answer divided by 40 (sample), then multiplied by 1000.

For example : $\frac{20}{40} \times 1000 = 500$

Therefore, the students' vocabulary size is considered to have 500 words in the first 1000 word level, etc. To get the final score, the total vocabulary size of the four levels is divided by 38, because the maximum score for all levels would be 3800.

$$\frac{3800}{38} = 100$$

3.6 Research Procedure

There are some steps of the procedure in conducting the research :

- a) Determining the research question and determining the focus of the research. In order to determine the problem, the researcher read books and E-journals that were related to the topic.

- b) Determining the instruments

The researcher used the appropriate instruments in order to be able to collect

the data. The instruments were:

1. Questionnaire
2. Vocabulary Size Test

c) Finding the sample

The sample of this research was two classes of the first year students of SMAN 1 Purbolingo. The class was chosen randomly.

d) Trying out the instruments

Before distributing the instruments, the researcher conducted the try-out to the students first in order to guarantee the validity and reliability of the instruments.

e) Analyzing the result of the try-out test

After both the questionnaire and the vocabulary size test were administered, the researcher analyzed the validity and the reliability of the instruments.

f) Giving treatment

The two treatments by using crossword puzzle game in X MIA 3 class and clustering technique in X MIA 4 class in one month were employed. The treatments were conducted in one month and 90 minutes for each. The treatments were classroom activity applied through crossword puzzle game and clustering technique to improve their vocabulary size.

g) Scoring the data

The researcher counted the score of questionnaire and vocabulary size test.

h) Analyzing the data

The researcher in this step analyzed the tabulated data. The analysis was done by using SPSS 16.0 computer program. The researcher analyzed the data in this research using Independent Group T-Test and Two Way Anova. Independent Group T-Test was used to compare “*mean*” from two different groups and both of groups were taken in different situation. Two Way Anova was used if the research had two variables that were compared, and each variable had two levels or more. This analysis was used for the data retrieved through factorial design.

i) Conducting post-test

Post-test was conducted after the treatment. Post-test was conducted to find out whether there was a difference in students’ vocabulary size of introvert and extrovert personality after treatments. It was administered for about 45 minutes in the experimental classes.

3.7 Data Analysis

In the attempt to investigate the difference of crossword puzzle game and clustering technique between introvert and extrovert students, the researcher followed the following steps for analyzing the data.

- 1) Tabulating the score of the questionnaire and the vocabulary size test.
- 2) Analyzing the data

The tabulated data were analyzed using Independent Group T-Test and Two Way Anova. Independent Group T-Test was used to compare “*mean*” from two different groups and both of groups were taken in different situation. Two Way Anova was used if the research had two variables that were compared, and each

variable had two levels or more. This analysis was used for the data that were retrieved through factorial design. In this research, some analysis were done involving the analysis of these following steps :

- a) The reliability and validity of the questionnaire and the vocabulary size test.
- b) Discrimination power of the vocabulary size test.
- c) The difference of the questionnaire preferences based on personality.

3) Making inference

The researcher inferred the comparison of crossword puzzle game and clustering technique used by the first grade students of SMAN 1 Purbolinggo, based on students' vocabulary size within their personality to the result of the Independent Group T-Test statistical package.

3.8 Hypothesis Testing

The hypothesis testing was used to prove whether the hypothesis which was proposed in this research was accepted or not. In the effort to measure the hypotheses, Independent Group T-Test of SPSS 16.0 was implemented, considering that the data came from the same sample. The following are the hypotheses of this research :

H_0 : 1. There is no interaction between the techniques and personality of the students.

H_1 : 1. There is an interaction between the techniques and personality of the students.

H_0 : 2. There is no significant difference in vocabulary size of introvert and extrovert students who use crossword puzzle game.

H₁: 2. There is a significant difference in vocabulary size of introvert and extrovert students who use crossword puzzle game.

H₀: 3. There is no significant difference in vocabulary size of introvert and extrovert students who use clustering technique.

H₁: 3. There is a significant difference in vocabulary size of introvert and extrovert students who use clustering technique.

H₀: 4. There is no significant difference in vocabulary size of introvert students taught through crossword puzzle game and clustering technique.

H₁: 4. There is a significant difference in vocabulary size of introvert students taught through crossword puzzle game and clustering technique.

H₀: 5. There is no significant difference in vocabulary size of extrovert students taught through crossword puzzle game and clustering technique.

H₁: 5. There is a significant difference in vocabulary size of extrovert students taught through crossword puzzle game and clustering technique.

The hypotheses were analyzed by using Independent Group T-Test and Two Way Anova through Statistical Package for Social Science (SPSS) version 16 for window. The researcher used the level of significance 0.05 in which the hypothesis was approved if $\text{Sign} < \alpha$. It means that the probability of error in the hypothesis was only 5%.

This chapter had explained the overview of research design, population and sample, data collecting technique, validity of the instrument, reliability of the instrument, level of difficulty, discrimination power, scoring system, research procedure, data analysis, and hypothesis testing that were applied in this research.

V. CONCLUSIONS AND SUGGESTIONS

This chapter deals with conclusions and suggestions based on the results and discussions of the research.

5.1 Conclusions

Based on the findings of the data analysis, some conclusions could be drawn that there was an interaction between techniques and personality in students' vocabulary size at the first grade of SMAN 1 Purbolinggo. It means that the influence of both techniques could be picked out. Since extrovert students were very suitable with both techniques (crossword puzzle game & clustering technique), introvert students could not be considered that they were not good at both techniques. Given that introvert students' vocabulary size increased through both techniques, they were also suitable with both techniques. It points out that it could not be concluded that extrovert is appropriate in crossword puzzle game, and introvert is appropriate in clustering technique and vice versa. Actually, if there were an interaction, in fact, it would weaken the argument in favor of one of the techniques. Moreover, although it proved an interaction, the introvert and extrovert students' vocabulary size increased through both techniques.

In this case, the interpretation would be that the H_0 of no difference between the two techniques could be rejected. The techniques differed significantly with the students performing better in clustering technique. The H_0 of no difference for personality could also be rejected. Extroverts did better than introverts regardless of the techniques. Therefore, the crossword puzzle game and clustering technique are more useful for extrovert students than introvert students in improving students' vocabulary size.

In addition, there was a different vocabulary size between introvert and extrovert students who used crossword puzzle game (X MIA 3). Extroverts in crossword puzzle game had higher score than introverts. But, it does not mean that introvert students had negative effect in this technique. Moreover, both introvert and extrovert students' vocabulary size increased, it represents that the two types of personality had positive effect in their score. As a matter of fact, the difference was only in their vocabulary size, which the extroverts had higher vocabulary size than introverts. Consequently, crossword puzzle game is more effective for extrovert students than introvert students.

In clustering class (X MIA 4), the findings also showed that there was a different vocabulary size between introvert and extrovert students. It is clearly seen that introvert and extrovert students had different score in clustering technique, but, extrovert had positive effect in their vocabulary size. But, it does not mean that introvert students had negative effect in this technique. Moreover, both introvert and extrovert students' vocabulary size increased, meaning that the two types of

personality had positive effect in their vocabulary size. In fact, the difference was only in their vocabulary size, which the extroverts were higher than introverts. Due to that matter, clustering technique is more beneficial for extrovert students than introvert students.

Based on this research, in both classes, extrovert students had higher score in the post test. Since extrovert students had higher score in the post test than introvert students in crossword puzzle game and clustering technique, these techniques could be considered very valuable to be applied for the students who had extrovert personality.

5.2 Suggestions

In accordance with the findings and conclusions, some suggestions are proposed as follows:

1. For English teachers, crossword puzzle game and clustering technique are a part of vocabulary techniques presumed to help students overcome difficulties in increasing their vocabulary size. The teacher should give these techniques to his/her students based on their personality. As the findings showed that extrovert and introvert students' vocabulary increased through both techniques, it is recommended that the teachers should be aware of their personality that introvert and extrovert students are suitable for crossword puzzle game and clustering technique.
2. This research was limited by the use of whole class, small sample size, and short-time period. The result could not be universalized into all contexts of

situation since this result is probably compatible in certain field but not for others. Therefore, further research on vocabulary techniques should try to investigate with randomized subject, bigger sample size in longer-time period in order to get more reliable and valid on the result of the research. It is also suggested for further research to use more than one instrument such as, qualitative instruments. The researcher recommends further research of vocabulary size to conduct deep investigation on the process of vocabulary learning by adding more than two variables such as learning style, motivation, attitude towards English, and other factors.

REFERENCES

- Arbainaya, A. (2012). Increasing Students' Vocabulary Achievement Taught through Clustering Technique at SMP Negeri 1 Abung Semuli North Lampung. Script. Bandar Lampung: Lampung University.
- Arikunto, S. (2010). *Prosedur Penelitian Suatu Pendekatan Praktek*. Jakarta: Rineka Cipta.
- Ashraf, H.& Khosravani, M. (2014). Developing Critical Vocabulary Learning via Semantic Clustering. *International Journal of Foreign Language Teaching in the Islamic World*, Vol. 2, No. 2, 44-50.
- Babayemi, J.O & Akinsola, M.K. (2014). Effects of Crossword-Picture Puzzle Teaching Strategy and Mental Ability on Students' Achievement in Basic Science in Southwestern Nigeria. *Journal of Research & Method in Education (IOSR-JRME)*. Volume 4, Issue 4 Ver. III (Jul-Aug. 2014), PP 08-13.
- Baleghizadeh, S. & Naeim, M. Y. (2011). Enhancing Vocabulary Retention through Semantic Mapping: A Single-Subject Study. *The International Journal–Language Society and Culture*. <http://www.educ.utas.edu.au/users/tle/journal/>.
- Baroudy, I. (2008). A Procedural Approach to Process Theory of Writing: Pre-writing Techniques. *The International Journal of Language, Society and Culture*. Australia, University of Tasmania, Issue 24, pp. 1-10.
- Brinberg, D. & McGrath, J. E. (1985). *Validity and the Research Process*. Beverly Hills: Sage Publications.
- Brody, S. (2005). Cluster-Based Pattern Recognition in Natural Language Text. Thesis. Jerusalem: Hebrew University.
- Bryant, J. (2016). Crossword Puzzles – Entertaining tool to reinforce lecture content in undergraduate physiology teaching. *International Journal of Biomedical Research* 2016; 7(6): 346-349.
- Burruss, J. D. & Kaenzig, L. (1999). *Introversion: The Often Forgotten Factor Impacting the Gifted*. <http://cfge.wm.edu/documents/Introversion.html>
- Cheung, C. Y. (2004). The Effectiveness of Vocabulary Learning Strategies of Chinese Low Achievers. Thesis. Hong Kong: The University of Hong Kong.
- Coticone, S. (2013). Utility of Self-Made Crossword Puzzles as an Active Learning Method to Study Biochemistry in Undergraduate Education. *Journal of College Science Teaching*, 42(4), 38-42.
- Crocker, L., & Algina, J. (1986). *Introduction to Classical and Modern Test Theory*. New York: Holt, Rinehart and Winston.
- Davis, T.M, Shepherd, B, & Zwiefelhofer, T. (2009). Reviewing for Exams: Do Crossword Puzzles Help in the Success of Student Learning. *The Journal of Effective Teaching*, Vol. 9, No. 3, 4-10.

- Eysenck, H. J. (1981). *A Model for Personality*. New York: Springer-Verlag.
- Franklin, S., Peat, M. & Lewis, A. (2003). Non-Traditional Interventions to Stimulate Discussion: The Use of Games and Puzzles. *Journal of Biological Education*. 37(2), 76-82.
- Fulwiler, T. (2002). *College Writing a Personal Approach to Academic Writing*. NH: Boynton/ Cook Heinemann.
- Haladyna, T. M. (2004). *Developing and Validating Multiple-Choice Test Items-3rd ed*. New Jersey: Lawrence Erlbaum Associates.
- Hapsari, K. Y. (2013). Implementing Clustering Technique in Teaching Vocabulary. Script. Bandar Lampung: Lampung University.
- Hatch, E. & Lazaration, A. (1991). *The Research Manual: Design and Statistics for Applied Linguistics*. New York: Newburry House.
- Heaton, J. B. (1975). *Writing English Language Test*. London: Longman Group.
- Jaramillo, C. M. Z., Losada, B. M., & Fekula, M.J. (2012). Designing and Solving Crossword Puzzles: Examining Efficacy in A Classroom Exercise. *Developments in Business Simulation and Experiential Learning*, volume 39.
- Johnson, A. P. (2008). *Teaching Reading and Writing: A Guidebook for Tutoring and Remediating Students*. New York. Rowman & Littlefield Education.
- Jung, C. G. (1921). *Psychological Types*. Zürich: Rascher.
- KhaliliSabet, M. (2015). The Effect of Vocabulary Cluster on Iranian Intermediate EFL Learners' Vocabulary Achievement. *International Journal of Applied Linguistics & English Literature*, Vol. 4 No. 1.
- Lai, Y. (2005). Teaching Vocabulary Learning Strategies: Awareness, Beliefs, And Practices. A Survey of Taiwanese EFL Senior High School Teachers. Thesis. Taiwan: University of Essex.
- Marzban, A & Hadipour, R. (2012). Depth versus Breath of Vocabulary Knowledge: Assessing Their Roles in Iranian Intermediate EFL Students' Lexical Infering Success through Reading. *Procedia - Social and Behavioral Sciences* 46, 5296 – 5300
- Moursund, D. (2007). *Introduction to Using Games in Education: A Guide for Teachers and Parents*. Oregon. <http://pages.uoregon.edu/moursund/Books/Games/Games.pdf>
- Namaghi, S. A. & Malekpour, A. (2015). Vocabulary Learning Strategies from the Bottom-Up: A Grounded Theory. *The Reading Matrix: An International Online Journal*, Volume 15, Number 2.
- Njoroge, M.C, Ndung'u R.W. & Gathigia, M.G. (2013). The Use of Crossword Puzzles as a Vocabulary Learning Strategy: A Case of English as a Second Language in Kenyan Secondary Schools. *International Journal of Current Research Vol. 5, Issue, 02, pp.313-321, February, 2013*.
- Nurweni, A., & Read, J. (1999). The English Vocabulary Knowledge of Indonesian University Students. *English for Specific Purposes*, 18, 161-175.

- O'Neill, P. (2009). *A Guide to College Writing Assessment*. Logan: Utah State University Press.
- Orawiwnakul, W. (2013). Crossword Puzzles as a Learning Tool for Vocabulary Development. *Electronic Journal of Research in Educational Psychology*, vol. 11, núm. 30, pp. 413-428.
- Oshima, A. & Hogue, A. (1999). *Introduction to Academic Writing*. New York: Addison Wesley Longman.
- Putra, Y. A. (2012). Improving Students' Vocabulary Mastery through Crossword Puzzle Game at the Tenth Grade Students' of SMK Mathla'ul Anwar Cibuah in 2011/2012 Academic Year. Script. Banten: STKIP Setia Budhi Rangkasbitung.
- Raphael, T.E. (1985). *Vocabulary Teaching and Learning*. New York : McGraw-Hill.
- Richards, J. C. & Renandya. (2002). *Methodology in Language Teaching an Anthology of Current Practice*. The United States of America: Cambridge University press.
- Schmitt, N. (2000). *Vocabulary in Language Teaching*. USA: Cambridge University Press.
- Serna, I.M. & Ajor, J.F.P. (2011). Active learning: Creating Interactive Crossword Puzzles. *Paper presented at the International Conference on Education and New Learning Technologies*. Cartagena: Universidad Politécnica de Cartagena. p.1731-1738.
- Setiyadi, A. B. (2006). *Metode Penelitian Untuk Pengajaran Bahasa Asing Pendekatan Kuantitatif Dan Kualitatif*. Yogyakarta: Graha Ilmu.
- Soukhanov, A.H. (1980). *The American Heritage Dictionary*. Boston: The New Thesaurus.
- Surya, D. (2014). Improving Students' English Vocabulary Through Cluster Technique. Script. Jakarta: Syarif Hidayatullah State Islamic University.
- Sutarsyah, C. (2006). Word Definition Matching Format: A Vocabulary Level Test for EFL Learners. *Paper presented at the 51st TEFLIN International Conference*. Bandung, Indonesia.
- Tarigan, H. G. (1984). *Pengajaran Kosakata*. Bandung: Penerbit Angkasa.
- Thornbury, S. (2002) *How to Teach Vocabulary*. Harlow: Pearson.
- Tumanggor, L. Y. (2012). Improving Students' Achievement in Vocabulary through Clustering Technique. Script. Medan: State University of Medan.
- Utami, Y., S. (2014). Improving Students' Vocabulary Mastery Using Crossword Puzzles for Grade VII of SMP N 2 Srandakan in the Academic Year of 2013/2014. Thesis. Yogyakarta: Yogyakarta State University.
- Wright, A., Betteridge, D., & Buckby, M. (1979). *Games for Language Learning*. Third Edition. Cambridge: Cambridge University.
- Zhou, S. (2010). Comparing Receptive and Productive Academic Vocabulary Knowledge of Chinese EFL Learners. *Asian Social Science*. Vol. 6, No. 10.
- Zimmerman, B. J., & Schunk, D. H. (2003). *Educational psychology: A century of contributions*. Mahwah, NJ: Erlbaum.