A COMPARATIVE STUDY BETWEEN USING CROSSWORD PUZZLE AND MIND MAPPING STRATEGIES TOWARD VOCABULARY MASTERY AT GRADE VIII STUDENTS SMP NEGERI 5 PADANGSIDIMPUAN

A THESIS

Submitted to the State Institute for Islamic Studies Padangsidimpuan
a Partial Fulfillment of the Requirement for the Graduate
Degree of Education (S.Pd.) in English

Written By:

ZAINUDDIN HASIBUAN
Reg. No. 12 340 0040

ENGLISH EDUCATION PROGRAM

TARBIYAH AND TEACHER TRAINING FACULTY
STATE INSTITUTE FOR ISLAMIC STUDIES
PADANGSIDIMPUAN
2019

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LETTER OF AGREEMENT

Term : Munaqosyah
a.n. Zainuddin Hasibuan
Item : 7 (seven) exemplars

Padangsidimpuan, May 2019
To:
Dean Tarbiyah and
Teacher Training Faculty
In-
Padangsidimpuan

Assalamu'alaikum Wr.Wb.

After reading, studying and giving advice for necessary revision on thesis belongs to **Zainuddin Hasibuan**, entitled ***"A Comparative Study Between Using Crossword Puzzle and Mind Mapping Strategy Toward Students' Vocabulary Mastery at Grade VIII SMP Negeri 5 Padangsidimpuan"***, we approved that the thesis has been acceptable to complete the requirement to fulfill for the degree of Graduate of Education (S.Pd.) in English.

Therefore, we hope that the thesis will soon be examined in front of the Thesis Examiner Team of E. Dept. of Tarbiyah and Teacher Training Faculty IAIN Padangsidimpuan. Thank you.

Wassalamu'alaikum Wr.Wb.

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Thesis	**: A COMPARATIVE STUDY BETWEEN USING CROSSWORD PUZZLE AND MIND MAPPING STRATEGY TOWARD STUDENTS' VOCABULARY MASTERY AT GRADE VIII SMP NEGERI 5 PADANGSIDIMPUAN**
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Padangsidimpuan, 06 May 2019
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ABSTRACT

This research discussed about A Comparative Study Between Using Crossword Puzzle and Mind Mapping Strategy Toward Students' Vocabulary Mastery at Grade VIII SMP Negeri 5 Padangsidimpuan. The problems of this research were students were lack in remembering the meaning of words, students had lack motivation in learning vocabulary, and students did not have the suitable strategy in learning vocabulary. So that the students could not master in vocabulary.

The purposes of this research was to examine the students' vocabulary mastery before and after using Crossword Puzzle and Mind Mapping Strategies and examine whether there was significant difference between using crossword puzzle and mind mapping strategy toward students' vocabulary mastery at grade VIII SMP Negeri 5 Padangsidimpuan or not.

In order to achieve the purposes of this research, the researcher conducted experimental research. The population of this research was the eleventh grade of SMP Negeri 5 Padangsidimpuan, that consisted of 260 students. Then, the sample of the research was 2 experimental classes, the first experimental class by using crossword puzzle strategy (VIII-1), and the second experimental class by using mind mapping strategy (VIII-2). It was taken after conducting normality and homogeneity test. In collecting the data, researcher used test for measuring students' vocabulary mastery. In analyzing the data, the researcher used t-test formula.

Based on the result of the research, researcher showed the description of the data was found that the mean score of the first experimental class by using crossword puzzle strategy was higher than the second experimental class by using mind mapping strategy (73.4>67.3), and the score of t_{count} was higher than t_{table} (2.857>2.024). It means that the hypothesis alternative (H_a) was accepted. It was concluded that there was the significant difference between using crossword puzzle and mind mapping strategy toward students' vocabulary mastery at grade VIII SMP Negeri 5 Padangsidimpuan.

Keywords: Crossword Puzzle Strategy, Mind Mapping Strategy, Students' Vocabulary mastery

TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

LIST OF APPENDIXES

CHAPTER I

INTRODUCTION

A. Background of the Research

English is an International language. It is used by many people in the world. English has globalized in every part of the world and become a universal language because it is used by almost all countries, even in some countries have became the primary language. To master English, someone needs to have much vocabularies.

Vocabulary is the knowledge of meaning of words. Vocabulary is one of the language aspects that is very important for studying English beside the other components like grammar, structure, and pronunciation. Vocabulary plays an important role in learning foreign language. By having vocabulary well, students are easier to accept the teacher explanation. In communication, students who are rich in vocabulary will be successful in mastering skills; they are listening, speaking, reading and writing. On the other hand, the students who are poor in vocabulary will get trouble in those skills. In a class, most of the students are passive because they do not know a lot of vocabularies.

It means that the vocabulary plays an important role for the study in their field of study. The students who are less in vocabulary, will be difficult in understanding the text, unable to speak English, and difficult

to write their own idea. Here, vocabulary mastery is so important because it will carry the students in learning process.

There are so many efforts to enrich vocabulary, such as read many books, listen to radio, watch television, learn as much as possible words everyday, play word games, etc. The all efforts will help someone to enrich vocabulary.

In Indonesia, vocabulary mastery is still weak, especially in junior high school level. Students still have problems with the four language skills due to lack of vocabulary mastery.

It is caused by several factors, such as attitude, motivation, the influence of the environment, and teaching learning vocabulary strategy factor. It is difficult for them to develop their vocabulary because the students sometimes forget with the vocabulary materials that has been explained by the teacher.

Occasionally, in teaching learning process, the students are afraid to follow the teaching learning process of English because they do not understand about the meaning of English words. For avoiding the condition and to motivate the students in learning English, the teacher can use teaching aids to give different atmosphere in classroom situation that make the students love the subject. Mrs. Elmi Sartika Dewi Lubis said that the main problem that is faced by the students in junior high school in vocabulary mastery is the

students' interest.[1] To make students interest in learning English, especially in mastering vocabulary, the English teachers need to make the right strategies in teaching vocabulary.

At school, the teachers should know the way to build the interesting of the students. It becomes the teachers' responsibility to give them motivation by arranging the class situation to make an interesting teaching learning process by using interesting teaching vocabulary strategies.

There are many strategies can be applied by the teachers, such as semantic maps, word wizard, word detective, word connect, concept cube, crossword puzzle and mind mapping strategies. The researcher chose crossword puzzle and mind mapping strategies to be used because both of stategies use visuals remainder to make the students use the combination of their left and right brain, so it can help the students think perfectly, invite the students to learn relaxely in fun way, make the students enjoy the learning material, challenge the students to learn more. So, both of stategies are suitable way for increasing the students' motivation to memorize vocabularies in Junior High School. The strategies are very interesting to make the students master in vocabulary.

Based on the case, the researcher interests to compare crossword puzzle and mind mapping strategy toward students' vocabulary mastery. So,

[1] Elmi Sartika Dewi Lubis, *Private Interview,* English Teacher of SMP Negeri 5 Padangsidimpuan, (Padangsidimpuan, October 10th 2016, at: 10.00 a.m).

the reseacher wants to conduct a research by title: “A Comparative Study Between Using Crossword Puzzle and Mind Mapping Strategies Toward Vocabulary Mastery at Grade VIII Students SMP Negeri 5 Padangsidimpuan”.

B. Identification of the Problem

Vocabulary is the knowledge of meaning of words. So, Vocabulary as the basic of learning language is very important and should be achievable by the students. The students will have problem in learning English if they are lack in remembering the meaning of words.

To make the students be easier remembering the meaning of words, teachers need some strategies to help them. There are so many strategies that can be used by the teachers to teach vocabulary, such as semantic maps, word wizard, word detective, word connect, concept cube, crossword puzzle and mind mapping strategies. The all strategies will make the class be interesting, so it will make students be easier remembering the meaning of words.

C. Limitation of the Problem

Based on identification of the problem above, there are so many strategies that can be used by the teachers to teach vocabulary, such as semantic maps, word wizard, word detective, word connect, concept cube, crossword puzzle and mind mapping strategies. All of it aims to make the students easier to remember the meaning of words.

In this research, the reseacher just compared two strategies, those are using crossword puzzle and mind mapping strategies. Crossword puzzle strategy is a strategy in which words, guessed from their definitions, are fitted into a diagram of white and black squares. Mind mapping strategy is a strategy for graphically representing concepts.

The researcher chose crossword puzzle and mind mapping strategies because both of stategies are suitable way to increase the students' motivation to memorize vocabularies in Junior High School level. Both strategies help students to increase their interesting in learning English. It makes the students easier to remember the meaning of words. So, they master the vocabulary.

D. The Formulation of the Problems

The formulation of problems in this research are:

1. How is the result of teaching vocabulary by using crossword puzzle strategy at grade VIII students SMP Negeri 5 Padangsidimpuan?
2. How is the result of teaching vocabulary by using mind mapping strategy at grade VIII students SMP Negeri 5 Padangsidimpuan?
3. Is there a significant difference between using crossword puzzle and mind mapping strategy toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan?

E. The Purpose of the Research

Based on formulation of the problems above, this research is to compare between using crossword puzzle and mind mapping strategies toward students' vocabulary mastery. The purposes of this research can be formulated as follows:

1. To find out the result of teaching vocabulary by using crossword puzzle at grade VIII students SMP Negeri 5 Padangsidimpuan.
2. To find out the result of teaching vocabulary by mind mapping at grade VIII students SMP Negeri 5 Padangsidimpuan.
3. To find out the significant difference between using crossword puzzle and mind mapping strategy toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan.

F. Significances of the Research

The significances of the research are:

1. As an information for the headmaster, to develop support the teachers to do best way in teaching through this research.
2. As an information for English teachers, to give additional contribution to English teachers to develop language teaching strategy and the teachers are also able to improve the quality of teaching learning process.
3. For the Researchers, to get information and reference to do related research.

G. The Thesis Outline

The research is going to organize this research paper in order to make the reader easier to understand.

Chapter 1 consists of six parts. First, background of the problem explains about the researcher's reason why the researcher chooses this research's tittle. Second, identification of problem organized all of students' problems and teacher's problem inside. Third, limitation of problem is researcher's ways to focus this research. Fourth, formulation of problem is a question about students' vocabulary mastery. Fifth, purpose of research is about mission of research to find the better strategy between crossword puzzle and mind mapping strategy toward students' vocabulary mastery. Sixth, significances of research are an explanation about to whom the significances of research would be useful.

Chapter II consists of; first, theoretical description, which explains about concept of vocabulary mastery. Second, review related findings which talk about the other research which relate with this research. Third, conceptual framework is researcher thought about comparing between crossword puzzle and mind mapping strategy toward students' vocabulary mastery. Last, Hypothesis is temporary statement about the significant difference between crossword puzzle and mind mapping strategy toward students' vocabulary mastery.

Chapter III consists of; first, research methodology described about place and time of research where and when the research will be done. Second, method of research is about kinds of research. Third, population and sample is about amount of students as population and how to take the sample. Fourth, procedure of research is about planning before and after research is done. Fifth, instrument of collecting data is about how to make the instrument in valid, determined the difficult of level, and determined the difference capacity, determined of homogeneity and variant of sample and data analysis used to test the hypothesis.

Chapter IV consists of; first, description of the data and discussion which research present about the result of the research. Second, result of the hypothesis talks what the researcher will be found in the research.

Chapter V consists of; first, conclusion and suggestion which researcher answer formulation of the problem and hypothesis. Second, suggestion about problem solving which researcher found in this research.

CHAPTER II

LITERATURE REVIEW

A. Theoretical Description

1. Vocabulary

a. The Definition of Vocabulary

The basic element in English is vocabulary. The learners should master it firstly for mastering the four skills in English; listening, speaking, reading, and writing. According to Jack C. Richard and Willy a Renandya, "Vocabulary is a core component of language proficiency and provides much of the basis for how well learners listen, speak, read and write".[1] It means vocabulary is very important aspect in language. Someone can listen, speak, read, and write by using a language because they have had, known, and mastered much vocabularies.

According to Hornby, vocabulary is a person's knowledge about all the words using.[2] Vocabulary may be defined as the total number of words in a language and vocabulary is a list of words with their meanings.

[1] Jack C. Richard and Williy A. Renandya, *Methodology in Language Teaching and Anthology of Current Practice* (USA: Cambridge University Press, 2000), p. 255.

[2] A.S. Hornby, *Oxford Advance Learner's Dictionary* (New York: Oxford University Press, 2000), p. 1506.

Schmitt Broadly stated, “We must consider what we mean by vocabulary. The first idea that probably springs to mind is words, a formulation that is admirably adequate for the layperson”.[3] It means we should use the vocabulary in the right placement. We must know what we mean by using the vacobulary.

According to Elfrieda H. Hiebert and Michael L. Kamil, “vocabulary is the knowledge of meaning of words”.[4] The same thing is also delivered by Caroline T. Linse that Vocabulary is the individual’s knowledge about the collection of words. [5] It means that vocabulary is someone’s knowledge about words.

So it can be concluded that, vocabulary is someone’s knowledge about the words with the meaning of word itself that is used to master the skills in language such as listening, speaking, reading, and writing. Therefore, vocabulary is the core component of language.

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[3] Norbert Schmitt, *Vocabulary in Language Teaching* (Cambridge: Cambridge University Press, 2000), p. 1.

[4] Elfrieda H. Hiebert, and Michael L. Kamil, *Teaching and Learning Vocabulary: Bringing Research to Practice* (Jew Jersie: Lawrence Erlbaum Associates, 2005), p. 3.

[5] Caroline T. Linse, *Practical English Language Teaching: Young Learners* (New York: McGraw-Hill, 2005), p. 121.

b. Kinds of Vocabulary

According to Thombury in Harmer, there are two kinds of vocabulary, they are:

1) Receptive Vocabulary or Passive Vocabulary

Receptive vocabulary can be understood only through listening and reading. Someone doesn't need to know much about the receptive vocabulary because it is impossible for someone rarely uses the receptive vocabulary and it is impossible for someone to memorize all the vocabularies of a certain language but someone can understand the ideas of the utterance contextually not word by word.

2) Productive Vocabulary or Active Vocabulary

Productive vocabulary involves of knowing how to pronounce the word, how to write and spell it, how to use it in correct grammatical patterns along with the words that usually collocate with.[6]

Based on definition above, active vocabulary refers to the words that are used in speaking and writing, and passive vocabulary means the words that are used in reading and listening.

[6] Jeremy Harmer, *The Practical of English Language Teaching* (New York: Longman, 2000), p. 158-159.

According to Hatch and Brown, there are at least five kinds of vocabulary, they are:

1) Word Classes

Word classes are a group of words that have the same basic behavior. It is known well as parts of speech such as noun, adjective, pronoun, verb, adverb, preposition, conjunction, and interjection.

2) Word Families

Word families are groups of words that have a common feature or pattern. They have the same letter combinations, a similar sound, and they are a wonderful tool for those new to spelling. It clarifies about affix and the shift of word.

Example: play-plays-played = inflected

play-replay-playful = derivatives

3) Word Formation

Word formation is the creation of a new word. Word formation can denote either a state or a process, and it can be viewed either diachronically or synchronically. Example:

(1) Compounding = second-hand, word processor,

typeresearcher

(2) Blending = information + entertaiment = infotainment

(3) Clipping = electronic mail = email

Influenza = flu

4) Collocation

Collocation is a sequence of words or terms that co-occur more often than would be expected by chance. It can be called as two words usually found together. Example: this week, once more, once again, as well.

5) Homonyms

Homonyms are words which sound alike or are spelled alike, but have different meanings It has same form but different in meaning.

Example: well = sumur left = kiri

well = baik left = berangkat[7]

[7] Evelyn Hatch, Brown, and Cheryl, *Vocabulary, Semantic and Language Education* (Cambridge: Cambridge University Press, 1995), p. 181-243.

Based on the explanations above, the researcher just talks about word classes in this research. The reseacher focuses on noun only.

Noun is name of person, place, or things such as John, England, hotel, love, etc.[8] According to Jayanti, noun has eight kinds, they are:

1) Common Noun

Common Noun is words that are given to name people, things, and places. For example, girl, teacher, pen, book, town, hotel, etc.

2) Proper Noun

Proper noun is a name especially person, place, or things such as Morgan, Indonesia, Sihadabuan, Saturday, etc. It is usually begun with capital letter.

3) Concrete Noun

Concrete noun is a word for a physical object that can be perceived by sense, it can be seen, touch and smell the object. Such as table, moon, girl, boy.

[8] Gordon Winch, *The foundation Grammar Dictionary* (Australia: New Frontier Publishing, 2004), p. 26.

4) Abstract Noun

Abstract noun is a noun that refers to a thing that does not exist as a material object. Something in mind that can not be seen or touched like love, kindness, happiness, anger, etc.

5) Countable Noun

Countable noun is a noun that can be modified by a numeral and that occurs in both singular and plural forms. The name of a thing that can be counted or divided into singular or plural is called as countable noun such as student, plane, car, pencil, phone, etc.

6) Uncountable Noun

Uncountable noun is a noun with the syntactic property that any quantity of it is treated as an undifferentiated unit, rather than as something with discrete subsets. The name of a thing that cannot be counted or divided into singular or plural is called as uncountable noun such as money, ice, rice, coffee, life, gold, etc.

7) Material Noun

Material noun is the name of a material or substance out of which things are made. For example, gold, silver, iron, air, wood, etc.

8) Collective Noun

Collective noun is a noun that refers to a group of individuals. Collective noun is words for group people, animals, or things are called collective noun. Such as crowd, mob, team, herd etc. [9]

Based on definitions above, there are eight kinds of noun. In this research, the researcher focuses on noun especially animals, fruits, things in the classsroom, and things in the house as topics which can be classified as common noun.

c. Aspect of Vocabulary

There are three aspects to teach vocabulary. They are:

1) Meaning

The teacher should try to get the meaning to thr class without using translation. This is not preferable on the ground that translation may or may not provide the meaning of the word accurately and precisely. It is advocated as it enables the class to go without grasping the meaning of a word that they learned to pronounce rather than to depend upon the translation.

[9] Jayanthi Dakshina Murthy, *Contemporary English Grammar* (Delhi: Book Palace, 1998) p. 10-11.

2) Spelling

The students should know how to spell the word and how this differs from similary pronounced word.

3) Pronouncing

Pronouncing the word enables the students to remember it longer and identify it more readily when they hear or see it.[10]

Those are the main aspects that should be implemented in teaching vocabulary. The crossword puzzle and mind mapping strategies focus on meaning. So, the indicators of this research is for remembering the meaning of the word.

d. Advantages of Vocabulary

In language, vocabulary is very important to convey the idea, express desire and feelings; and to communicate with others. Vocabulary is one of the components which supports the speakers in communication, whenever we want to communicate with other people using a language.

Tarigan points out the importances of vocabulary in language is essential for successfull language use, because without an extensive someone will be unable to use structure and function that has learned for comprehesible communication. Someone uses

[10] Harmer, *How to Teach Vocabulary* (England: Series Editor. Education Limited, 2002), p. 34.

vocabulary to listen, speak, read, and write effectively.[11] So, the students must have much vocabularies for successful in language use.

Students learn vocabulary inderectly and directly. They can express their ideas and comprehend other people idea if they have good vocabulary mastery.

e. Material of the Vocabulary

In this research, to know the students' vocabulary mastery, the researcher uses noun as the topics of vocabulary. The researcher used multiple choices to know the students' vocabulary mastery. The topics of evaluation are:

1) Identify the animals
2) Identify the fruits
3) Identify things in the classroom
4) Identify things in the house[12]

2. Crossword Puzzle

a. The Definition of Crossword Puzzle

Crossword puzzle has been proposed as one of alternatives strategy in teaching-learning. Dhand defined a crossword puzzle as a puzzle with sets of squares to be filled in with words or numbers, one letter or number to each square. Synonyms or definitions of words

[11] H. G. Tarigan, *Pengajaran Kosakata* (Bandung: Aksara, 1985), p. 2.
[12] Tim Masmedia Buana Pustaka, *Experiencing English: English for Junior High School Students Year VIII* (Sidoarjo: PT. Masmedia Buana Pustaka, 2015), p. 7.

are given with number corresponding to numbers in the squares. Letters or words are fitted into a pattern of numbered squares in answer to clues.[13] So, crossword puzzle is a puzzle with sets of squares to be filled in with words or numbers, one letter or number to each square

According to Moursund crossword puzzle is a popular puzzle strategy which in every case, the puzzle-solver's goal is to solve a particular mentally challenging problem or accomplish a particular mentally challenging task.[14] So, crossword puzzle is a popular strategy which in every case.

Based on the statements above, crossword puzzle is a popular strategy that has sets of grids to be filled with words or letters. It has become one of alternative strategies in teaching-learning, including language learning.

b. Types of Crossword Puzzle

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. Dhand stated that, "crossword puzzle is a good way to teach vocabulary because the definitions of synonyms of the

[13] Harry Dhand, *Techniques of Teaching* (New Delhi: APH Publishing Corporation, 2008), p. 55.

[14] Dave Moursund, *Introduction to Using Games in Education: A Guide for Teachers and Parents* (Oregon, 2007), p. 8.

words are right there to provide reinforcement".[15] Puzzle 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.

Nation proposed a type of crossword puzzle that suitable for spoken activity, communicative crossword puzzle. He explained the instructions to do as follow:

1) the learners work in pairs.
2) They each have a crossword puzzle.
3) The puzzle has no clues, but learner A has half of the words written in and learner B has the other half.
4) They ask each other for the words missing from their version.
5) They are not allowed to say the words themselves or show their puzzles to each other, but they must give paraphrases of the words.
6) So A asks, "What is 5 down?"
7) B has to say something like "It is what you use to turn on or turn of the light.

[15] Harry Dhand, *Techniques of Teaching…*, p. 55.

8) It point gives overview the way communicative crossword puzzle strategy used during the teaching-learning process. [16]

Sentences also become one of ways to help the students find out word meaning. According to Johnson, "students use the context of the sentence or paragraph to identify the missing or unknown word". He also adds contextual sentence types are named cloze sentences.[17] It's a sentence with one word missing. For very low level readers, provide one letter clue. This types of sentences are also used in the crossword puzzle.

In conclusion, there are some types of crossword puzzle such as crossword puzzles with pictures or cloze sentences, and communicative crossword puzzles that can be developed to improve English teaching-learning process especially teaching-learning of vocabulary.

c. The Making Process of a Crossword Puzzle

In this era, there are so many online websites which provide crossword puzzle making facility. Some websites also provide instructions of how a crossword puzzle is made based on our needs.

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[16] I.S.P. Nation, *Teaching Vocabulary: Strategies and Techniques* (New York: Heinle Cengage Learning, 2008), p. 45.

[17] Andrew P. Johnson, *Teaching Reading and Writing: A Guidebook for Tutoring and Remediating Students (*New York: Rowman & Littlefield Education, 2008), p. 43.

June Preszler stated that there are 3 steps to make a crossword puzzle, they are:

1) Construct puzzles using graph paper and writing the terms across and down then drawing boxes around each of the letters.
2) Number the boxes at the beginning of each word in numerical order – both across and down.
3) List definitions alongside the grid according to the *across* words, then the *down words* are listed. [18]

Vega-Singer offered the making crossword puzzles, as follows:

1) Decide how hard the teacher would like to work to make her or his crossword puzzle. A simple crossword puzzle could have as few as 10 clues and answers that overlap in only one or two letters. A crossword puzzle that is more difficult to make will include multiple "across" and "down" clues that overlap partially or fully. (How difficult the puzzle is to do has more to do with the clues than with the size of the puzzle).
2) Start by writing the longest theme word in the middle of a piece of graph paper. Place the rest of the theme words into the grid vertically and horizontally, overlapping them wherever the letters match. If the teacher put two "across" words next to each other, every place the words touch must make "down" words as well. Number the first box for each word.
3) Review the grid to make sure it is as small as the teacher can make it and still fit the words in. Add a few short words that do not fit with the theme, to plump up the puzzle and fill in some of the blank spaces between theme words.
4) Outline your grid, and color all the empty spaces black. This is what the puzzle will look like when it has been completed. Carefully copy the grid (including the black

[18] June Preszler, *On Target: Strategies to Build student vocabularies* (Rapid city: Black Hills State University, 2006), p. 20.

spaces and the numbers, but without the letters) to a fresh sheet of graph paper.

5) Create the clues. Using the numbers in the puzzle, make two lists: one for "across" clues, and one for "down" clues. For the theme words, make sure the clues are personal enough for the recipient to understand. (For example, if the answer is "Nirvana," the clue could be "Your favorite band when you were in college.") For the filler words, use dictionary definitions if needed.
6) Check the puzzle again to make sure the clues match up with the correct numbers, and that there are the appropriate numbers of spaces for each answer before it is given to the intended recipient. There is nothing more frustrating than a puzzle that doesn't work. [19]

Maluniu also provided making crossword puzzles instructions. It will be explained below:

1) Decide on a crossword grid size

If someone using an online crossword puzzle maker or puzzle-making software, she/he may be restricted to a certain range of available sizes. If she/he is making puzzle by hand, she/he can make it any size she/ he want.

2) Create a list of words for the crossword puzzle

Usually she/ he will select words according to a theme had been chosen. That theme, or a clue to it, can then become the title of the puzzle. Examples of common themes include foreign

[19] Alexis Vega-Singer, "How to Make Cross Word Puzzle" (*http://www.ehow.com/how_5378056_make-cross-wordpuzzle.html#ixzz2t5TKKqeP*, accessed on December, 2nd 2016 retrieved at 02.45 p.m.).

places or languages, words from a certain time period, famous people and things in the house.

3) Lay the words out in a grid format.

4) Number the starting square for each word, starting in the upper-left corner of the puzzle

Divide the words by whether they run vertically or horizontally. For example, it's possible to have two words numbered "1"; 1 -Across and 1- Down.

5) Create a clue for every word that was included in the puzzle

Number the clues according to the corresponding word's place in the puzzle (e.g. 4-Across, 31-Down).List all the across clues together in ascending numerical order, and list all the Down clues together in ascending numerical order.

6) Create another copy of the crossword puzzle

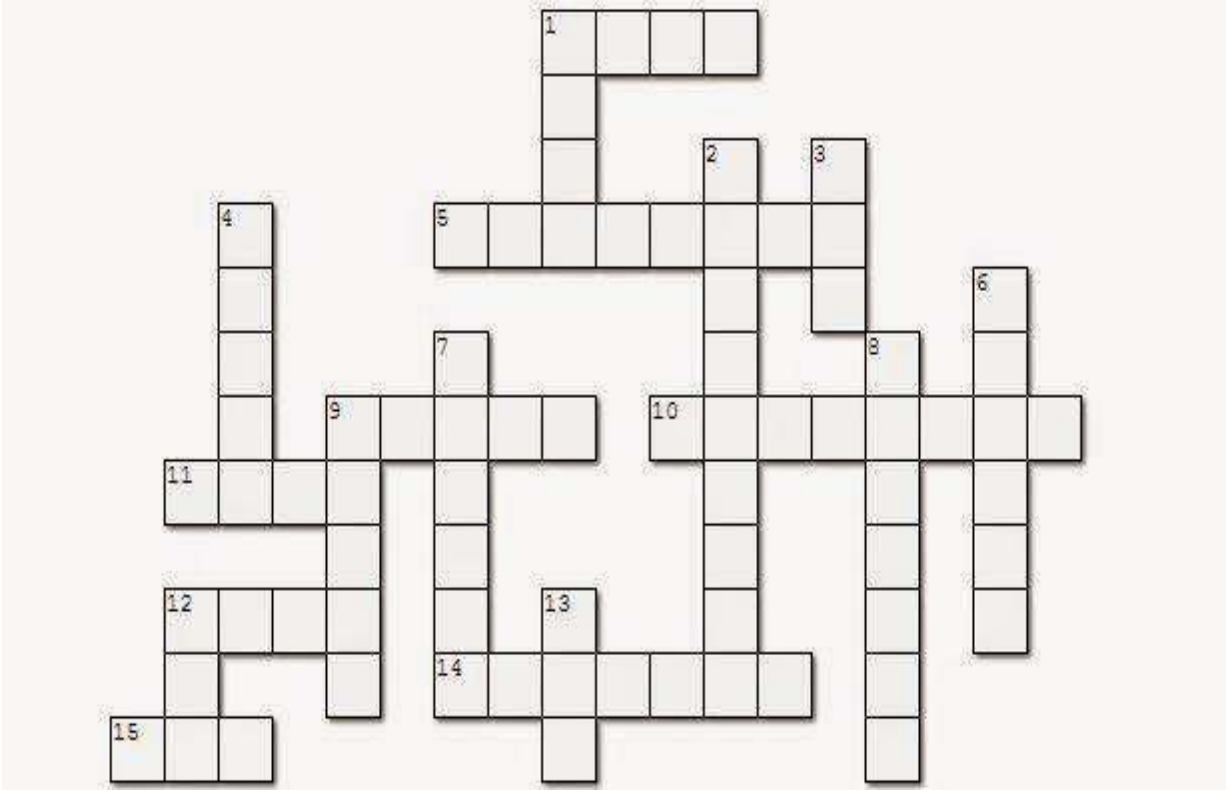
This time the starting square for each word should be numbered, but the squares themselves should be otherwise blank.

7) Set aside the filled-in puzzle for use as an answer key

8) Make enough copies of the blank puzzle and clue list to distribute[20]

[20] Maluniu, "How to Make Crossword Puzzles" (*http://www.wikihow.com/MakeCrossword-Puzzles*, accessed on December, 2nd 2016 retrieved at 03.00 p.m.).

Those guidelines help teacher to make the crossword puzzle appropriately and suitable for certain students. Below is an example of the crossword puzzle strategy.



Across

1. A baby sheep
5. The famous animal from Australia
9. A baby dog
10. An animal that gives dengue fever
11. The animal that lives in the hair or fur
12. An animal that always makes chirp
14. A male chicken
15. A female chicken

Down

1. The king of the jungle
2. An wild animal that lives in swamp and river
3. An animal that helps police

4. An animal that lives in desert
6. A baby cat
7. The animal that has eight legs
8. An animal that helps farmer to dig up fields
9. The famous animal from China
12. The animal that produces honey
13. An animal that produces milk[21]

Answers:

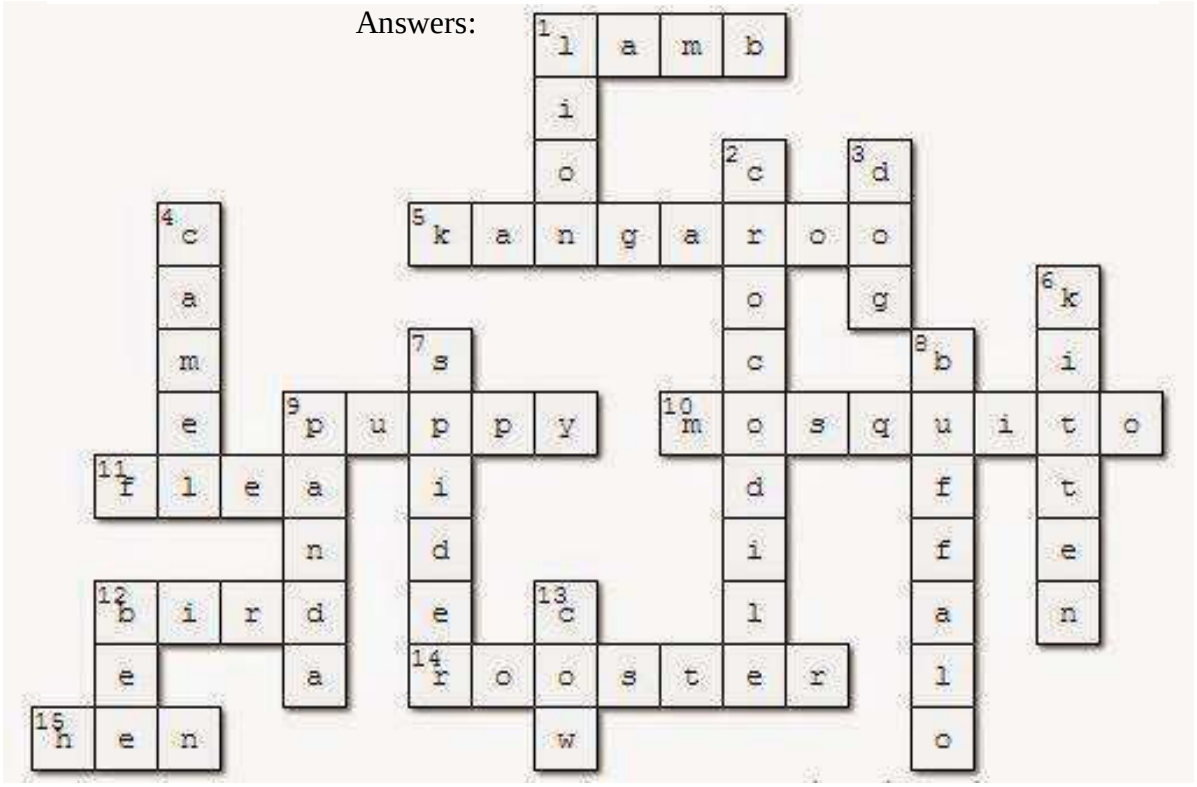


Figure 1. The example of crossword puzzle

[21] Maluniu, "How to Make Crossword Puzzles" (*http://www.wikihow.com/MakeCrossword-Puzzles*, accessed on December, 2nd 2016 retrieved at 03.00 p.m.).

d. The Advantages of Using Crossword Puzzle

Dhand explained how crossword puzzles help the students in learning, as follows:

1) Crossword puzzle is a good strategy to teach and enrich vocabulary because the definition or synonyms of the words are right there to provide reinforcement.
2) Crossword puzzle is motivating and challenging
3) Crossword puzzle provides language practice in the various skills-speaking, writing, listening and reading
4) Crossword puzzle can be used to encourage students to interact and communicate
5) Crossword puzzle creates a meaningful context for language use
6) Crossword puzzle can also be used to encourage the use of dictionary or thesaurus or to learn terminology used in a particular subject. They can be used as a quiz or review at the end of a unit/ chapter or a lesson.
7) Crossword Puzzle usually involves friendly competition and they keep students interested in learning the language
8) Crossword Puzzle Gives motivation to students learn and learn, but also a challenge

9) Crossword puzzles can be easily made by the teacher and presented to students. [22]

Additionally, crossword puzzles are available for different classroom management of students' activities. Hill and Popkin in Little proposed some options of procedural suggestions in using crossword puzzles, "they are usually to 1) have students to do the crosswords individually, or 2) have them do the same crossword in pairs, or small groups, with discussion of possible answers, or 3) have them do the puzzle as a whole-class activity".[23] So, the crossword puzzle can be used individually, pairs, or small group.

Crossword puzzle is considered useful in teaching-learning because it maintain someone's vocabulary. Moreover, it is helpful to enrich someone's vocabulary mastery. Additionally, it is useful to improve someone's spelling knowledge of information, and encouraging the use of dictionary. In term of classroom teaching-learning crossword puzzle provides fun learning that can be used for different classroom management of students.

[22] Harry Dhand, *Techniques of Teaching…*, p. 55.
[23] James Little, *What's a Nine Letter Word for "A Type of Word Puzzle"* ? (Canada, 1986), p. 78.

3. Mind Mapping

a. The Definition of Mind Mapping

Buzan stated that, "mind mapping is a creative note taking strategy in a visualization and graphic form that is used to make people feel easy in entering information into their brains, keeping information in a long term memory and taking it out from their brains easily by engaging imagination and association".[24] It uses the combination of left and right brain.

Windura stated that, "mind mapping has a work principle that is suitable with the natural work of the brain".[25] The recording of information through symbols, pictures, emotional meaning, and colors is exactly the same as how the human brain processes information. In nature, the brain tends to process information more easily in a picture form or image than in a verbal or spoken language.

Based on the defenitions above, the researcher takes five important concepts of the using of mind mapping strategy. They are:

1) Mind mapping is one of creative note taking strategy. It is a strategy that is used by people to represent ideas into

[24] T. Buzan, *How to Mind Map: Mind Map untuk Meningkatkan Kreativitas* (Jakarta: PT Gramedia Pustaka Utama, 2006), p. 6.

[25] S. Windura, *Mind Map Langkah demi Langkah* (Jakarta: PT Alex Media Komputindo, 2008), p. 17.

visualization and graphic forms where one idea is connected to another idea by using branches.

2) Mind mapping helps people to enter the information into their brains. By using mind mapping, it is easy for people to put information into their memory.

3) Mind mapping helps people to keep information in the long term memory. By using mind mapping, the information can be saved in their memories for a long time.

4) Mind mapping helps people take information out from their brain easily. By using mind mapping, it is easy to recall information saved in their memories.

5) Mind mapping engages the use of imagination and association in its application. It means that in presenting ideas into mind mapping diagrams, people enclose imagination stimulators such as pictures, symbols, and colors to present ideas clearly and use association techniques to help them build their senses to the new concepts.

b. The Characteristics of Mind Mapping

Buzan stated that there are nine characteristics of mind mapping, they are:

1) Using many pictures
A picture is a part of imagination. Imagination helps learners understand words and their meaning and can

stimulate the right brain to work actively. If pictures are used together with letters, both sides of the brain will work in balance and it can create the best condition for learners to study and concentrate.

2) Using many colors
   Colors encourage creativity and help in memorization. It makes easier to comprehend and remember lesson materials because it makes the learning activity become fun for the learners.
3) Using key words to present ideas
   Using key words to present ideas or concepts in mind mapping can make concepts or ideas become stronger to be remembered. It is related to the work of the brain where the 15 human brain is just able to remember information presented in key word forms and pictures.
4) Applying the classification of information
   It is aimed at making it easy for the brain to memorize and remember information. In mind mapping, information is classified based on its category.
5) Showing whole and detail information in the same time
   The format of mind mapping using imagination, association, and presenting them in a diagram form makes mind mapping easy to embrace materials from general information to detailed information.
6) Using association
   By using association, it will be easier for information to be remembered because the learners associate it with information that has been already known.
7) Presenting the central image in the middle part
   A central image is drawn to describe the main idea of the mind mapping. In addition, the work of mind mapping is similar with the work of brain cells in creating a network where the brain cells spread out from the middle to all directions as does mind mapping.
8) Making learners more creative
   Mind mapping stimulates learners to think by using their imagination such as drawing pictures, using colors, etc. It can help them to activate the work of their right brain that is rarely used in learning activities.
9) Helping learners to review materials in a short time
   Mind mapping makes the work of the brain become more relaxed and finally it causes learners to feel relaxed in

> thinking. In a relaxing condition, learners can learn materials optimally. [26]

Based on the characteristics above, the reseacher concludes that mind mapping uses many pictures, many colors, key words to present ideas, and association. It also Presents the central image in the middle part, and the classification of information. It makes learners more creative and helps learners to review materials in a short time

c. The Making Process of Mind Mapping

Buzan explained that there are some steps to make mind mapping, as follows:

1) Start in the center of a blank page turned sideways

   Starting in the center makes your brains freedom to think and to express it more freely and naturally.

2) Use an image, symbol or picture for your central idea

   An image is more interesting, keep you focused, and help you concentrate. It makes your brain and feeling more excellent.

3) Use color, code or something that makes you interesting

   Color or code in your maps is a key to motivate your brain, support to your thinking and make it fun.

[26] T. Buzan, *How to Mind Map…*, p. 21-23.

4) Connect your main branches to the central image and connect your second, third, fourth level braches to the first level and second level braches.

5) Make your branches curved rather than straight lined

You can use not only straight line but also curve to make your idea and map more interesting and fine.

6) Use one key word per line

Single key word in your mind mapping is more power and flexible for you to develop in your idea. [27]

Those steps help teacher to make the mind mapping appropriately and suitable for certain students. Below is an illustration of the mind mapping strategy.[28]

[27] T. Buzan, *How to Mind Map…*, p. 36.

[28] Svantesson, "The Mind Mapping's Making Steps" (*http://www.wikihow.com/Mind-Mapping-Making-Steps*, accessed on December, 2nd 2016 retrieved at 03.00 p.m.).

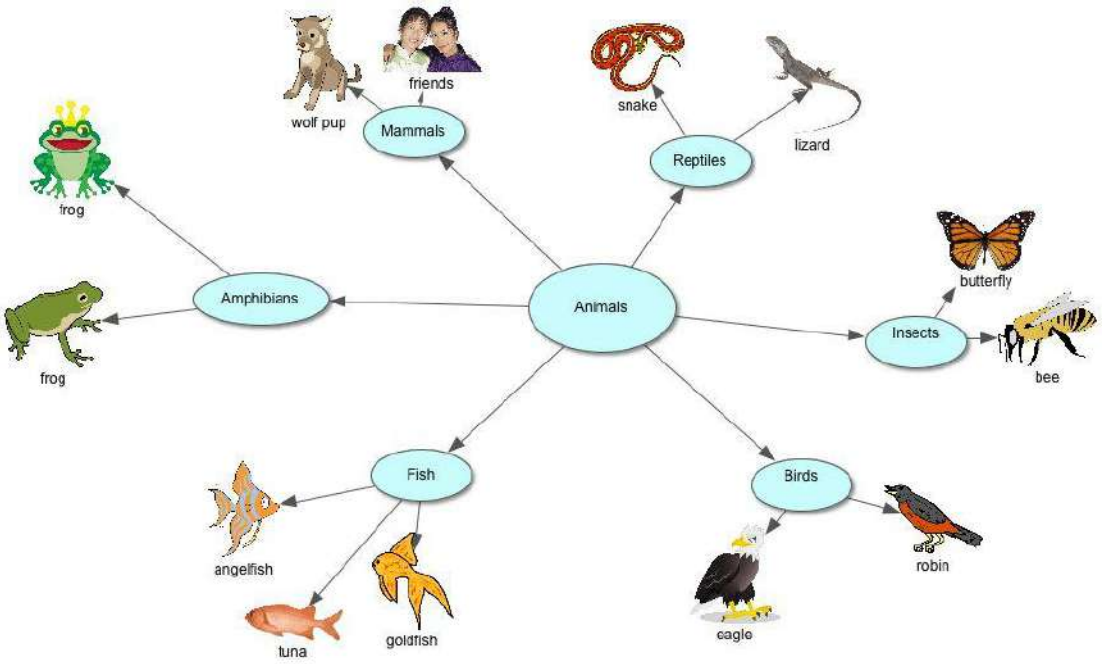


Figure 2. **The example of Mind mapping about Nouns**

d. The Advantages of Using Mind Mapping

Buzan described that mind mapping has some benefits, especially in teaching and learning. They are:

1) They automatically inspire interest to the student, thus making them more receptive and co-operative in the classroom.
2) They make lesson and presentations more spontaneous, creative and enjoyable, both for teacher and the students.

3) The teacher's notes are flexible and adaptable. In these times of rapid change and development, the teacher needs to be able to alter and add to teaching notes quickly and easily.
4) Because mind mapping only relevant material in a clear and memorable form, the student tend to get better marks in examination.
5) Mind mapping not just the real fact, but the relationship between those facts, thus giving students a deeper understanding of the subject.
6) The physical volume of lecture notes is dramatically reduced. [29]

Mind Mapping is considered useful in teaching-learning because it maintain someone's vocabulary. Moreover, it is helpful to enrich someone's vocabulary mastery. It also make the students more receptive and co-operative, spontaneous, creative and enjoyable in the classroom.

[29] T. Buzan, *How to Mind Map…*, p. 232-233.

B. Review of Related Findings

There are some related findings relate to this research. The first is Yheni Siwi Utami's research.[30] After the implementations of crossword puzzles and the complementary actions, she concluded that the students' vocabulary mastery was improved. It is proved by more precise pronunciation and spelling, and better usage of words in sentences that was performed by the students if it is compared to what their performed before the research was conducted.

The second is Neneng Ratnawati's research.[31] She found that the value of t-test was 2.54 and it was higher than 1.67. Therefore, it could be concluded that there was a significant effect of using Crossword Puzzle on the eighth grade students' vocabulary achievement at SMPN 5 Jember in the 2012/2013 academic year.

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[30] Yheni Siwi Utami, "Improving Students' Vocabulary Mastery Using Crossword Puzzles for Grade VII of SMP N 2 Srandakan in The Academic Year of 2013/2014", *Thesis*, (English Education Department Faculty of Languages and Art Yogyakarta State University, 2014), (*http://eprints.uny.ac.id/17231/1/Yheni%20Siwi%20Utami%2010202244076.pdf*, accessed on November, 7th 2016 retrieved at 10.23 p.m.).

[31] Neneng Ratnawati, "The Effect of Using Crossword Puzzle on Vocabulary Achievement of The Eighth Year Students at SMP Negeri 5 Jember", *Thesis*, (Program Studi Pendidikan Bahasa Inggris Jurusan P. Bahasa dan Seni Fakultas Keguruan dan Ilmu Pendidikan, Universitas Negeri Jember, 2013), (*http://jurnal.unej.ac.id/index.php/pancaran/article/view/678*, accessed on November, 7th 2016 retrieved at 10.30 p.m.).

The third is Martin C. Njoroge's International journal of current research.[32] The study concluded that the use of crossword puzzle is of pedagogical significance as it helps learners enlarge vocabulary and deepen their mastery of the English lexis.

The fourth is Putri Ziko Mamura's research.[33] She concluded that the different results of students' pre-test and post-test show that mind mapping can improve the students' vocabulary mastery. It is because the students' average scores of the post-test after giving treatment increase 1.90517 from the students' average scores of the pre-test before giving the treatment.

The fifth is Eka Sustri Harida's journal.[34] She concluded that the Mind Mapping is very good for teaching vocabulary. It is caused Mind Mapping uses visuals remainder and sensory in to a pattern from the ideas which are related. So, Mind Mapping stimulates the students to use the combination of their left and right brain to think perfectly; the right brain is for creativity and visualization and the left brain is for logical and rational.

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[32] Martin C. Njoroge, "The Use of Crossword Puzzles as a Vocabulary Learning Strategy: A Case of English as Second Language in Kenyan Secondary Schools", *an International journal of current research* (Department of English and Linguistics, Kenyatta University, 2013), (***http://www.journalcra.com***, accessed on November, 7th 2016 retrieved at 11.00 p.m.).

[33] Putri Ziko Mamura, "The Use of Mind Mapping to Improve Vocabulary Mastery of The Fourth Grade Students of SD Muhammadiyah Ngijon 1 in The Academic Year of 2009/2010", *Thesis* (English Education Program Faculty of Languages and Arts State University of Yogyakarta, 2011), (*http://eprints.uny.ac.id/18568/1/Putri%20Ziko%20Mamura%20(Thesis).pdf*, accessed on November, 8th 2016 retrieved at 10.00 p.m.).

[34] Eka Sustri Harida, "Using Mind Mapping Technique to teach Vocabulary", *English Education journal*, Vol. 3 No. 1, January 2015, (*http://jurnal.iain-padangsidimpuan.ac.id*, accessed on May, 4th 2019 retrieved at 11.00 p.m.).

Based on the related findings above, the researcher concluded that crossword puzzle and mind mapping strategy can improve, and influence the students' vocabulary mastery. So, the reseacher wants to compare which one the best strategy is, between crossword puzzle and mind mapping strategy towards students' vocabulary mastery.

C. Conceptual Framework

Vocabulary is one of component for the language, where is vocabulary help people for speaking and language communication. Vocabulary is someone's knowledge about the words with the meaning of word itself that is used to master the skills in language such as speaking, listening, reading, and writing. Therefore, vocabulary is the core component of language.

Students still have problems with the four language skills due to lack of vocabulary mastery. It is difficult for them to develop their vocabulary because the students sometimes forget with the vocabulary materials that the teacher has explained. Occasionally, in teaching learning process, the students feel afraid of following the teaching learning process of English because they do not understand about the meaning of English words in English. To avoid that condition and to motivate the students in learning English, the teacher can use teaching aids to give different atmosphere to classroom situation that make the students love the subject. Teachers can make the students love the subject by using interesting teaching strategies.

Crossword puzzle is a good way to teach vocabulary because the definitions of synonyms of the words are right there to provide reinforcement. crossword puzzle as a puzzle with sets of squares to be filled in with words or numbers, one letter or number to each square. Synonyms or definitions of words are given with number corresponding to numbers in the squares. Letters or words are fitted into a pattern of numbered squares in answer to clues. Crossword puzzle is considered useful in teaching-learning because it maintain someone's vocabulary. Crossword puzzle provides fun learning that can be used for different classroom management of students.

Mind mapping is a creative note taking strategy in a visualization and graphic form that is used to make people feel easy in entering information into their brains, keeping information in a long term memory and taking it out from their brains easily by engaging imagination and association. The recording of information through symbols, pictures, emotional meaning, and colors is exactly the same as how the human brain processes information. In nature, the brain tends to process information more easily in a picture form or image than in a verbal or spoken language.

From both of strategies above, the reseacher concludes that the both of strategies are good strategies to make the students love the English subject to improve the students' vocabulary mastery. So, the reseacher wants to compare between crossword puzzle and mind mapping strategies toward students'

vocabulary mastery, which strategy will be better to use in teaching vocabulary.

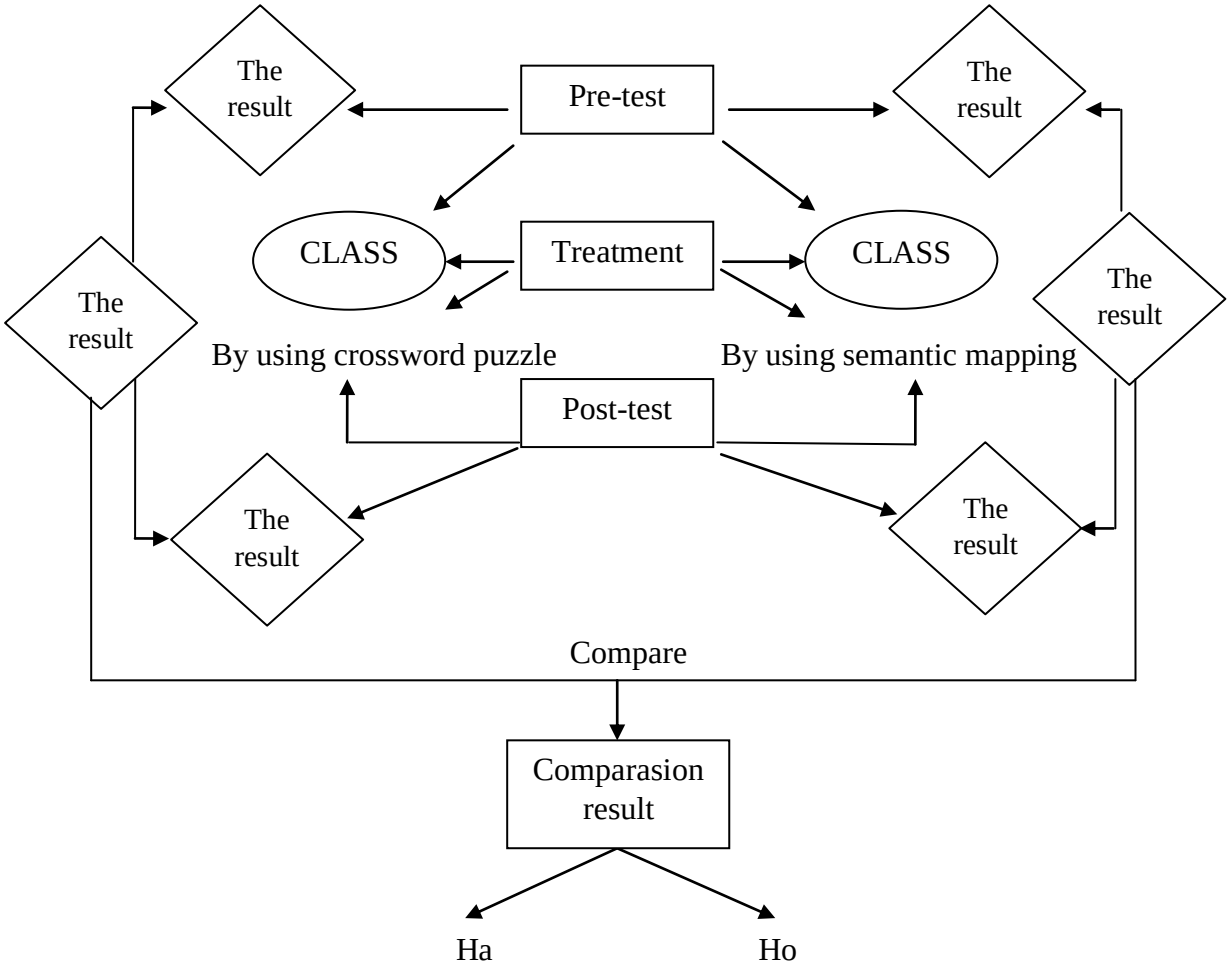

Figure 3. **Conceptual Framework**

Based on the scheme above, the researcher took 2 classes of grade VIII in SMP Negeri 5 Padangsidimpuan. Both of classes became experimental classes. One class of the experimental classes was treated by using crossword

puzzle strategy after pre-test, and another one was treated by using mind mapping strategy after pre-test.

D. Hypothesis

Creswell stated, "hypothesis is predictions the researcher holds about the relationship among variables".[35] Then, L.R. Gay stated, "A hypothesis is a tentative prediction result of the research findings."[36] Therefore, the hypothesis should be made in a research to predict the result of the research findings.

In additional, Suharsimi Arikunto stated, "*hipotesis dapat diartikan sebagai suatu jawaban yang bersifat sementara terhadap permasalahan penelitian, sampai terbukti melalui data yang terkumpul"*.[37] It means hypothesis is provisional answer of prediction result in a research. The hypothesis still need an improvement by the datas that have been collected as the final result of the research. A hypothesis is accepted if the result is suitable with the hypothesis, while it is rejected if the result is lose from the hypothesis.

Based on the defenitions above, the hypothesises of this research are, as follows:

1. H_a: There is a significant difference between using crossword puzzle

[35] John W. Creswell, *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches 2nd Edition* (USA: Sage Publication Inc., 2003), p. 108.

[36] L. R Gay and Peter Airaisan, *Educational Research for Analysis and Application* (America: Prentice Hall, 1992), p. 71.

[37] Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik* (Jakarta: Rineka Cipta, 2006), p. 71.

and mind mapping strategy toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan.

2. H_o: There is no a significant difference between using crossword puzzle and mind mapping strategy toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan.

CHAPTER III
RESEARCH METHODOLOGY

A. Place and Time of Research

The research done in SMP Negeri 5 Padangsidimpuan. It is located at Perintis Kemerdekaan Street, Padangsidimpuan.

The subject of this research was eighth grade of students in SMP Negeri 5 Padangsidimpuan. The time of this research was from October 2016 until April 2019.

B. Research Design

The kind of this research is quantitative research. Suharsimi Arikunto stated that a quantitative research use numbers; collecting data, interpretation of data, and view the data result.[1] While L. R Gay stated, "Experimental research is the only type of research that can test hypothesis to establish cause and effect".[2] It means that to know the cause and effect between a variable to another variable we can use experimental research.

Actually, this research is conducted by comparative research. L. R Gay stated, "comparative research is the researcher attempt to determine the cause, or reason, for preexisting differences in groups individuals".[3] So, this research

[1] Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik* (Jakarta: Rineka Cipta, 2006), p. 12.

[2] L. R Gay and Peter Airaisan, *Educational Research for Analysis and Application* (America: Prentice Hall, 1992), p. 367.

[3] L. R Gay and Peter Airaisan, *Educational Research for Analysis…*, p. 367.

aims to compare crossword puzzle and mind mapping strategy toward students' vocabulary mastery.

In this research, the reseacher took two classes. Both of classes as experimental classes. The experimental class one was taught by using crossword puzzle strategy, and another one was taught by mind mapping strategy. The research design is used by giving pre-test and post-test to both of experimental classes. It can be seen in the table below: [4]

Table 1
Pre-test and Post-test Group Design

Class	Pre-test	Treatment	Post-test
Experimental	O_1	Teaching vocabulary about animals, fruits, things in the classsroom, and things in the house by using crossword puzzle strategy.	O_2
Experimental	O_1	Teaching vocabulary about animals, fruits, things in the classsroom, and things in the house by using mind mapping strategy.	O_2

[4] Suharsimi Arikunto, *Prosedur Penelitian Suatu…*, p. 86.

C. Population and Sample

1. Population

The population of this research is the whole of the students at grade VIII of SMP Negeri 5 Padangsidimpuan. The population of research consists of 13 classes with 260 students. It can be seen from the table below:

Table 2
The Population of the Grade VIII Students of SMPN 5 Padangsidimpuan

NO.	Class	Total of Students
1.	VIII-1	20
2.	VIII-2	20
3.	VIII-3	20
4.	VIII-4	20
5.	VIII-5	20
6.	VIII-6	20
7.	VIII-7	20
8.	VIII-8	20
9.	VIII-9	20
10.	VIII-10	20
11.	VIII-11	20
12.	VIII-12	20
13.	VIII-13	20
Total of Students		260

2. Sample

According to Suharsimi Arikunto, sample is a part of population.[5] Then Gay and Airasian stated that sample was selected from a larger group which consists of the individuals, items, or events and referred to as

[5] Suharsimi Arikunto, *Prosedur Penelitian Suatu…*, p. 134.

a population.[6] It can be concluded that sample is a part of the population that is used as the respondent of a research.

This research decided to take two classes as the sample. The first class was VIII-1 which consists of 20 students as the first experimental class. Second was VIII-2 which consists of 20 students as the second experimental class. Therefore, total of the samples were 40 students. The researcher chose both of these classes because they had similar competence in English based on their school report book, the information which was gotten from the teacher, and the result of normality test.

To take the sample from the population, the researcher used random sampling. Before it, Normality and Homogeneity test had been done first to determine appropriate sample of population.

a. Normality Test

Normality test is used to know whether the data of research is normal or not. To know the normality, the researcher used *Chi-Quadrate* formula. The formula is as follow:

$$x^2 = \sum \left(\frac{f_o - f_h}{f_h} \right)$$

Where:

x^2 = Chi-Quadrate

f_o = Frequency is gotten from the sample/result of observation

[6] L. R Gay and Peter Airaisan, *Educational Research for Analysis…*, p. 71.

(questioner).

f_h = Frequency is gotten from the sample as image from frequency is hoped from the population.[7]

To calculate the result of *Chi-Quadrate,* it is used significant level 5% (0,05) and degree of freedom as big as total of frequency is lessened 3 (dk= k-3). If result $x^2_{count} < x^2_{table}$, so, it can be concluded that data is distributed normal.

After comparing the normality test of the two classes in pre-test, the researcher found that the classes were normal, they were VIII-1, and VIII-2. So, the researcher decided to take VIII-1 and VIII-2 as the sample of this research. The researcher chose these classes because they had similar competence based on their result in pre-test and information that had gotten by the teacher. In this research, the first experimental class was VIII-1 and the second experimental class was VIII-2. The researcher chose VIII-1 consists of 20 students and VIII-2 consists of 20 students. Therefore, total of the samples are 40 students. The calculation can be seen in the appendix 20.

b. Homogeneity Test

Homogeneity test is used to know whether experimental class by using crossword puzzle strategy and experimental class by using mind

[7] Anas Sudjiono, *Pengantar Statistik Pendidikan* (Jakarta: PT. Raja Grafindo Persada. 2005), p. 298.

mapping strategy have the same variant or not. If both classes are same, it can be called homogenous. To find the homogeneity, the researcher used Harley test. The formula is as follow:

$$F = \frac{The\ biggest\ \ variant}{The\ smallest\ \ variant}$$

Where:

n_1 = Total of the data that bigger variant

n_2 = Total of the data that smaller variant[8]

Hypotheses is accepted if $F_{(count)} \leq F_{(table)}$

Hypotheses is rejected if $F_{(count)} \geq F_{(table)}$

Hypothesis is rejected if $F \leq F\frac{1}{2}\ a(n_1\text{-}1)$ (1= n_2-1), while if $F_{count} > F_{table}$ hypothesis is accepted. It determined with significant level 5% (0.05) and dk numerator was (n_1-1), while dk detominators is (n_2-1).

Based on explanation above, the population was thirteen classes of grade VIII at the second year students, two classes were selected randomly in order to be the first experimental or the second class.

After conducted homogeneity test of the two classes in pre-test, the researcher found that all the classes are homogenous. The calculation can be seen in the appendix 21.

[8] Agus Irianto, *Statistik Konsep Dasar dan Aplikasinya* (Padang: P2LPTK Departemen Pendidikan Nasional, 2003), p. 276.

Table 3
Sample of the Research

The First Experimental Class	The Second Experimental Class	Total
VIII-1 = 20 Students	VIII-2= 20 Students	40 Students

D. Definition of the Operational Variables

The terms are used in this research are as follows:

1. Crossword puzzle strategy is a strategy in which words, guessed from their definitions, are fitted into a diagram of white and black squares. The crossword puzzle has words written horizontally (across clues) and words written vertically (down clues). The pattern of black squares usually serves to separate each word from adjacent words.
2. Mind mapping strategy is a strategy for graphically representing concepts. A mind word map allows students to explore their knowledge of a new word by mapping it with other related words or phrases similar in meaning to the new word.
3. Students' vocabulary mastery is students' knowledge about the meaning of word that use to identify the animals, identify the fruits, identify things in the classroom.and identify things in the house.

E. Instrument of Collecting Data

Instrument was very important to support every research. This research made test as the instrument to collect the data of students' vocabulary mastery. The researcher used multiple choice test. Brown stated that multiple choice items, "which may on the surface appear to be simple items to construct".[9] It means that multiple choice test is suitable to test vocabulary mastery.

Table 4
Indicators of Vocabulary Mastery for Pre Test

No	Topics	Indicators	Items	Numbers of Item	Score	Total Score
1.	Identify the animals	Students are able to remember the meaning of the word	10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	2.5	25
2.	Identify the fruits		10	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	2.5	25
3.	Identify things in the classroom		10	21, 22, 23, 24, 25, 26, 27, 28, 29, 30	2.5	25
4	Identify things in the house		10	31, 32, 33, 34, 35, 36, 37, 38, 39, 40	2.5	25
	TOTAL					100

[9] H. Douglas Brown, *Language Assessment Practical and language Practice* (San Francisco: Longman, 2003), p. 67.

Table 5
Indicators of Vocabulary Mastery for Post Test

No	Topics	Indicators	Items	Numbers of Item	Score	Total Score
1.	Identify the animals	Students are able to remember the meaning of the word	10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10	2.5	25
2.	Identify the fruits		10	11, 12, 13, 14, 15, 16, 17, 18, 19, 20	2.5	25
3.	Identify things in the classroom		10	21, 22, 23, 24, 25, 26, 27, 28, 29, 30	2.5	25
4	Identify things in the house		10	31, 32, 33, 34, 35, 36, 37, 38, 39, 40	2.5	25
	TOTAL					100

F. Validity and Reliability Instrument

1. Validity

Suharsimi Arikunto stated that validity is a measurement that shows the valid level an instrument.[10] In addition, Gay and Airasian stated that stated that validity is the most important characteristic a test or measuring instrument can possess.[11] Thus, validity is a measurement to show the characteristic of good test.

[10] Suharsimi Arikunto, *Prosedur Penelitian Suatu…*, p. 168.
[11] L. R Gay and Peter Airaisan, *Educational Research for Analysis…*, p. 161.

There are three types of validity in quantitative research:

a. Face and content validity

b. Concurrent and predictive validity

c. Construct validity[12]

In this research, the researcher used construct validity to get the validity of instrumentation because construct validity was used by judgment experts and then tested to the sample of population that was taken.[13] Where, the test consists of 80 multiple choice test items. They are 40 for pre-test and 40 for post-test.

To know the validity of the whole questions, the researcher takes the result of sample tester. They are 27% of the highest score and 27 % of the lowest score of all the item test.

To test the significant differences of the test, the researcher used the formula of t-test as follow:

$$t = \frac{\overline{X1} - \overline{X2}}{sgab\sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

Where:

t : coefficient item validity

$\overline{X1}$: mean score of high group score

[12] Ranjit Kumar, *Research Methodology, Third Edition* (London: SAGE Publication, Inc., 2011), p. 179.

[13] Sugiyono, *Metode Penelitian Pendidikan* (Bandung: Alfabeta, 2013), p. 177.

$\overline{X2}$: mean score of low group score

Sgab : $\sqrt{\frac{(n_1-1)\,{s_1}^2+(n_2-1)\,{s_2}^2}{(n_1-n_2)-2}}$

$n1$: total of high group

$n2$: total of low group[14]

The instrument is valid if the t_{count} is bigger than t_{table} in level significant 5% with dk n1 + n2 – 2.

From the result of the analysis eighty instruments test, where fourty for pre-test and fourty for post-test, researcher concluded that for pre-test and post test the data were valid. It can be seen in the result t_{count} was higher than t_{table} in pretest (7.39>1.345) and post test(7.37>1.345) instruments. The calculation of how to get it can be seen in the appendix 8 and 9.

2. Reliability

A reliable test is consistent and dependable.[15] In addition, Suharsimi Arikunto stated that reabilty shows an instrument can be trusted enough to be used as an data collection equipment.[16] It means that reabilty is very important to be conducted to know that the data that used is dependable.

[14] Sugiyono, *Metode Penelitian Pendidikan…,* p. 181.
[15] H. Douglas Brown, *Language Assessment Practical…*, p. 27.
[16] Suharsimi Arikunto, *Prosedur Penelitian Suatu…*, p. 178.

To get the reliability of the test, the researcher used Test-retest. Sugiyono stated that Test-retest was done by giving the instrument in several times to the respondent.[17] The instrument and respondent are same but the time is different. The reability was counted by using coefficient of correlation between the first test and the second test.

In this research the researcher used formula correlation of product moment as below:

$$r_{xy} = \frac{N(\sum XY) - (\sum X)(\sum Y)}{\sqrt{\{N(\sum X^2) - (\sum X)^2\}\{N(\sum Y^2) - (\sum Y)^2\}}}$$

r_{xy} = coefficient of correlation

N = total of the sample reability

X = score of the first test

Y = score of the second test[18]

Reliability is a good character of the test that refers to the consistency of the measurement. The test is reliable if $r_{count} > r_{table}$. The test is reliable if $r_{count} > r_{table}$ by using formulation correlation of product moment with the interpretation table as follow:

[17] Sugiyono, *Metode Penelitian Pendidikan…,* p.184.

[18] Iqbal Hasan, *Analisis Data Penelitian Dengan Statistik* (Jakarta: PT Bumi aksara, 2004), p. 44.

Table 6
Correlation Level of Reability Instrument

Coefficient Interval	Correlation Level
Between 0.00-0.199	Very Low
Between 0.20-0.399	Low
Between 0.40-0.599	Enough
Between 0,60-0,799	High
Between 0.800-1.000	Very High[19]

To test reabilty the researcher gave the same test to the same participants twice in different time. From the result of the analysis eighty instruments test, where fourty for pre-test and fourty for post-test. Researcher concluded that for pre-test instruments the calculation of r_{count} was 0.693 was higher than t_{table} 0.361 and for the post test instruments r_{count} was 0.821 was higher than t_{table} 0.361. It means that the data were reliable. The calculation of how to get it can be seen in the appendix 16 and 17.

G. Procedures of Collecting data

In collecting data the researcher used test to students. The kind of the test was multiple choice test. The test was divided into two kinds; pre-test and post-test. The procedures as below:

1. Pre-test

Pre-test is important to be conducted. The pre-test was conducted to find out the homogeneity and normality of the sample. It also has

[19] Sugiyono, *Statistika untuk Penelitian* (Bandung: Alfabeta, 2007), p. 231.

function to find the main score of the first and the second experimental classes before giving treatment. In this case, the researcher had some procedures. They are:

a. The researcher prepared 40 items of the multiple choices.
b. The researcher distributed the paper of test to the first and the second experimental classes.
c. The researcher explained the instruction to the students.
d. Giving time
e. Collected the paper test.
f. The researcher checked the answer of students and found the mean score of both of the classes.

2. Treatment

After giving the pre-test, the students are given treatment. One of the experimental classes was taught by using crossword puzzle strategy, and another experimental class was taught by using mind mapping strategy. The researcher had some procedures in treatment class. They are:

a. The students were divided into 5 groups that contain of 4 students
b. The teacher asked the students to choose their leader
c. The leader in every group had a role in answering the question and raising hand when his/her group could answer the question

d. The teacher showed the Slide of Crossword puzzle and Mind Mapping
e. The teacher announced the rules of Crossword puzzle and Mind Mapping
f. The teacher chose a question as the first question
g. The group who could answer the question should answer by writing the answer in the slide of Crossword puzzle and Mind Mapping
h. The group who could answer the question correctly would choose the next category and number of question. However, the fastest group who raise hand had a right to answer the question
i. The winner was the group who got the highest score

3. Post-test

After giving treatment, the researcher conducted post-test. It was different test with the pre-test. This post-test was the final test on the research, it has function to measure the treatment, whether is a differences or not between using crossword puzzle and mind mapping strategy toward students' vocabulary mastery. After conducting the post-test, the researcher analyzed and compared the datas, which the better strategy was, between crossword puzzle strategy and mind mapping strategy. The researcher had some procedure. They are:

a. The researcher prepared multiple choices test 40 item

b. The researcher distributed the paper of the test to students of the first and the second experimental classes

c. The researcher explained instruction to answer the test

d. Giving time

e. The students answered the question

f. Collecting their paper test to researcher

g. The researcher checked the answer of students and found the mean score of the first and the second experimental classes

H. Techniques of Analyzing Data

In this research, the researcher used the techniques of data analysis as follow:

1. Requirement Test

a. Normality Test

To know the normality, the researcher used Chi-Quadrate formula. The formula is as follow:

$$x^2 = \sum \left(\frac{f_o - f_h}{f_h} \right)$$

Where:

x^2 = Chi-Quadrate

f_o = Frequency is gotten from the sample/result of observation (questioner).

f_h = Frequency is gotten from the sample as image from frequency is hoped from the population. [20]

b. Homogeneity test

To find the homogeneity, the researcher used Harley test. The formula is as follow: [21]

$$F = \frac{The\ biggest\ \ variant}{The\ smallest\ \ variant}$$

Hypotheses is accepted if $F_{(count)} \leq F_{(table)}$

Hypotheses is rejected if $F_{(count)} \geq F_{(table)}$

Hypothesis is rejected if $F \leq F\frac{1}{2}\ a(n_1.1)$ $(1= n_2\text{-}1)$, while if $F_{count} > F_{table}$ hypothesis is accepted. It determined with significant level 5% (0.05) and dk numerator was $(n_1\text{-}1)$, while dk detominators is $(n_2\text{-}1)$.

2. Hypothesis Test

Before analyzing the data to find the hypothesis, the researcher calculated the normality and homogeneity of the post-test. It was used to know whether the data was normal and homogenous or not.

To analyze the data based on the hypothesis, the researcher used t-test. According to Anas Sudjiono[22] said that *t-test* is one of the statistic

[20] Anas Sudjiono, *Pengantar Statistik Pendidikan…*, p. 298.
[21] Agus Irianto, *Statistik Konsep Dasar…*, p. 276.
[22] Anas Sudjiono, *Pengantar Statistik Pendidikan…*, p. 78.

examine that used to compare two variables. So, the data will be analyzed by using the following *t-test* formula:[23]

$$H_{a:}\ \mu_1 > \mu_2$$

$$H_o : \mu_1 \leq \mu_2$$

If $H_{a:}\ \mu_1 > \mu_2$, it means that the result of students' vocabulary achievement by using Jeopardy Game at grade VIII SMP Negeri 7 Padangsidimpuan was better than conventional strategy. But, if the H_0: $\mu_1 \leq \mu_2$, it means the result of students' vocabulary achievement by using jeopardy Game at grade VIII SMP Negeri 7 Padangsidimpuan was not better than conventional strategy.

Then, the researcher used t-test formula to know how significant the difference between crossword puzzle and mind mapping strategy toward students' vocabulary mastery was. The formula is as follow:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \text{ with } S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

Where:

t : the value which the statistical significance
$\overline{X_1}$: the average score of the experimental class by using crossword puzzle strategy
$\overline{X_2}$: the average score of the experimental class by using mind

[23] Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik* (Jakarta: RinekaCipta, 2006), p. 311.

mapping strategy
s_1^2 : deviation of the experimental class by using crossword puzzle strategy
s_2^2 : deviation of the the experimental class by using mind mapping strategy
n_1 : total of experimental class sample by using crossword puzzle strategy
n_2 : total of the experimental class sample by using mind mapping strategy[24]

$t_{count} > t_{table}$ = Hypothesis will be accepted

$t_{count} < t_{table}$ = Hypothesis will be rejected

Based on the formulas above, if the $t_{count} > t_{table}$, it means there is a significant different between using crossword puzzle and mind mapping strategy toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan. But, if the $t_{count} < t_{table}$, it means there is no a significant difference between using crossword puzzle and mind mapping strategy toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan.

[24] Sugiyono, *Statistika untuk Penelitian…*, p. 138-139.

CHAPTER IV

DATA ANALYSIS

This chapter discussed a comparative study between using crossword puzzle and mind mapping strategies toward students' vocabulary mastery. The researcher has calculated the data using pre test and post test. Applying quantitative research, the researcher used the formulation of T-test. Next, researcher describes the result based on the data that has been researched as follow:

A. Description of Data Before Using Crossword Puzzle and Mind Mapping Strategies

1. Score of Pre-Test the First Experimental Class by Using Crossword Puzzle Strategy

In pre-test the first experimental class by using crossword puzzle strategy, the researcher gave 40 multiple choice items as pre-test to the students. Every right answer was given score 5. So, the students who answered the all pre-test with right answer, would be given score 100. After collecting and checking the students' answer, the researcher calculated the result of students' answering in the question (test). The scores pre-test of the first experimental class by using crossword puzzle strategy could be seen in the following table:

Table 7
The Score of Experimental Class by Using Crossword Puzzle Strategy in Pre-Test

Total	952.5
Highest score	65
Lowest score	30
Mean	47.2
Median	42.46
Modus	43.9
Range	35
Interval	6
Standard deviation	8.34
Varian	85.18

Based on the table above the total score of the first experimental class by using crossword puzzle strategy in pre-test was 952.5, mean was 47.2, standard deviation was 8.34, variants was 85.18, median was 42.46, range was 35, modus was 43.9, interval was 6. The researcher got the highest score was 65 and the lowest score was 30. Next the calculation of how to get all of these can be seen in the appendix 20. Then, the computed of the frequency distribution of the students' score of experimental class could be applied into table frequency distribution as follow:

Table 8
Frequency Distribution of Students' Score

No	Interval	Frequency	Mid Point	Percentages
1	30 – 35	2	32.5	10 %
2	36 – 41	3	38.5	15%
3	42 – 47	6	44.5	30%
4	48 – 53	4	50.5	20%
5	54 – 59	3	56.5	15%
6	60 – 65	2	62.5	10%
i = 6		20		100%

From the table above, the students' score in class interval between 30 – 35 was 2 students (10 %), class interval between 36 – 41 was 3 students (15 %), class interval between 42 – 47 was 6 students (30 %), class interval between 48 – 53 was 4 students (20 %), class interval between 54 – 59 was 3 students (15 %), and the last class interval between 60 – 65 was 2 students (10%). In order to get description of the data clearly and completely, the researcher presents them in histogram on the following figure:

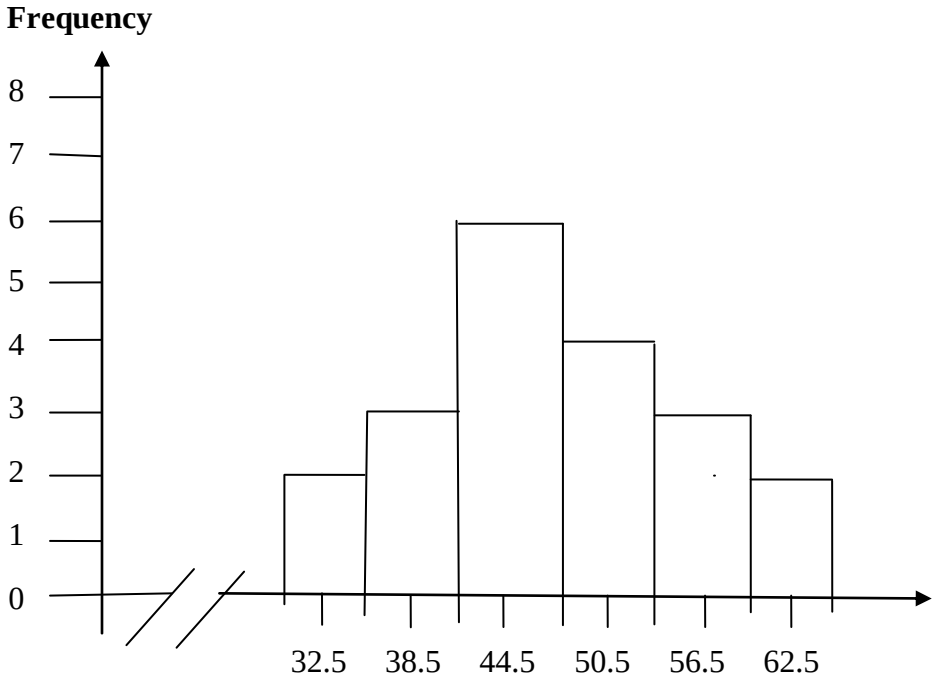

Figure 4. histogram of the students' vocabulary mastery in the first experimental class (Pre-test)

Based on histogram above, we can see that there were 2 students who got score between 30-35, 3 students who got score between 36-41, 6 students who got score between 42-47, 4 students who got score between 48-53, 3 students who got score between 54-59, and 2 students who got score between 60-65. It can be concluded that the distribution of students' score of pre-test the first experimental class by using crossword puzzle strategy was normal.

2. Score of Pre Test the Second Experimental Class by Using Mind Mapping Strategy

In pre-test of the second experimental class by using mind mapping strategy, the researcher calculated the result that got by the students in

answering the question (test). The scores pre test in the second experimental class by using mind mapping strategy could be seen in the following table:

Table 9
The Score of the Second Experimental Class in Pre-test

Total	985
Highest score	65
Lowest score	32.5
Mean	49.7
Median	55.25
Modus	53.78
Range	32.5
Interval	6
Standard deviation	8.1
Variants	73.75

Based on the table above the total score of the second experimental class by using mind mapping strategy in pre-test was 985, mean was 49.7, median was 55.25, modus was 53.78, range was 32.5, interval was 6, standard deviation was 8.1, variants was 73.75. The researcher got the highest score was 65, and the lowest score was 32.5. It can be seen on appendix 20. Then, the computed of the frequency distribution of the students' score of the second experimental class by using mind mapping strategy could be applied into table frequency distribution as follow:

Table 10
Frequency Distribution of Students' Score

No	Interval	Frequency	Mid Point	Percentages
1	32.5 – 37.5	2	35	10 %
2	38.5 – 43.5	3	41	15%
3	44.5 – 49.5	4	47	20%
4	50.5 – 55.5	8	53	40%
5	56.5 – 61.5	1	59	5%
6	62.5 – 67.5	2	65	10%
$i = 6$		20		100%

From the table above, the students' score in class interval between 32.5 – 37.5 was 2 students (10 %), class interval between 38.5 – 43.5 was 3 students (15 %), class interval between 44.5 – 49.5 was 4 students (20 %), class interval between 50.5 – 55.5 was 8 students (40 %), class interval between 56.5 – 61.5 was 1 students (5 %), and the last class interval between 62.5 – 67.5 was 2 students (10%). In order to get a description of the data clearly and completely, the researcher presents them in histogram on the following figure:

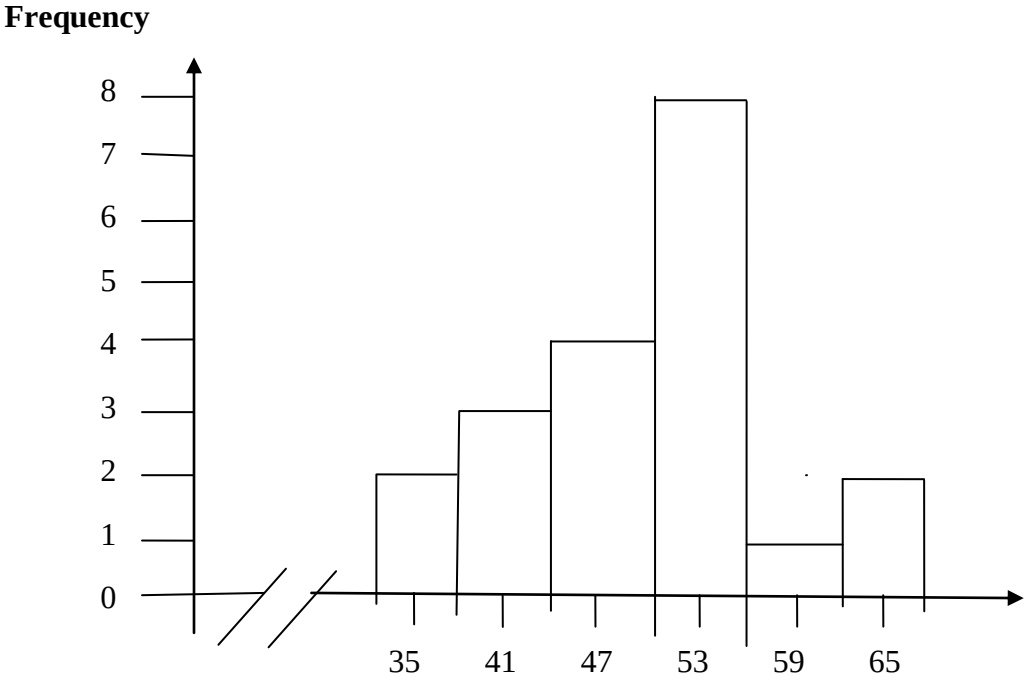

Figure 5. Histogram of the Students' Vocabulary Mastery in the Second Experimental Class (Pre-Test)

Based on histogram above, we can see that there were 2 students who got score between 32.5–37.5, 3 students who got score between 38.5–43.5, 4 students who got score between 44.5–49.5, 8 students who got score between 50.5–55.5, 1 student who got score between 56.5–61.5, and 2 students who got score between 62.5–67.5. It can be concluded that the distribution of students' score of pre test the second experimental class by using mind mapping strategy was normal.

B. Description of Data After Using Crossword Puzzle and Mind Mapping Strategies

After giving the pre-test, both of the class was taught. The first experimental class was taught by using crossword puzzle strategy and the second experimental class was taught by using mind mapping strategy. Then researcher gave the post test as the final test. The researcher has calculated the result of students' answering in the question post-test, as below:

1. Score of Post-Test the First Experimental Class by Using Crossword Puzzle Strategy

In post-test the first experimental class, the researcher calculated the result of students' answering in the question (test). The scores post-test of the first experimental class could be seen in the following table.

Table 11
Score of the First Experimental Class in Post-Test

Total	1485
Highest score	90
Lowest score	55
Mean	73.4
Median	76.784
Modus	77.3
Range	35
Interval	6
Standard deviation	8.28
Variants	85.59

Based on the table above the total score of the first experimental class in post-test was 1485, mean was 73.4, median was 76.784, modus was 77.3, range was 35, interval was 6, standard deviation was 8.28 variants was 85.59 the researcher got the highest score was 90 and the lowest score was 55. The calculation can be seen on the appendix 22. Then, the computed of the frequency distribution of the students' score of the first experimental class could be applied into table frequency distribution as follow:

Table 12
The Frequency Distribution of Students' Score

No	Interval Class	Frequency	Mid Point	Percentages
1	55 – 60	2	57.5	10 %
2	61 – 66	2	63.5	10 %
3	67 -72	4	69.5	20 %
4	73 – 78	7	75.5	35 %
5	79 – 84	3	81.5	15 %
6	85 – 90	2	87.5	10 %
i = 6		20		100%

From the table above, the students' score in class interval between 55 – 60 was 2 students (10 %), class interval between 61 – 66 was 2 students (10 %), class interval between 67 – 72 was 4 students (20 %), class interval

between 73 – 78 was 7 students (35 %), class interval between 79 – 84 was 3 students (15 %), and the last class interval between 85 – 90 was 2 students (10%). In order to get description of the data clearly and completely, the researcher presents them in histogram on the following figure:

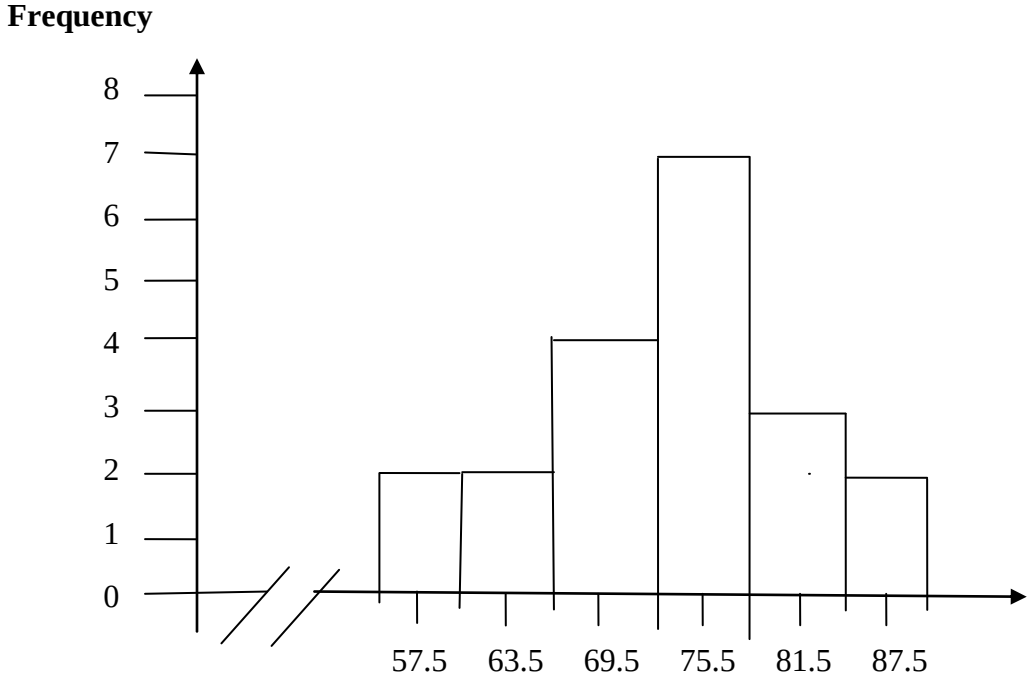

Figure 6. Histogram of the Students' Vocabulary Mastery in the First Experimental Class (Post-Test)

Based on histogram above, we can see that there were 2 students who got score between 55–60, 2 students who got score between 61–66, 4 students who got score between 67–72, 7 students who got score between 73–78, 3 student who got score between 79–84, and 2 students who got score between 85–90. It can be concluded that the distribution of students' score of post-test the first experimental class by using crossword puzzle strategy was normal.

2. Score of Post Test the Second Experimental Class by Using Mind Mapping Strategy

In post-test the second experimental class, the researcher calculated the result of students' answering in the question (test). The scores post-test of the second experimental class could be seen in the following table.

Table 13
The Score of the Second Experimental Class in Post-Test

Total	1327.5
Highest score	87.5
Lowest score	52.5
Mean	67.3
Median	69.92
Modus	70.52
Range	35
Interval	6
Standard deviation	7.68
Variants	72.68

Based on the table above the total score of the second experimental class in post-test was 1327.5, mean was 67.3, standard deviation was 7.68, variants was 72.68, median was 69.92, modus was 70.52, range was 35, interval was 6. The researcher got the highest score was 87.5 and the lowest 52.5 score was. The calculation can be seen in the appendix 22. Then, the computed of the frequency distribution of the students' score of control class could be applied into table frequency distribution as follow:

Table 14
Frequency Distribution of Students' Score

No	Interval Class	Frequency	Mid Point	Percentages
1	52.5 – 57.5	2	55	10%
2	58.5 – 63.5	5	61	25%
3	64.5 – 69.5	7	67	35%
4	70.5 – 75.5	3	73	15%
5	76.5 – 81.5	2	79	10%
6	82.5 – 87.5	1	85	5%
i = 6		20		100%

From the table above, the students' score in class interval between 52.5 – 57.5 was 2 students (10 %), class interval between 58.5 – 63.5 was 5 students (25 %), class interval between 64.5 – 69.6 was 7 students (35 %), class interval between 70.5 – 75.5 was 3 students (5 %), class interval between 76.5 – 81.5 was 2 students (10 %), and the last class interval between 82.5 – 87.5 was 1 students (5%). In order to get description of the data clearly and completely, the researcher presents them in histogram on the following figure:

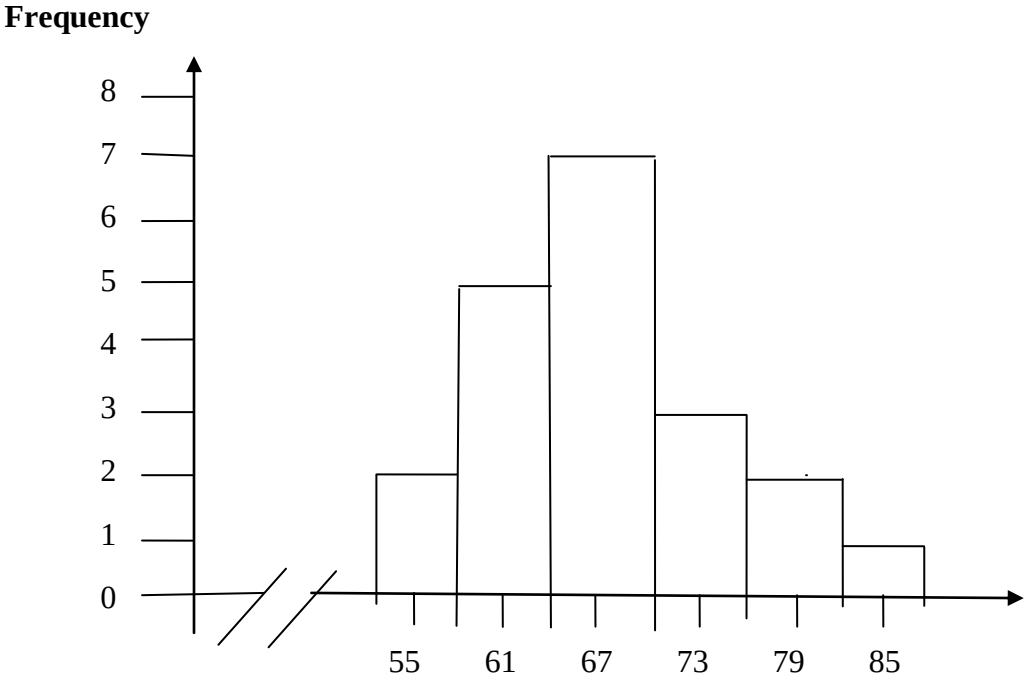

Figure 7. Histogram of the Students' Vocabulary Mastery in the Second Experimental Class (Post-Test)

Based on histogram above, we can see that there were 2 students who got score between 52.5–57.5, 5 students who got score between 58.5–63.5, 7 students who got score between 64.5–69.6, 3 students who got score between 70.5–75.5, 2 student who got score between 76.5–81.5, and 1 student who got score between 82.5–87.5. It can be concluded that the distribution of students' score of post test the second experimental class by using mind mapping strategy was normal.

C. Technique of Data Analysis

1. Hypothesis Test

a. The data would be analyzed to prove hypothesis by using formula of t-test. Hypothesis alternative (H_a) of research was "There is a significant difference between using crossword puzzle and mind mapping strategies toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan".

Table 15
Result of T-test from the Both Averages

Pre-test		**Post-test**	
t_{count}	t_{table}	t_{count}	t_{table}
0.582	2.024	2.857	2.024

$H_a: \mu_1 > \mu_2$

Where:

$H_a: \mu_1 > \mu_2$ " Crossword Puzzle strategy better than Mind Mapping strategy on Students' Vocabulary Mastery."

b. Based on the calculation, researcher found that t_{count} 2.857. while t_{table} 2.024. With opportunity $(1 - \alpha)$ = 1-5% = 95% and dk = $(n_1 + n_2 - 2)$ = (20+ 20– 2) = 38, cause $t_{count} > t_{table}$ (2.857>2.024). It means that hypothesis (H_a) was accepted. So, there is a significant difference between using crossword puzzle and mind mapping strategy toward students' vocabulary mastery. In this case, the average of the first

experimental class by crossword puzzle strategy was 74.25, and average of the second experimental class by mind mapping strategy was 66.375. The calculation can be seen on the appendix 24 and 25.

D. Discussion

Based on the related findings, the researcher discussed the result of this research and compared with the related findings. It also discussed with the theory that has been stated by the researcher.

The First, the research by Siti Yheni Siwi Utami, she concluded that the students' vocabulary mastery was improved by using crossword puzzle. It is proved by more precise pronunciation and spelling, and better usage of words in sentences that was performed by the students if it is compared to what their performed before the research was conducted.[1] The second, The Neneng Ratnawati's research, she found that the value of t-test was 2.54 and it was higher than 1.67. It means that there was a significant effect of using Crossword Puzzle on the eighth grade students' vocabulary achievement at SMPN 5 Jember in the 2012/2013 academic year.[2] The third, Martin C. Njoroge's International journal of

[1] Yheni Siwi Utami, "Improving Students' Vocabulary Mastery Using Crossword Puzzles for Grade VII of SMP N 2 Srandakan in The Academic Year of 2013/2014", *Thesis*, (English Education Department Faculty of Languages and Art Yogyakarta State University, 2014), (*http://eprints.uny.ac.id/17231/1/Yheni%20Siwi%20Utami%2010202244076.pdf*, accessed on November, 7th 2016 retrieved at 10.23 p.m.).

[2] Neneng Ratnawati, "The Effect of Using Crossword Puzzle on Vocabulary Achievement of The Eighth Year Students at SMP Negeri 5 Jember", *Thesis*, (Program Studi Pendidikan Bahasa Inggris Jurusan P. Bahasa dan Seni Fakultas Keguruan dan Ilmu Pendidikan, Universitas Negeri Jember, 2013), (*http://jurnal.unej.ac.id/index.php/pancaran/article/view/678*, accessed on November, 7th 2016 retrieved at 10.30 p.m.)

current research, he concluded that the use of crossword puzzle is of pedagogical significance as it helps learners enlarge vocabulary and deepen their mastery of the English lexis.[3]

The fourth, Putri Ziko Mamura's research, she concluded that the different results of students' pre-test and post-test show that mind mapping can improve the students' vocabulary mastery because the students' average scores of the post-test after giving treatment increase 1.90517 from the students' average scores of the pre-test before giving the treatment.[4] The fifth is Eka Sustri Harida's journal, she concluded that the Mind Mapping is very good for teaching vocabulary. It is caused Mind Mapping uses visuals remainder and sensory in to a pattern from the ideas which are related.[5] So, Mind Mapping stimulates the students to use the combination of their left and right brain to think perfectly; the right brain is for creativity and visualization and the left brain is for logical and rational.

Based on the explanation above, crossword puzzle and mind mapping strategies are very good strategies to teach vocabulary. The researcher found that

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[3] Martin C. Njoroge, "The Use of Crossword Puzzles as a Vocabulary Learning Strategy: A Case of English as Second Language in Kenyan Secondary Schools", *an International journal of current research* (Department of English and Linguistics, Kenyatta University, 2013), (***http://www.journalcra.com***, accessed on November, 7th 2016 retrieved at 11.00 p.m.).

[4] Putri Ziko Mamura, "The Use of Mind Mapping to Improve Vocabulary Mastery of The Fourth Grade Students of SD Muhammadiyah Ngijon 1 in The Academic Year of 2009/2010", *Thesis* (English Education Program Faculty of Languages and Arts State University of Yogyakarta, 2011), (*http://eprints.uny.ac.id/18568/1/Putri%20Ziko%20Mamura%20(Thesis).pdf*, accessed on November, 8th 2016 retrieved at 10.00 p.m.)

[5] Eka Sustri Harida, "Using Mind Mapping Technique to teach Vocabulary", *English Education journal*, Vol. 3 No. 1, January 2015, (*http://jurnal.iain-padangsidimpuan.ac.id*, accessed on May, 4th 2019 retrieved at 11.00 p.m.).

t_{count} of using crossword puzzle and mind mapping strategies were higher than t_{table} in every research. In this research, the researcher found t_{count} was 2.857 in post-test after using crossword puzzle strategy in the first experimental class, then, 2.024 in t_{count} in post-test after using mind mapping strategy in the second experimental class. It means, the t_{count} that the researcher found by using crossword puzzle is the highest amoung the researches. It also described that crossword puzzle strategy is better than mind mapping strategy toward students' vocabulary mastery.

E. Threats of the Research

The researcher found the threats of this research as follows:

1. The result of learning could not be considered as the result of treatment at all because the variations of students' learning activity outside of school. For example there were some students who followed English course, diligent to study at home, or some of them learnt at school only. So that, there was possibility for bias in the result of research.
2. There were some students that were lack of serious to answer the test in pre-test and post-test. It would be possible threat the research. So that, there was possibility the researcher cannot reach the validity of trustworthiness of data.
3. Students' attitude could be change to be better or worse when the teacher who teaches them changes. So that it would be possible give the influence to the result of the research.

4. The validity of the lesson plans and the instrument of the collecting data are done by the English teacher's suggestions, who has Graduate Degree of Education (S.Pd.) in English. So, the validity of the lesson plans and the instrument of the collecting data have low legal standing.

CHAPTER V

CONCLUSION AND SUGGESTION

A. Conclusion

Based on the result of the research and calculation of the data, the researcher got the conclusion as follows:

1. The result of students' vocabulary mastery before using crossword puzzle strategy was "bad" in pre-test, by mean score 47.2. It became "good" after using crossword puzzle, by mean score 73.4 in post-test.
2. The result of students' vocabulary mastery before using mind mapping strategy was "bad" in pre-test, by mean score 49,7. It became "enough" after using mind mapping strategy, by mean score 67.3 in post test.
3. Based on the calculation of t_{count} was 2.857 was higher than t_{table} was 2.024, it means that the hypothesis alternative (H_a) was accepted. So that it can be concluded that there was a significant difference between using crossword puzzle and mind mapping strategy toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan. Futhermore, the mean score of the first experimental class by using crossword puzzle strategy in post test was 73.4, while the mean score of the second experimental class by using mind mapping strategy in post test was 67.3. The first experimental class mean score was higher than the second experimental class (73.4>67.3). It can be concluded that crossword puzzle strategy was better than mind mapping

strategy toward vocabulary mastery at grade VIII students SMP Negeri 5 Padangsidimpuan.

B. Suggestion

After finishing this research, the researcher got many information in English teaching and learning process. Therefore, the writer has suggestion to:

1. For the headmaster, to develop support the teachers, especially English teachers, to do best way in teaching, especially in teaching vocabulary.
2. For English teachers, are hoped to use appropriate strategy to teach vocabulary in English subject for improving the quality of teaching learning process. Then, from the result of the research, showing crossword puzzle strategy is better than mind mapping strategy. So that, the writer suggests crossword puzzle strategy can be applied on the English teaching classroom especially for increasing vocabulary mastery.
3. Other researcher, the researcher hopes that the others researchers who want to conduct a research related to this research to find the others influence of these strategies deeply because it gives the contribution.

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CURRICULUM VITAE

A. Identity

Name	: Zainuddin Hasibuan
Reg. No.	: 12 340 0040
Place and Birth	: Padangsidimpuan, August, 6th 1993
Sex	: Male
Religion	: Islam
Address	: Jalan Teuku Umar, Gang Surau II, Kelurahan Losung, Kecamatan Padangsidimpuan Selatan, Kota Padangsidimpuan

B. Parents

Father's Name	: Alm. Burhanuddin Hasibuan
Mother's Name	: Nurlana Lubis

C. Educational Background

1.	Elementary School	: SD Negeri 200204 Losung	(2006)
2.	Junior High School	: SMP Negeri 2 Padangsidimpuan	(2009)
3.	Senior High School	: SMA Negeri 3 Padangsidimpuan	(2012)
4.	Institute	: IAIN Padangsidimpuan	(2019)

Appendix 1

Experimental Class by Using Crossword Puzzle Strategy

RENCANA PELAKSANAAN PEMBELAJARAN (RPP)

Nama sekolah : SMP Negeri 5 Padangsidimpuan

Mata Pelajaran : Bahasa Inggris

Kelas/Semester : VIII (Delapan)/ II (Genap)

Tema : *Noun (animals, fruits, things in the classsroom, and things in the house)*

Alokasi Waktu : 4 x 40 menit

Standar Kompetensi :

- Memahami instruksi sederhana terhadap kosakata dalam konteks sekitar peserta didik.

Kompetensi Dasar :

- Merespon instruksi sederhana terhadap kosakata yang berhubungan dengan konteks sekitar peserta didik secara verbal.

Indikator :

a. Mengidentifikasi noun *(animals, fruits, things in the classsroom, and things in the house)* yang diberikan oleh guru.
b. Menyebutkan noun *(animals, fruits, things in the classsroom, and things in the house)* yang guru tunjuk dengan benar.
c. Menuliskan nama noun *(animals, fruits, things in the classsroom, and things in the house)* tersebut dengan ejaan yang benar.

Tujuan pembelajaran :

a. Siswa dapat mengidentifikasi noun *(animals, fruits, things in the classsroom, and things in the house)* yang diberikan oleh guru.

b. Siswa dapat menyebutkan noun *(animals, fruits, things in the classsroom, and things in the house)* yang guru tunjuk dengan benar.
c. Siswa dapat menuliskan noun *(animals, fruits, things in the classsroom, and things in the house)* tersebut dengan ejaan yang benar.

Metode/strategi pembelajaran **:** *Crossword Puzzle strategy*

Materi Pembelajaran **:** *Noun (animals, fruits, things in the classsroom, and things in the house).*

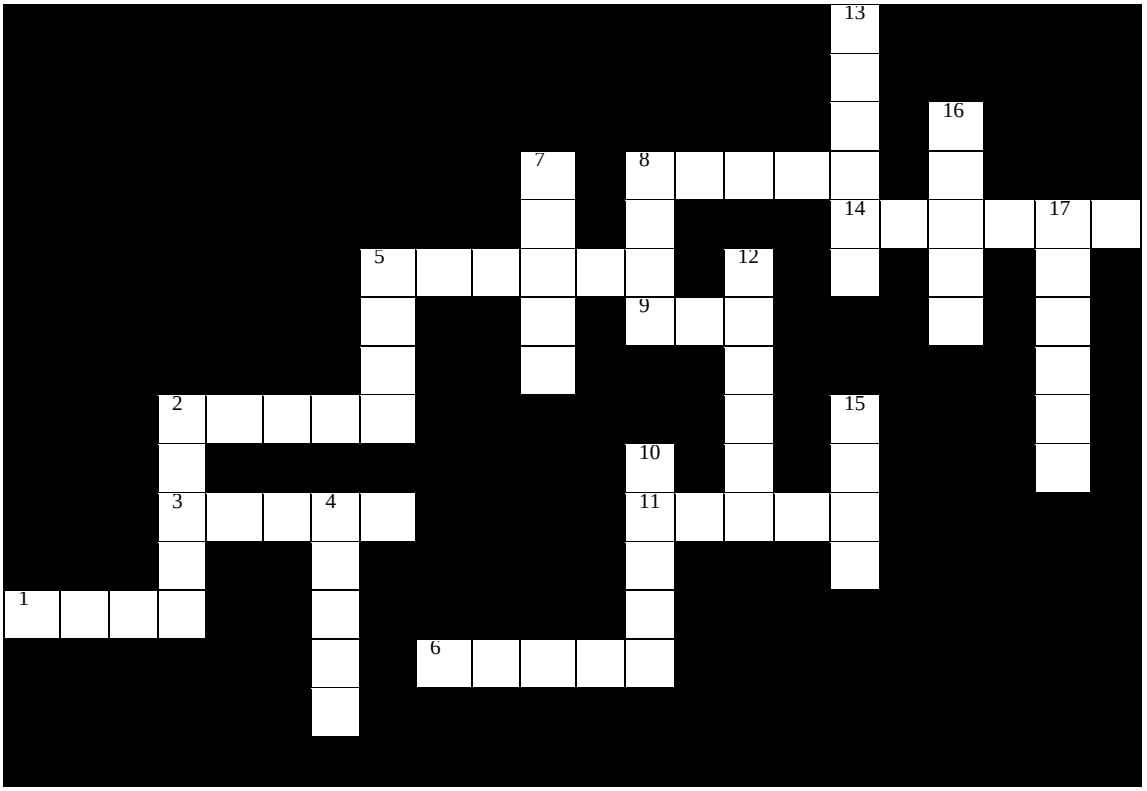
ANIMALS	**FRUITS**	**THINGS IN THE CLASSROOM**
Cat = kucing	Coconut = kelapa	Table = meja
Chicken = ayam	Orange = jeruk	Chair = bangku
Cow = sapi	Grape = anggur	Chalk = kapur
Duck = bebek	Banana = pisang	Blackboard = papan tulis
Bee = lebah	Strawberry = stroberi	Pen = pulpen
Bird = burung	Avocado = Alpukat	Ruler = penggaris
Camel = unta	Lychee = leci	Eraser = penghapus
Dog = anjing	Apple = apel	Bag = tas
Crab = kepiting	Mangoo = mangga	Pencil = pensil
Shark = hiu	Pineapple = nanas	Book = buku

THINGS IN HOUSE

Garage = garasi
Bathroom = kamar mandi
Bedroom = kamar tidur
Television= televisi
Freezer = kulkas
Plate = piring
Glass = gelas
Yard = halaman

Mirror = cermin

Well = sumur



Across :

1. A place contains water in a house
2. A tool for writing in the blackboard
3. A fruit has a yellow flesh inside, and green outside. It's taste is sour
5. This fruit has a curved shape and yellow
6. A fruit similar to a pear
8. A thing is needed by the students for sitting
9. A animal produces honey
11. A tool is used to make a straight line
14. A yellow fruit contains a lot of vitamin C

Down :

2. The famous arabic animal
4. A tool is used when we drink water
5. A thing contains knowledge
7. A tool is used when we want to eat rice
8. Sea animal with hard shells
10. A purple fruit
12. A tool is used for writing. It can be erased.
13. A tool is used for looking our twin
15. An animal can fly in the sky.
16. A sea animal has sharp teeth
17. A place for car parking in the house

The answers:

Across :

4. Well
5. Chalk
6. Mango
7. Banana
8. Apple
10. Chair
11. Bee
12. Ruler
15. Orange

Down :

3. Camel
6. Glass
7. Book
9. Plate
10. Crab
11. Grape
14. Pencil
15. Mirror
18. Bird
19. Shark
20. Garage

Langkah-langkah pembelajaran :

a. Kegiatan Pendahuluan
   1. Merespon salam dan tegur sapa yang disampaikan oleh guru.
   2. Merespon pemeriksaan kehadiran yang dilakukan oleh guru.
   3. Mempersiapkan media pembelajaran: gambar, *crossword puzzle*.
   4. Menyimak penjelasan guru tentang tujuan pembelajaran hari yaitu tentang *noun (animals, fruits, things in the classsroom, and things in the house).*

b. Kegiatan Inti
   1. Menyimak arahan guru.
   2. Guru membangun pengetahuan siswa mengenai topik materi dengan memberikan pertanyaan pembuka.
   3. Guru membagi siswa ke dalam beberapa kelompok.
   4. Guru menempelkan *crossword puzzle* tentang *noun (animals, fruits, things in the classsroom, and things in the house)* di papan tulis.
   5. Dengan menggunakan *crossword puzzle* tersebut, guru membacakan soal yang ada dalamnya satu persatu untuk dijawab oleh siswa dari masing-masing kelompok dengan cara rebutan. Siswa yang menunjuk tangan terlebih dahulu akan diberi kesempatan untuk mengisi kotak-kotak yang ada pada *crossword puzzle* di papan tulis tersebut. Bagi kelompok yang menjawab dengan benar akan diberi nilai 100.
   6. Setelah selesai mempresentasikan seluruh kosakata. Guru menyuruh siswa untuk membaca semua kosakata yang ada pada *crossword puzzle* dengan nyaring. Jika siswa salah dalam mengucapkan kata, guru akan segera mengoreksinya.

c. Kegiatan Penutup
   1. Melakukan refleksi pembelajaran (kesan, manfaat yg siswa peroleh dan kesulitan yang siswa hadapi) dipandu oleh guru.
   2. Memberikan motivasi kepada siswa berdasarkan nilai-nilai moral yang terdapat dalam hasil karangan siswa.

3. Menyimak komentar dan arahan guru untuk pertemuan berikutnya.
4. Merespon salam penutup yang disampaikan oleh guru.

Media dan sumber pembelajaran :

a. Media Pembelajaran : Tabel *crossword puzzle*.
b. Sumber pembelajaran : Experiencing English: English for Junior High School Students Year VIII, Tim Masmedia Buana Pustaka, Jakarta: Pusat Pembukuan: Sidoarjo: PT. Masmedia Buana Pustaka, 2015.

Penilaian :

Rubrik Penilaian :

Setiap nama *noun (animals, fruits, things in the classsroom, and things in the house)* dengan penulisan yang tepat dan benar diberi skor 5.

Indikator pencapaian kompetensi	**Teknik penilaian**	**Bentuk instrument**	**Instrument soal**
1. Mengidentifikasi nama hewan 2. Mengidentifikasi nama buah 3. Mengidentifikasi nama benda yang ada dikelas 4. Mengidentifikasi nama benda di dalam rumah	Tes tulisan	Multiple choice	Memilih jawaban yang sesuai dengan petunjuk soal

Jumlah skor maksimal keseluruhan adalah 100.

Setiap jawaban yang benar diberi skor 5.

Jumlah skor keseluruhan 5 x 20 =100.

Padangsidimpuan,

Mengetahui guru bidang studi, **Researcher,**

Elmi Sartika Dewi Lubis S.Pd.
NIP:19790813 200604 2 011

Zainuddin Hasibuan
NIM : 12 340 0040

Appendix 2

Experimental Class by Using Mind Mapping Strategy

RENCANA PELAKSANAAN PEMBELAJARAN (RPP)

Nama sekolah : SMP Negeri 5 Padangsidimpuan

Mata Pelajaran : Bahasa Inggris

Kelas/Semester : VIII (Delapan)/ II (Genap)

Tema : *Noun (animals, fruits, things in the classsroom, and things in the house)*

Alokasi Waktu : 4 x 40 menit

Standar Kompetensi :

- Memahami instruksi sederhana terhadap kosakata dalam konteks sekitar peserta didik.

Kompetensi Dasar :

- Merespon instruksi sederhana terhadap kosakata yang berhubungan dengan konteks sekitar peserta didik secara verbal.

Indikator :

a. Mengidentifikasi noun *(animals, fruits, things in the classsroom, and things in the house)* yang diberikan oleh guru.
b. Menyebutkan noun *(animals, fruits, things in the classsroom, and things in the house)* yang guru tunjuk dengan benar.
c. Menuliskan nama noun *(animals, fruits, things in the classsroom, and things in the house)* tersebut dengan ejaan yang benar.

Tujuan pembelajaran :

a. Siswa dapat mengidentifikasi noun *(animals, fruits, things in the classsroom, and things in the house)* yang diberikan oleh guru.

b. Siswa dapat menyebutkan noun *(animals, fruits, things in the classsroom, and things in the house)* yang guru tunjuk dengan benar.
c. Siswa dapat menuliskan noun *(animals, fruits, things in the classsroom, and things in the house)* tersebut dengan ejaan yang benar.

Metode/strategi pembelajaran **:** *Mind mapping strategy*

Materi Pembelajaran **:** *Noun (animals, fruits, things in the classsroom, and things in the house).*

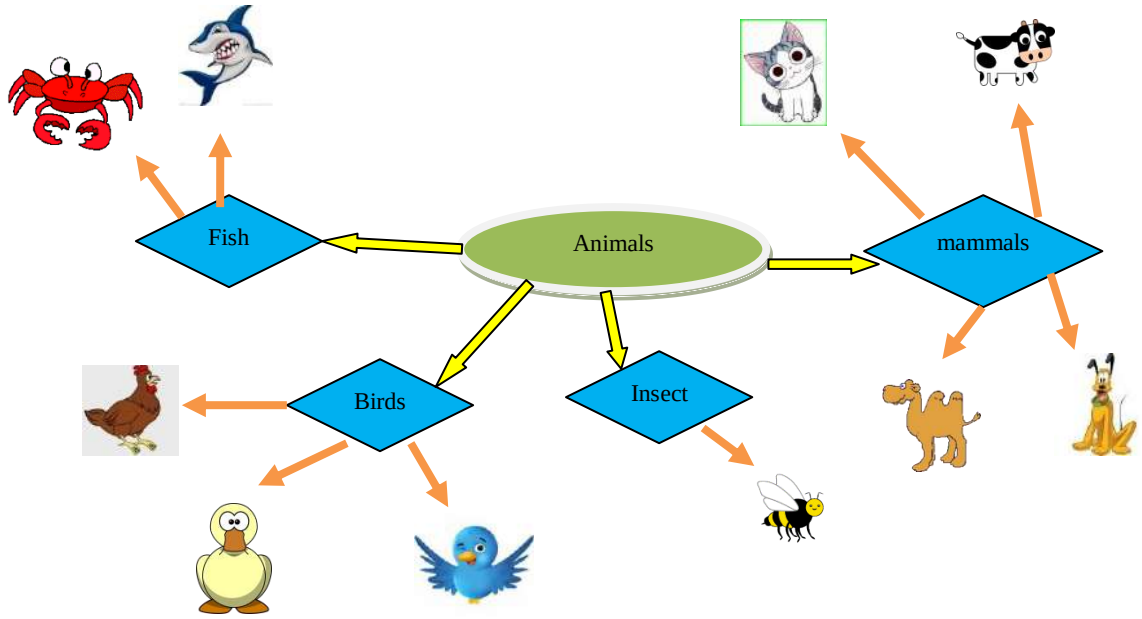
ANIMALS	**FRUITS**	**THINGS IN THE CLASSROOM**
Cat = kucing	Coconut = kelapa	Table = meja
Chicken = ayam	Orange = jeruk	Chair = bangku
Cow = sapi	Grape = anggur	Chalk = kapur
Duck = bebek	Banana = pisang	Blackboard = papan tulis
Bee = lebah	Strawberry = stroberi	Pen = pulpen
Bird = burung	Avocado = Alpukat	Ruler = penggaris
Camel = unta	Lychee = leci	Eraser = penghapus
Dog = anjing	Apple = apel	Bag = tas
Crab = kepiting	Mangoo = mangga	Pencil = pensil
Shark = hiu	Pineapple = nanas	Book = buku

THINGS IN HOUSE

Garage = garasi
Bathroom = kamar mandi
Bedroom = kamar tidur
Television= televisi
Freezer = kulkas
Plate = piring
Glass = gelas
Yard = halaman

Mirror = cermin

Well = sumur



Langkah-langkah pembelajaran :

a. Kegiatan Pendahuluan

1. Merespon salam dan tegur sapa yang disampaikan oleh guru.
2. Merespon pemeriksaan kehadiran yang dilakukan oleh guru.
3. Mempersiapkan media pembelajaran: gambar, diagram mind mapping.
4. Menyimak penjelasan guru tentang tujuan pembelajaran hari yaitu tentang *noun (animals, fruits, things in the classsroom, and things in the house).*

b. Kegiatan Inti

1. Menyimak arahan guru.
2. Guru membangun pengetahuan siswa mengenai topik materi dengan memberikan pertanyaan pembuka.
3. Guru menempelkan diagram mind mapping tentang *noun (animals, fruits, things in the classsroom, and things in the house)* di papan tulis.

4. Dengan menggunakan diagram mind mapping tersebut, guru mempresentasikan *noun (animals, fruits, things in the classsroom, and things in the house)*.
5. Dengan menggunakan gambar dan kata kunci yang ditunjuk oleh guru, siswa di suruh untuk menebak kosakata yang di maksudkan. Setelah itu, guru akan menuliskan kosakata tersebut pada cabang mind mapping yang tersedia (guru mempresentasikan kosakata satu persatu).
6. Setelah selesai mempresentasikan seluruh kosakata. Guru menyuruh siswa untuk membaca semua kosakata yang ada pada diagram mind mapping dengan nyaring. Jika siswa salah dalam mengucapkan kata, guru akan segera mengoreksinya.

c. Kegiatan Penutup
   1. Melakukan refleksi pembelajaran (kesan, manfaat yg siswa peroleh dan kesulitan yang siswa hadapi) dipandu oleh guru.
   2. Memberikan motivasi kepada siswa berdasarkan nilai-nilai moral yang terdapat dalam hasil karangan siswa.
   3. Menyimak komentar dan arahan guru untuk pertemuan berikutnya.
   4. Merespon salam penutup yang disampaikan oleh guru.

Media dan sumber pembelajaran :

a. Media Pembelajaran : Diagram mind mapping.
b. Sumber pembelajaran : Experiencing English: English for Junior High School Students Year VIII, Tim Masmedia Buana Pustaka, Jakarta: Pusat Pembukuan: Sidoarjo: PT. Masmedia Buana Pustaka, 2015.

Penilaian :

Guru menyuruh siswa untuk membuat diagram mind mapping tentang *noun (animals, fruits, things in the classsroom, and things in the house)* sebanyak 20 dalam bahasa inggris dengan penulisan yang tepat dan benar beserta terjemahannya.

Rubrik Penilaian :

Setiap nama *noun (animals, fruits, things in the classsroom, and things in the house)* dengan penulisan yang tepat dan benar diberi skor 5.

Indikator pencapaian kompetensi	**Teknik penilaian**	**Bentuk instrument**	**Instrument soal**
1. Mengidentifikasi nama hewan 2. Mengidentifikasi nama buah 3. Mengidentifikasi nama benda yang ada dikelas 4. Mengidentifikasi nama benda di dalam rumah	Tes tulisan	Multiple choice	Memilih jawaban yang sesuai dengan petunjuk soal

Jumlah skor maksimal keseluruhan adalah 100.

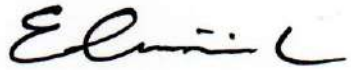
Setiap jawaban yang benar diberi skor 5.

Jumlah skor keseluruhan 5 x 20 =100.

Padangsidimpuan,

Mengetahui guru bidang studi,

Researcher,



Elmi Sartika Dewi Lubis S.Pd.
NIP: 19790813 200604 2 011

Zainuddin Hasibuan
NIM : 12 340 0040

Appendix 3

VALIDITY INSTUMENTS

FOR PRE-TEST

Name :
Class :

Answer the questions below by giving cross (X) in the correct answer!

1. It is a big animal. The farmers often use it to plow the rice field. It is ....
   A. buffalo C. cow
   B. cat D. sheep
2. It is animal. Its kind is bird. It actives at the night. Many people call it as ghost bird. It is ....
   A. owl C. bat
   B. eagle D. dove
3. The skin is moist and smooth. It is amphibian. It has long sticky tongue. It is ....
   A. snake C. frog
   B. bird D. mouse
4. It belongs to reptile. It is originally from one of the island of the Indonesian Archipelago. People call its name as its place of origin. It is ....
   A. komodo C. crocodile
   B. snake D. alligator
5. It is king of jungle. It eats meat. It is similar to cats but bigger than it. It is mammal. It is ....
   A. lion B. elephant
   B. snake D. crocodile
6. The feathers is light brown. Its claws are very sharp. It hunts for chicken and small birds. It is ....
   A. dove C. eagle
   B. cockatoo D. pigeon
7. Its fur is brown. It is walk with two foot. It has physical features similar to a human. It is ....
   A. rabbit C. orang utan
   B. hen D. duck
8. An animal eat the grass, pets and usually it is lazy to take a bath. It is ....
   A. lion C. elephant
   B. horse D. goat
9. The fastest animal in the world. It is ....
   A. lion C. cheetah
   B. horse D. tiger

10. An animal that its wool is taken for cloth. It is ....
    A. horse
    B. sheep
    C. orang utan
    D. bear

11. It has hair. It is red and sweet. The ant loves it. It is .....
    A. rambutan
    B. mango
    C. watermelon
    D. orange
12. It can be found locally. It has thorn. Its skin and seed is black but the flesh is white or red. It is ....
    A. salak
    B. durian
    C. avocado
    D. mangosteen
13. The flesh is sweet, juicy and soft. Its colour is red or yellow. Its skin rather to green. It is ....
    A. melon
    B. mango
    C. watermelon
    D. apple
14. It is queen of fruit. The skin colour is purple and white inside. It is very sweet. It is ....
    A. apple
    B. mangosteen
    C. orange
    D. pear
15. This fruit is similiar with cactus, but it has flesh, and its colour is red. It is ....
    A. dragon fruit
    B. cherry
    C. jicama
    D. star fruit
16. This fruit has hard thorns outside, and it has a strong smell. The flesh is soft and creamy. It is ....
    A. mangosteen
    B. longan
    C. durian
    D. orange
17. It has a shape like a star. The taste is sour. It is ....
    A. rambutan
    B. ambarella
    C. watermelon
    D. star fruit
18. This fruit has brown. People always say that Indonesian skin is familiar with this fruit’s colour. It is ....
    A. longan
    B. sapodilla
    C. jicama
    D. papaya
19. It has small brown shape. The flesh is white. It also has a black kernel inside the flesh. It is ....
    A. apple
    B. guava
    C. longan
    D. orange
20. This fruit belongs to the syzygium family. We can eat all the fruit within the skin. Its colour inside is pink. It also has many small kernels inside. It is ....
    A. guava
    B. rose apple
    C. jicama
    D. papaya

21. This thing is used by the students to erase their writing. It is ....
    A. notebook C. compass
    B. calculator D. eraser
22. This thing is used to keep the table clean. It is ....
    A. broom C. eraser
    B. table cloth D. bucket

23. The students use this thing to keep their classroom floor clean and shine. It is ....
    A. Mop C. Broom
    B. Bucket D. Eraser
24. It can be black or white. It is in the classroom. It is square. Teacher explains in it. It is ....
    A. chair C. table
    B. board D. lamp
25. We use it to write on the paper. It needs ink. It is ....
    A. pen C. pencil
    B. marker D. pen correction
26. Its colour is white. You use it when you make mistake by pen. You often shake it before you use it. It is ....
    A. pen C. pencil
    B. marker D. pen correction
27. The shape is usually square. You save your pen, pencil, eraser and other tools to write in it. It is ....
    A. pen box C. correction pen
    B. bag D. basket
28. It has many colours. It is similar to pencil. You use it to colour your picture. It is ....
    A. pencil case C. pencil colour
    B. crayon D. pen
29. It is usually on the roof. It can be found in your classroom. It is used to light the room. It is ....
    A. pencil case C. pencil colour
    B. lamp D. wall
30. The students use it on their neck in the school. It is ....
    A. Cap C. ring
    B. necklace D. tie
31. We use this thing to store junk. It is ....
    A. garage C. warehouse
    B. bathroom D. living room
32. After shower, we will need this thing. It is ....
    A. soap C. towel
    B. toothpaste D. toothbrush

33. We use it for sleeping time. It is ....
    A. phone
    B. towel
    C. bed
    D. stove
34. It is used for calling your friend in a long distance. It has numbers. It is ....
    A. phone
    B. television
    C. radio
    D. freezer
35. We use it to keep our clothes. It is ....
    A. sofa
    B. dresser
    C. cupboard
    D. drawer
36. It is used for washing hand and face. It is ....
    A. sink
    B. bedroom
    C. kitchen
    D. living room
37. It is used for entertaining. We watch it to get some informations. It is ....
    A. radio
    B. phone
    C. air conditioner
    D. television
38. We will use it when the rain is falling down. It is ....
    A. kettle
    B. bag
    C. umbrella
    D. basket
39. When we want to drink, we will need it. It is ....
    A. cup
    B. stove
    C. plate
    D. Iron
40. It is made from paper. It has many informations inside. We need to read it to know a latest news. It is ....
    A. radio
    B. newspaper
    C. television
    D. phone

Validator,

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Appendix 4

VALIDITY INSTUMENTS

FOR POST-TEST

Name :
Class :

Answer the questions below by giving cross (X) in the correct answer!

1. This animal likes to eat fish. It is ....
   A. Cat C. Cow
   B. Buffalo D. Wolf
2. This animal always wake up early every morning. It likes to eat rice. It is ....
   A. Duck C. Cow
   B. Cat D. Chicken
3. This animals produces milk. It is ....
   A. Wolf C. Horse
   B. Lion D. Cow
4. This animal voices “wekwekwek”. It is ....
   A. Chicken C. Mouse
   B. Duck D. Cat
5. This animal produces honey. It is ....
   A. Bee C. Bird
   B. Butterfly D. Bat
6. This animal can fly in the sky. It is ....
   A. Penguin C. Bird
   B. Frog D. Butterfly
7. This animal live in desert. It is ....
   A. Wolf C. Kangaroo
   B. Cow D. Camel
8. The police usually use this animal to catch a thief. It is ....
   A. Wolf C. Dog
   B. Lion D. Tiger
9. This animal lives in the sea. It has a couple of tweezers. It is ....
   A. Crab C. Shark
   B. Clam D. Pope
10. A wild animal in the sea. It is very dangerous because it has sharp teeth. It is ....
    A. Pope C. Stingray
    B. Shark D. Dolphin
11. This fruit has round shape and green when it is still raw. It is ....
    A. Apple C. Mango
    B. Coconut D. Pineapple

12. This fruit contains a lot of vitamin C. It is ....
    A. Orange C. Apple
    B. Banana D. Watermelon
13. It is small round fruit. In one stalk has a lot of flesh. It is ....
    A. Grape C.Mango
    B. Banana D. Guava
14. Monkey very likes this fruit. It is ....
    A. Orange C.Grape
    B. Jackfruit D. Banana
15. It is a small red fruit. The taste is sour, but many people like this fruit. It is ....
    A. Apple C. Strawberry
    B. Banana D. Watermelon
16. It has greennees flesh. There is a kernel inside. It is ....
    A. Jicama C. Melon
    B. Avocado D. Papaya
17. This fruit looks like strawberry. Both of fruits is red small shape, but this fruit has a kernel inside. It is ....
    A. Snackfruit C. Apple
    B. Pear D. Lychee
18. This fruit will change to be red color when it has matured. But, inside is white. It is ....
    A. Mangosteen C. Apple
    B. Banana D. Ambarella
19. This fruit is green outside, but it is yellow inside. It also has a kernel inside. It contains a lot of vitamin C. It is ....
    A. Jicama C. Mango
    B. Banana D. Orange
20. This fruit has sharp thorn skin. The flesh taste is sweet and sour. It is ....
    A. Apple C. Mango
    B. Coconut D. Pineapple
21. This thing is used by the students when they want to write on it. It is ....
    A. Chair C. Bag
    B. Table D. Blackboard
    C.
22. This thing is used to show a mini country location in a paper. It is ....
    A. Map C. Textbook
    B. Notebook D. Drawing book
23. We use it when we need to find out the meaning of a word. It is ....
    A. Notebook C. Dictionary
    B. Map D. Drawing book
24. The teacher writes something on this thing by chalk for teaching. It is ....
    A. Whiteboard C. Blackboard
    B. Drawing book D. Notebook

25. The students need this thing to sit when they are studying. It is ....
    A. Table
    C. Floor
    B. Chair
    D. Blackboard
26. This thing is used for writing on the blackboard. It is ....
    A. Pen
    C. Pencil
    B. Chalk
    D. Marker
27. The students draw something on this thing. It is ....
    A. Notebook
    C. Dictionary
    B. Map
    D. Drawing book
28. The students use this thing when they want to count something in a Math. It is ....
    A. Ruler
    C. Eraser
    B. Calculator
    D. Compass
29. The students need this thing to bring all tools that they need from home to school. It is ....
    A. Bag
    C. Shoes
    B. Hat
    D. Uniform
30. The students need this thing to clean their classroom. It is ....
    A. Dump
    C. Broom
    B. Bucket
    D. Eraser
31. We should open this thing when we enter to a house. It is ....
    A. Window
    C. Door
    B. Floor
    D. Wall
32. We use this thing when the weather is hot. It is ....
    A. Fan
    C. Television
    B. Lamp
    D. Freezer
33. This thing will be need when the day will be night. It is ....
    A. Freezer
    C. Fan
    B. Air conditioner
    D. Lamp
34. This thing is usually located on the house wall. It is ....
    A. Computer
    C. Picture
    B. Lamp
    D. Television
35. We use this thing when we want to go the next floor in the house. It is ....
    A. Stair
    C. Table
    B. Desk
    D. Cupboard
36. This thing is used to be access for entering fresh air to the house. It is ....
    A. Fence
    C. Door
    B. Vent
    D. Floor
37. We use this thing to put books in the house. It is ....
    A. Vase
    C. Bookcase
    B. Drawer
    D. Wardrobe
38. This thing is used to keep a car in a house. It is ....
    A. Dinning room
    C. Bedroom
    B. Bathroom
    D. Garage

39. We use this thing when we eat rice. It is ....
    A. Ketle
    B. Plate
    C. Glass
    D. Fork
40. We use this thing when we feel so cold. It is ....
    A. Blanket
    B. Mirror
    C. Lamp
    D. Clock

Validator,

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Appendix 5

Key Answer

A. Pre-Test

1. C. cow
2. A. owl
3. C. frog
4. A. komodo
5. A. lion
6. C. eagle
7. C. orang utan
8. D. goat
9. C. cheetah
10. B. sheep
11. A. rambutan
12. A. salak
13. C. watermelon
14. B. mangosteen
15. A. dragon fruit
16. C. durian
17. D. star fruit
18. B. sapodilla
19. C. longan
20. A. guava
21. D. eraser
22. B. table cloth
23. A. mop
24. B. board
25. A. pen
26. D. pen correction
27. A. pen box
28. B. crayon
29. B. lamp
30. B. necklace
31. C. warehouse
32. C. towel
33. C. bed
34. A. phone
35. C. cupboard
36. A. sink
37. D. television
38. C. umbrella
39. A. cup
40. B. newspaper

B. Post-Test

1. A. cat
2. D. chicken
3. D. cow
4. B. duck
5. A. bee
6. C. bird
7. D. camel
8. C. dog
9. A. crab
10. B. shark
11. B. coconut
12. A. orange
13. A. grape
14. D. banana
15. C. strawberry
16. B. avocado
17. D. lychee
18. C. apple
19. C. mango
20. D. pineapple
21. B. table
22. A. map
23. C. dictionary
24. C. blackboard
25. B. chair
26. B. chalk
27. D. drawing book
28. B. calculator
29. A. bag
30. C. broom
31. C. door
32. A. fan
33. D. lamp
34. C. picture
35. A. stair
36. B. vent
37. C. bookcase
38. D. garage
39. B. plate
40. A. blanket

Appendix 6

Validity of Pre Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	1	1	1	0	1	0	1	0	0	1	1	1	0	1	1	1	1	1	1
2	1	1	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1
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N = 30	19	23	16	13	11	19	18	19	14	19	18	19	19	26	11	19	25	21	18	24

Validity of Pre Test

NO	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	X
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16	1	1	0	0	0	0	0	0	0	1	1	1	1	1	0	1	1	0	0	1	23
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23	1	0	1	0	1	0	0	0	1	1	0	0	1	0	1	1	0	1	1	0	21
24	0	1	1	0	1	0	0	1	1	1	0	0	1	0	1	1	1	1	1	1	27
25	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	1	0	1	0	0	24
26	0	0	1	1	1	0	1	1	1	1	0	0	0	1	0	1	1	1	0	1	27
27	0	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0	0	1	1	27
28	1	0	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	0	1	1	31
29	1	1	1	0	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1	33
30	0	1	1	1	0	1	0	1	0	1	1	1	0	1	1	1	1	1	0	1	25
N = 30	19	20	18	18	18	18	9	19	17	19	19	19	18	17	18	26	22	18	18	19	∑X = 740

Appendix 7

Validity of Post Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	1	0	0	0	1	0	1	0	1	1	1	0	1	1	0	1	1	1	0
2	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	1	0
3	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	0	0
5	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	0	1
6	1	0	0	0	0	0	1	0	1	0	1	1	1	1	0	1	0	0	0	0
7	0	0	0	0	1	0	1	0	1	1	1	1	1	0	0	0	1	1	1	0
8	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	0	0	1	0	1
9	1	0	0	0	0	0	1	0	1	0	0	0	1	1	0	1	1	1	1	1
10	1	1	0	0	0	0	1	1	0	1	0	1	1	1	0	1	0	0	1	1
11	1	0	1	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	0	1
12	1	1	0	0	0	0	1	0	0	1	1	0	1	1	0	1	1	0	1	1
13	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	0	1	1	1	0
14	1	1	1	1	0	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1
15	1	1	1	1	1	1	0	1	1	1	0	1	0	0	0	0	0	1	1	1
16	0	1	1	1	0	1	0	1	0	1	0	1	1	0	1	0	1	1	1	1
17	1	1	1	1	1	1	1	0	1	0	1	0	0	1	0	1	0	1	0	1
18	1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	1
19	0	1	1	1	0	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1
20	1	1	1	0	0	1	1	0	1	0	1	0	0	1	0	1	1	1	1	1
21	1	1	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0
22	1	0	0	0	1	0	0	1	1	1	0	1	0	0	1	1	0	1	1	0
23	1	1	1	0	1	0	1	0	1	1	0	1	1	0	1	1	1	1	1	1
24	1	1	1	0	1	0	1	0	1	1	0	0	0	0	1	1	1	0	1	0
25	0	1	1	1	1	0	0	1	1	1	0	1	0	1	1	1	0	1	1	1
26	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0
27	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	1	1	0	0	1
28	0	1	1	0	0	1	1	1	1	1	1	0	0	1	0	1	0	1	1	1
29	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1
30	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
N = 30	21	25	17	13	12	15	19	19	19	24	19	19	18	19	10	19	19	19	18	20

Validity of Post Test

NO	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	X
1	1	1	0	0	0	1	1	0	0	1	0	0	1	1	0	1	1	0	0	1	21
2	0	1	1	1	0	1	1	0	0	1	1	0	0	0	1	1	1	1	0	0	20
3	1	1	0	0	0	0	1	1	0	1	1	1	1	1	0	1	1	0	1	1	30
4	1	0	0	0	0	1	1	0	1	0	1	1	1	1	0	1	1	1	0	1	23
5	1	1	0	1	0	1	0	1	0	1	1	1	1	1	0	1	1	0	0	1	28
6	0	0	0	1	0	1	0	1	1	0	1	1	1	1	0	0	1	1	1	1	20
7	1	1	1	0	0	0	0	0	1	0	1	0	1	1	0	1	1	1	0	1	21
8	0	0	0	1	0	1	1	0	1	0	0	1	1	1	1	1	0	0	1	1	23
9	0	0	0	1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	20
10	0	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	0	1	0	1	24
11	0	1	1	1	0	0	0	1	0	1	1	0	0	1	1	0	1	1	0	1	24
12	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	26
13	0	0	1	1	1	1	1	1	1	0	0	0	0	1	1	0	1	0	1	1	25
14	0	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	31
15	0	0	1	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1	0	21
16	1	0	0	0	0	0	1	1	1	1	0	1	1	1	1	0	1	1	0	0	24
17	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	0	29
18	0	1	1	1	0	1	0	0	0	1	1	1	1	1	1	1	0	1	0	1	21
19	0	0	0	0	0	0	0	1	0	1	0	1	1	1	0	1	1	0	1	1	24
20	1	1	1	1	1	1	0	1	1	0	0	0	0	1	0	1	1	1	1	1	27
21	1	1	1	1	0	1	1	0	1	0	1	0	1	1	1	1	0	1	1	0	22
22	1	1	1	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1	0	19
23	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	0	30
24	0	0	0	0	1	0	0	0	1	1	0	0	1	1	1	1	0	0	0	1	19
25	1	1	0	0	1	0	0	1	0	1	0	0	0	1	1	1	1	1	1	1	26
26	0	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	30
27	0	1	1	1	0	1	1	0	0	1	0	0	1	1	1	0	0	1	1	1	22
28	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	0	1	0	1	0	27
29	1	1	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	33
30	0	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	1	27
N = 30	14	20	18	19	11	18	18	19	18	18	17	19	23	26	19	19	19	18	18	22	∑ = 737

Appendix 8

Calculation of Validity Pre Test

To get the validity of the pre test, the researcher uses Construct Validity by using formula of t-test below:

$$t = \frac{\overline{X1} - \overline{X2}}{sgab\sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

1. Taken total of high and low score

27 % X sum of respondent

27% X 30 = 8.1 => N=8

High score	Low Score
26	9
26	11
25	11
24	13
23	14
22	16
21	17
20	17

2. Means score of high and low group score

$\overline{X1} = \frac{\Sigma X1}{N1}$ $\overline{X2} = \frac{\Sigma X2}{N2}$

$\overline{X1} = \frac{187}{8}$ $\overline{X2} = \frac{108}{8}$

$\overline{X1}$ = 23.375 $\overline{X1}$ = 13.5

3. Variant

Table Calculation of S_1^2 and S_2^2

X	X^2	X	X^2
26	676	9	81
26	676	11	121
25		11	
24	625	13	121
23		14	
22	576	16	169
21	529	17	196
20	1089	17	256
	441		289
	400		289
$\sum X = 187$	$\sum X^2 = 4407$	$\sum X = 108$	$\sum X = 1522$

$$S_1^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)} \qquad S_2^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)}$$

$$S_1^2 = \frac{8(4407) - (187)^2}{8(8-1)} \qquad S_2^2 = \frac{8(1522) - (108)^2}{8(8-1)}$$

$$S_1^2 = \frac{35256 - 34969}{8(7)} \qquad S_1^2 = \frac{12176 - 11664}{8(7)}$$

$$S_1^2 = \frac{287}{56} \qquad S_2^2 = \frac{512}{56}$$

$$S_1^2 = 5.125 \qquad S_2^2 = 9.14$$

4. Calculation of *Sgab*

$$Sgab = \sqrt{\frac{(n_1-1)\, {s_1}^2+(n_2-1)\, {s_2}^2}{(n_1-n_2)-2}}$$

$$Sgab = \sqrt{\frac{(8-1)\ 5.125+(8-1)\ 9.14}{(8+8)-2}}$$

$$Sgab = \sqrt{\frac{(7)\ 5.125+(7)\ 9.14}{14}}$$

$$Sgab = \sqrt{\frac{35.875+63.98}{14}}$$

$$Sgab = \sqrt{\frac{99.855}{14}}$$

$$Sgab = \sqrt{7.1325}$$

$$Sgab = 2.67$$

5. Calculation of t-test

$$t = \frac{\overline{X1}-\overline{X2}}{sgab\sqrt{\frac{1}{n1}+\frac{1}{n2}}}$$

$$t = \frac{23.375 - 13.5}{2.67\sqrt{\frac{1}{8}+\frac{1}{8}}}$$

$$t = \frac{9.875}{2.67\sqrt{\frac{2}{8}}}$$

$$t = \frac{9.875}{2.67\sqrt{0.25}}$$

$$t = \frac{9.875}{2.67\ (0.5)}$$

$$t = \frac{9.875}{1.335}$$

$$t = 7.39$$

Based on the calculation above it can be concluded that t_{count} is higher than t_{table} in level 5% with dk 14. Score of the t_{count} is 7.39 and the score of t_{table} is 1.345 (7.39>1.345). It means that there is a significant differences between the high score and low score of the items of test. So we can conclude that the instrument is valid.

Appendix 9

Calculation of Validity Post Test

To get the validity of the post test, the researcher used Construct Validity by using formula of t-test below:

$$t = \frac{\overline{X1} - \overline{X2}}{sgab\sqrt{\frac{1}{n1} + \frac{1}{n2}}}$$

1. Taken sum of high and low score

27 % X total of respondent

27% X 30 = 8.1 => N=8

High score	Low Score
26	10
25	11
24	12
23	13
22	14
21	15
20	17
20	17

1. Means score of high and low group score

$\overline{X1} = \frac{\Sigma X1}{N1}$ $\overline{X2} = \frac{\Sigma X2}{N2}$

$\overline{X1} = \frac{181}{8}$ $\overline{X2} = \frac{109}{8}$

$\overline{X1}$ = 22.625 $\overline{X1}$ = 13.625

2. Variant

Table Calculation of S_1^2 and S_2^2

X	X^2	X	X^2
26	676	10	100
25	625	11	121
24	576	12	144
23	529	13	169
22	484	14	196
21	441	15	225
20	400	17	289
20	400	17	289
$\sum X = 181$	$\sum X^2 = 4131$	$\sum X = 109$	$\sum X = 1533$

$$S_1^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)} \qquad S_2^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)}$$

$$S_1^2 = \frac{8(4131) - (181)^2}{8(8-1)} \qquad S_2^2 = \frac{8(1533) - (109)^2}{8(8-1)}$$

$$S_1^2 = \frac{33048 - 32761}{8(7)} \qquad S_1^2 = \frac{12264 - 11881}{8(7)}$$

$$S_1^2 = \frac{287}{56} \qquad S_2^2 = \frac{383}{56}$$

$$S_1^2 = 5.125 \qquad S_2^2 = 6.83$$

3. Calculation of *Sgab*

$$Sgab = \sqrt{\frac{(n_1-1)\,{s_1}^2+(n_2-1)\,{s_2}^2}{(n_1-n_2)-2}}$$

$$Sgab = \sqrt{\frac{(8-1)\,5.125+(8-1)\,6.839}{(8+8)-2}}$$

$$Sgab = \sqrt{\frac{(7)\,5.125+(7)\,6.839}{14}}$$

$$Sgab = \sqrt{\frac{35.875+47.873}{14}}$$

$$Sgab = \sqrt{\frac{83.748}{14}}$$

$$Sgab = \sqrt{5.982}$$

$$Sgab = 2.44$$

4. Calculation of t-test

$$t = \frac{\overline{X1}-\overline{X2}}{sgab\sqrt{\frac{1}{n1}+\frac{1}{n2}}}$$

$$t = \frac{22.625-13.625}{2.44\sqrt{\frac{1}{8}+\frac{1}{8}}}$$

$$t = \frac{9}{2.44\sqrt{\frac{2}{8}}}$$

$$t = \frac{9}{2.44\sqrt{0.25}}$$

$$t = \frac{9}{2.44\,(0.5)}$$

$$t = \frac{9}{1.22}$$

$$t = 7.37$$

Based on the calculation above it can be concluded that t_{count} is higher than t_{table} in level 5% with dk 14. Score of the t_{count} is 7.37 and the score of t_{table} is 1.345 (7.37>1.345). It means that there is a significant differences between the high score and low score of the items test. So we can conclude that the instrument is valid.

Appendix 10

Reability Test of Pre Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	1	1	1	0	1	0	1	0	0	1	1	1	0	1	1	1	1	1	1
2	1	1	0	0	0	0	0	1	1	1	0	1	1	1	1	1	1	0	1	1
3	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1
4	1	1	0	0	0	1	1	1	1	1	0	0	0	0	0	1	1	1	1	1
5	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1
6	1	0	0	0	0	0	1	1	1	0	1	1	1	1	0	1	0	0	1	0
7	0	0	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1
8	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	1	1	1	0	1
9	0	0	0	0	0	1	0	0	1	0	1	1	0	0	0	1	1	1	1	1
10	1	1	0	0	0	0	0	1	1	0	1	1	1	0	0	0	1	0	1	1
11	1	1	0	0	0	1	1	1	1	1	1	0	1	1	0	1	1	0	1	1
12	1	1	0	0	0	0	1	1	0	1	1	0	0	1	0	0	1	0	1	1
13	1	0	1	0	0	0	0	0	1	0	1	0	0	1	0	0	1	1	1	1
14	0	1	1	1	0	1	1	0	0	1	0	0	1	1	0	1	0	1	0	0
15	1	0	1	1	1	1	1	1	1	0	1	0	0	1	0	0	1	1	1	1
16	1	1	1	1	0	1	0	0	0	1	0	1	1	1	0	0	1	1	1	1
17	1	1	1	1	1	1	1	0	1	0	1	0	0	1	0	1	1	1	1	0
18	0	1	0	0	0	0	1	0	0	1	1	1	1	1	0	0	0	0	0	1
19	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1	0	1
20	0	0	1	0	0	1	1	0	1	0	0	0	0	1	0	1	0	1	0	0
21	1	1	0	0	0	1	1	1	0	0	1	1	0	1	0	0	1	0	0	0
22	1	0	0	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1	1	1
23	0	1	1	0	1	0	1	0	0	1	0	0	1	1	1	0	0	1	1	1
24	1	1	1	0	1	1	1	1	0	1	0	1	0	1	1	0	1	1	1	0
25	0	1	0	0	1	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	0	1	1	0	1
27	1	1	0	0	0	1	1	1	0	1	1	1	1	1	0	1	1	0	0	1
28	0	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1
30	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
N = 30	19	23	16	13	11	19	18	19	14	19	18	19	19	26	11	19	25	21	18	24

Reability Test of Pre Test

NO	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	X	X^2
1	1	1	0	1	1	1	0	1	0	1	1	1	1	1	0	1	0	0	0	1	27	729
2	0	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	30	900
3	1	1	0	1	0	1	0	1	0	1	1	1	1	1	0	1	1	0	0	1	28	784
4	1	0	0	0	0	1	0	1	1	0	1	1	1	1	0	0	1	1	0	0	22	484
5	1	1	0	0	1	0	1	0	1	0	1	1	0	0	0	1	1	0	1	1	26	676
6	1	0	0	1	0	0	0	1	1	0	1	1	0	0	0	1	0	1	1	1	20	400
7	1	0	0	0	0	0	1	1	1	0	1	1	0	1	0	1	1	1	0	0	25	625
8	0	0	0	1	1	1	1	0	1	0	0	1	0	0	1	1	1	1	1	1	27	729
9	1	1	0	0	1	0	0	1	0	1	1	1	1	1	0	0	0	0	1	0	19	361
10	0	1	1	1	0	1	0	0	1	1	1	0	1	1	1	1	1	1	1	0	24	576
11	0	1	1	1	0	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	29	841
12	0	1	1	1	1	1	0	0	1	1	1	1	0	0	1	1	1	1	1	1	25	625
13	1	1	1	1	1	1	0	0	1	0	0	0	0	1	0	1	1	1	1	0	21	441
14	1	1	0	1	0	1	0	0	0	1	1	0	1	1	1	0	1	0	0	1	21	441
15	1	1	1	0	0	0	1	1	1	0	0	1	0	0	0	1	0	0	1	0	23	529
16	1	1	0	0	0	0	0	0	0	1	1	1	1	1	0	1	1	0	0	1	23	529
17	1	0	1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	0	1	1	29	841
18	0	0	1	1	1	1	0	1	0	1	1	1	1	0	1	1	1	0	0	1	21	441
19	1	1	0	0	0	0	0	1	0	0	0	0	1	0	0	1	1	0	1	1	23	529
20	1	1	1	1	1	1	0	0	1	0	0	0	0	1	1	1	1	1	0	0	19	361
21	0	1	1	1	0	1	0	1	0	1	1	0	1	0	1	1	0	1	0	0	20	400
22	1	0	1	0	1	0	0	1	1	1	0	1	0	0	1	1	1	1	1	0	23	529
23	1	0	1	0	1	0	0	0	1	1	0	0	1	0	1	1	0	1	1	0	21	441
24	0	1	1	0	1	0	0	1	1	1	0	0	1	0	1	1	1	1	1	1	27	729
25	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	1	0	1	0	0	24	576
26	0	0	1	1	1	0	1	1	1	1	0	0	0	1	0	1	1	1	0	1	27	729
27	0	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	0	0	1	1	27	729
28	1	0	1	1	1	1	1	1	1	0	1	0	1	0	1	1	1	0	1	1	31	961
29	1	1	1	0	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1	33	1089
30	0	1	1	1	0	1	0	1	0	1	1	1	0	1	1	1	1	1	0	1	25	625
N = 30	19	20	18	18	18	18	9	19	17	19	19	19	18	17	18	26	22	18	18	19	$\sum X$ = 740	$\sum X^2$ = 18650

Appendix 11

Reability Re-Test of Pre Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	1	0	0	0	1	0	1	0	1	1	1	0	1	1	1	1	1	0	1
2	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1
3	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1
5	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1
6	1	0	0	0	0	0	0	0	1	0	1	1	1	1	0	1	0	0	0	0
7	0	0	0	0	1	0	1	0	1	1	1	1	1	1	0	1	1	1	0	1
8	1	1	1	1	1	1	1	1	1	0	0	0	1	1	0	1	1	1	0	1
9	1	0	0	0	0	0	0	1	1	0	1	1	1	1	0	1	1	1	0	1
10	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
11	1	0	1	1	1	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
12	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
13	0	0	0	0	0	0	0	1	1	0	1	0	0	1	0	1	1	1	0	0
14	1	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1
15	1	1	1	1	1	1	0	1	1	1	1	1	0	1	0	1	1	1	0	1
16	0	0	0	0	0	1	0	0	0	1	0	1	1	1	1	1	1	1	0	1
17	1	1	1	1	1	1	0	1	1	0	1	0	0	1	0	1	1	1	0	1
18	1	1	0	0	1	1	1	1	0	1	1	1	1	1	0	1	1	0	0	1
19	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1
20	1	1	1	0	0	1	0	1	1	0	1	0	0	1	0	1	1	1	0	1
21	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
22	1	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1
23	1	1	1	0	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1
24	1	1	1	0	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	0
25	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	0	0	0
27	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
28	0	1	1	0	0	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1
30	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
N = 30	21	24	18	14	14	16	8	27	12	24	23	24	24	29	13	29	28	20	8	26

Reability Re-Test of Pre Test

NO	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Y	Y^2
1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	0	1	1	1	1	1	28	784
2	0	1	1	1	0	1	0	1	0	1	1	1	0	0	1	1	1	1	0	0	29	841
3	1	1	0	0	1	1	0	1	0	1	1	1	1	1	0	1	1	0	0	0	29	841
4	1	0	1	1	1	0	0	1	1	0	1	1	1	1	0	1	1	1	0	0	29	841
5	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	1	1	0	27	729
6	1	1	1	0	0	0	1	1	1	0	1	1	1	1	0	0	1	1	1	1	21	441
7	1	1	1	0	0	0	0	1	1	0	1	1	1	1	0	1	1	1	1	1	26	675
8	0	0	0	1	0	1	1	0	1	0	0	1	1	1	1	1	0	0	0	1	25	625
9	0	1	0	0	0	0	1	1	0	1	1	1	1	1	1	1	0	0	0	1	22	484
10	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	0	0	0	1	24	575
11	0	1	1	1	0	1	1	1	0	1	1	0	0	1	1	0	1	1	1	1	27	729
12	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	0	0	25	625
13	1	1	1	1	1	1	0	1	1	0	1	0	0	1	0	1	1	0	0	0	19	361
14	1	1	0	1	1	1	1	1	0	1	0	0	0	0	0	1	1	0	0	0	26	675
15	0	1	1	0	0	0	1	1	1	0	1	1	0	0	0	0	1	1	0	0	25	625
16	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	1	0	0	25	625
17	0	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	0	0	27	729
18	0	1	1	1	0	1	0	1	0	1	1	1	1	0	0	1	1	1	0	1	27	729
19	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	0	1	1	27	729
20	1	1	1	1	1	1	0	1	1	0	1	0	0	1	0	0	0	0	0	1	23	529
21	1	1	1	1	0	1	0	1	0	1	1	1	1	1	1	0	0	1	0	0	24	575
22	1	1	1	0	1	0	0	1	0	1	0	1	0	1	1	1	0	0	1	0	27	729
23	1	1	1	1	1	1	1	1	0	1	0	0	0	0	0	1	1	1	1	0	28	784
24	1	1	1	1	1	0	0	1	0	1	0	1	1	1	0	0	1	1	1	1	28	784
25	1	1	0	0	1	0	0	1	0	1	0	0	0	0	0	1	1	1	0	1	24	575
26	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	27	729
27	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	0	0	1	25	625
28	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	30	900
29	1	1	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	0	0	1	33	1089
30	0	1	1	1	0	1	0	1	0	0	0	0	1	0	0	1	0	1	1	1	27	729
N = 30	18	26	23	20	15	19	14	29	10	19	21	21	20	21	13	22	21	16	11	17	$\sum Y$ = 784	$\sum Y^2$ = 20715

Appendix 12

Reability Test of Post Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	1	0	0	0	1	0	1	0	1	1	1	0	1	1	0	1	1	1	0
2	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	0	0	0	1	0
3	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	0	0
5	0	1	1	1	0	1	1	1	0	1	1	1	1	1	1	0	1	1	0	1
6	1	0	0	0	0	0	1	0	1	0	1	1	1	1	0	1	0	0	0	0
7	0	0	0	0	1	0	1	0	1	1	1	1	1	0	0	0	1	1	1	0
8	1	1	1	1	1	1	1	1	1	0	0	0	1	0	0	0	0	1	0	1
9	1	0	0	0	0	0	1	0	1	0	0	0	1	1	0	1	1	1	1	1
10	1	1	0	0	0	0	1	1	0	1	0	1	1	1	0	1	0	0	1	1
11	1	0	1	1	1	0	1	1	0	1	1	0	1	1	0	1	1	0	0	1
12	1	1	0	0	0	0	1	0	0	1	1	0	1	1	0	1	1	0	1	1
13	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	0	1	1	1	0
14	1	1	1	1	0	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1
15	1	1	1	1	1	1	0	1	1	1	0	1	0	0	0	0	0	1	1	1
16	0	1	1	1	0	1	0	1	0	1	0	1	1	0	1	0	1	1	1	1
17	1	1	1	1	1	1	1	0	1	0	1	0	0	1	0	1	0	1	0	1
18	1	1	0	0	0	0	0	0	0	1	1	1	1	0	0	1	0	0	0	1
19	0	1	1	1	0	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1
20	1	1	1	0	0	1	1	0	1	0	1	0	0	1	0	1	1	1	1	1
21	1	1	0	0	0	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0
22	1	0	0	0	1	0	0	1	1	1	0	1	0	0	1	1	0	1	1	0
23	1	1	1	0	1	0	1	0	1	1	0	1	1	0	1	1	1	1	1	1
24	1	1	1	0	1	0	1	0	1	1	0	0	0	0	1	1	1	0	1	0
25	0	1	1	1	1	0	0	1	1	1	0	1	0	1	1	1	0	1	1	1
26	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0
27	1	1	0	0	0	0	0	1	1	1	1	1	0	0	0	1	1	0	0	1
28	0	1	1	0	0	1	1	1	1	1	1	0	0	1	0	1	0	1	1	1
29	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1
30	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
N = 30	21	25	17	13	12	15	19	19	19	24	19	19	18	19	10	19	19	19	18	20

Reability Test of Post Test

NO	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	X	X^2
1	1	1	0	0	0	1	1	0	0	1	0	0	1	1	0	1	1	0	0	1	21	441
2	0	1	1	1	0	1	1	0	0	1	1	0	0	0	1	1	1	1	0	0	20	400
3	1	1	0	0	0	0	1	1	0	1	1	1	1	1	0	1	1	0	1	1	30	900
4	1	0	0	0	0	1	1	0	1	0	1	1	1	1	0	1	1	1	0	1	23	529
5	1	1	0	1	0	1	0	1	0	1	1	1	1	1	0	1	1	0	0	1	28	784
6	0	0	0	1	0	1	0	1	1	0	1	1	1	1	0	0	1	1	1	1	20	400
7	1	1	1	0	0	0	0	0	1	0	1	0	1	1	0	1	1	1	0	1	21	441
8	0	0	0	1	0	1	1	0	1	0	0	1	1	1	1	1	0	0	1	1	23	529
9	0	0	0	1	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	20	400
10	0	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	0	1	0	1	24	576
11	0	1	1	1	0	0	0	1	0	1	1	0	0	1	1	0	1	1	0	1	24	576
12	0	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	26	676
13	0	0	1	1	1	1	1	1	1	0	0	0	0	1	1	0	1	0	1	1	25	625
14	0	1	0	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1	31	961
15	0	0	1	0	0	0	1	1	1	0	0	1	0	0	0	0	1	1	1	0	21	441
16	1	0	0	0	0	0	1	1	1	1	0	1	1	1	1	0	1	1	0	0	24	576
17	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	0	29	841
18	0	1	1	1	0	1	0	0	0	1	1	1	1	1	1	1	0	1	0	1	21	441
19	0	0	0	0	0	0	0	1	0	1	0	1	1	1	0	1	1	0	1	1	24	576
20	1	1	1	1	1	1	0	1	1	0	0	0	0	1	0	1	1	1	1	1	27	729
21	1	1	1	1	0	1	1	0	1	0	1	0	1	1	1	1	0	1	1	0	22	484
22	1	1	1	0	1	0	1	0	1	0	0	0	0	0	1	0	0	1	1	0	19	361
23	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	0	30	900
24	0	0	0	0	1	0	0	0	1	1	0	0	1	1	1	1	0	0	0	1	19	361
25	1	1	0	0	1	0	0	1	0	1	0	0	0	1	1	1	1	1	1	1	26	676
26	0	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	30	900
27	0	1	1	1	0	1	1	0	0	1	0	0	1	1	1	0	0	1	1	1	22	484
28	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	0	1	0	1	0	27	729
29	1	1	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	33	1089
30	0	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	0	1	1	1	27	729
N = 30	14	20	18	19	11	18	18	19	18	18	17	19	23	26	19	19	19	18	18	22	∑ = 737	$\sum X^2$ = 18555

Appendix 13

Reability Re-test of Post Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1
2	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	1	1
3	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1
4	1	1	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	1	1	1
5	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1
6	1	0	0	0	0	0	0	1	1	0	1	1	1	1	0	1	0	0	0	0
7	0	0	0	0	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1
8	0	0	0	1	1	1	1	1	1	0	0	0	1	1	0	0	0	0	0	1
9	1	0	0	0	0	0	0	1	1	0	1	1	1	1	0	1	1	1	0	1
10	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
11	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
12	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
13	1	0	1	0	0	0	0	0	1	0	1	0	0	1	0	1	1	1	0	1
14	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
15	1	0	1	1	1	1	0	1	1	0	1	0	0	1	0	1	1	1	0	1
16	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1
17	1	1	1	1	1	1	1	0	1	0	1	0	0	1	0	1	1	1	0	1
18	1	1	0	0	0	0	1	0	0	1	1	1	1	1	0	1	1	0	0	1
19	0	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1
20	0	0	1	0	0	1	1	0	1	0	1	0	0	1	0	1	1	1	0	1
21	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
22	1	0	0	0	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1
23	1	1	1	0	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1
24	1	1	1	0	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1
25	0	0	0	0	1	0	0	1	0	1	0	1	1	1	1	1	1	1	1	1
26	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	0	1	1	0	1
27	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
28	0	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1
29	1	1	1	1	1	1	1	0	0	0	0	0	1	1	0	1	1	1	0	1
30	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1
N = 30	20	21	16	13	12	15	13	21	11	22	23	22	25	29	11	28	28	20	11	29

Reability Re-test of Post Test

NO	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	Y	Y^2
1	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	24	576
2	0	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	23	529
3	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	1	1	1	28	784
4	1	0	1	1	0	0	0	1	1	0	1	1	1	1	0	1	1	1	0	1	25	625
5	1	1	1	1	1	0	0	1	0	1	1	1	1	1	0	1	1	1	1	1	31	961
6	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	1	0	1	22	484
7	1	0	0	0	0	0	0	1	1	0	1	1	1	1	0	1	1	1	1	1	24	576
8	0	0	0	1	0	1	1	0	1	0	0	1	1	1	1	1	0	0	0	0	21	441
9	1	1	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	0	22	484
10	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	1	26	676
11	0	1	1	1	0	1	0	1	0	0	0	0	1	1	1	1	0	1	0	1	22	484
12	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	28	784
13	1	0	0	0	1	1	0	1	1	0	1	0	0	1	0	1	1	1	1	1	27	729
14	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	0	0	1	35	1225
15	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	19	361
16	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1	26	676
17	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	0	1	27	729
18	1	1	1	1	0	1	1	1	0	0	0	0	0	0	1	1	1	1	0	1	23	529
19	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	1	26	676
20	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	0	0	0	1	25	625
21	0	1	1	1	0	1	0	1	0	1	1	1	1	0	0	0	0	0	0	0	20	400
22	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	22	484
23	1	1	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	1	0	0	29	841
24	0	1	1	0	1	1	1	1	0	1	0	1	0	0	0	0	0	1	1	1	22	484
25	1	1	1	1	1	0	0	1	0	1	0	0	0	0	0	1	1	1	0	0	24	576
26	0	0	1	1	1	0	1	1	1	1	0	1	0	1	0	1	1	1	0	1	28	784
27	0	1	1	1	0	1	0	1	0	1	1	1	1	1	0	0	0	1	0	1	23	529
28	1	1	1	0	0	1	1	0	1	0	1	1	1	0	1	1	1	0	0	0	29	841
29	1	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	35	900
30	0	1	1	1	0	1	0	1	0	1	1	1	1	1	1	1	1	1	0	0	25	625
N = 30	29	18	22	21	17	13	17	9	28	11	17	17	20	18	18	10	22	19	18	6	$\sum Y$ = 756	$\sum Y^2$ = 19418

Appendix 14

Table Calculation of Reability Pre-Test

No.	X	Y	X^2	Y^2	XY
1	27	28	729	784	756
2	30	29	900	841	870
3	28	29	784	841	812
4	22	29	484	841	638
5	26	27	676	729	702
6	20	21	400	441	420
7	25	26	625	676	650
8	27	25	729	625	675
9	19	22	361	484	418
10	24	24	576	576	576
11	29	27	841	729	783
12	25	25	625	625	625
13	21	19	441	361	399
14	21	26	441	676	546
15	23	25	529	625	575
16	23	25	529	625	575
17	29	27	841	729	783
18	21	27	441	729	567
19	23	27	529	729	621
20	19	23	361	529	437
21	20	24	400	576	480
22	23	27	529	729	621
23	21	28	441	784	588
24	27	28	729	784	756
25	24	24	576	576	576
26	27	27	729	729	729
27	27	25	729	625	675
28	31	30	961	900	930
29	33	33	1089	1089	1089
30	25	27	625	729	675
∑	740	784	18650	20716	19547

Appendix 15

Table Calculation of Reability Post-Test

No.	X	Y	X^2	Y^2	XY
1	21	24	441	576	504
2	20	23	400	529	460
3	30	28	900	784	840
4	23	25	529	625	575
5	28	31	784	961	868
6	20	22	400	484	440
7	21	24	441	576	504
8	23	21	529	441	483
9	20	22	400	484	440
10	24	26	576	676	624
11	24	22	576	484	528
12	26	28	676	784	728
13	25	27	625	729	675
14	31	35	961	1225	1085
15	21	19	441	361	399
16	24	26	576	676	624
17	29	27	841	729	783
18	21	23	441	529	483
19	24	26	576	676	624
20	27	25	729	625	675
21	22	20	484	400	440
22	19	22	361	484	418
23	30	29	900	841	870
24	19	22	361	484	418
25	26	24	676	576	624
26	30	28	900	784	840
27	22	23	484	529	506
28	27	29	729	841	783
29	33	30	1089	900	990
30	27	25	729	625	675
∑	737	756	18555	19418	18906

Appendix 16

Calculation of Reability Pre-Test

To find the correlation between the test and re-test of the pretest, the researcher uses formula correlation of product moment below:

$$r_{xy} = \frac{N(\sum XY) - (\sum X)(\sum Y)}{\sqrt{\{N(\sum X^2) - (\sum X)^2\}\{N(\sum Y^2) - (\sum Y)^2\}}}$$

$$r_{xy} = \frac{30(19547) - (740)(784)}{\sqrt{\{30(18650) - (740)^2\}\{30(20716) - (784\}}}$$

$$r_{xy} = \frac{586410 - 580160}{\sqrt{\{559500 - 547600\}\{621480 - 614656\}}}$$

$$r_{xy} = \frac{6250}{\sqrt{\{11900\}\{6824\}}}$$

$$r_{xy} = \frac{6250}{\sqrt{81205600}}$$

$$r_{xy} = \frac{6250}{9011.41}$$

$r_{xy} = 0.693$

Based on the calculation above it can be concluded that r_{count} is higher than r_{table} in level 5% with N = 30. Score of the r_{count} is 0,693 and the score of r_{table} is 0,361 (0.693>0.361). It means that there is enough correlation between the test score and retest score. So we can conclude that the instrument is realible.

Appendix 17

Calculation of Reability Post-Test

To find the correlation between the test and re-test of the post test, the researcher uses formula correlation of product moment below:

$$r_{xy} = \frac{N(\sum XY) - (\sum X)(\sum Y)}{\sqrt{\{N(\sum X^2) - (\sum X)^2\}\{N(\sum Y^2) - (\sum Y)^2\}}}$$

$$r_{xy} = \frac{30(18906) - (737)(756)}{\sqrt{\{30(18555) - (737)^2\}\{30(19418) - (756)^2\}}}$$

$$r_{xy} = \frac{567180 - 557172}{\sqrt{\{556650 - 543169\}\{582540 - 571536\}}}$$

$$r_{xy} = \frac{10008}{\sqrt{\{13481\}\{11004\}}}$$

$$r_{xy} = \frac{10008}{\sqrt{148344924}}$$

$$r_{xy} = \frac{10008}{12179.69}$$

$r_{xy} = 0.821$

Based on the calculation above, it can be known that r_{count} is higher than r_{table} in level 5% with N = 30. Score of the r_{count} is 0,821 and the score of r_{table} is 0,361 (0.821>0.361). It means that there is high correlation between the test score and retest score. So we can conclude that the instrument is realible.

Appendix 18

Score of Experimental Class by Using Crossword Puzzle in VIII-1

NO	Name	Pre test Score	Post Test Score
1	ARR	55	90
2	AFS	30	55
3	AR	52.5	77.5
4	AFN	52.5	82.5
5	BDH	50	77.5
6	DFY	57.5	70
7	DNT	40	75
8	DSS	40	77.5
9	DK	35	62.5
10	EBWH	62.5	77.5
11	EL	45	67.5
12	FL	52.5	70
13	FAAS	65	90
14	FN	57.5	80
15	GS	42.5	82.5
16	HH	45	77.5
17	IA	42.5	70
18	JS	45	77.5
19	PSR	45	65
20	RAS	37.5	60
	∑=	952.5	1485

Appendix 19

Score of Experimental Class by Using Mind Mapping in VIII-2

NO	Name	Pre test Score	Post Test Score
1	ATS	65	87.5
2	ALP	52.5	72.5
3	BH	47.5	65
4	DAF	42.5	60
5	DSZ	62.5	77.5
6	ENI	55	65
7	GS	55	77.5
8	IR	55	52.5
9	IS	35	52.5
10	JG	57.5	72.5
11	JSN	32.5	60
12	JR	40	60
13	KP	45	60
14	LL	52.5	62.5
15	MMW	52.5	65
16	ML	45	67.5
17	Sa	45	65
18	PAA	52.5	67.5
19	RSC	40	65
20	RR	52.5	72.5
	∑=	985	1327.5

Appendix 20

RESULT OF NORMALITY TEST IN PRE-TEST

RESULT OF THE NORMALITY TEST OF VIII-2 IN PRE-TEST

1. The score of VIII-2 class in pre test from low score to high score:

32.5	35	40	40	42.5	45	45	45	47.5	52.5
52.5	52.5	52.5	52.5	55	55	55	57.5	62.5	65

2. High = 65

   Low = 32.5

   Range = High – Low

   = 65 – 32.5

   = 32.5

3. Total of Classes = 1 + 3,3 log (n)

   = 1 + 3,3 log (20)

   = 1 + 3,3 (1.30)

   = 1 + 4.29

   = 5.29

   = 6

4. Length of Classes $= \frac{range}{total\ of\ class} = \frac{32.5}{6} = 5.41 = 6$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
62.5 – 67.5	2	65	2	4	4	8
56.5 – 61.5	1	59	1	1	1	1
50.5 – 55.5	8	53	0	0	0	0
44.5 – 49.5	4	47	-1	-4	1	4
38.5 – 43.5	3	41	-2	-6	4	12
32.5 – 37.5	2	35	-3	-6	9	18
i = 6	20	-	-	-11	-	43

$$Mx = M^1 + i\frac{\Sigma fx^1}{N}$$

$= 53 + 6\ (\frac{-11}{20})$

$= 53 + 6\ (-0.55)$

$= 53 - 3.3$

$= 49.7$

6. Deviation standard

$$SD_t = i\sqrt{\frac{\Sigma fx'^2}{N} - \left[\frac{\Sigma fx'}{N}\right]^2}$$

$= \sqrt[6]{\frac{43}{20} - \left(\frac{-11}{20}\right)^2}$

$= \sqrt[6]{2.15 - (-0.55)^2}$

$= \sqrt[6]{2.15 - 0.3025}$

$= \sqrt[6]{1.8475}$

$= 6\ (1.35)$

$= 8.1$

7. Median

NO	Interval Class	F	Fk
1	62.5 – 67.5	2	2
2	56.5 – 61.5	1	3
3	50.5 – 55.5	8	10
4	44.5 – 49.5	4	15
5	38.5 – 43.5	3	18
6	32.5 – 37.5	2	20

Position of Me in the interval of classes is number 3, that:

Bb = 50

F = 3

fm = 8

i = 6

n = 20

1/2n = 10

So :

$$Me = Bb + i\left(\frac{n/2 - F}{fm}\right)$$

$$= 50 + 6\left(\frac{10-3}{8}\right)$$

$$= 50 + 6\left(\frac{7}{8}\right)$$

$$= 50 + 6\ (0.875)$$

$$= 50 + 5.25$$

$$= 55.25$$

8. Modus

NO	Interval Class	F	Fk
1	62.5 – 67.5	2	2
2	56.5 – 61.5	1	3
3	50.5 – 55.5	8	10
4	44.5 – 49.5	4	15
5	38.5 – 43.5	3	18
6	32.5 – 37.5	2	20

$$M_o = L + \frac{d_1}{d_1 + d_2}\, i$$

L = 50

d_1 = 8 – 1= 7

d_2 = 8 – 4= 4

i = 6

M_o = $50 + \frac{7}{7+4}\ 6$

= $50 + \frac{7}{11}\ 6$

= 50 + 0.63 (6)

= 50 + 3.78

= 53.78

9. Table of Normality

Interval Class	Real Upper Limit	Z - Score	Limit of Area	Large of Area	F_0	F_h	(f_0-f_h)	$(f_0-f_h)^2$	$\frac{(f_0-f_h)^2}{f_h}$
62.5 – 67.5	68	2.26	0.4783	0.0576	2	1.05	0.9520	0.906304	0.864794
56.5 – 61.5	62	1.52	0.4207	0.1384	1	3.07	-2.0680	4.276624	1.393945
50.5 – 55.5	56	0.78	0.2823	-0.0947	8	5.33	2.6740	7.150276	1.342523
44.5 – 49.5	50	0.04	0.377	0.6962	4	5.16	-1.1600	1.3456	0.260775
38.5 – 43.5	44	-0.70	0.3192	0.1813	3	3.34	-0.3420	0.116964	0.034998
32.5 – 37.5	38	-1.44	0.1379	0.0952	2	1.21	0.7880	0.620944	0.51233
	32	-2.19	0.0427						
								X^2	4.409365

Based on table above,reseracher found that x^2_{count} = 4.409 while x^2_{table} = 11.070 cause $x^2_{count} < x^2_{table}$ (4.409<11.070) with degree of freedom dk = 6 – 1 = 5 and significat level α = 5%. So distribution of class VIII-2 was normal.

RESULT OF THE NORMALITY TEST OF VIII-1 IN PRE-TEST

1. The score of VIII-1 class in pre-test from low score to high score:

30	35	37.5	40	40	42.5	42.5	45	45	45
45	50	52.5	52.5	52.5	57.5	57.5	57.5	55	65

2. High = 65

   Low = 30

   Range = High – Low

   = 65 – 30

   = 35

3. Total of Classes = 1 + 3,3 log (n)

   = 1 + 3,3 log (20)

   = 1 + 3,3 (1.30)

   = 1 + 4.29

   = 5.29

   = 6

4. Length of Classes $= \frac{range}{total\ of\ class}$ $= \frac{35}{6} = 5.8 = 6$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
60 – 65	2	62.5	3	6	9	16
54 – 59	3	56.5	2	6	4	12
48 – 53	4	50.5	1	4	1	4
42 – 47	6	44.5	0	0	0	0
36 – 41	3	38.5	-1	-3	1	3
30 – 35	2	32.5	-2	-4	4	8
$i = 5$	20	-	-	9	-	43

$$Mx = M^1 + i\frac{\Sigma fx^1}{N}$$

$= 44.5 + 6\ (\frac{9}{20}\ )$

$= 44.5 + 6\ (0.45)$

$= 44.5 + (2.7)$

$= 47.2$

6. Deviation Standard

$$SD_t = i\sqrt{\frac{\Sigma fx'^2}{N} - \left[\frac{\Sigma fx'}{N}\right]^2}$$

$$= \sqrt[6]{\frac{43}{20} - \left(\frac{9}{20}\right)^2}$$

$$= \sqrt[6]{2.15 - (0.45)^2}$$

$$= \sqrt[6]{2.15 - 0.2025}$$

$$= \sqrt[6]{1.9475}$$

$= 6\ (1.39)$

$= 8.34$

7. Median

NO	Interval Class	F	Fk
1	60 – 65	2	2
2	54 – 59	3	5
3	48 – 53	4	9
4	42 – 47	6	15
5	36 – 41	3	18
6	30 – 35	2	20

Position of Me in the interval of classes is number 4, that:

Bb = 41.5

F = 9

fm = 6

i = 6

n = 20

1/2n =10

So :

$$Me = Bb + i\left(\frac{n/2 - F}{fm}\right)$$

$$= 41.5 + 6\left(\frac{10-9}{6}\right)$$

$$= 41.5 + 6\left(\frac{1}{6}\right)$$

$$= 41.5 + 6\ (0.16)$$

$$= 41.5 + 0.96$$

$$= 42.46$$

8. Modus

NO	Interval Class	F	Fk
1	60 – 65	2	2
2	54 – 59	3	5
3	48 – 53	4	9
4	42 – 47	6	15
5	36 – 41	3	18
6	30 – 35	2	20

$$M_o = L + \frac{d_1}{d_1 + d_2}\, i$$

L = 41.5

d_1 = 6 – 4 = 2

d_2 = 6 – 3 = 3

i = 6

M_o = $41.5 + \frac{2}{2+3}\ 6$

= $41.5 + \frac{2}{5}\ 6$

= 41.5 + 0.4 (6)

= 41.5 + 2.4

= 43.9

9. Table of Normality

Interval Class	Real Upper Limit	Z - Score	Limit of Area	Large of Area	F_0	F_h	(f_0-f_h)	$(f_0-f_h)^2$	$\frac{(f_0-f_h)^2}{f_h}$
60 – 65	65.5	2.19	0.4857	0.0565	2	1.13	0.8700	0.7569	0.669823
54 – 59	59.5	1.47	0.4292	0.1528	3	3.06	-0.0560	0.003136	0.001026
48 – 53	53.5	0.76	0.2764	0.2604	4	5.21	-1.2080	1.459264	0.280197
42 – 47	47.5	0.04	0.016	0.2642	6	5.28	0.7160	0.512656	0.09702
36 – 41	41.5	-0.68	0.2482	0.1674	3	3.35	-0.3480	0.121104	0.036172
30 – 35	35.5	-1.40	0.0808	0.0638	2	1.28	0.7240	0.524176	0.410796
	29.5	-2.12	0.017						
								X^2	1.495035

Based on table above, reseracher found that x^2_{count} = 1.495 while x^2_{table}= 11.070 cause $x^2_{count} < x^2_{table}$ (1.495<11.070) with degree of freedom dk = 6 – 1 = 5 and significat level α = 5%. So distribution of class VIII-1 was normal.

Based on the calculation of pre-test of the class VIII-1, and VIII-2, we can see that class VIII-1, and VIII-2 was normal.

Appendix 21

HOMOGENEITY TEST (PRE-TEST)

Calculation of parameter to get variant of the first class as experimental class by using crossword puzzle and variant of the second class as as experimental class by using mind mapping, are used homogeneity test by using formula below:

$$S^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)}$$

Hypotheses:

$H_0 \quad : \delta_1^2 = \delta_2^2$

$H_1 \quad : \delta_1^2 \neq \delta_2^2$

Variant of the VIII-1 class is:

NO	Xi	Xi^2
1	65	4225
2	62.5	3906.25
3	57.5	3025
4	57.5	3306.25
5	55	3306.25
6	52.5	2756.25
7	52.5	2756.25
8	52.5	2756.25
9	50	2500
10	45	2025
11	45	2025
12	45	2025
13	45	2025
14	42.5	1806.25
15	42.5	1806.25
16	40	1600
17	40	1600
18	37.5	1406.25

19	35	1225
20	30	900
	952.5	46981.25

N = 27
$\sum xi$ = 952.5
$\sum_{xi} 2$ = 46981.25

So:

$$S^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)}$$

$$= \frac{20(46981.25) - (952.5)^2}{20(20-1)}$$

$$= \frac{939625 - 907365.25}{20(19)}$$

$$= \frac{32368.75}{380}$$

$$= 85.18$$

Variant of the VIII- 2 class is:

NO	**Xi**	**Xi^2**
1	65	1056.25
2	62.5	4225
3	57.5	3906.25
4	55	3306.25
5	55	3025
6	55	3025
7	52.5	3025
8	52.5	2756.25
9	52.5	2756.25
10	52.5	2756.25
11	52.5	2756.25
12	47.5	2756.25
13	45	2256.25
14	45	2025
15	45	2025
16	42.5	2025

17	40	1806.25
18	40	1600
19	35	1600
20	32.5	1225
	985	49912.5

N = 20
$\sum xi$ = 985
$\sum_{xi}$ 2 = 49912.5

So:

$$S^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)}$$

$$= \frac{20(49912.5) - (985)^2}{20(20-1)}$$

$$= \frac{998250 - 970225}{20(19)}$$

$$= \frac{28025}{380}$$

$$= 73.75$$

The Formula was used to test hypothesis was:

VIII-1 and VIII-2 :

$$F = \frac{The\ Biggest\ \ Variant}{The\ Smallest\ \ Variant}$$

So:

$$F = \frac{85.18}{73.75}$$

$$= 1.15$$

After doing the calculation, researcher found that F_{count} = 1.15 with α = 5% and dk_1 = 20 - 1 =19 and dk_2 = 20 - 1 = 19 from the distribution list F, researcher found that F_{table} = 2.17, cause $F_{count} < F_{table}$ (1.15< 2.17). So, there is no difference the variant between the VIII-1 class and VIII-2 class. It means that the variant is homogenous**.**

Appendix 22

RESULT OF NORMALITY TEST IN POST TEST

RESULT OF THE NORMALITY TEST OF VIII-1 IN P0ST-TEST

1. The score of VIII-1 class in pre test from low score to high score:

55	60	62.5	65	67.5	70	70	70	75	77.5
77.5	77.5	77.5	77.5	77.5	80	82.5	82.5	90	90

2. High = 90

   Low = 55

   Range = High – Low

   = 90 – 55

   = 35

3. Total of Classes = 1 + 3,3 log (n)

   = 1 + 3,3 log (20)

   = 1 + 3,3 (1.30)

   = 1 + 4.29

   = 5.29

   = 6

4. Length of Classes $= \frac{range}{total\ of\ class}$ $= \frac{35}{6} = 5.83 = 6$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
85 – 90	2	87.5	2	4	4	8
79 – 84	3	81.5	1	3	1	3
73 – 78	7	75.5	0	0	0	0
67 -72	4	69.5	-1	-4	1	4
61 – 66	2	63.5	-2	-4	4	8

55 – 60	2	57.5	-3	-6	9	18
i = 6	20	-	-	-7	-	41

$$Mx = M^1 + i\frac{\Sigma fx^1}{N}$$

$= 75.5 + 6\left(\frac{-7}{20}\right)$

$= 75.5 + 6\ (-0.35)$

$= 75.5 - 2.1$

$= 73.4$

6. Deviation Standard

$$SD_t = i\sqrt{\frac{\Sigma fx'^2}{N} - \left[\frac{\Sigma fx'}{N}\right]^2}$$

$= {}^{6}\sqrt{\frac{41}{20} - \left(\frac{-7}{20}\right)^2}$

$= {}^{6}\sqrt{2.05 - (-0.35)^2}$

$= {}^{6}\sqrt{2.05 - 0.1225}$

$= {}^{6}\sqrt{1.9275}$

$= 6\ (1.38)$

$= 8.28$

7. Median

NO	Interval Class	F	Fk
1	85 – 90	2	2
2	79 – 84	3	5
3	73 – 78	7	12
4	67 -72	4	16
5	61 – 66	2	18
6	55 – 60	2	20

Position of Me in the interval of classes is number 4, that:

Bb = 72.5

F = 5

fm = 7

i = 6

n = 20

1/2n =10

So :

$$Me = Bb + i\left(\frac{n/2 - F}{fm}\right)$$

$$= 72.5 + 6\left(\frac{10-5}{7}\right)$$

$$= 72.5 + 6\left(\frac{5}{7}\right)$$

$$= 72.5 + 6\ (0.714)$$

$$= 72.5 + 4.284$$

$$= 76.784$$

8. Modus

NO	Interval Class	F	Fk
1	85 – 90	2	2
2	79 – 84	3	5
3	73 – 78	7	12
4	67 -72	4	16
5	61 – 66	2	18
6	55 – 60	2	20

$$M_o = L + \frac{d_1}{d_1 + d_2}\ i$$

L = 72.5

d_1 = 7 – 3 = 4

d_2 = 7 – 4= 3

i = 6

M_o = $72.5 + \frac{4}{3+2}\ 6$

= $72.5 + \frac{4}{5}\ 6$

= 72.5 + 0.8 (6)

= 72.5 + 4.8

= 77.3

9. Table of Normality

Interval Class	Real Upper Limit	Z - Score	Limit of Area	Large of Area	F_0	F_h	(f_0-f_h)	$(f_0-f_h)^2$	$\frac{(f_0-f_h)^2}{f_h}$
85 – 90	90.5	2.07	0.4808	0.0709	2	1.42	0.5820	0.338724	0.238874
79 – 84	84.5	1.34	0.4099	0.1775	3	3.55	-0.5500	0.3025	0.085211
73 – 78	78.5	0.62	0.2324	0.6886	7	13.77	-6.7720	45.85998	3.329944
67 -72	72.5	-0.11	0.4562	0.25293	4	5.06	-1.0586	1.120634	0.22153
61 – 66	66.5	-0.83	0.20327	0.14389	2	2.88	-0.8778	0.770533	0.267751
55 – 60	60.5	-1.56	0.05938	0.04808	2	0.96	1.0384	1.078275	1.121334
	54.5	-2.28	0.0113						
								X^2	5.264644

Based on table above, reseracher found that x^2_{count} = 5.264 while x^2_{table}= 11.070 cause $x^2_{count} < x^2_{table}$ (5.264<11.070) with degree of freedom dk = 6 – 1 = 5 and significat level α = 5%. So distribution of class VIII-1 in post test was normal.

RESULT OF THE NORMALITY TEST OF VIII-2 IN POST-TEST

1. The score of VIII-2 class in pre test from low score to high score:

52.5	52.5	60	60	60	60	62.5	65	65	65
65	65	67.5	67.5	72.5	72.5	72.5	77.5	77.5	87.5

2. High = 87.5

   Low = 52.5

   Range = High – Low

   = 87.5 – 52.5

   = 35

3. Total of Classes = 1 + 3,3 log (n)

   = 1 + 3,3 log (20)

   = 1 + 3,3 (1.30)

   = 1 + 4.29

   = 5.29

   = 6

4. Length of Classes $= \frac{range}{total\ of\ class} = \frac{35}{6} = 5.8 = 6$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
82.5 – 87.5	1	85	3	3	9	9
76.5 – 81.5	2	79	2	4	4	8
70.5 – 75.5	3	73	1	3	1	3
64.5 – 69.5	7	67	0	0	0	0
58.5 – 63.5	5	61	-1	-5	1	5
52.5 – 57.5	2	55	-2	-4	4	8
i = 6	20	-	-	1	-	33

$$Mx = M^1 + i\frac{\Sigma fx^1}{N}$$

$= 67 + 6\ (\frac{1}{20})$

= 67 + 6. (0.05)

= 67 + 0.3

= 67.3

6. Deviation standard

$$SD_t = i\sqrt{\frac{\Sigma fx'^2}{N} - \left[\frac{\Sigma fx'}{N}\right]^2}$$

$$= \sqrt[6]{\frac{33}{20} - \left(\frac{1}{20}\right)^2}$$

$$= \sqrt[6]{1.65 - (0.05)^2}$$

$$= \sqrt[6]{1.65 - 0.0025}$$

$$= \sqrt[6]{1.6475}$$

= 6 (1.28)

= 7.68

7. Median

NO	Interval Class	F	Fk
1	82.5 – 87.5	1	1
2	76.5 – 81.5	2	3
3	70.5 – 75.5	3	8
4	64.5 – 69.5	7	15
5	58.5 – 63.5	5	18
6	52.5 – 57.5	2	20

Position of Me in the interval of classes is number 3, that:

Bb = 64

F = 6

fm = 7

i = 6

n = 20

1/2n = 10

So :

$$Me = Bb + i\left(\frac{n/2 - F}{fm}\right)$$

$$= 64 + 6\left(\frac{10-6}{7}\right)$$

$$= 64 + 6\left(\frac{4}{7}\right)$$

$$= 64 + 6\ (0.57)$$

$$= 64 + 3.42$$

$$= 67.42$$

8. Modus

NO	Interval Class	F	Fk
1	82.5 – 87.5	1	1
2	76.5 – 81.5	2	3
3	70.5 – 75.5	3	8
4	64.5 – 69.5	7	15
5	58.5 – 63.5	5	18
6	52.5 – 57.5	2	20

$$M_o = L + \frac{d_1}{d_1 + d_2}\ i$$

L = 64

d_1 = 7 - 3 = 4

d_2 = 7- 5 = 2

i = 6

$$M_o = 64 + \frac{4}{4+2}\ 6$$

$= 64 + \frac{4}{6}\ 6$

$= 64 + 0.67\ (6)$

$= 64 + 4.02$

$= 68.02$

9. Table of Normality

Interval Class	Real Upper Limit	Z - Score	Limit of Area	Large of Area	F_0	F_h	(f_0-f_h)	$(f_0-f_h)^2$	$\frac{(f_0-f_h)^2}{f_h}$
82.5 – 87.5	88	2.70	0.4965	0.0246	1	0.49	0.5080	0.258064	0.52452
76.5 – 81.5	82	1.91	0.4719	0.1011	2	2.02	-0.0220	0.000484	0.000239
70.5 – 75.5	76	1.13	0.3708	0.234	3	4.68	-1.6800	2.8224	0.603077
64.5 – 69.5	70	0.35	0.1368	0.4704	7	9.41	-2.4080	5.798464	0.616333
58.5 – 63.5	64	-0.43	0.3336	0.2205	5	4.41	0.5900	0.3481	0.078934
52.5 – 57.5	58	-1.21	0.1131	0.0898	2	1.80	0.2040	0.041616	0.023171
	52	-1.99	0.0233						
								X^2	1.846276

Based on table above,reseracher found that $x^2_{count} = 1.846$ while $x^2_{table} = 11.070$ cause $x^2_{count} < x^2_{table}$ $(1.846<11.070)$ with degree of freedom dk = 6 – 1 = 5 and significat level α = 5%. So distribution of class VIII-2 was normal.

Based on the calculation normality post test, we can see that class VIII-1 and classs VIII-2 was normal.

Appendix 23

HOMOGENEITY TEST (POST-TEST)

Calculation of parameter to get variant of the first class as experimental class sample by using jeopardy games and variant of the second class as control class sample by using conventional stategy are used homogeneity test by using formula below:

$$S^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)}$$

Hypothesis:

$H_0 \quad : \delta_1^2 = \delta_2^2$

$H_1 \quad : \delta_1^2 \neq \delta_2^2$

A. Variant of the VIII-1 class is:

NO	Xi	Xi^2
1	55	3025
2	60	3600
3	62.5	3906.25
4	65	4225
5	67.5	4556.25
6	70	4900
7	70	4900
8	70	4900
9	75	5625
10	77.5	6006.25
11	77.5	6006.25
12	77.5	6006.25
13	77.5	6006.25
14	77.5	6006.25
15	77.5	6006.25
16	80	6400
17	82.5	6806.25
18	82.5	6806.25
19	90	8100
20	90	8100

	1485	111887.5

n = 20
$\sum xi$ = 1485
$\sum_{xi}$ 2 = 1118887.5

So:

$$S^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)}$$

$$\frac{20(111887.5) - (1485)^2}{20(20-1)}$$

$$= \frac{2237750 - 2205225}{20(19)}$$

$$= \frac{32525}{380}$$

$$= 85.59$$

B. Variant of the VIII-2 class is:

NO	**Xi**	**Xi^2**
1	52.5	2756.25
2	52.5	2756.25
3	60	3600
4	60	3600
5	60	3600
6	60	3600
7	62.5	3906.25
8	65	4225
9	65	4225
10	65	4225
11	65	4225
12	65	4225
13	67.5	4556.25
14	67.5	4556.25
15	72.5	5256.25
16	72.5	5256.25
17	72.5	5256.25
18	77.5	6006.25
19	77.5	6006.25
20	87.5	7656.25

	1327.5	89493.75

N = 20
$\sum xi$ = 1327.5
$\sum_{xi}$ 2 = 89493.75

So:

$$S^2 = \frac{n\Sigma xi^2 - (\Sigma xi)}{n(n-1)}$$

$$= \frac{20(89493.75) - (1327.5)^2}{20(20-1)}$$

$$= \frac{1789875 - 1762256.25}{20(19)}$$

$$= \frac{27618.75}{380}$$

$$= 72.68$$

The Formula that was used to test hypothesis was:

VIII-1 and VIII-2 :

$$F = \frac{The\ Biggest\ Variant}{The\ Smallest\ Variant}$$

So:

$$F = \frac{85.59}{72.68}$$

$$= 1.17$$

After doing the calculation, researcher found that F_{count} = 1.17 with α 5 % and dk_1 = 20 - 1 =19 and dk_2 = 20 - 1 = 19 from the distribution list F, researcher found that F_{table} = 2.17, cause $F_{count} < F_{table}$ (1.17< 2.17). So, there is no difference the variant between the VIII-1 class and VIII-2 class. It means that the variant is homogenous**.**

Appendix 24

T_{test}OF THE BOTH AVERAGES IN PRE-TEST

The formula was used to analyze homogeneity test of the both averages was t-test, that:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt[5]{\frac{1}{n_1} + \frac{1}{n_2}}} \text{ with } S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

So:

$$S = \sqrt{\frac{(20-1)\ 85.18+(20-1)\ 73.75}{20+20-2}}$$

$$= \sqrt{\frac{19\ (85.18)+19\ (73.75)}{38}}$$

$$= \sqrt{\frac{1618.42+1401.25}{38}}$$

$$= \sqrt{\frac{3082.67}{38}}$$

$$= \sqrt{81.12}$$

$$= 9$$

So:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt[5]{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$t = \frac{47.625-49.25}{\sqrt[9]{\frac{1}{20}+\frac{1}{20}}}$$

$$= \frac{-1.625}{\sqrt[9.0]{0.05+0.05}}$$

$$= \frac{-1.625}{\sqrt[9]{0.1)}}$$

$$= \frac{-1.625}{9\ (0.31)}$$

$$= \frac{-1.625}{2.79}$$

= -0.582 = 0.582

Based on researcher's calculation, result of the homogeneity test of the both averages was t_{count}= 0.582 with opportunity (1- α) = 1 – 5% = 95% and dk = n_1 + n_2 - 2 = 20 + 20 – 2 = 38 , reseracher found that t_{table} = 2.024, cause t_{count}< t_{table} (0.582 < 2.024). So that, H_0 was accepted, it means there was no difference average between the first class as experimental class by using crossword puzzle and the second class as experimental class by using mind mapping in this research.

Appendix 25

T_{test} OF THE BOTH AVERAGES IN POST – TEST

The formula was used to analyse homogeneity test of the both averages was t-test, that:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \text{ with } S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

So:

$$S = \sqrt{\frac{(20-1)\ 85.59+(20-1)\ 72.68}{20+20-2}}$$

$$= \sqrt{\frac{19\ (85.59)+19\ (72.68)}{38}}$$

$$= \sqrt{\frac{1626.21+1380.92}{38}}$$

$$= \sqrt{\frac{3007.13}{38}}$$

$$= \sqrt{79.135}$$

$$= 8.89$$

So:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$t = \frac{74.25 - 66.375}{8.89\sqrt{\frac{1}{20}+\frac{1}{20}}}$$

$$= \frac{7.875}{8.89\sqrt{0.05+0.05}}$$

$$= \frac{7.875}{8.89\sqrt{0.1}}$$

$$= \frac{7.875}{8.89(0.31)}$$

$$= \frac{7.875}{2.7559}$$

$$= 2.857$$

Based on researcher's calculation, result of the homogeneity test of the both averages was t_{count}= 2.857 with opportunity (1-α) = 1 – 5% = 95% and dk = n_1 + n_2 - 2 = 20+ 20 – 2 = 38 , reseracher found that t_{table} = 2.024, cause t_{count}> t_{table}(2.857 > 2.024). So that, H_a was accepted, it means there was the difference average between the first class as experimental class by using crossword puzzle and the second class as experimental class by using mind mapping in this research.

Appendix 26

Chi-Square Table

dk	Significant level					
	50%	30%	20%	10%	5%	1%
1	0,455	1,074	1,642	2,706	3,841	6,635
2	1,386	2,408	3,219	4,605	5,991	9,210
3	2,366	3,665	4,642	6,251	7,815	11,341
4	3,357	4,878	5,989	7,779	9,488	13,277
5	4,351	6,064	7,289	9,236	11,070	15,086
6	5,348	7,231	8,558	10,645	12,592	16,812
7	6,346	8,383	9,803	12,017	14,067	18,475
8	7,344	9,524	11,030	13,362	15,507	20,090
9	8,343	10,656	12,242	14,684	16,919	21,666
10	9,342	11,781	13,442	15,987	18,307	23,209
11	10,341	12,899	14,631	17,275	19,675	24,725
12	11,340	14,011	15,812	18,549	21,026	26,217
13	12,340	15,119	16,985	19,812	22,362	27,688
14	13,339	16,222	18,151	21,064	23,685	29,141
15	14,339	17,222	19,311	22,307	24,996	30,578
16	15,338	18,418	20,465	23,542	26,296	32,000
17	16,338	19,511	21,615	24,769	27,587	33,409
18	17,338	20,601	22,760	25,989	28,869	34,805
19	18,338	21,689	23,900	27,204	30,144	36,191
20	19,337	22,775	25,038	28,412	31,410	37,566
21	20,337	23,858	26,171	29,615	32,671	38,932
22	21,337	24,939	27,301	30,813	33,924	40,289
23	22,337	26.018	28,429	32,007	35,172	41,638
24	23,337	27,096	29,553	33,196	35,415	42,980
25	24,337	28,172	30,675	34,382	37,652	44,314
26	25,336	29,246	31,795	35,563	38,885	45,642
27	26,336	30,319	32,912	36,741	40,113	46,963
28	27,336	31,391	34,027	37,916	41,337	48,278
29	28,336	32,461	35,139	39,087	42,557	49,588
30	29,336	33,530	36,250	40,256	43,773	50,892

Appendix 27

Z-Table

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.9	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00003
-3.8	0.00007	0.00007	0.00007	0.00006	0.00006	0.00006	0.00006	0.00005	0.00005	0.00005
-3.7	0.00011	0.00010	0.00010	0.00010	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008
-3.6	0.00016	0.00015	0.00015	0.00014	0.00014	0.00013	0.00013	0.00012	0.00012	0.00011
-3.5	0.00023	0.00022	0.00022	0.00021	0.00020	0.00019	0.00019	0.00018	0.00017	0.00017
-3.4	0.00034	0.00032	0.00031	0.00030	0.00029	0.00028	0.00027	0.00026	0.00025	0.00024
-3.3	0.00048	0.00047	0.00045	0.00043	0.00042	0.00040	0.00039	0.00038	0.00036	0.00035
-3.2	0.00069	0.00066	0.00064	0.00062	0.00060	0.00058	0.00056	0.00054	0.00052	0.00050
-3.1	0.00097	0.00094	0.00090	0.00087	0.00084	0.00082	0.00079	0.00076	0.00074	0.00071
-3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100
-2.9	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139
-2.8	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193
-2.7	0.00347	0.00336	0.00326	0.00317	0.00307	0.00298	0.00289	0.00280	0.00272	0.00264
-2.6	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.03680	0.00357
-2.5	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480
-2.4	0.00820	0.00798	0.00776	0.00755	0.00734	0.00714	0.00695	0.00676	0.00657	0.00639
-2.3	0.01072	0.01044	0.01017	0.00990	0.00964	0.00939	0.00914	0.00889	0.00866	0.00842
-2.2	0.01390	0.01355	0.01321	0.01287	0.01255	0.01222	0.01191	0.01160	0.01130	0.01101
-2.1	0.01786	0.01743	0.01700	0.01659	0.01618	0.01578	0.01539	0.01500	0.01463	0.01426
-2.0	0.02275	0.02222	0.02169	0.02118	0.02068	0.02018	0.01970	0.01923	0.01876	0.01831
-1.9	0.02872	0.02807	0.02743	0.02680	0.02619	0.02559	0.02500	0.02442	0.02385	0.02330
-1.8	0.03593	0.03515	0.03438	0.03362	0.03288	0.03216	0.03144	0.03074	0.03005	0.02938
-1.7	0.04457	0.04363	0.04272	0.04182	0.04093	0.04006	0.03920	0.03836	0.03754	0.03673

-1.6	0.05480	0.05370	0.05262	0.05155	0.05050	0.04947	0.04846	0.04746	0.04648	0.04551
-1.5	0.06681	0.06552	0.06426	0.06301	0.06178	0.06057	0.05938	0.05821	0.05705	0.05592
-1.4	0.08076	0.07927	0.07780	0.07636	0.07493	0.07353	0.07215	0.07078	0.06944	0.06811
-1.3	0.09680	0.09510	0.09342	0.09176	0.09012	0.08851	0.08691	0.08534	0.08379	0.08226
-1.2	0.11507	0.11314	0.11123	0.10935	0.10749	0.10565	0.10383	0.10204	0.10027	0.09853
-1.1	0.13567	0.13350	0.13136	0.12924	0.12714	0.12507	0.12302	0.12100	0.11900	0.11702
-1.0	0.15866	0.15625	0.15386	0.15151	0.14917	0.14686	0.14457	0.14231	0.14007	0.13786
-0.9	0.18406	0.18141	0.17879	0.17619	0.17361	0.17106	0.16853	0.16602	0.16354	0.16109
-0.8	0.21186	0.20897	0.20611	0.20327	0.20045	0.19766	0.19489	0.19215	0.18943	0.18673
-0.7	0.24196	0.23885	0.23576	0.23270	0.22965	0.22663	0.22363	0.22065	0.21770	0.21476
-0.6	0.27425	0.27093	0.26763	0.26435	0.26109	0.25785	0.25463	0.25143	0.24825	0.24510
-0.5	0.30854	0.30503	0.30153	0.29806	0.29460	0.29116	0.28774	0.28434	0.28096	0.27760
-0.4	0.34458	0.34090	0.33724	0.33360	0.32997	0.32636	0.32276	0.31918	0.31561	0.31207
-0.3	0.38209	0.37828	0.37448	0.37070	0.36693	0.36317	0.35942	0.35569	0.35197	0.34827
-0.2	0.42074	0.41683	0.41294	0.40905	0.40517	0.40129	0.39743	0.39358	0.38974	0.38591
-0.1	0.46017	0.45620	0.45224	0.44828	0.44433	0.44038	0.43644	0.43251	0.42858	0.42465
-0.0	0.50000	0.49601	0.49202	0.48803	0.48405	0.48006	0.47608	0.47210	0.46812	0.46414

Z-Table

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974

2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3,1	0,4990	0,4991	0,4991	0.4991	0,4992	0,4992	0,4992	0,4992	0,4993	0,4993
3,2	0,4993	0,4993	0,4994	0,4994	0,4994	0,4994	0,4994	0,4995	0,4995	0,4995
3,3	0,4995	0,4995	0,4995	0,4996	0,4996	0,4996	0,4996	0,4996	0,4997	0,4997
3,4	0,4997	0,4997	0,4997	0,4997	0,4997	0,4997	0,4997	0,4997	0,4997	0,4998
3,5	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998
3,6	0,4998	0,4998	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999
3,7	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999
3,8	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999
3,9	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000

APPENDIX 28

Percentage Points of the t Distribution

Pr / df	0.25 / 0.50	0.10 / 0.20	0.05 / 0.10	0.025 / 0.050	0.01 / 0.02	0.005 / 0.010	0.001 / 0.002
1	1.00000	3.07768	6.31375	12.70620	31.82052	63.65674	318.30884
2	0.81650	1.88562	2.91999	4.30265	6.96456	9.92484	22.32712
3	0.76489	1.63774	2.35336	3.18245	4.54070	5.84091	10.21453
4	0.74070	1.53321	2.13185	2.77645	3.74695	4.60409	7.17318
5	0.72669	1.47588	2.01505	2.57058	3.36493	4.03214	5.89343
6	0.71756	1.43976	1.94318	2.44691	3.14267	3.70743	5.20763
7	0.71114	1.41492	1.89458	2.36462	2.99795	3.49948	4.78529
8	0.70639	1.39682	1.85955	2.30600	2.89646	3.35539	4.50079
9	0.70272	1.38303	1.83311	2.26216	2.82144	3.24984	4.29681
10	0.69981	1.37218	1.81246	2.22814	2.76377	3.16927	4.14370
11	0.69745	1.36343	1.79588	2.20099	2.71808	3.10581	4.02470
12	0.69548	1.35622	1.78229	2.17881	2.68100	3.05454	3.92963
13	0.69383	1.35017	1.77093	2.16037	2.65031	3.01228	3.85198
14	0.69242	1.34503	1.76131	2.14479	2.62449	2.97684	3.78739
15	0.69120	1.34061	1.75305	2.13145	2.60248	2.94671	3.73283
16	0.69013	1.33676	1.74588	2.11991	2.58349	2.92078	3.68615
17	0.68920	1.33338	1.73961	2.10982	2.56693	2.89823	3.64577
18	0.68836	1.33039	1.73406	2.10092	2.55238	2.87844	3.61048
19	0.68762	1.32773	1.72913	2.09302	2.53948	2.86093	3.57940
20	0.68695	1.32534	1.72472	2.08596	2.52798	2.84534	3.55181
21	0.68635	1.32319	1.72074	2.07961	2.51765	2.83136	3.52715
22	0.68581	1.32124	1.71714	2.07387	2.50832	2.81876	3.50499
23	0.68531	1.31946	1.71387	2.06866	2.49987	2.80734	3.48496
24	0.68485	1.31784	1.71088	2.06390	2.49216	2.79694	3.46678
25	0.68443	1.31635	1.70814	2.05954	2.48511	2.78744	3.45019
26	0.68404	1.31497	1.70562	2.05553	2.47863	2.77871	3.43500
27	0.68368	1.31370	1.70329	2.05183	2.47266	2.77068	3.42103
28	0.68335	1.31253	1.70113	2.04841	2.46714	2.76326	3.40816
29	0.68304	1.31143	1.69913	2.04523	2.46202	2.75639	3.39624
30	0.68276	1.31042	1.69726	2.04227	2.45726	2.75000	3.38518
31	0.68249	1.30946	1.69552	2.03951	2.45282	2.74404	3.37490
32	0.68223	1.30857	1.69389	2.03693	2.44868	2.73848	3.36531
33	0.68200	1.30774	1.69236	2.03452	2.44479	2.73328	3.35634
34	0.68177	1.30695	1.69092	2.03224	2.44115	2.72839	3.34793
35	0.68156	1.30621	1.68957	2.03011	2.43772	2.72381	3.34005
36	0.68137	1.30551	1.68830	2.02809	2.43449	2.71948	3.33262
37	0.68118	1.30485	1.68709	2.02619	2.43145	2.71541	3.32563
38	0.68100	1.30423	1.68595	2.02439	2.42857	2.71156	3.31903
39	0.68083	1.30364	1.68488	2.02269	2.42584	2.70791	3.31279
40	0.68067	1.30308	1.68385	2.02108	2.42326	2.70446	3.30688

Percentage Points of the t Distribution

Pr	0.25	0.10	0.05	0.025	0.01	0.005	0.001
df	**0.50**	**0.20**	**0.10**	**0.050**	**0.02**	**0.010**	**0.002**
41	0.68052	1.30254	1.68288	2.01954	2.42080	2.70118	3.30127
42	0.68038	1.30204	1.68195	2.01808	2.41847	2.69807	3.29595
43	0.68024	1.30155	1.68107	2.01669	2.41625	2.69510	3.29089
44	0.68011	1.30109	1.68023	2.01537	2.41413	2.69228	3.28607
45	0.67998	1.30065	1.67943	2.01410	2.41212	2.68959	3.28148
46	0.67986	1.30023	1.67866	2.01290	2.41019	2.68701	3.27710
47	0.67975	1.29982	1.67793	2.01174	2.40835	2.68456	3.27291
48	0.67964	1.29944	1.67722	2.01063	2.40658	2.68220	3.26891
49	0.67953	1.29907	1.67655	2.00958	2.40489	2.67995	3.26508
50	0.67943	1.29871	1.67591	2.00856	2.40327	2.67779	3.26141
51	0.67933	1.29837	1.67528	2.00758	2.40172	2.67572	3.25789
52	0.67924	1.29805	1.67469	2.00665	2.40022	2.67373	3.25451
53	0.67915	1.29773	1.67412	2.00575	2.39879	2.67182	3.25127
54	0.67906	1.29743	1.67356	2.00488	2.39741	2.66998	3.24815
55	0.67898	1.29713	1.67303	2.00404	2.39608	2.66822	3.24515
56	0.67890	1.29685	1.67252	2.00324	2.39480	2.66651	3.24226
57	0.67882	1.29658	1.67203	2.00247	2.39357	2.66487	3.23948
58	0.67874	1.29632	1.67155	2.00172	2.39238	2.66329	3.23680
59	0.67867	1.29607	1.67109	2.00100	2.39123	2.66176	3.23421
60	0.67860	1.29582	1.67065	2.00030	2.39012	2.66028	3.23171
61	0.67853	1.29558	1.67022	1.99962	2.38905	2.65886	3.22930
62	0.67847	1.29536	1.66980	1.99897	2.38801	2.65748	3.22696
63	0.67840	1.29513	1.66940	1.99834	2.38701	2.65615	3.22471
64	0.67834	1.29492	1.66901	1.99773	2.38604	2.65485	3.22253
65	0.67828	1.29471	1.66864	1.99714	2.38510	2.65360	3.22041
66	0.67823	1.29451	1.66827	1.99656	2.38419	2.65239	3.21837
67	0.67817	1.29432	1.66792	1.99601	2.38330	2.65122	3.21639
68	0.67811	1.29413	1.66757	1.99547	2.38245	2.65008	3.21446
69	0.67806	1.29394	1.66724	1.99495	2.38161	2.64898	3.21260
70	0.67801	1.29376	1.66691	1.99444	2.38081	2.64790	3.21079
71	0.67796	1.29359	1.66660	1.99394	2.38002	2.64686	3.20903
72	0.67791	1.29342	1.66629	1.99346	2.37926	2.64585	3.20733
73	0.67787	1.29326	1.66600	1.99300	2.37852	2.64487	3.20567
74	0.67782	1.29310	1.66571	1.99254	2.37780	2.64391	3.20406
75	0.67778	1.29294	1.66543	1.99210	2.37710	2.64298	3.20249
76	0.67773	1.29279	1.66515	1.99167	2.37642	2.64208	3.20096
77	0.67769	1.29264	1.66488	1.99125	2.37576	2.64120	3.19948
78	0.67765	1.29250	1.66462	1.99085	2.37511	2.64034	3.19804
79	0.67761	1.29236	1.66437	1.99045	2.37448	2.63950	3.19663
80	0.67757	1.29222	1.66412	1.99006	2.37387	2.63869	3.19526
∞							

Appendix 29

Research Photos







Appendix 3

INSTUMENTS FOR PRE-TEST

Name : Frans Ari Anto Samosir

Class : VIII-1.

65

Answer the questions below by giving cross (X) in the correct answer!

1. It is a big animal. The farmers often use it to plow the rice field. It is ....

   A. buffalo C. cow

   B. cat D. sheep

2. It is animal. Its kind is bird. It actives at the night. Many people call it as ghost bird. It is ....

   A. owl C. bat

   B. eagle D. dove

3. The skin is moist and smooth. It is amphibian. It has long sticky tongue. It is ....

   A. snake C. frog

   B. bird D. mouse

4. It belongs to reptile. It is originally from one of the island of the Indonesian Archipelago. People call its name as its place of origin. It is ....

   A. komodo C. crocodile

   B. snake D. alligator

5. It is king of jungle. It eats meat. It is similar to cats but bigger than it. It is mammal. It is ....

A. lion
B. elephant
B. snake
D. crocodile

6. The feathers is light brown. Its claws are very sharp. It hunts for chicken and small birds. It is ....

A. dove
C. eagle
B. cockatoo
D. pigeon

7. Its fur is brown. It is walk with two foot. It has physical features similar to a human. It is ....

A. rabbit
C. orang utan
B. hen
D. duck

8. An animal eat the grass, pets and usually it is lazy to take a bath. It is ....

A. lion
C. elephant
B. horse
D. goat

9. The fastest animal in the world. It is ....

A. lion
C. cheetah
B. horse
D. tiger

10. An animal that its wool is taken for cloth. It is ....

A. horse
C. orang utan
B. sheep
D. bear

11. It has hair. It is red and sweet. The ant loves it. It is .....

A. rambutan
B. mango
C. watermelon
D. orange

12. It can be found locally. It has thorn. Its skin and seed is black but the flesh is white or red. It is ....

A. salak
B. durian
C. avocado
D. mangosteen

13. The flesh is sweet, juicy and soft. Its colour is red or yellow. Its skin rather to green. It is ....

A. melon
B. mango
C. watermelon
D. apple

14. It is queen of fruit. The skin colour is purple and white inside. It is very sweet. It is ....

A. apple
B. mangosteen
C. orange
D. pear

15. This fruit is similiar with cactus, but it has flesh, and its colour is red. It is ....

A. dragon fruit
B. cherry
C. jicama
D. star fruit

16. This fruit has hard thorns outside, and it has a strong smell. The flesh is soft and creamy. It is ....

A. mangosteen
B. longan
C. durian
D. orange

17. It has a shape like a star. The taste is sour. It is ....

A. rambutan
C. watermelon

B. ambarella
D. star fruit

18. This fruit has brown. People always say that Indonesian skin is familiar with this fruit's colour. It is ....

A. longan
C. jicama

B. sapodilla
D. papaya

19. It has small brown shape. The flesh is white. It also has a black kernel inside the flesh. It is ....

A. apple
C. longan

B. guava
D. orange

20. This fruit belongs to the syzygium family. We can eat all the fruit within the skin. Its colour inside is pink. It also has many small kernels inside. It is ....

A. guava
C. jicama

B. rose apple
D. papaya

21. This thing is used by the students to erase their writing. It is ....

A. notebook
C. compass

B. calculator
D. eraser

22. This thing is used to keep the table clean. It is ....

A. broom
C. eraser

B. table cloth
D. bucket

23. The students use this thing to keep their classroom floor clean and shine. It is ....

A. Mop
B. Broom
B. Bucket
D. Eraser

24. It can be black or white. It is in the classroom. It is square. Teacher explains in it. It is ....

A. chair
C. table
B. board
D. lamp

25. We use it to write on the paper. It needs ink. It is ....

A. pen
C. pencil
B. marker
D. pen correction

26. Its colour is white. You use it when you make mistake by pen. You often shake it before you use it. It is ....

A. pen
C. pencil
B. marker
D. pen correction

27. The shape is usually square. You save your pen, pencil, eraser and other tools to write in it. It is ....

A. pen box
C. correction pen
B. bag
D. basket

28. It has many colours. It is similar to pencil. You use it to colour your picture. It is ....

A. pencil case
B. pencil colour
B. crayon
D. pen

29. It is usually on the roof. It can be found in your classroom. It is used to light the room. It is ....

A. pencil case
C. pencil colour
B. lamp
D. wall

30. The students use it on their neck in the school. It is ....

A. Cap
C. ring
B. necklace
D. tie

31. We use this thing to store junk. It is ....

A. garage
C. warehouse
B. bathroom
D. living room

32. After shower, we will need this thing. It is ....

A. soap
C. towel
B. toothpaste
D. toothbrush

33. We use it for sleeping time. It is ....

A. phone
C. bed
B. towel
D. stove

34. It is used for calling your friend in a long distance. It has numbers. It is ....

A. phone
C. radio
B. television
D. freezer

35. We use it to keep our clothes. It is ....

A. sofa
C. cupboard
B. dresser
D. drawer

36. It is used for washing hand and face. It is ....

A. sink
C. kitchen

B. bedroom
D. living room

37. It is used for entertaining. We watch it to get some informations. It is ....

A. radio
C. air conditioner

B. phone
D. television

38. We will use it when the rain is falling down. It is ....

A. kettle
C. umbrella

B. bag
D. basket

39. When we want to drink, we will need it. It is ....

A. cup
C. plate

B. stove
D. Iron

40. It is made from paper. It has many informations inside. We need to read it to know a latest news. It is ....

A. radio
C. television

B. newspaper
D. phone

Appendix 4

INSTUMENTS FOR POST-TEST

Name : Frans Ari Arto Samosir

Class : VIII - 1.

90

Answer the questions below by giving cross (X) in the correct answer!

1. This animal likes to eat fish. It is ....

   A. Cat C. Cow

   B. Buffalo D. Wolf

2. This animal always wake up early every morning. It likes to eat rice. It is ....

   A. Duck C. Cow

   B. Cat D. Chicken

3. This animals produces milk. It is ....

   A. Wolf C. Horse

   B. Lion D. Cow

4. This animal voices "wekwekwek". It is ....

   A. Chicken C. Mouse

   B. Duck D. Cat

5. This animal produces honey. It is ....

   A. Bee C. Bird

   B. Butterfly D. Bat

6. This animal can fly in the sky. It is ....

A. Penguin
B. Bird
B. Frog
D. Butterfly

7. This animal live in desert. It is ....

A. Wolf
C. Kangaroo
B. Cow
B. Camel

8. The police usually use this animal to catch a thief. It is ....

A. Wolf
B. Dog
B. Lion
D. Tiger

9. This animal lives in the sea. It has a couple of tweezers. It is ....

A. Crab
B. Shark
B. Clam
D. Pope

10. A wild animal in the sea. It is very dangerous because it has sharp teeth. It is ....

A. Pope
C. Stingray
B. Shark
D. Dolphin

11. This fruit has round shape and green when it is still raw. It is ....

A. Apple
C. Mango
B. Coconut
D. Pineapple

12. This fruit contains a lot of vitamin C. It is ....

A. Orange
C. Apple
B. Banana
D. Watermelon

13. It is small round fruit. In one stalk has a lot of flesh. It is ....

A. Grape C.Mango

B. Banana D. Guava

14. Monkey very likes this fruit. It is ....

A. Orange C.Grape

B. Jackfruit D. Banana

15. It is a small red fruit. The taste is sour, but many people like this fruit. It is ....

A. Apple C. Strawberry

B. Banana D. Watermelon

16. It has greennees flesh. There is a kernel inside. It is ....

A. Jicama C. Melon

B. Avocado D. Papaya

17. This fruit looks like strawberry. Both of fruits is red small shape, but this fruit has a kernel inside. It is ....

A. Snackfruit C. Apple

B. Pear D. Lychee

18. This fruit will change to be red color when it has matured. But, inside is white. It is ....

A. Mangosteen C. Apple

B. Banana D. Ambarella

19. This fruit is green outside, but it is yellow inside. It also has a kernel inside. It contains a lot of vitamin C. It is ....

A. Jicama
C. Mango
B. Banana
D. Orange

20. This fruit has sharp thorn skin. The flesh taste is sweet and sour. It is ....

A. Apple
C. Mango
B. Coconut
D. Pineapple

21. This thing is used by the students when they want to write on it. It is ....

A. Chair
C. Bag
B. Table
D. Blackboard

22. This thing is used to show a mini country location in a paper. It is ....

A. Map
C. Textbook
B. Notebook
D. Drawing book

23. We use it when we need to find out the meaning of a word. It is ....

A. Notebook
C. Dictionary
B. Map
D. Drawing book

24. The teacher writes something on this thing by chalk for teaching. It is ....

A. Whiteboard
C. Blackboard
B. Drawing book
D. Notebook

25. The students need this thing to sit when they are studying. It is ....

A. Table
C. Floor
B. Chair
D. Blackboard

26. This thing is used for writing on the blackboard. It is ....

A. Pen
C. Pencil
B. Chalk
D. Marker

27. The students draw something on this thing. It is ....

A. Notebook
C. Dictionary
B. Map
D. Drawing book

28. The students use this thing when they want to count something in a Math. It is ....

A. Ruler
C. Eraser
B. Calculator
D. Compass

29. The students need this thing to bring all tools that they need from home to school. It is ....

A. Bag
C. Shoes
B. Hat
D. Uniform

30. The students need this thing to clean their classroom. It is ....

A. Dump
B. Broom
B. Bucket
D. Eraser

31. We should open this thing when we enter to a house. It is ....

A. Window
B. Door
B. Floor
D. Wall

32. We use this thing when the weather is hot. It is ....

A. Fan
C. Television
B. Lamp
D. Freezer

33. This thing will be need when the day will be night. It is ....

A. Freezer
C. Fan
B. Air conditioner
D. Lamp

34. This thing is usually located on the house wall. It is ....

A. Computer
C. Picture
B. Lamp
D. Television

35. We use this thing when we want to go the next floor in the house. It is

A. Stair
C. Table
B. Desk
D. Cupboard

36. This thing is used to be access for entering fresh air to the house. It is .

A. Fence
C. Door
B. Vent
D. Floor

37. We use this thing to put books in the house. It is ....

A. Vase
C. Bookcase
B. Drawer
D. Wardrobe

38. This thing is used to keep a car in a house. It is ....

A. Dinning room
C. Bedroom
B. Bathroom
D. Garage

39. We use this thing when we eat rice. It is ....

A. Ketle
C. Glass
B. Plate
D. Fork

10. We use this thing when we feel so cold. It is

A. Blanket
C. Lamp
B. Mirror
D. Clock

Appendix 3

INSTUMENTS FOR PRE-TEST

Name : Agnes Tri Susanti

Class : VIII - 2

65

Answer the questions below by giving cross (X) in the correct answer!

1. It is a big animal. The farmers often use it to plow the rice field. It is ....

   A. buffalo C. cow

   B. cat D. sheep

2. It is animal. Its kind is bird. It actives at the night. Many people call it as ghost bird. It is ....

   A. owl C. bat

   B. eagle D. dove

3. The skin is moist and smooth. It is amphibian. It has long sticky tongue. It is ....

   A. snake C. frog

   B. bird D. mouse

4. It belongs to reptile. It is originally from one of the island of the Indonesian Archipelago. People call its name as its place of origin. It is ....

   A. komodo C. crocodile

   B. snake D. alligator

5. It is king of jungle. It eats meat. It is similar to cats but bigger than it. It is mammal. It is ....

A. lion
B. elephant
B. snake
D. crocodile

6. The feathers is light brown. Its claws are very sharp. It hunts for chicken and small birds. It is ....

A. dove
C. eagle
B. cockatoo
D. pigeon

7. Its fur is brown. It is walk with two foot. It has physical features similar to a human. It is ....

A. rabbit
C. orang utan
B. hen
D. duck

8. An animal eat the grass, pets and usually it is lazy to take a bath. It is ....

A. lion
C. elephant
B. horse
D. goat

9. The fastest animal in the world. It is ....

A. lion
C. cheetah
B. horse
D. tiger

10. An animal that its wool is taken for cloth. It is ....

A. horse
C. orang utan
B. sheep
D. bear

11. It has hair. It is red and sweet. The ant loves it. It is .....

A. rambutan C. watermelon

B. mango D. orange

12. It can be found locally. It has thorn. Its skin and seed is black but the flesh is white or red. It is ....

A. salak C. avocado

B. durian D. mangosteen

13. The flesh is sweet, juicy and soft. Its colour is red or yellow. Its skin rather to green. It is ....

A. melon B. watermelon

B. mango D. apple

14. It is queen of fruit. The skin colour is purple and white inside. It is very sweet. It is ....

A. apple C. orange

B. mangosteen D. pear

15. This fruit is similiar with cactus, but it has flesh, and its colour is red. It is ....

A. dragon fruit C. jicama

B. cherry D. star fruit

16. This fruit has hard thorns outside, and it has a strong smell. The flesh is soft and creamy. It is ....

A. mangosteen B. durian

B. longan D. orange

17. It has a shape like a star. The taste is sour. It is ....

A. rambutan
C. watermelon
B. ambarella
D. star fruit

18. This fruit has brown. People always say that Indonesian skin is familiar with this fruit's colour. It is ....

A. longan
C. jicama
B. sapodilla
D. papaya

19. It has small brown shape. The flesh is white. It also has a black kernel inside the flesh. It is ....

A. apple
C. longan
B. guava
D. orange

20. This fruit belongs to the syzygium family. We can eat all the fruit within the skin. Its colour inside is pink. It also has many small kernels inside. It is ....

A. guava
C. jicama
B. rose apple
D. papaya

21. This thing is used by the students to erase their writing. It is ....

A. notebook
C. compass
B. calculator
D. eraser

22. This thing is used to keep the table clean. It is ....

A. broom
C. eraser
B. table cloth
D. bucket

23. The students use this thing to keep their classroom floor clean and shine. It is ....

A. Mop
B. Broom
B. Bucket
D. Eraser

24. It can be black or white. It is in the classroom. It is square. Teacher explains in it. It is ....

A. chair
C. table
B. board
D. lamp

25. We use it to write on the paper. It needs ink. It is ....

A. pen
C. pencil
B. marker
D. pen correction

26. Its colour is white. You use it when you make mistake by pen. You often shake it before you use it. It is ....

A. pen
C. pencil
B. marker
D. pen correction

27. The shape is usually square. You save your pen, pencil, eraser and other tools to write in it. It is ....

A. pen box
C. correction pen
B. bag
D. basket

28. It has many colours. It is similar to pencil. You use it to colour your picture. It is ....

A. pencil case
C. pencil colour
B. crayon
D. pen

29. It is usually on the roof. It can be found in your classroom. It is used to light the room. It is ....

A. pencil case
C. pencil colour
B. lamp
D. wall

30. The students use it on their neck in the school. It is ....

A. Cap
C. ring
B. necklace
D. tie

31. We use this thing to store junk. It is ....

A. garage
C. warehouse
B. bathroom
D. living room

32. After shower, we will need this thing. It is ....

A. soap
C. towel
B. toothpaste
D. toothbrush

33. We use it for sleeping time. It is ....

A. phone
C. bed
B. towel
D. stove

34. It is used for calling your friend in a long distance. It has numbers. It is ....

A. phone
C. radio
B. television
D. freezer

35. We use it to keep our clothes. It is ....

A. sofa
C. cupboard
B. dresser
D. drawer

36. It is used for washing hand and face. It is ....

A. sink
C. kitchen
B. bedroom
D. living room

37. It is used for entertaining. We watch it to get some informations. It is ....

A. radio
C. air conditioner
B. phone
D. television

38. We will use it when the rain is falling down. It is ....

A. kettle
C. umbrella
B. bag
D. basket

39. When we want to drink, we will need it. It is ....

A. cup
C. plate
B. stove
D. Iron

40. It is made from paper. It has many informations inside. We need to read it to know a latest news. It is ....

A. radio
C. television
B. newspaper
D. phone

Appendix 4

INSTUMENTS FOR POST-TEST

Name : Agnes Tri Susanti

Class : VIII - 2

87,5

Answer the questions below by giving cross (X) in the correct answer!

1. This animal likes to eat fish. It is ....

   A. Cat C. Cow

   B. Buffalo D. Wolf

2. This animal always wake up early every morning. It likes to eat rice. It is ....

   A. Duck C. Cow

   B. Cat D. Chicken

3. This animals produces milk. It is ....

   A. Wolf C. Horse

   B. Lion D. Cow

4. This animal voices "wekwekwek". It is ....

   A. Chicken C. Mouse

   B. Duck D. Cat

5. This animal produces honey. It is ....

   A. Bee C. Bird

   B. Butterfly D. Bat

6. This animal can fly in the sky. It is ....

A. Penguin
B. Bird
B. Frog
D. Butterfly

7. This animal live in desert. It is ....

A. Wolf
C. Kangaroo
B. Cow
B. Camel

8. The police usually use this animal to catch a thief. It is ....

A. Wolf
B. Dog
B. Lion
D. Tiger

9. This animal lives in the sea. It has a couple of tweezers. It is ....

A. Crab
B. Shark
B. Clam
D. Pope

10. A wild animal in the sea. It is very dangerous because it has sharp teeth. It is ....

A. Pope
B. Stingray
B. Shark
D. Dolphin

11. This fruit has round shape and green when it is still raw. It is ....

A. Apple
C. Mango
B. Coconut
D. Pineapple

12. This fruit contains a lot of vitamin C. It is ....

A. Orange
C. Apple
B. Banana
D. Watermelon

13. It is small round fruit. In one stalk has a lot of flesh. It is ....

A. Grape C.Mango

B. Banana D. Guava

14. Monkey very likes this fruit. It is ....

A. Orange C.Grape

B. Jackfruit D. Banana

15. It is a small red fruit. The taste is sour, but many people like this fruit. It is ....

A. Apple C. Strawberry

B. Banana D. Watermelon

16. It has greennees flesh. There is a kernel inside. It is ....

A. Jicama C. Melon

B. Avocado D. Papaya

17. This fruit looks like strawberry. Both of fruits is red small shape, but this fruit has a kernel inside. It is ....

A. Snackfruit C. Apple

B. Pear D. Lychee

18. This fruit will change to be red color when it has matured. But, inside is white. It is ....

A. Mangosteen C. Apple

B. Banana D. Ambarella

19. This fruit is green outside, but it is yellow inside. It also has a kernel inside. It contains a lot of vitamin C. It is ....

A. Jicama
C. Mango
B. Banana
D. Orange

20. This fruit has sharp thorn skin. The flesh taste is sweet and sour. It is ....

A. Apple
C. Mango
B. Coconut
D. Pineapple

21. This thing is used by the students when they want to write on it. It is ....

A. Chair
C. Bag
B. Table
D. Blackboard

22. This thing is used to show a mini country location in a paper. It is ....

A. Map
C. Textbook
B. Notebook
D. Drawing book

23. We use it when we need to find out the meaning of a word. It is ....

A. Notebook
C. Dictionary
B. Map
D. Drawing book

24. The teacher writes something on this thing by chalk for teaching. It is ....

A. Whiteboard
C. Blackboard
B. Drawing book
D. Notebook

25. The students need this thing to sit when they are studying. It is ....

A. Table
C. Floor
B. Chair
D. Blackboard

26. This thing is used for writing on the blackboard. It is ....

A. Pen C. Pencil

B. Chalk D. Marker

27. The students draw something on this thing. It is ....

A. Notebook C. Dictionary

B. Map D. Drawing book

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B. Mirror D. Clock

KEMENTERIAN AGAMA
INSTITUT AGAMA ISLAM NEGERI PADANGSIDIMPUAN
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Sifat : Biasa
Lampiran : -
Hal : Pengesahan Judul dan Pembimbing skripsi

Kepada Yth Bapak/Ibu
1. **Dr. Fitriadi Lubis, M.Pd (Pembimbing I)**
2. **Fitri Rayani Siregar, M.Hum (Pembimbing II)**

Di –
Padangsidimpuan

Assalamu'alaikum Wr.Wb.

Dengan hormat, sehubungan dengan hasil sidang bersama tim pengkajian judul skripsi Jurusan Tadris Bahasa Inggris (TBI) Fakultas Tarbiyah dan Ilmu Keguruan IAIN Padangsidimpuan, maka dengan ini kami mohon kepada Bapak/Ibu agar dapat menjadi Pembimbing Skripsi dan melakukan penyempurnaan judul bilamana perlu untuk mahasiswa di bawah ini dengan data sebagai berikut:

Nama/NIM : Zainuddin Hasibuan / NIM. 12 340 0040
Jurusan : Tadris Bahasa Inggris
Judul Skripsi : **A Comparative Study Between Using Crossword Puzzle and Mind Mapping Strategy Toward Students' Vocabulary Mastery at Grade VIII SMP Negeri 5 Padangsidimpuan**

Demikian surat ini disampaikan, atas perhatian dan kesediaan Bapak/Ibu, kami ucapkan terimakasih.

Ketua Jurusan TBI

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Dr. Lelya Hilda, M.Si
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Nomor : B - 437 /In.14/E/TL.00/04/2019 9 April 2019
Hal : **Izin Penelitian**
Penyelesaian Skripsi.

Yth. Kepala SMP Negeri 5 Padangsidimpuan
Kota Padangsidimpuan

Dengan hormat, bersama ini kami sampaikan bahwa :

Nama	: Zainuddin Hasibuan
NIM	: 12 340 0040
Program Studi	: Tadris/Pendidikan Bahasa Inggris
Fakultas	: Tarbiyah dan Ilmu Keguruan
Alamat	: Jl. Teuku Umar

adalah Mahasiswa Fakultas Tarbiyah dan Ilmu Keguruan IAIN Padangsidimpuan yang sedang menyelesaikan Skripsi dengan Judul **"A Comparative Study Between Using Crossword Puzzle and Mind Mapping Strategy Toward Students' Vocabulary Mastery at Grade VIII SMP Negeri 5 Padangsidimpuan".**

Sehubungan dengan itu, kami mohon bantuan Bapak/Ibu untuk memberikan izin penelitian sesuai dengan maksud judul diatas.

Demikian disampaikan, atas kerja sama yang baik diucapkan terimakasih.

Dekan

Dr. Lelya Hilda, M.Si.
NIP. 19720920 200003 2 002

PEMERINTAH KOTA PADANGSIDIMPUAN
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SURAT KETERANGAN

NOMOR 422/ 114 /SMP.5/2019

Yang bertanda tangan dibawah ini Kepala SMP Negeri 5 Padangsidimpuan di Padangsidimpuan, menerangkan bahwa:

Nama	: **ZAINUDDIN HASIBUAN**
NIM	: 12 340 0040
Program Studi	: Tadris/Pendidikan Bahasa Inggris
Alamat	: Jl. Teuku Umar Padangsidimpuan

Benar telah mengadakan penelitian (riset) di SMP Negeri 5 Padangsidimpuan pada tanggal 15 April 2019 sampai dengan selesai, guna untuk melengkapi penyelesaian skripsinya yang berjudul : **"A COMPARATIVE STUDY BETWEEN USING CROSSWORD PUZZLE AND MIND MAPPING STRATEGY TOWARD STUDENTS' VOCABULARY MASTERY AT GRADE VIII SMP NEGERI 5 PADANGSIDIMPUAN".** sesuai dengan surat Dekan Fakultas Tarbiyah dan Ilmu Keguruan, Nomor: B-437/In.14/E/TL.00/04/2019 tanggal 09 April 2019.

Demikianlah surat keterangan ini dibuat dengan sebenarnya untuk dipergunakan seperlunya.

Padangsidimpuan, 20 April 2019
Kepala SMP Negeri 5 Padangsdimpuan

PEMERINTAH KOTA PADANGSIDIMPUAN DINAS PENDIDIKAN SMP NEGERI 5 PADANGSIDIMPUAN SELATAN

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