



**A COMPARATIVE STUDY BETWEEN PUZZLE  
AND SHOWING PICTURE MEDIA TOWARD  
STUDENTS' VOCABULARY MASTERY  
AT GRADE VIII MTs NEGERI 2  
PADANGSIDIMPUAN**

**A THESIS**

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

**By:**

**ELIA KASUM LUBIS**  
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**ENGLISH EDUCATION DEPARTMENT**

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

**2016**



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**2016**

## LETTER OF AGREEMENT

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Padangsidimpuan, 22 April 2016

To :

Dean Tarbiyah and Techer Training  
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**Item** : 7 (Seven) Exemplars

in –  
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Assalamu'alaikum Wr. Wb.

After reading, studying and giving advice for necessary reviseion on thesis belongs to ELIA KASUM LUBIS, entitle "A Comparative Study between Using Puzzle and Showing Picture Students' Vocabulary Mastery at Grade VIII MTsN 2 Padangsidimpuan." We approved that the thesis has been acceptable to complete the requirement to fulfill for the degree of Graduate of Islamic Education (S.Pd.I) 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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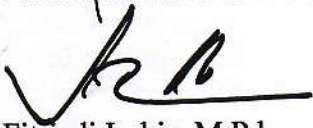
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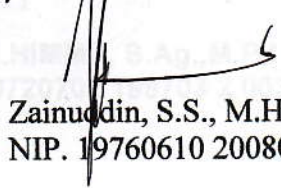
  
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**LEGALIZATION**

Thesis : A COMPARATIVE STUDY BETWEEN USING USING PUZZLE  
AND SHOWING PICTURE MEDIA TOWARD STUDENTS'  
VOCABULARY MASTERY AT GRADE VIII OF MTSN  
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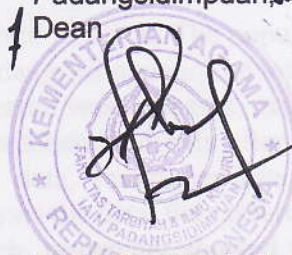
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### **ABSTRACT**

This research concerned about: A comparative study of students' vocabulary mastery by using Puzzle and Showing Picture Media at Grade VIII of MTs Negeri 2 Padangsidempuan. The problems of this research were most of students had lack of vocabulary mastery, lack of motivation, students feel English vocabulary is boring, and students unable to integrate text and context.

The purpose of this research was to find out the difference between Using Puzzle and Showing Picture Media toward students' mastery in vocabulary at grade VIII of MTs Negeri2 Padangsidempuan.

This research employed experimental research. The population of this research was the eighth grade of MTs Negeri2 Padangsidempuan. The total of population were five classes. Then, the sample of the research was 2 classes, experiment class I (VIII-1) and experiment class II(VIII-2). It was taken randomly after conducting normality and homogeneity test. To collect the data, researcher used test for measuring students' mastery in vocabulary. To analysis the data, the researcher used t-test.

Based on the result of the research, researcher showed the description of the data was found that the result of experimental classI and Experiment class II in pre-test ( $72.65 > 69.9$ ). In posttest the result of experiment class I and Experimentclass II was higher than Experiment class II ( $86.95 > 70.4$ ). So, it was concluded that Showing Picture Media was better than Using Puzzle Media. The score of  $t_{count}$  was bigger than  $t_{table}$  ( $28.53 > 2.00$ ). It means that the hypothesis alternative ( $H_a$ ) was accepted, and it was concluded that there was the difference between students' vocabulary mastery by using Puzzle and showing Picture Media at Grade VIII of MTs Negeri 2 Padangsidempuan.

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This thesis is still so far from being perfect based on the weakness of the research. Therefore, the researcher aspects the constructive criticisms and suggestions from the readers in order to improve this thesis.

Padangsidimpuan, 22 April 2016

  
**Ella Kasum Lubis**  
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## **CHAPTER I**

### **INTRODUCTION**

#### **A. The Background of The Problem**

English is an International language. It is an important language which is studied by students at schools, colleges, and universities so they can communicate by using English. It is used by many people in the world. They use it not only for trade association but also for scientific terminologies. English has mushroomed in every part of the world and become a universal language because it is used by almost all countries, even in some countries have become the primary language or has become the standard language used in everyday life whether in government, social, and other formal institution.

Many schools and course give English as one of the lesson. It has been as compulsory subject from elementary school until university. It seems that interest in the teaching of the English to Junior High School is growing well. The curriculum in MTs Negeri 2 Padangsidimpuan applied KTSP.<sup>1</sup> This curriculum asks to teacher to up grade and improve student's vocabulary mastery with used teaching media. Then, using puzzle and showing picture media to increase students' vocabulary mastery. So, there is syllabus to get the vocabulary to English teaching.

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<sup>1</sup> Dewi Rafni as English Teacher in MTs Negeri 2 Padangsidimpuan at Grade VIII, Interview, at Mei 20<sup>th</sup> 2015



According to the English Syllabus in MTsN 2 Padangsidempuan Junior High School, there are many materials from English Vocabulary that consist about animals, plants, sports, travelling, vocation and food and drink.<sup>2</sup> The material is hoped to develop the students' in English vocabulary. Therefore, the teacher have to know how to teach the lesson by using media in teaching vocabulary to increase their ability in vocabulary. The purpose of media in English teaching is a tool of learning the material, that make the students easy to comprehend about the material English vocabulary.

Vocabulary refers to the collection of word. Vocabulary is the total number of the words.<sup>3</sup> Vocabulary is important not merely in educational world but in daily activities. Vocabulary is recognized as the perfect instrument of language and language is recognized as the perfect instrument communication, because it is one important matter in language. When doing communication, the people will understand each other because they use vocabulary. So, getting much vocabulary is better because they will have stronger base in learning and simple vocabulary is the best choice for the students'.

Media is a tool, here in this case media means a tool of transferring learning materials from the teachers to the students that can make them easier and more interest in the process of teaching and learning. Therefore, media is

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<sup>2</sup> Kementerian Agama, English Syllabus in MTsN 2 at Grade VIII MTsN 2 Padangsidempuan, (Kementerian Agama) p.10

<sup>3</sup>A S hornby, *Oxford Advanced Learner's Dictionary of Current English*, (Oxford University Press: 1995) p. 1331.

aids which are used physically to convey the content of material that includes a book, tape recorder, puzzle, cassette, video recorder, film, photo, picture, graph, television and computer. English teachers have to think, the media that they use in teaching vocabulary is a kind of media being loved by their students such as using puzzle and showing picture.

Puzzle is one kind of traditional media.<sup>4</sup> In this research, that researcher compare between using puzzle and showing picture towards vocabulary mastery at grade VIII MTs Negeri 2 Padangsidempuan. The puzzle media can help the students not boring to study English vocabulary. This media can identify areas of understanding as well as lack of comprehension and areas of weakness students.

Picture is a visual representation or image painted, drawn, photographed, or otherwise rendered on a flat surface.<sup>5</sup> According to M. Basyiruddin Usman and Asnawir that pictures is effective visual tool because can visually something that will clarified more concrete and realistic. Information sending understood and easy because the product can be a model and children achieve the materiel.<sup>6</sup> The role of picture in teaching vocabulary is the teachers show the children pictures on it.

When use the picture teacher says the word clearly and students repeat it together. Then, teacher waits and sees if anyone can remember the word. There is

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<sup>4</sup> Azhar Arsyad, *Media, Pembelajaran*, (Jakarta: PT Raja Grafindo persada), p. 34

<sup>5</sup> Arief S. Sadiman, dkk, *Media Pendidikan*, ( Jakarta: PT Raja Grafindo Persada),p. 29

<sup>6</sup>M. Basyiruddin Usman & H. Asnawir, *Media Pembelajaran*, (Jakarta: Delia Citra Utama: 2002), p.47.

usually at least a students' who can more or less say the word; give the students' encouragement and help with more words. This research, the researcher to compare between using puzzle and showing picture towards vocabulary mastery at grade VIII MTs Negeri 2 Padangsidimpuan. In teaching vocabulary, the teacher usually applied many various media, they are real thing, Flashcard, photo, book, encyclopedia, magazine, newspaper, reference book, and other printed material goods, picture, illustration, clipping, frame film/slide, chain film, graph, diagram, puzzle, sketch, poster, cartoon, map, globe, tape recorder, radio, video, TV, computer and telephone. The media is usually used by the teachers in the Junior High School is picture, puzzle, poster, book, cartoon.

There are many problems of students in learn English Vocabulary. Based on interview English teacher at grade VIII students of MTsN 2 Padangsidimpuan. Firstly, The English teacher said: the student's very low in English vocabulary. Secondly, the problem is begun from the fact that English is second language in Indonesia, the mother tongue of the students use Indonesia language beside region language. Thirdly, the school also leak from facility: language laboratory, instrument for help picture and puzzle media is well. Fourthly, students' bored study about English vocabulary, they need media. Based on the reason above determine the students' vocabulary still low and have problem in MTsN 2 Padangsidimpuan.<sup>7</sup>

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<sup>7</sup> Dewi Rafni as English Teacher in MTs Negeri 2 Padangsidimpuan at grade VIII, *Op., Cit.*, at Mei 20<sup>th</sup> 2015



Other problems of students in learn English Vocabulary is low. That makes students lazy to follow study English. Based on the result of preliminary studies by asking the English teacher about students' result teaching vocabulary by using media it can to motivation the students about vocabulary mastery. Then, can be assumed that there are some problems in learning English process.

Based on the explanation above, the researcher wants to do a research about the comparative study media in vocabulary achievement. This research entitled **“A Comparative Study between Using Puzzle and Showing Picture Media toward Students' Vocabulary Mastery at Grade VIII MTs Negeri 2 Padangsidempuan”**.

## **B. Identification of the Problem**

Based on the background above vocabulary is a core component of language proficiency and provides much of the basis how well speaks, listen, read, and write. Than getting much vocabulary is better because they will have stronger base in learning and simple vocabulary is the best choice for the students. So, they have a good idea of how to expand their vocabulary so that they can improve their interest in learning the language.

There are various media can be used in teaching vocabulary such as, real thing, flashcard, photo, encyclopedia, magazine, newspaper, book, picture, illustration, puzzle, clipping, frame film/slide, chain film, graph, schema, poster, map, globe, radio, tape recorder, telephone, video, CD, computer, and television.

### **C. The Limitation of the Problem**

Based on the identification above, the media of teaching vocabulary mastery the teacher has taught students by using media to some vocabulary mastery. There are various media can be used in teaching vocabulary such as real thing, flashcard, photo, encyclopedia, magazine, newspaper, book, picture, illustration, puzzle, clipping, frame film/slide, chain film, graph, schema, poster, map, globe, radio, tape recorder, telephone, video, CD, computer, and television. In this research, the researcher just focus mainly on two media, those are using puzzle media and showing picture media.

In this research, the researcher just compares two media, those are using puzzle and showing picture media.

The research is conducted by experimental research at grade VIII, especially in teaching vocabulary. The researcher will research about functional words of animals, plants, sports, travelling, vocation and food and drink because to know which the better to both of media that can use and considering the limitation of the writers' time, ability, cost and experience.

### **D. The Formulation of the Problems**

The formulation of problem in this research is:

1. How was result of teaching vocabulary by using puzzle at grade VIII MTs Negeri 2 Padangsidimpuan?

2. How was result of teaching vocabulary by showing picture at grade VIII MTs Negeri 2 Padangsidimpuan?
3. Which one was the better result in teaching vocabulary by using puzzle and showing picture media at grade VIII MTs Negeri 2 Padangsidimpuan?

#### **E. Aims of the Research**

Based on formulation of the problems above, this research is to find out how the students' vocabulary mastery use puzzle, showing picture media and compare vocabulary mastery between them. The purposes of this research can be formulated as follows:

1. To know result of teaching vocabulary by using puzzle at grade VIII MTs Negeri 2 Padangsidimpuan.
2. To know the result of teaching vocabulary by showing picture at grade VIII MTs Negeri 2 Padangsidimpuan.
3. To know the better media in teaching vocabulary at grade VIII MTs Negeri 2 Padangsidimpuan.

#### **F. The Significances of the Research**

The significances of the research are:

1. For the headmaster of MTs Negeri 2 Padangsidimpuan to give the direction to the English teacher about the English media that is suitable to learn vocabulary that can improve the students' vocabulary achievement.

2. As an input to the teachers in teaching and learning process, so they are able to know the effectiveness media to learn vocabulary and can give motivation for the students at grade VIII MTs Negeri 2 Padangsidimpuan.
3. This research is hoped to help the other researcher who will conduct further research in the same topic.

#### **G. Outline Of The Thesis**

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

In chapter I, it consist of; first, background of the problem is explained about the students' in vocabulary mastery is poor and cause effect. Second, identification of problem is organized all of the students' problems and teachers' problem inside. Third, limitation of problem is researches' ways to focus this research. Fourth, formulation of the problem is arranged some question about students' in vocabulary mastery at MTsN 2 PADANGSIDIMPUAN. Fifth, purposes of research were arranged some mission of research in vocabulary mastery. Sixth, significances of research is explained to whom is the significances of the research would be useful.

In chapter II, it consists of; first, theoretical description, which explains about concept of vocabulary mastery in using puzzle and showing picture method. Second, review related findings which talked about the other research which related with this title were done by researchers. Third, framework of



thinking is researcher thought of vocabulary achievement in using puzzle and showing picture method to describe implementation of this research. Last. Hypothesis is temporary statement in using puzzle and showing picture method and conventional method made by researcher.

Chapter III, it consists of; first, research methodology described about place and schedule of research where and when the research is done. Second, method of research using puzzle and showing picture about kinds of research. Third, population and sample using puzzle and showing picture about amount students as population and how to take the sample. Fourth, procedures of research using puzzle and showing picture about planning before and after research were done. Fifth, instrument of data collection using puzzle and showing picture 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, it consists of; first, description of the data and discussion which research present about the result of the research. Second, using puzzle and showing picture about theory and result of the hypothesis what the researcher found in the research.

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

## CHAPTER II

### THEORETICAL REVIEW

#### A. Theoretical Description

##### 1. Teaching Vocabulary

###### a. Definitions of Teaching

Talking about the definition of teaching this refers to activities of educating. It is relevant to Brown who said that: “teaching is guiding and facilitating learning, enabling, and setting the condition for learning”.<sup>1</sup> Then, according to Wikipedia Meriam-Webster said that “teaching is the activities of educating or instructing; activities that impart knowledge or skill”.<sup>2</sup>

Teaching theory has been developed by make students engaged active learning, to awaken their interest, to develop their desire to learn, and to explore and develop their potentials.<sup>3</sup>

Leo, S course, dessert and garnish as show in diagram:

Based of explanation above, the researcher can conclude that teaching is guiding, facilitating learning and activities of educating or instructing, then active learning, to interest, explore and develop potential. Then,

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<sup>1</sup> Brown, H. Douglas, *Principle of Language Learning and Language Teaching*, ( New Jersey: Pritice Hall Inc , 1988), p. 8.

<sup>2</sup>Wikipedia Meriam Webster, *Teaching*, Dictionary sensagent, (<http://dictionary.sensagent.com/teaching.en-en/>), accesed at February 15, 2016 at 10:00

<sup>3</sup> Susanto Leo, *A challenging Book to Practice Teaching in English* , (Yokyakarta: Andi, 2013), p. 85.

Teaching use teacher to improve knowledge to students and explore the all about education.

## **b. The Components of Teaching**

Schools currently use a number of frameworks that describe the core elements of effective teaching. The problem is that these attributes are so broadly defined that they can be open to wide and different interpretation whether high quality teaching has been observed in the classroom. It is important to understand these limitations when making assessments about teaching quality.

Below we list the six common components suggested by research that teachers should consider when assessing teaching quality. We list these approaches, skills and knowledge in order of how strong the evidence is in showing that focusing on them can improve student outcomes. There are six components of teaching student:

1. Pedagogical content knowledge (Strong evidence of impact on student outcomes).
2. Quality of instruction (Strong evidence of impact on student outcomes).
3. Classroom climate (Moderate evidence of impact on student outcomes).
4. Classroom management (Moderate evidence of impact on student outcomes).
5. Teacher beliefs (Some evidence of impact on student outcomes).
6. Professional behaviors (Some evidence of impact on student outcomes).<sup>4</sup>

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<sup>4</sup>Robert Coe and Friends, *What Make Greats teaching?*, (Durham University: October 2014), p. 2-3

Based explanation above, the researcher conclude component of teaching are content knowledge, quality of interaction, classroom climate, classroom management, Teacher beliefs, and teacher behaviors. So, the component of teaching must be to improve teacher self.

### **c. The Aims of Teaching**

Student teaching is the culminating experience of the teacher education program at Murray State University. The student teacher is placed under the supervision of an experienced public school teacher and a university coordinator. According to Kentucky New Teacher Standards about the aims of teaching student such as:

1. Designs/Plans Instruction
2. Creates/Maintains Learning Climates
3. Implements/Manages Instruction
4. Assesses and Communicates Learning Results
5. Reflects/Evaluates Teaching/Learning
6. Collaborates with Colleagues/Parents/Others
7. Engages in Professional Development
8. Knowledge of Content
9. Knowledge of Technology<sup>5</sup>

A student teacher should be making acceptable progress in each of the Nine Kentucky New Teacher Standards in order to receive credit for student teaching. Credit in student teaching and completion of all other program requirement allows the student teacher to receive a Statement of Eligibility.

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<sup>5</sup> Kentucky, *Equal education and employment opportunities M/F/D, AA employer*, Murray State University, Murray, 42071, Revised 06/28/01, p.1



#### **d. Principles of Teaching**

The nine principles were first adopted by the University's Academic Board in 2002. Aspects of the principles guiding knowledge transfer with regard to teaching and learning are the most significant additions and while they are embedded throughout the document, they are particularly concentrated in principles two and seven. In principle two the interrelations between research, knowledge transfer and teaching are described while in principle seven the practical elements of embedding knowledge transfer in teaching are discussed.

Guiding principles of teaching student there are:

1. A shared vision and commitment to young people needs to be developed and communicated between school staff, students and their families.
2. Sensitivity to child and adolescent stages of development needs to be reflected in school policies, procedures and practices.
3. Commitment to supportive relationships needs to be a school community priority.<sup>6</sup>

So, there are three guiding principles are interrelated and inter dependent. Some relate to the broad intellectual environment of the University while others describe specific components of the teaching process. Together, these principles reflect the balance of evidence in the research literature on the conditions under which student learning thrives.

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<sup>6</sup>Department Education and Training, *Start School Transition And Resilience Training*, State Government Victoria, p. 10-11

### e. Definitions of Vocabulary

Vocabulary is one of component for the language, where is vocabulary help people to speaking and language communication. Vocabulary is also one of the important things to mastery the four skills like; reading, speaking, listening and writing. “Vocabulary is all the words that a person knows to use, the word the people use when they are talking about particular subject”.<sup>7</sup> According to Shirley Burrridge that “Vocabulary is all the in language, list of word in a lesson or books, all the words that one person know”.<sup>8</sup> It means vocabulary is all the word in language, lesson or books and all the word that human know.

Addition to definition of vocabulary, according to Richad and Willy A Renandya that “Vocabulary is a core component of language proviciency and provides much of the basis how well speaks, listen, read, and write”.<sup>9</sup> It means words can be noun, verb, adjective, adverb, conjunction, preposition to use language. Vocabulary is the stock of word on which they can draw in expressing people selves. Most of the people do not use nearly as many words in speaking or writing as someone recognizes or understands when they hear or see.<sup>10</sup>

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<sup>7</sup>Hornby, *Oxford words Advanced....., Op. Cit.*, p. 495

<sup>8</sup>Shirley Burrridge, *Oxford Basic English Dictionary*, (New York: Oxford University Press, 1981), p. 477.

<sup>9</sup>Jack C. Richard & Williy A. Renandya, *Methodology in Language Teaching and Anthology of Current Practice*, (USA:Cambridge University Press, 2000), P. 255

<sup>10</sup>Richard D. Mallery, *How to Enlarge and Improve your Vocabulary*, (United state, America: The Blakiston Company, 1947), p. 1.

It means, someone uses vocabularies which they have been known, and cannot use vocabulary that they have been known yet. The researcher can conclude that vocabulary is all the words which use in a language and vocabulary is all words that people know or use and also as the core component of words that is list in the alphabetical order.

#### **f. Kinds of Vocabulary**

Many kinds of vocabulary can be used to know some people about their vocabulary. Another word, with many kinds of vocabulary can be used to identify the level of someone; beginner level, intermediate level, or advance level. So, kinds of vocabulary are one of knowledge to know some people about their ability in vocabulary.

In this research there are some kinds of the vocabulary, Evelyn Marcusen says, “that vocabulary can divided in two kinds, there high frequency vocabulary and low frequency vocabulary”. They are below:

1. High frequency vocabulary consist of words that are used very often in normal language, use in all four skill and across the full range situation of used. High frequency of vocabulary consist of 2000 word families, which are about 87% of the running words in normal written text and more that 95% of the words informal spoken texts.
2. The Low frequency on other hand, cover only small proportion of the running words of continues text. It means that low frequency vocabulary is rarely used in common activity of English language. This group includes well over 100.000 word families.<sup>11</sup>

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<sup>11</sup>Evelyn Marcusen, *Vocabulary Semantic and Language Education* (Cambridge: University Press. 1997), p. 45.

More about kinds of vocabulary Thornbury in Harmer says there are two kind of vocabulary: Receptive vocabulary or passive vocabulary and Productive vocabulary or active Vocabulary.<sup>12</sup> There are further explanations is:

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 someone rarely uses the receptive vocabulary and it is impossible for 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 used it in correct grammatical patterns along with the words that usually collocate with.<sup>13</sup>

Based on the statements above the researcher takes conclusion that kinds of vocabulary; An active vocabulary refers to the words students should using in speaking and writing, and passive vocabulary means words they need only to comprehend especially in reading and listening.

### **g. Material of Teaching Vocabulary**

One of the most influential structural linguistic of the day went so far as to argue that vocabulary was the easiest aspect of a second language to learn and that it hardly required formal attention in the classroom. Since then, however the status of vocabulary has been considerable enhanced.

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<sup>12</sup>Jeremy Harmer, *the Practical of English Language Teaching*, (New York: Longman, 2000), P. 158.

<sup>13</sup>*Ibid.*, p. 159.





## 2. Puzzle

### a. The Definition of Puzzle

Puzzle is one kind of traditional media.<sup>16</sup> Puzzle is one of the media in English teaching process. It will challenge the students to be creative in the classroom. Puzzle or media which has a pattern of white and black space are to be filled with the letters that form words vertically and horizontally. According to Jones say that puzzle solving is a much more active type of learning and will engage students with the material more than passive types of review techniques do.<sup>17</sup> So, puzzle that is one of media in English teaching and it can contribute to the material vocabulary achievement.

A puzzle, according to Wahyuningsih is a media in which words guessed from their definitions are fitted into a diagram of white and black squares. The crossword 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. Correctly deciphering a crossword requires correct spelling, which for students means practicing dictionary skills. Making inferences, evaluating choices, drawing

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<sup>16</sup> Azhar Arsyad, *Op., Cit.*, p.34

<sup>17</sup> Kerry Jones, *Education Games English for Teaching*, in *Journal* (USA: Cambridge University Press, 1995), p. 5

conclusions are important skills required for completing crossword puzzles.<sup>18</sup>

Than puzzle is one of skill to practice, evaluate, and draw to the students' vocabulary. So, puzzles have role to make a media. So, it can be concluded puzzle is one of media to learn English teaching with creative, funny, interest, and enjoy following the media process.

#### **b. Kinds of puzzle**

According Bressan and Wolfe have attempted to classify the kinds of crossword puzzles according to the clues used. Bressan discusses two main categories: direct-definition clues and cryptic clues.

- 1) Direct definition clues include generic, synonymic, antonymic, divinatory, and descriptive clues.
- 2) Cryptic clues include anagrams, word inversions, double meanings and so on.<sup>19</sup>

Most second language puzzles use clues from the direct-definition clues, although cryptic clues in the form of anagrams occasionally appear. Bressan argues that puzzles, among other things, enhance vocabulary building, orthography and develop and test the student's knowledge of

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<sup>18</sup> Martin C. Njoroge and Friends, Department of English and Linguistics, *International Journal of Current Research*, Vol. 5, Issue, 02, pp.313-321, February, 2013 (<http://www.journalcra>). In acces 0 October 2015 at 11"30 WIB), p. 315

<sup>19</sup> *Ibid.*

morphology, hence the need to focus on the effectiveness of puzzles in the research that informed our paper.

### **c. Procedures of Using Puzzle**

Before give the puzzle media to the class given time to complete the book, they were allowed to work individually, and answers to the puzzle were reviewed at the end of the class. Then, many instructions to answer puzzle.

There are many procedures using puzzle such as:

1. Description of the material by showing media puzzle.
2. Student worksheets and make little notes in the form of vocabulary.
3. Discussion of the contents of the record in the form of vocabulary using puzzle media.
4. Formulate goals and ideas presented in writing results in a value that get students.
5. Show the evaluating of the students.
6. After completion of the learning, then teacher and students reflect on the material they have learned.<sup>20</sup>

The conclude of procedure using puzzle such as; before to material that description of showing media puzzle about the material, discussion the content, make the note vocabulary, give the goal in writing result, value that get the student, evaluating students and give the reflecting about the material.

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<sup>20</sup> Yuli Setiawati, Ngatman, and Imam Suyanto, *Penggunaan Model Think Talk Write Dengan Media Puzzle Dalam Peningkatan Keterampilan Menulis Karangan Deskripsi Pada Siswa Kelas Iva Sdn 1 Kracak Tahun Pelajaran 2014/2015*, (Surakarta: PGSD FKIP UNS), Volume 3, Nomor 2.1, p. 210

#### **d. The Advantages and Disadvantages of Puzzle**

Puzzle media is one of many instructional media that reinforce word level onto a grid and persuades the class to make suggestions for the puzzle clues. A simpler but still popular alternative word puzzle is the word search. But, this media have advantages and disadvantages for use.

There are some advantages of using puzzle in the classroom they are:

- 1) They are motivating and challenging.
- 2) Learning a language requires a great deal of effort.
- 3) Puzzle helps the students to make and sustain the effort and learning.
- 4) Puzzle provides language practice in the various skills, speaking, writing, listening and reading.
- 5) They encourage students to interact and communicate.
- 6) They create a meaningful context for language use.
- 7) Puzzle usually involves friendly competition and they keep students interested in learning the language
- 8) Puzzle can help them (children) learn and hang on to new words more easily.<sup>21</sup>

There are some advantages of using crossword puzzle are:

- 1) Media make the students can enjoy in subject material.
- 2) Media will support the students to communication and interaction in the classroom.
- 3) Give the motivation to students learns and learn but, also a challenge.
- 4) The teachers able to teach much learning material than if the teachers only use conventional method.
- 5) Doesn't need action or material to give element of game in the class.<sup>22</sup>

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<sup>21</sup> Fauzan Bchrie, "skripsi Bahasa Inggris Increasing" (<http://Fauzan-Bachrie.Educationalnet.com/2012/11/.html> accessed at October 2015).

<sup>22</sup>David Betteridge and Micheal Bucky in Diyan Yulianto, *Belajar Bahasa Inggris dengan Ragam Permainan Kata*, (Jokjakarta: Diva Press), 2010, p. 12



Than using puzzle media to help students study English language and make creation in English teaching. Puzzle also into media and game in the classroom. Many material use to the puzzle in class but, it depended of the curriculum. Students become focus toward material English teaching and give motivation to face challenge the material.

There are three statement advantages in using puzzle are:

- 1) Advantage is that puzzle helps students to solve lack of vocabularies problem.
- 2) By using crossword puzzle, the students will be introduced with new vocabularies that are related with vocabulary achievement.
- 3) That is helps teacher to encourage students' motivation to study.
- 4) By answering the puzzle, the students will find an interesting activity.
- 5) Crossword puzzle is can be a guideline that can develop students' ideas in vocabulary.<sup>23</sup>

Correspondingly, puzzle also motivation students because it facilities students in vocabulary achievement. This interesting learning activity of course can motivate the students in learning. So, it students can guideline to vocabulary achievement in right spelling. If can solve the crossword well, they also can right spelling for specific vocabularies.

There are many statements disadvantages about puzzle are:

- 1) The teacher has to create their own puzzle. That not all the characteristics of vocabularies can be provided in puzzle because in creating puzzle the teacher has to adjust one word with other word.

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<sup>23</sup>Meutiah Annisa, *Jurnal Englis Department FBS Universitas Negeri Padang*, JELT Vol. 2 No. 2 Serie C. March 2014, ( in acces 02 October 2015 at 1: 30 WIB) ), p. 175-176.

- 2) The teacher needs to search more information about the kinds of puzzle in internet or puzzle books.<sup>24</sup>

So, there are many about disadvantages puzzle not only advantages. That all of about disadvantages make the teacher create used the puzzle. The teacher can get the model of puzzle in internet or puzzle books. She has to make s list of main words and supporting words as contents in puzzle.

Beside advantages, there are many disadvantages of using puzzle in the classroom:

- 1) Player elimination. Players can get knocked out of the game early. Who want to watch other people play a game?
- 2) Too dependent on luck. Once all the properties are bought and traded, the game is just rolling the dice until everybody goes bankrupt.
- 3) Doesn't scale well to the number of players.<sup>25</sup>

That have disadvantages about puzzle is the difficult key word to find the word or meaning of word.

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<sup>24</sup> *Ibid.*176

<sup>25</sup>Fauzan Behrie, *Op. Cit.* (accessed at October 2015).

### 3. Picture

#### a. Definitions of Picture

Picture is a visual representation or image painted, drawn, photographed, or otherwise rendered on a flat surface.<sup>26</sup> According to M. Basyiruddin Usman and Asnawir said Picture is a media reproduction original from two dimensions; picture is that the effective visual tool because can be visualized something that will be clarified more concrete and realistic. Information sending can be understood easily because the product can be a model more approach the fact though picture that visualized to the children and outcomes that receipt by the children will be same.<sup>27</sup>

Harmer said: teachers have always used pictures or graphics whether drawn, taken from books, newspaper and magazine, or photograph- to facilitate learning. Pictures cab be in the form of flashcards (smallish cards which we can hold up for our students to see) large wall pictures (big enough for everyone to see details), cue cards (small cards which students use in pair or group work), photographs, or illustration (typically in a text book). Some teachers use projected slides, images from an overhead projector. Teachers also draw pictures on the board to help with explanation and language work.<sup>28</sup>

Another definition is proposed by Sadiman that “Picture/photo is media most general to use. It is general language,, that can understood and

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<sup>26</sup>Arief S. Sadiman,dkk, *Op. Cit.*, p.29.

<sup>27</sup> Asnawir and Basyruddin Usman, *Op. Cit.*,, p. 47.

<sup>28</sup>Jeremy Harmer, *The practice English Language Teaching, Op., Cit.*, p. 134.

comfort in everywhere. So, there is China's aphorism said that a picture tell many than a million words".<sup>29</sup>

According to Gerlach and Ely definition of picture ii:

A picture is a two-dimension visual representation of person, Places or things. Most commonly it is a photograph, but it also may be sketch, a cartoon, a mural, or even a chart, graph or map. pictures may be used for individual study, for display on bulletin boards and in exhibits, and for projection when groups of students need to look at one picture at the same.<sup>30</sup>

From the statement above, picture are media more general or used for individual study. Media picture is easy to getting, easy to showed to students, and it is understand with easy to students. It is can give students information after look the picture.

#### **b. Kinds of Pictures**

There are many kinds of picture can be used as visual aids and help the teacher bring the material easier for the students understand. One of them is picture of situational pictures that show or suggest relationship between object or people can be perfect teaching aid, for introducing, practicing or reviewing grammatical structure. According to Basyirun Usman and Asnawir, there are some kinds of picture, they are:

- 1) Documentation picture is the picture has history for individual or society.
- 1) Actual picture, is picture that explain a incident to cover any aspect life, such as, quake, storm, etc.

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<sup>29</sup> Arief S sadiman, *Op. Cit.*, p. 29.

<sup>30</sup> Vernon S Gerlach and Donal P Ely, *Teaching and Media* (New Jersey: Prentice-Hall, (1971), p. 365.

- 2) View picture, is picture that describe view a location.
- 3) Advertisement picture is that used to influence people or society.
- 4) Symbolic pictures, is pictures that use form symbol or sign that use certain message and can express life of people and idea or the idea students.<sup>31</sup>

So, pictures have many kinds, there are documentation, actual, view, advertisement, and symbol picture. So, by using picture the teacher can help the student to dominate of good vocabulary.

### **c. Procedure of Using Picture**

Picture is one a media that can use. That is facilitating in English learning for make student easy to comprehend about materials. Directly, the picture has procedures to use. Before us using picture, we follow the procedures about picture. There are the procedures using picture such us;

1. Make the picture interest the student
2. Help to translate the meaning of the list of the text
3. To give a context for the language and for the students' activity
4. To give cultural information about picture
5. To contribute to the search for specific information in the text and to help the students demonstrate none verbally at s/he has found that information and understood it has a personal response to offer about it.<sup>32</sup>

Based explain above, the most useful contribution a picture can make is to contribute to the student's understanding of a more general context ravish may be made up of pictures, the teacher's actions, the student's actions, sound effects and words.

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<sup>31</sup> Asnawir and Basyruddin Usman, *Op. Cit.*, p. 51.

<sup>32</sup> Edinburgh Gate, Harlow, *1000+ Pictures for Teachers*, (England: 1984), p. 128.

#### d. The Advantages and Disadvantages of Picture

Picture is media more general or used for individual study. Media picture is easy to getting, easy to showed to students, and it is understand with easy to students. It is can give students information after look the picture. But, there are some advantages and disadvantages of picture sequence description:

- 1) They can be used for vocabulary development. Since everything cannot be brought into the classroom, flashcard and poster provide opportunity to approximate reality and present new vocabulary to the students.
- 2) One can use the flashcard effectively to teach grammar in context. Depending on what the picture illustrates the teacher can find an opportunity to convert it into an inactive grammar class-daily routine of A or B/ narrating a story/ what might happen later now/ what ought to been done/ what could be the reason ( of the situation occurring) etc.
- 3) Picture can be effectively used for story building too.<sup>33</sup>

Then, according to Hackbarrth in Nurani, “picture can help teachers teach the material to the students”. The advantage the pictures are as follows:

- 1) Pictures can attract students’ attention because the like seeing pictures.
- 2) Pictures are making clear the description of abstract things.
- 3) Pictures can illustrate the process of something
- 4) Pictures can be gotten easily from sources such as from the books, newspaper, magazines.
- 5) The teacher just need a little of money to get the pictures.
- 6) Pictures can give concrete description about the object.<sup>34</sup>

There are some disadvantages of picture sequence description are:

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<sup>33</sup> Shefali ray, *Questioning and Aswering of Picture*, (New Jersey: Prentice Hell), 2007, p. 73.

<sup>34</sup> Nurani Yuliani, dkk, *Strategi Pembelajaran*, (Jakarta: Pusat Univarsitas Terbuka, 2003), p. 10-17

- 1) They are not useful for a large audience during a lecture.
- 2) Pictures are limitation in form, so in large classroom not suitable in using because not of all students can to see the object.
- 3) They can be easily stolen or destroyed. Pictures were easily destroyed because it was small things.
- 4) They are hard to stolen in good conditions over long periods. In over long periods the pictures are bad in using.
- 5) You need artistic to produce good quality ones.<sup>35</sup>

Based explain above the researcher can conclude the advantages and disadvantages. Pictures can attract students' attention because the like seeing pictures, Pictures are making clear the description of abstract things, Pictures can illustrate the process of something, and then disadvantages are they are not useful for a large audience during a lecture, Pictures are limitation in form, so in large classroom not suitable in using because not of all students can to see the object.

## **B. Review of Related Findings.**

Sumarni Sitinjak in 2008/2009, the title is "The effect of Total Physical response (TPR) on Students' Vocabulary Achievent at SMP N 3 Palipi". The result of her script is: there is a significant effect of using TPR method on students' vocabulary achievement.<sup>36</sup>

Mila Sartika Tanjung, 2012, the title is "The Comparative Study on Using Pictures and Plash Cards Media in Teaching Vocabulary at SD N 200508

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<sup>35</sup> Ibid, p. 90.

<sup>36</sup> Sumarni Sitinjak, *The effect of Total Physical response (TPR) on Students' Vocabulary Achievement*, (Thesis, UNIMED, 2009).



Padangsidimpuan, the research get score 68,62, which was categorized good enough.<sup>37</sup>

Septi Anzani Putri Harahap, 2013, the title is “ The Comparative Study between The result of Teaching Classroom Objects by Using Guessing Game and Using Picture at SDN 200205 Padangsidimpuan”. The researcher get score 73, 75, which was categorized very good.<sup>38</sup>

The research is also related to Fatimah Imas (2006) University of Budi Utomo Malang, research on the title “Improving the Student Mastery on Vocabulary through Picture Cards of The First Year Students of Mts Nurul Huda Mangunsari Tekung Lumajang in Academic Year 2005/2006. Where find out there are significant difference scores. The mean score increased from 65.58 in the first cycle to 71.28 in the second one, which was categorized good enough.<sup>39</sup> In relation with that, researcher wanted to know and to try a new thing to do a research whether the media and strategy affect the students’ vocabulary mastery.

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<sup>37</sup> Mila Sartika Tanjung, *The Comparative Study on Using Pictures and Plash Cards Media in Teaching Vocabulary*, (STAIN,2012).

<sup>38</sup> Septi Anzani Putri Harahap, “ *The Comparative Study between The result of Teaching Classroom Objects by Using Guessing Game and Using Picture*, (Thesis, STAIN, 2013)

<sup>39</sup> Fatimah Imas, *Improving The Student Mastery on Vocabulary Through Picture Cards of The First Year Students of Mts Nurul Huda Mangunsari Tekung Lumajang in Academic Year 2005/2006* (Malang: np, 2006).

### **C. Framework of Thinking**

Vocabulary is one of component for the language, where is vocabulary help people to speaking and language communication. Vocabulary is also one of the important things to mastery the four skills like; reading, speaking, listening and writing. Vocabulary is all the words that a person knows to use, the word the people use when they are talking about particular subject.

The rule of using puzzles is that puzzle helps students to solve lack of vocabularies problem, by using crossword puzzle, the students will be introduced with new vocabularies that are related with vocabulary mastery, That is helps teacher to encourage students' motivation to study and Crossword puzzle is can be a guideline that can develop students' ideas in vocabulary.

The rule of showing picture can attract students' attention because the like seeing pictures, making clear the description of abstract things, that can illustrate the process of something, can be gotten easily from sources such as from the books, newspaper, magazines and the teacher just need a little of money to get the pictures, and then can give concrete description about the object.

The researcher can assume using puzzle and showing picture media, which will be better use in teaching vocabulary mastery is showing picture, because we can look and read the rule both of media. Picture is description about the object, we can look concrete the process of object in media, and picture is media to easy the students understand about the material of

vocabulary. If we show the media so, we will related to the children world and probably can interest them in learning vocabulary. This media will make junior high school students enjoy learning vocabulary.

#### **D. Hypothesis**

Hypothesis is a provisional respond to the problem, proved after collecting the data. Suharsimi says “Hypothesis is a tentative answer that is needs the answer to the Problem”.<sup>40</sup> The hypothesis is not a final answer so, it needs testing. An established the nature of the problem and gives direction to the data gathering process. It will be accepted if the data findings suitable with the hypothesis unless it will be rejected if the data lose from the hypothesis.

The hypothesis is one the important elements of a research that an essential position in are search, because it can be used a guide in carrying out the research. While Suharsimi Arikantosaid that said:

The characteristics of a good hypothesis are:

- 1) It should be conjuncture upon a relationship between two or more variables
- 2) It should be stated clearly and unambiguously in the form of declarative sentence, and
- 3) It should be testable that is should be possible to restate it in operational form can be evaluated base on the data.<sup>41</sup>

The hypothesis of this research stated that:

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<sup>40</sup> Suharsimi Arikunto, *Manajemen Penelitian* (Jakarta: Rineka Cipta, 2009) p. 55.

<sup>41</sup> Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktek, Op., Cit.*, p. 63.

$H_a$ : There are comparative study between using puzzle and showing picture media toward students' vocabulary achievement at grade VIII MTsN 2 Padangsidempuan.

$H_0$ : There is no comparative study between using puzzle and showing picture media toward students' vocabulary achievement at grade VIII MTsN 2 Padangsidempuan.

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **A. The Place and the Time of the Research**

This research will be done at MTs Negeri 2 Padangsidempuan. It is located at Jl. HT Rizal Nurdin km 5,5 Padangsidempuan. It is selected because it is only stated junior high school at the grade VIII MTsN 2 Padangsidempuan 2015 Academic Years.

That has been process as National Curriculum. This research will be done from December 2015 until finish.

#### **B. Research Design**

This research was designed by using experiment method. Quantitative method was method of research that have statistical and usually used formula and percentage. Actually, this study use experimental research. According to John. W. Creswell, experimental research includes true experiment with the random assignment of subject to treatment condition as well as quasi experiment that use non randomized.”<sup>1</sup> Next, according to L.R Gay and Peter Airasian say “experimental research is the only type of research that can test hypotheses to establish cause and effect”.<sup>2</sup>

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<sup>1</sup> John W. Creswell, *Research Design*, ( USA: sage publication, 2002), p.14.

<sup>2</sup>L.R Gay & Peter Airasian, *Op. Cit.* 367

From the definition above, researcher concludes that the experiment is a kind of research that had aim to know the causal effect relationship between one or more variable to other variables

The research design used by giving pre-test and post-test control to experiment class I and experiment class II. In this case, both of these classes gave different treatment, to experiment class I gave picture media and experiment class II gave puzzle media. It would know the comparative of experiment both of these media to students' vocabulary mastery at grade VIII MTs Negeri 2 Padangsidempuan.

The experimental research controls the selection of participant for the study and divides the select participant into more groups having similar characteristic at the start of experiment. In this research, the researcher use Pretest – Posttest control Group Design.

**Table: 1**

**Pretest – Posttest Control Group**

<b>Group</b>	<b>Pre-test</b>	<b>Treatment</b>	<b>Post - test</b>
<b>Experiment class I</b>	✓	✓	✓
<b>Experiment class II</b>	✓	✓	✓ <sup>3</sup>

(Resource: John W. Creswell, *Research Design*)

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<sup>3</sup> John W. Creswell, *Research Design, Op. Cit*, p.14

## C. The Population and Sample

### a. Population

According L.R. Gay and Peter Airasian (“The population is the group of interest to the researcher, the group to which she or he would like the results of the study to be generalizable.” Generalizability is the extent to which the results of one study can be applied to other populations or situations. The population may be virtually any size and may cover almost any geographical area. The entire groups the researcher would really like to generalize are rarely available. The population that the researcher would ideally like to generalize to is referred to as the target of population.<sup>4</sup>

Suharsimi Arikunto says, “A population is a set (collection) of all elements processing one or more attributes of interest.<sup>5</sup> Based on the quotation above, the population of research consist three classes in MTsN 2 Padangsidempuan. The total population of the grade VIII students of MTsN 2 Padangsidempuan in 2014/2015Academic Year can be seen as table below:

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<sup>4</sup> L.R. Gay and Peter Airasian, *Op. Cit.*, p. 122.

<sup>5</sup>Suharsimi Arikunto. *Op. Cit.* p. 108.



**Table: 2**  
**The Population of the Grade VIII Students of MTs Negeri 2**  
**Padangsidimpuan**

No.	Class	Number of the Students
1.	VIII – 1	29
2.	VIII – 2	29
3.	VIII – 3	25
4	VIII- 4	25
5	VIII – 5	25
Total		133

#### **b. Sample**

Arikunto says, “Sample is a part of population which will be researched.”<sup>6</sup> In this research, the writer used cluster sample. Cluster sample is the technique to get the sample by choosing at grade VIII class. Sample is the parts of population, like L.R. Gay and Peter Airasian said:

Sampling is the process of selecting a number of individuals for a study in such way that the present the large group from which they were selected. A sample comprises the individuals, items, or events selected from a large group referred to as a population. The purpose of sampling is to gained information about the population by using the sample”.<sup>7</sup>

It means that sampling is process of selecting a number of individual data from entire population, in fact, not only is it generally not be

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<sup>6</sup>*Ibid*, p. 109.

<sup>7</sup>L.R. Gay and Peter Airasian, *Op. Cit.*.p. 121

feasible to study the whole population, it is also not necessary. If the population of the interest is large or geographically scattered, study of it would not be feasible or would be prohibitively costly and time consuming.

So, the researcher chose class VIII -1 and VIII – 2 as a sample because just these cleases learning English in a same knowledge level. And class VIII-3 not same knoledge level with class VIII 1 and VIII 2. Beside it, the researcher wants to know the differences between showing picture media and using puzzle media. Therefore, VIII – 1 and VIII – 2 will be take as sample. It can be seen in the table following table grade students of MTs Negeri 2 Padangsidimpuan in 2015/2016 Academic Year. It can be seen the table follows:

**Table: 3**

**Table of the Sample Students**

Experimental Class I	Experimental Class II
VIII.1 = 29	VIII. 2 = 29

The researcher choose the sample at grade VIII because their material about vocabulary. It is undeniable that to vocabulary mastery needs many media to avoid the student saturation.

In this research, the researcher uses random sampling. The researcher chooses two classes. The researcher chooses VIII-1 consists of 29 students

and VIII-2 consists of 29 students. Therefore, total samples are 58 students. Before use cluster sampling, the researcher uses normality and homogeneity test, they are:<sup>8</sup>

a. Normality Test

In Normality test, the data can be tested with Chi-quadrade:

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

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.

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

b. Homogeneity Test

Homogeneity test is used to know whether control class and experimental class have the same variant or not. If both of classes are same, it can be called homogeneous. Homogeneity is the similarity of variance of the group will be compared. So, the function of

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<sup>8</sup>Mardalis, *Metode Penelitian: Suatu Pendekatan Proposal* (Jakarta: BumiAksara, 2003), p.85.

homogeneity test was to find out whether the data homogeneity or not. It used Harley test, as follow:<sup>9</sup>

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

Where:

$n_1$  = Total of the data that bigger variant

$n_2$  = Total of the data that smaller variant

Hypothesis is rejected if  $F \leq F_{\frac{1}{2}a(n_1-1)(n_2-1)}$  while if  $F_{count}$

$> F_{table}$  Hypothesis is accepted. It determined with significant level 5%

(0,05) and dk numerator is  $(n_1 - 1)$  while dk denominator is  $(n_2 - 1)$ .

#### D. The Instrument of the Collecting the Data

Collecting data is needed in this research, as the first step, the writer specifies the operation of all definition. It means to give the scope of both variables of the research. So that it is easier to measure. According to L.R. Gay and Peter Airasian there are three major ways to collect research data: 1) administer a standardized instrument, 2) administer a self-developed instrument, and 3) record naturally occurring or already available data (such as observing or using existing grade point averages).<sup>10</sup>

Furthermore, vocabulary mastery is the ability of the students in understands about vocabulary. Then, focus into nouns which related to

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<sup>9</sup>AgusIrianto, *Statistik Konsep Dasar dan Aplikasinya* (Padang: P2PLTK, 2003), p. 276.

<sup>10</sup> L.R. Gay and Peter Airasian, *Op. Cit.*, p. 152

identifying and finding the detail of words like, animals, plants, sport travelling, food, and drink. The test used multiple choice forms that consist of four chosen, they are a, b, c, and d. By knowing the indicators of the variable, it can be measured by using 100 items. There are 50 pre-test and 50 pos-test item tests for the vocabulary mastery.

**Table: 4**  
**The Indicator of Vocabulary Mastery for**  
**Pre- test**

No	Indicator	Item	Number of Item	Score	Total Score
1	Identify noun about animals	10	1,2,3,4,5,6,7,8,9,10	2	20
2	Identify noun about plants	10	11,12,13,14,15,16,17,18,19,20	2	20
3	Identify noun about sports	10	21,22,23,24,25,26,27,28,29,30	2	20
4	Identify noun about travelling and vocation	10	31,32,33,34,35,36,37,38,39,40	2	20
5	Identify about food and drink	10	41,42,43,44,45,46,47,48,49,50	2	20
Total		50			100

**Table: 5**  
**The Indicator of Vocabulary Mastery for**  
**Post-test**

No	Indicator	Item	Number of Item	Score	Total Score
1	Identify noun about animals	10	31,21,32,22,23,24,25,32,33,34	2	20
2	Identify noun about plants	10	35,26,27,28,29,35,36,37,38,39	2	20
3	Identify noun about sports	10	41,42,43,44,45,46,47,48,49,50	2	20
4	Identify noun about travelling	10	1,2,3,4,5,6,7,8,9,10	2	20
5	Identify about food and drink	10	11,12,13,14,15,16,17,18,19,20	2	20
Total		50			100

To score the test is base on the kind of the test, the formula will be use:

$$S = \frac{R \times 100}{N}$$

Where:

S = Score

R = Right Answer

N = Total Number of Item

Next, to know the criteria of score, the researcher quoted Muhibbin Syah opinion as follow:

**Table: 6**  
**The Criteria of the Scores**

No	Class of Score	Predicate
1	80 – 100	Very Good
2	70 – 79	Good
3	60 – 69	Enough
4	50 – 59	Bad
5	40 – 49	Fail <sup>11</sup>

## **E. Validity and Reliability Instrument**

### **1. Validity of Measuring Instruments**

Validity is the most important quality of a test. It is the degree to which a test measures what it is supposed to measure and, consequently permits appropriate interpretations of test scores. There are three main point forms of validity are content, criterion-related, and construct.

In this research, the writer uses content validity to establish validity of instrument. Content validity is of prime importance for

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<sup>11</sup>Muhubbin Syah, *Psikologi Pendidikan Pendekatan Baru*, ( Bandung: Remaja Rosada Karya, 2000), p. 81.



achievement test. Content validity is determined by expert judgment of item and sample validity.<sup>12</sup>

To know the validity of items, researcher uses the correlation Biserial formula, as follow:<sup>13</sup>

$$r_{pbi} = \frac{Mp - Mt}{SD_t} \sqrt{\frac{p}{q}}$$

Where:

$r_{pbi}$  = Number of index Correlation point Biserial

$Mp$  = Re-average of the score of the students answer correctly

$M_t$  = Re-average of the total score that achieved success by member of the test.

$SD_t$  = Standard of deviation

$P$  = Proportion of the students answer correctly

$P = \frac{\text{Total of the students answer correctly}}{\text{Total of the students}}$

$\text{Total of the students}$

$q$  = Proportion of the incorrect answer students

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<sup>12</sup>*Ibid.*,p. 161.

<sup>13</sup>Anas Sudijono, *Pengantar Statistik Pendidikan* (Jakarta: Raja GrafindoPersada, 2008)

Result of calculation by coefficient of correlation Biserial is determined if  $r_{pbi} > r_{table}$  with the significant level 5 % (0,374) with the table r product moment. So, the item is tested valid.

## 2. Reliability of Measuring Instruments

An instrument of the research must be reliable. A reliable test is consistent and dependable.<sup>14</sup> To get the reliability of the test, Suharsimi Arikunto said that to obtain the reliability of the test, the researcher uses formula K-R 20.<sup>15</sup>

The formula:

$$R_{11} = \left( \frac{n}{n-1} \right) \left( \frac{St^2 - \sum pq}{St^2} \right)$$

Where:

$R_{11}$  : Reliability of the Instrument

N : Total of Question

$St^2$  : Variants Total

P :  $\frac{\text{Proporsi Subject who is right Answer}(1)}{N}$

Q :  $\frac{\text{Proporsi Subject who is Wrong Answer (0)}}{N}$

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<sup>14</sup>H. Douglas Brown. *Language Assessment Practical and language Practice*, (San Francisco: Longman, 2003), p. 21.

<sup>15</sup>Suharsimi Arikunto, *Op. Cit.*, p. 188.

Reliability is a good character of the test that refers to the consistency of the measurement. The test is reliable  $r_{\text{count}} > r_{\text{table}}$  by using formulation KR-20 with  $r_{\text{table}} 0.70$ .

Criteria of test reliability is as follows:

$r_{11} = 0,70$  high correlation (reliable)

$r_{11} > 0,70$  high correlation (reliable)

$r_{11} < 0,70$  low correlation (un- reliable)<sup>16</sup>

## **F. The Technique of Collecting the Data**

In completing the data, the next step of this research is collecting the data. The function of data collecting is to determine the result of the research, in collecting data, the researcher uses some steps. They are:

### **a. Pre-test**

The pre-test is conducted to find out the homogeneity of the sample. The function of the pre test is to find the main scores of the interactive strategy class and conventional class before the research give treatment. In this case, the researcher has some procedures. There are:

1. The researcher prepares the test 5 item
2. The researcher distributes the paper of test to students of experimental

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<sup>16</sup> Anas Sudijono. *Op.Cit.*, p. 209.

class and control class.

3. The researcher explains what the students to do
4. Giving time.
5. The students answer the question.
6. Collect their paper test of researcher.
7. The researcher checks the answer of students and finds the mean score of vocabulary achievement taught by using activating and connecting background knowledge.

#### **b. Treatment**

After giving the pre test, the students give the treatment. The experimental class receive the treatment taught give the tests. In learning outlining strategy while the control class just only taught by showing picture. The treatment is done in three meeting. The material consist vocabulary.

#### **c. Post test**

After giving treatment the researcher conduct a post test which the same test with the pre test, and that conduct in the previous of the research. This post test is the final test in the research especially measuring the treatment, whether is significant or not. After conducting the post test the researcher analyze the data, and the researcher found out the comparison outlining strategy in experimental class. The research has procedure there were:

1. The researcher prepares the test 5 item
2. The researcher distributes the paper of test to students of experimental class and control class.
3. The researcher explains what the students to do
4. Giving time (90 minutes)
5. The students answer the question
6. Collects their paper test to researcher

The researcher checks the answer of students and found the mean score of vocabulary achievement taught by outlining strategy. In collecting data, the research conducts twice of test for those groups. They are pre-test and post-test.

### **G. The Technique of Analyzing the Data**

After collecting the data of the students score, it should be analyzed with a formula in order to see the degree of influence of both variables or to complete the hypothesis that conducted in this research, so the writer used the formula of “t-test” as follows:

$$t_o = \frac{M_1 - M_2}{SE_{M_1 - M_2}}$$

to = Test  
 $M_1$  = Mean Variable I, the result of vocabulary achievement vocabulary using puzzle

- $M_2$  = Mean Variable II, the result of vocabulary achievement vocabulary showing picture
- $SE_{M1}$  = Standard Error Mean Variable I
- $SE_{M2}$  = Standard Error Mean Variable II<sup>17</sup>

## H. Testing Hypothesis

In analysis data, the researcher used t-test to test hypotheses, as follow:

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

Where:

$\bar{x}_1$  = Mean of experimental class sample

$\bar{x}_2$  = Mean of control class sample

$n_1$  = Total of experimental class sample

$n_2$  = Total of control class sample<sup>18</sup>

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<sup>17</sup>Anas Sudijono, *Pengantar Statistik Pendidikan*, (Jakarta, PT. Raja Grafindo Persada: 2003, Cet. XII), p. 314.

<sup>18</sup>Sugiyono, *Statistik untuk Penelitian* (Bandung: Alfabeta, 2011), p. 138-139.

## CHAPTER IV

### THE RESULT OF THE RESEARCH

This chapter presents research result. In order to evaluate a comparative study between using puzzle and showing picture media toward students' vocabulary mastery at grade VIII of MTs Negeri 2 Padangsidempuan. The researcher has calculated the data using pre test and post test. Applying quantitative research, the research used the formulation of t-test. Next, researcher will describe the result based on the data that has been researched as follow:

#### A. Description of Data

##### 1. Description of Data Before Showing Picture Media

###### a. Score of Pre-Test Experimental Class I

In pre-test experimental class I, the researcher calculated the result that got by the students in answering the question (test). The scores pre-test experimental class could be seen in the following table.

**Tabel: 7**  
**The score of Experimental Class I in Pre-Test**

Total	1720
Highest score	75
Lowest score	45
Mean	72.65
Median	71.25
Modus	66.15
Range	35
Interval	5
Standart deviation	8.8
Variants	79.86

Based on the table above the total score of experiment class in pre-test was 1720, mean was 72.65, standart deviation was 8.8, varians was 79.86, median was 71.25, range was 30, modus was 66.15, interval was 5. The researcher got the highest score was 75 and the lowest score was 45. It can be seen on appendix 18. Then, the computed of the frequency distribution of the students' score of experiment class could be applied into table frequency distribution as follow:

**Table: 8**  
**Frequency Distribution of Students' Score**

No	Interval	Mid Point	Frequency	Percentages
1	45 – 49	47	3	10.34%
2	50 – 54	52	4	13.79%
3	55 – 59	57	5	17.24%
4	60 – 64	62	5	17.24%
5	65 – 69	67	7	24.13%
6	70 – 74	72	3	10.34%
7	75 – 79	77	2	6.89%
$i = 5$			29	100%

In order to get description of the data clearly and completely, the researcher presents them in histogram on the following figure:



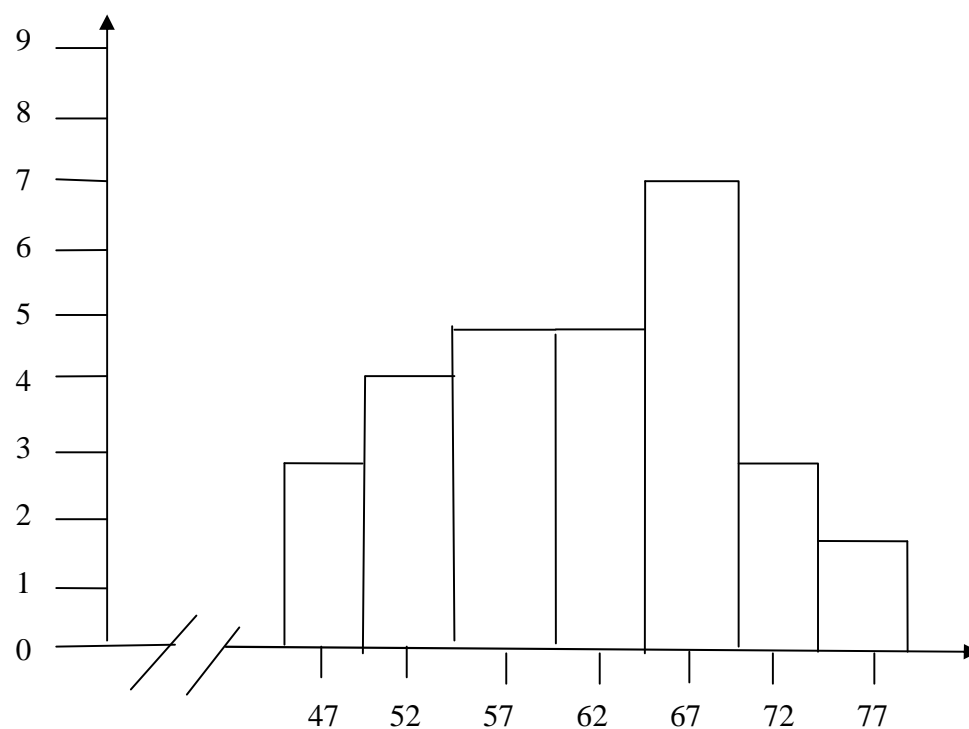
**Frequency**

Figure 1: Score Pre Test of Experimental Class I

**b. Score of Pre Test Experiment Class II**

In pre-test experiment class II, the researcher calculated the result that got by the students in answering the question (test). The scores pre test in experiment class II could be seen in the following table:

**Tabel: 9**  
**The Score of Experiment II in PreTest**

Total	1800
Highest score	75
Lowest score	45
Mean	69.9
Median	65.45
Modus	71.4
Range	35
Interval	5
Standart deviation	9.2
Varians	88.42

Based on the table above the total score of experiment class II in pre-test was 1800, mean was 69.9, median was 65.45, modus was 71.4, range was 30, interval was 5, standard deviation was 9.2, variants was 88.42. The researcher got the highest score was 75, and the lowest score was 45. It can be seen on appendix 18. Then, the computed of the frequency distribution of the students' score of experiment class II could be applied into table frequency distribution as follow:

**Table: 10**  
**Frequency Distribution of Students' Score**

No	Interval Class	Mid Point	F	Percentages
1	45 – 49	47	2	6.89%
2	50 – 54	52	3	10.34%
3	55 – 59	57	5	17.24%
4	60 – 64	62	8	27.58%
5	65 – 69	67	5	17.24%
6	70 – 74	72	3	10.34%
7	75 – 79	77	3	10.34%
$i = 5$			29	100%

In order to get a description of the data clearly and completely, the researcher presents them in histogram on the following figure:

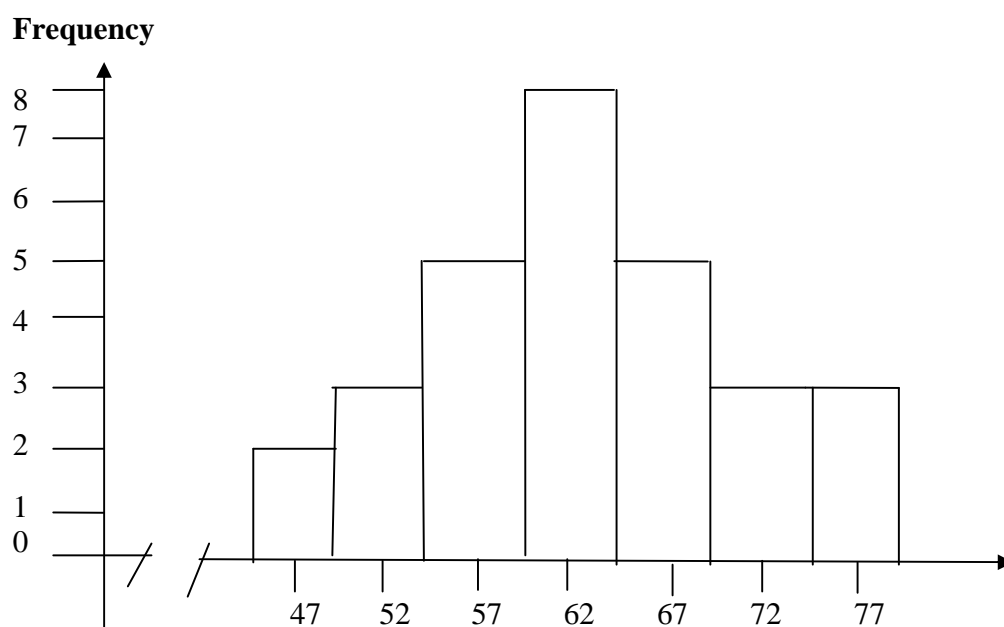


Figure 2: Score Pre test of Experiment Class II

## 2. Description of Data After Using Puzzle Media and Showing Picture Media

### a. Description of Data Showing Picture Media

Based on the result of students' vocabulary mastery by using test, the researcher calculated the score of experimental class I in post-test was described on the table below:

**Tabel:11**  
**Score of Experimental Class in Post-Test**

Total	2350
Highest score	95
Lowest score	65
Mean	86.95
Median	88.75
Modus	86.3
Range	35
Interval	5
Standart deviation	8.1
Varians	68.53

Based on the table above the total score of experiment class I in post-test was 2350, mean was 86.95, median was 88.75, modus was 86.3, range was 30, interval was 5, standard deviation was 8.1, variants was 68.53. The researcher got the highest score was 95 and the lowest score was 65. The calculation can be seen on the appendix 20. Then, the computed of the frequency distribution of the students' score of experiment class could be applied into table frequency distribution as follow:

**Table: 12**  
**The Frequency Distribution of Students' Score**

No	Interval Class	Mid Point	F	Percentages
1	65 – 69	67	2	6.89%
2	70 – 74	72	3	10.34%
3	75 – 79	77	3	10.34%
4	80 – 84	82	6	20.68%
5	85 – 89	87	10	34.48%
6	90 – 94	92	3	10.34%
7	95 – 99	97	2	6.89%
$i = 5$			29	100%

Based on the table above, it can be drawn at histogram as follow:

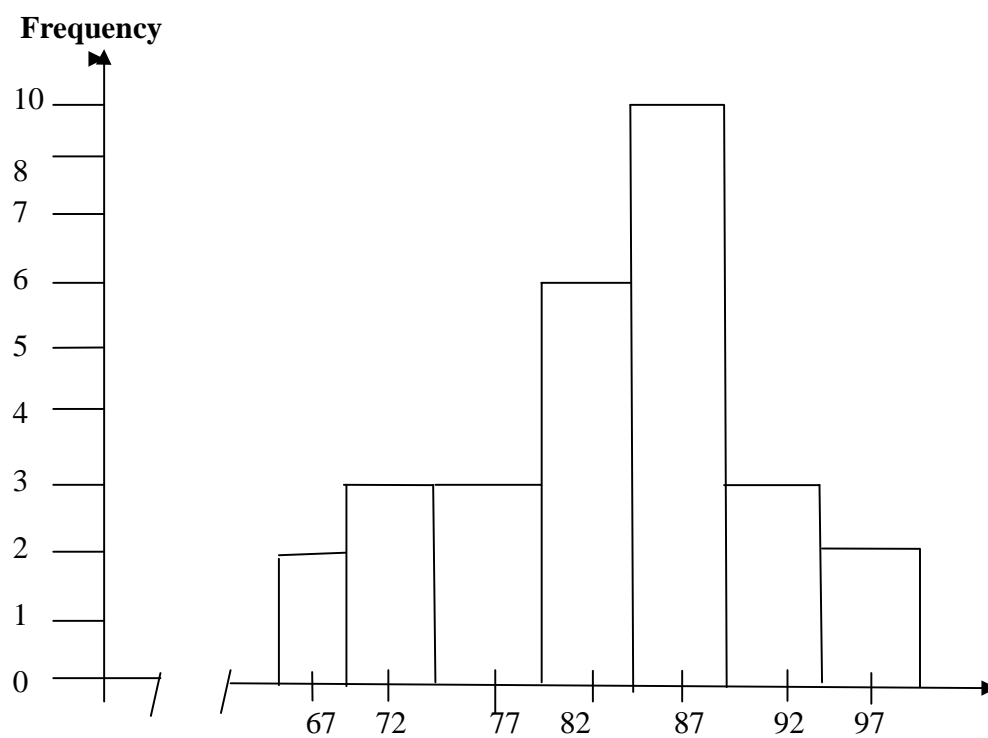


Figure 3: Score Post test of Experimental Class I

**b. Description of Data Using Puzzle media**

The researcher calculated the score of experiment class II in post-test was described on the table below:

**Tabel: 13**  
**The Score of Control Class in Post-Test**

Total	1930
Highest score	80
Lowest score	50
Mean	70.4
Median	76.25
Modus	72
Range	35
Interval	5
Standart deviation	7.55
Varians	80.54

Based on the table above the total score of experiment class II in post-test was 19.30 ,mean was 70.4, standart deviation was 7.55, varians was 80.54, median was 76.25, modus was 72, range was 30, interval was 5. The researcher got the highest score was 80 and the lowest 50 score was. The calculation can be seen in the appendix 21. 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	Mid Point	F	Percentages
1	50 – 54	52	2	6.89 %
2	55 – 59	57	3	10.34%
3	60 – 64	62	4	13.79%
4	65 – 69	67	5	17.24%
5	70 – 74	72	7	24.13%
6	75 – 79	77	5	17.24 %
7	80 – 84	82	3	10.34%
$i = 5$			29	100%

Based on the table above, it can be drawn at histogram as follow:

**Frequency**

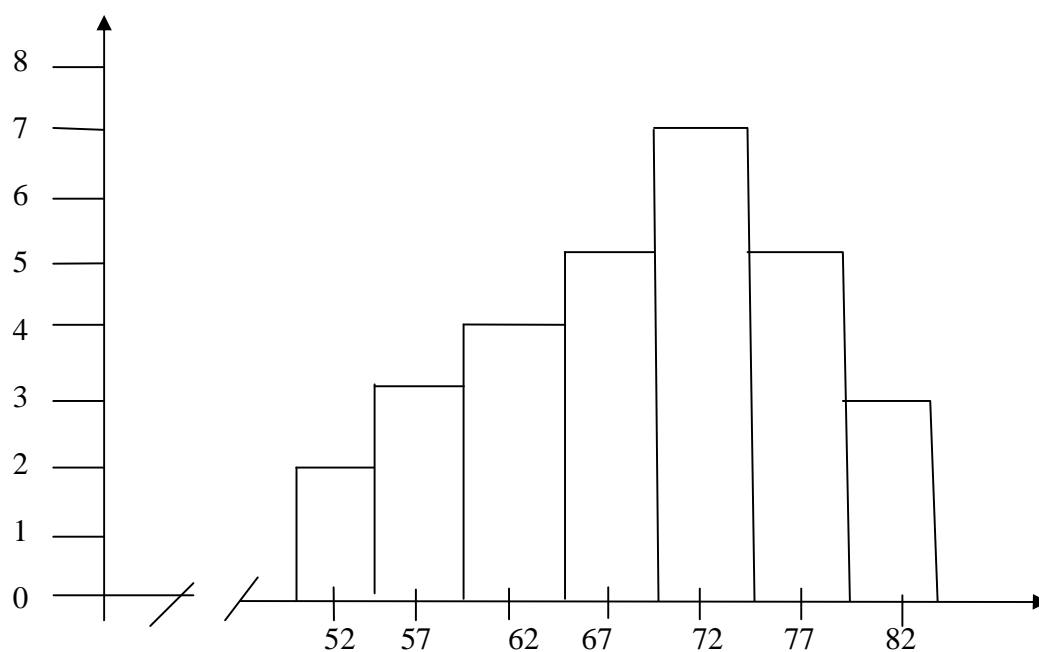


Figure 4: Score Post test of Experiment Class II

## B. Technique of Data Analysis

### 1. Requirement test

#### a. Normality and Homogeneity Pre-Test

##### 1) Normality of Experimental Class I and Experiment Class II in Pre-Test

**Table: 15**  
**Normality and Homogeneity in Pre-Test**

Class	Normality Test		Homogeneity Test	
	$t_{count}$	$t_{table}$	$t_{count}$	$t_{table}$
Experiment Class – 1	3.93	5.991	1.10 < 2.052	
Experiment Class – 2	4.06	5.991		

Based on the table above researcher calculation, the score of experiment class  $I_{count} = 3.93 < t_{table} = 5.991$  with  $n = 29$  and experiment class II  $c_{count} = 4.06 < t_{table} = 5.991$  with  $n = 29$ , and real level  $\alpha = 0.05$ . Cause  $c_{count} < t_{table}$  in the both class. So,  $H_a$  was accepted. It mean that experiment class I and experiment class II were distributed normal. It can be seen in appendix 18 and 19.

##### 2) Homogeneity of Experimental Class I and experiment Class II in Pre-test

The coefficient of  $F_{count} = 1.10$  was compared with F table.

Where F table was determined at real  $\alpha = 0.05$ , and the different



numerator  $dk=N-1=29-1=28$  and denominator  $dk N-1=29-1=28$  So, by using the list of critical value at F distribution is got  $F_{0.05}=2.042$  and  $2.052$ . It showed that  $F_{count}(1.10) < F_{table}(2.042 \text{ \& } 2.052)$ . So, the researcher concluded that the variant from the data of the students' vocabulary mastery at MTS N 2 Padangsidempuan by experimental class I and experiment class II was homogen. The calculation can be seen on the appendix 19.

**b. Normality and Homogeneity Post Test**

1) Normality of experimental class I and experiment class II in Post-test

**Tabel: 16**  
**Normality and homogeneity in post-test**

Class	NormalityTest		Homogeneity Test	
	$t_{count}$	$t_{table}$	$t_{count}$	$t_{table}$
Experiment Class I	2.79	5.991	$1.17 < 2.052$	
Experiment Class II	1.96	5.991		

Based on the table above, the score of experimental class I  $t_{count}=2.79 < t_{table}=5.991$  with  $n=29$  and experiment class II  $t_{count}=1.96 < t_{table}=5.991$  with  $n=29$ , real level  $\alpha$  was 0.05, Cause  $t_{count} < t_{table}$  in the both class. So,  $H_a$  was accepted, it mean that experiment I class and experiment class II were distributed normal. It can be seen on appendix 20 and 22.

2) Homogeneity of Experimental Class I and experiment Class II in Post-Test

The coefficient of  $F_{\text{count}} = 1.17$  was compared with F table. Where F table was determined at real  $\alpha = 0.05$ , and the different numerator  $dk = N - 1 = 29 - 1 = 28$  and denominator  $dk N - 1 = 29 - 1 = 28$  So, by using the list of critical value at F distribution was got  $F_{0.05} = 2.042$  and 2.052. It show that  $F_{\text{count}} (1.17) < F_{\text{table}} (2.042 \text{ \& } 2.052)$ . So, the researcher concluded that the variant from the data of the students' toward vocabulary mastery at MTs Negeri 2 Padangsidimpuan by experimental Class I and experiment class II was homogeny. The calculation can be seen on the appendix 22.

## 2. Hypothesis Test

The data would be analyzed to prove hypothesis by using formula of t-test. If  $t_{\text{count}} > t_{\text{table}}$   $H_0$  was rejected and  $H_a$  was accepted. Hypothesis alternative ( $H_a$ ) of research was "There was difference between students' vocabulary mastery by using puzzle media and showing picture media." The calculation can be seen on the appendix 24.

**Table: 17**  
**Result of T-test from the Both Averages**

Pre-test		Post-test	
$t_{\text{count}}$	$t_{\text{table}}$	$t_{\text{count}}$	$t_{\text{table}}$
1.16	2.000	28.53	2.000

Based on researcher calculation, researcher found that  $t_{\text{count}} 28.53$ . While  $t_{\text{table}} 2.000$ . With opportunity 5% and  $d_t = (n_1 + n_2 - 2) = (29 + 29 - 2) = 56$ . If  $t_{\text{count}} > t_{\text{table}}$   $H_0$  was rejected and  $H_a$  was accepted ( $28.53 > 2.000$ ). It means

there was difference between students' vocabulary mastery using puzzle and showing picture media. In this case, the mean score of experiment class I by showing picture media was 86.95, and mean score of experiment class II was 70.4. So, the students' in vocabulary mastery by showing picture media was better than using puzzle media. The calculation can be seen on the appendix 23 and 24.

### **C. Discussion**

Based on the related findings and the theory, the researcher discussed the result of this research and compared with the related findings. Constructivism theory is theory describing how learning happens and focuses on the factors that affect of students involvement. In learning process work with group of friends is very important; students can learn with their friend and exchange ideas with one another. So, based on theory above the researcher concluded that students' ability in reading can compare puzzle and picture media.

Based on the related findings, the researcher discussed the result of this research and compared with the related findings. First, Ahmadin Azhar is "The Effect of using Media Video Dora the Explorer to Students' Vocabulary Mastery at SD Negeri 200201/4 Padangsidempuan". The concluding of his research, there is the effect of using media video Dora the Explorer to students' vocabulary mastery, where the mean score after using media video Dora the Explorer was 93.26 and mean score before using media video Dore

the Explorer was 83.04, with  $t_0$  is higher than  $t_t$  (  $12.77 > 1.68$ ). So, the implication of media Video Dora the Explorer is better than conventional strategy.

Second, Sri Nardani Hasibuan is "The Effect of Watching Film to Students' Vocabulary Mastery at Grade XI SMK Negeri 1 Padangsidempuan". The concluding of her research, there is the effect of watching film to students' vocabulary mastery, were the mean score after using watching film was 86.66 and mean score before using watching film was 83.25, with  $t_0$  is higher than  $t_t$  ( $1.69 > 1.66$ ). So, the implication of watching film is better than conventional strategy.

Third, Muhammad Yusuf is "The Effect of Total Physical Response (TPR) on Grade V Students' Vocabulary Mastery". The concluding of his research, the result is the score of experimental group is higher than control group and from the calculation of t test 2.20 and t table 1.17, it means that, t test is higher than t table ( $2.20 > 1.17$ ).<sup>1</sup> So, there was a significant effect of Total Physical Response (TPR) on V grade students' vocabulary mastery at SD Negeri 142612 Panyabungan.

Then, the research by using direct method showed the result of mean score in experimental class was 81.15 and control class was 65. It means the result and hypothesis testing showed that direct method had the effect, and

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<sup>1</sup> Muhammad Yusuf, The Effect of Total Physical Response (TPR) on Grade V Students' Vocabulary Mastery (Padangsidempuan: np,2011) p. 33.

hypothesis alternative ( $H_a$ ) was accepted and hypothesis zero ( $H_0$ ) was rejected. It was indicated that the score of experimental class was bigger than control class ( $81.15 > 65$ ), and also indicated  $t_o > t_t$  ( $32.35 > 2.000$ ).

Then, the researcher concluded the students vocabulary mastery using puzzle media and showing puzzle media in showed the result of mean score experimental class I and Experimental class II in pre-test ( $72.65 > 69.9$ ) and  $t_{\text{count}} < t_{\text{table}}$  ( $1.16 < 2.000$ ) the hypothesis was accepted. In post test the result of experimental class I was higher than Experiment class II ( $86.95 > 70.4$ ) and  $t_{\text{count}} > t_{\text{table}}$  ( $28.53 > 2.000$ ) so the hypothesis was accepted. It means the result and hypothesis testing showed that puzzle and picture media had the effect, and hypothesis alternative ( $H_a$ ) was accepted and hypothesis zero ( $H_0$ ) was rejected. It was indicated that the score of picture was bigger than puzzle media.

Based on the explanation above, the researcher concluded that hypotheses alternative  $H_a$  was accepted and  $H_0$  was rejected there was difference between students' vocabulary mastery by using puzzle and picture media.

#### **D. Limitation of the Research**

The researcher found the threats of this research as follows:

1. The students needed more time for answering the test.

2. There were some students that were noisy while teaching and learning process. So, it can disturb the concentration of the others.
3. There were some students that were lack of serious to answer the test in pre-test and post-test. It can be the threat of the research. So, the researcher cannot reach the validity of trustworthiness data.

## **CHAPTER V**

### **CONCLUSIONS AND SUGGESTIONS**

#### **A. Conclusions**

Based on the result of the research and calculation of the data, the researcher concluded that:

1. The result of students' vocabulary mastery by using puzzle media was "enough" in pre- test, by getting mean score were: 69.9 and post- test "good" by getting mean score were 70.4.
2. The results of students' vocabulary mastery by showing picture media was "good" in pre- test, by getting mean score were 72.65 and post test "very good", by getting mean score were 86.95.
3. After testing hypothesis it found that showing picture media is better than using puzzle media of grade VIII MTs Negeri 2 Padangsidimpuan in 2015-2016 academic years. Because after calculated the data the researcher had found that the coefficient  $H_0$  was rejected and  $H_a$  was accepted,  $t_{count}$  was higher than  $t_{table}$  ( $28.53 > 2.000$ ). It means that the researcher concluded that showing picture media better than using puzzle media on students' vocabulary mastery. So,  $H_a$  more acceptable and  $H_0$  rejected.

## **B. Suggestions**

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

1. For teachers, as English teachers were hoped to use appropriate media to explain or to teach English subject to the students. Then, from the result of the research, showing picture media better than using puzzle media. So that, the writer suggests showing picture media can be applied on the English teaching classroom especially for the teachers who want to increase vocabulary mastery.
2. It is suggest to headmaster to motivate English teacher to develop their ability in teaching English for vocabulary mastery by showing picture media and using puzzle media.
3. Other researchers, the researchers hope that the others researchers who want to conduct a research related to this research to find the others influence of these strategies deeply.



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Tricia M. Davis<sup>1a</sup>, Brooke Shepherd<sup>b</sup>, and Tara Zwiefelhofer<sup>c</sup>, *The Journal of Effective Teaching, Reviewing for Exams: Do Crossword Puzzles Help in the Success of Student Learning*, University of Wisconsin: 2009, Vol. 9, No. 3, 2009, 4-10.

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## **CURRICULUM VITAE**

### **A. Identity**

Name : ELIA KASUM LUBIS

Nim : 11 340 0052

Place and Birthday : Padangsidempuan, 21<sup>th</sup> September 1992

Sex : Female

Religion : Moslem

Address :KEL. Palopat, KEC. Padangsidempuan Selatan, Kota  
Padangsidempuan

### **B. Parent**

1. Father's name : Fahmi Lubis
2. Mother's name : Golom Lubis

### **C. Educational Background**

1. Elementary School : SD Negeri No. 142658 (2004)
2. Junior High School : SMP Muhammadiyah 40 Tamiang (2007)
3. Senior High School : SMA Negeri 1 Kota Nopan (2011)
4. University : IAIN Padangsidempuan (2016)

## APPENDIX 1

### Experiment I

#### RPP KEMAMPUAN VOCABULARY MENGGUNAKAN MEDIA PUZZLE (RPP)

Nama Sekolah : MTSN NEGERI 2 PADANGSIMPUNAN

Mata Pelajaran : BAHASA INGGRIS

Kelas / Semester : VIII / 2

Alokasi Waktu : 2 X 40 Menit

---

- 1. Standar Kompetensi :**Memahami makna dalam percakapan transaksional dan interpersonalSangat sederhana untuk berinteraksi dengan lingkungan terdekat.

Merespon makna dalam percakapan transaksional (to get things done) dan interpersonal (bersosialisasi) sangat sederhana secara akurat, lancar danberterima untuk berineraksi dengan lingkungan terdekat yang melibatkan tindak tutur: meminta dan memberi jasa, meminta dan memberi barang, serta meminta dan memberi fakta.

**2. Indikator:**

Indikator	Nilai Karakter
Identifikasi Animals Identifikasi Plants Identifikasi Sports Identifikasi Traveling and Vocation Identifikasi Food and Drink	Religius, kreativef, mandiri, kerja keras, rasa ingin tahu, komunikatif.

**3. Tujuan Pembelajaran**

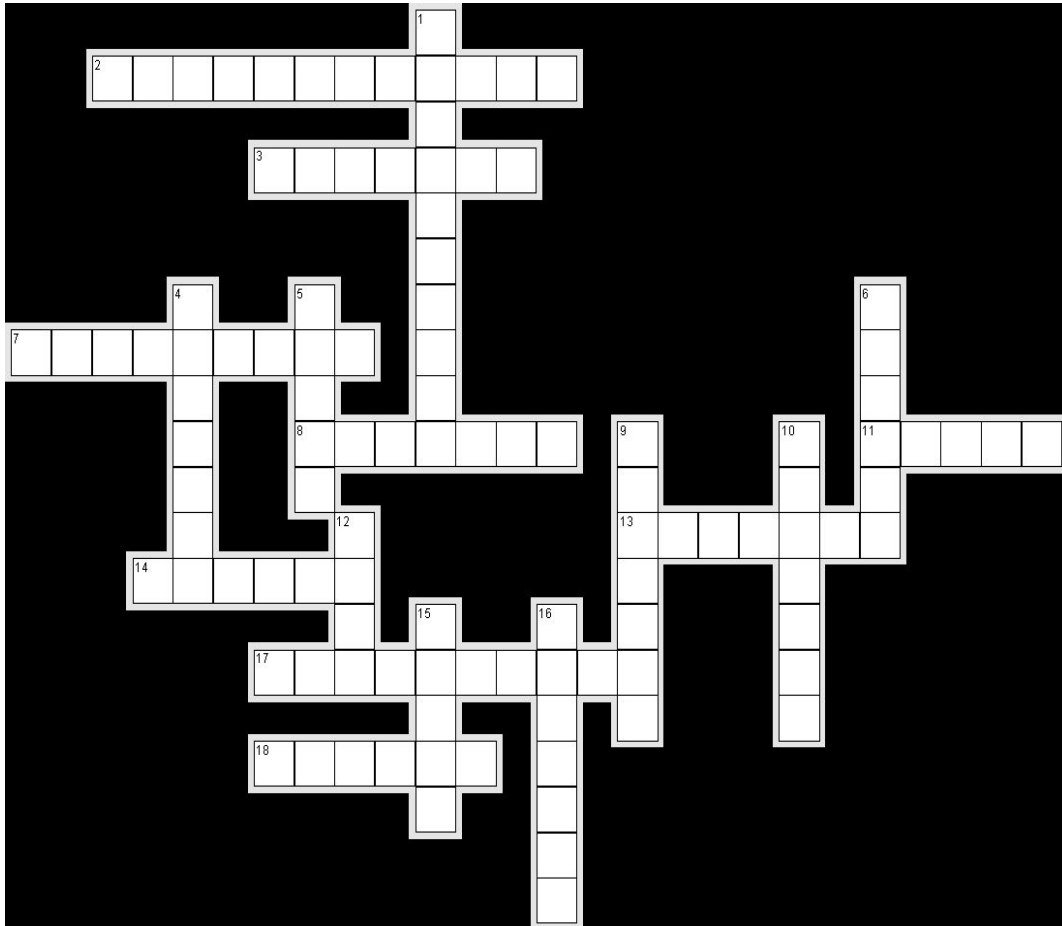
Pada akhir pembelajaran siswa diharapkan:

- Peserta didik memahami animals dan contohnya

- Peserta didik memahami plants dan contohnya
- Peserta didik memahami sports dan contohnya
- Peserta didik memahami traveling and vocation dan contohnya.
- Peserta didik memahami food and drink dan contohnya

#### 4. Materi Pembelajaran

- Sport Vocabulary



#### Across

2. Someone who earns money for doing a sport.
3. A person who makes certain that the rules are followed in a sports game.
7. Someone who watches a sport.
8. A competition to do better than other people, usually in which prizes are given.
11. An ability to do an activity or job well.
13. The leader of a sports team.
14. A group of teams which compete against each other in a sport.
17. A person or team that is competing against others.
18. When someone loses against someone else in a competition.

**Down**

1. A competition with a series of games between many teams or players, with one winner at the end.
4. A person who is very good at sports or physical exercise.
5. Someone whose job is to teach people to improve at a sport.
6. A period of the year when a particular thing happens.
9. When you win a game.
10. Someone who does something as a hobby and not as their job.
12. A group of people who play a sport or game together.
15. A metal disc given as a prize in a competition.
16. A large, open area with seats around it, used for playing and watching sports.

**5. Media Pembelajaran: Media Puzzle****6. Langkah-langkah Kegiatan****1. Pendahuluan**

1. Greeting (salam)
2. Mengabsen siswa
3. Tanya jawab mengenai sport vocabulary berbentuk media puzzle
4. Memberi motivasi pada siswa bahwa pentingnya materi yang akan dipelajari
5. Memberi sedikit penjelasan mengenai materi yang akan dipelajari dan cara belajar mengajar dengan media puzzle

**2. Kegiatan Inti**

Dalam kegiatan inti, Guru:

1. Mendeskripsikan materi dengan menunjukkan media puzzle
2. Lembar kerja siswa atau catatan kecil berupa vocabulary
3. Mendiskusikan hasil catatan dengan bentuk vocabulary menggunakan media puzzle
4. Merumuskan tujuan dan menampilkan ide ide dalam hasil penulisan di sebuah penilaiansiswa
5. Menunjukkan evaluasi siswa
6. Setelah menyelesaikan pembelajaran, guru dan siswa menggambarkan materi yang telah dipelajari

**3. Penutup**

Dalam kegiatan penutup, guru:

1. Bersama-sama dengan peserta didik membuat rangkuman/simpulan pelajaran.



2. Menyampaikan rencana pembelajaran pada pertemuan berikutnya.
3. Berdo'adiakhirpembelajaran

#### 7. Alat/Sumber Belajar:

- Buku teks yang relevan
- Dictionary
- Puzzle, objeksekitar yang relepan
- Kapur/spidol

#### 8. Penilaian

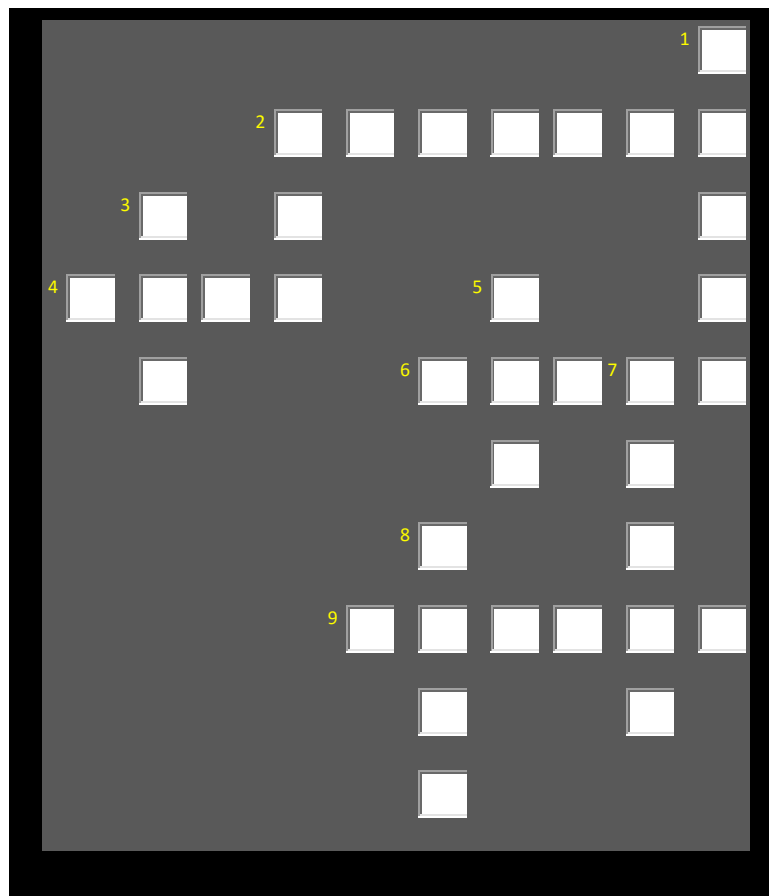
IndikatorPencapaian Kegiatan	Teknik Penilaian	Bentuk Instrumen	Instrumen/soal
1. Mengidentifikasi animals vocabulary 2. Mengidentifikasi plants vocabulary 3. Mengidentifikasi sports vocabulary 4. Mengidentifikasi travelling and vocation 5. vocabulary Mengidentifikasi foods and drinks vocabulary	Pertanyaansecaratertulis	Pilihan ganda	Readthe question below, thenanswer the question based on the sentence by crossing a, b,c, or d

1. Skor maksimal keseluruhan adalah 100
  2. Setiap jawaban yang benar diberi skor 2. Jumlah skor keseluruhan  $2 \times 50 = 100$ . (test tertulis)
  3. Nilai =  $\frac{\text{skor}}{\text{jumlah skor}} \times 100\%$
- a. Instrument: answer the question based on sentence
  - b. Rubrik Penilaian

Uraian	Skor
Jawaban benar	2
Wrong answer	0

**Read the sentence and answer the question!**

- **Animals Vocabulary**



**Across**

- 2. An animal which lays eggs
- 4. Used for milk and cheese
- 6. Found in races
- 9. A baby cat

**Down**

- 1. An animal with no feet
- 2. A popular house pet
- 3. "Man's best friend"
- 5. Relative of a bull
- 7. Produces wool
- 8. An animal which flies

**Mengetahui:****Validator**

**FitriRayaniSiregar**

**NIP. 19820731 2009122 004**

**Researcher**

**EliaKasumLubis**

**NIM. 11 340 0052**

## APPENDIX 1

### Experiment I

#### RPP KEMAMPUAN VOCABULARY MENGGUNAKAN MEDIA PICTURE (RPP)

Nama Sekolah : MTSN NEGERI 2 PADANGSIMPUAN

Mata Pelajaran : BAHASA INGGRIS

Kelas / Semester : VIII / 2

Alokasi Waktu : 2 X 40 Menit

---

- 1. Standar Kompetensi :**Memahami makna dalam percakapan transaksional dan interpersonalSangat sederhana untuk berinteraksi dengan lingkungan terdekat.

Merespon makna dalam percakapan transaksional (to get things done) dan interpersonal (bersosialisasi) sangat sederhana secara akurat, lancar danberterima untuk berineraksi dengan lingkungan terdekat yang melibatkan tindak tutur: meminta dan memberi jasa, meminta dan memberi barang, serta meminta dan memberi fakta.

**2. Indikator:**

Indikator	Nilai Karakter
Identifikasi Animals Identifikasi Plants Identifikasi Sports Identifikasi Traveling and Vocation Identifikasi Food and Drink	Religius, kreativef, mandiri, kerja keras, rasa ingin tahu, komunikatif.

**3. Tujuan Pembelajaran**

Pada akhir pembelajaran siswa diharapkan:

- Peserta didik memahami animals dan contohnya

- Peserta didik memahami plants dan contohnya
- Peserta didik memahami sports dan contohnya
- Peserta didik memahami traveling and vocation dan contohnya.
- Peserta didik memahami food and drink dan contohnya

#### 4. Materi Pembelajaran

##### - Travel, vocation and plants Vocabulary

1. What are in the picture?



2. What is in the Picture?



3. What is in the picture?



4. What is in the picture?



5. What are in the picture?



**5. Media Pembelajaran: Media Picture**

**6. Langkah-langkah Kegiatan**

**A. Pendahuluan**

1. Greeting (salam)
2. Mengabsen siswa
3. Tanya jawab mengenai sport vocabulary berbentuk media picture.
4. Memberi motivasi pada siswa bahwa pentingnya materi yang akan dipelajari
5. Memberi sedikit penjelasan mengenai materi yang akan dipelajari dan cara belajar mengajar dengan media puzzle

**B. Kegiatan Inti**

Dalam kegiatan inti, Guru:

1. Membuat gambar yang menarik kepada siswa
2. Memberi bantuan untuk menerjemahkan makna kata
3. Memberi bahasa yang sesuai dan kegiatan siswa
4. Memberikan informasi tentang kebiasaan yang dipakai dalam media gambar
5. Memberikan informasi secara lisan untuk membantu siswa dalam menggunakan media gambar dan siswa menanggapi atau merespon materi yang disampaikan

**C. Penutup**

Dalam kegiatan penutup, guru:

1. Bersama-sama dengan peserta didik membuat rangkuman/simpulan pelajaran.
2. Menyampaikan rencana pembelajaran pada pertemuan berikutnya.
3. Berdo'adiakhir pembelajaran

### 7. Alat/Sumber Belajar:

- Buku teks yang relevan
- Dictionary
- Picture, objeksekitar yang relepan
- Kapur/spidol

### 8. Penilaian

IndikatorPencapaian Kegiatan	Teknik Penilaian	Bentuk Instrumen	Instrumen/soal
1. Mengidentifikasi animals vocabulary 2. Mengidentifikasi plants vocabulary 3. Mengidentifikasi sports vocabulary 4. Mengidentifikasi travelling and vocation 5. vocabulary Mengidentifikasi foods and drinks vocabulary	Pertanyaansecaratertulis	Pilihan ganda	Readthe question below, thenanswer the question based on the sentence by crossing a, b,c, or d

JumlahSkor maksimal keseluruhan adalah 100

1. Setiap jawaban yang benar diberi skor 2. Jumlah skor keseluruhan  $2 \times 50 = 100$ . (test tertulis)
2. Nilai =  $x \ 100\%$ 
  - a. Instrument: answer the question based on sentence

b. Rubrik Penilaian

Uraian	Skor
Jawaban benar	2
Wrong answer	0

**Lookpicture and answer the question!**

- **Animals Vocabulary**

1. What is in the picture?



2. What is the picture?



3. What are in the picture?





4. What is in the picture?



5. What is in the picture?



Padangsidempuan,

**Mengetahui:**

**Validator**

**FitriRayaniSiregar**

**NIP. 19820731 2009122 004**

**Researcher**

**EliaKasumLubis**

**NIM. 11 340 0052**

## APPENDIX 3

### Instrument Pre-Test

#### Petunjuk:

1. Bacalah pertanyaan berikut dengan seksama!
2. Apabila pertanyaan kurang jelas tanyakan langsung pada pengawas
3. Bulatilah salah satu (a, b, c, atau d)
4. Bulatilah jawaban yang menurut anda benar

1. What is in the picture?



- a. snake
- b. Lion
- c. Tiger
- d. Horse

2. What is the picture?



- a. Chili
- b. Dog
- c. Cat
- d. Chicken

3. What is in the picture



- a. Chicken
- b. Goat
- c. Dog
- d. Tiger

4. What are in the picture?



- |           |         |
|-----------|---------|
| a. Monkey | c. Ant  |
| b. Horse  | d. Goat |

5. What is in the picture?



- |          |         |
|----------|---------|
| a. Cow   | c. Goat |
| b. Snake | d. Cat  |

6. What is in the picture?



- |            |          |
|------------|----------|
| a. Mouse   | c. Sheep |
| b. Buffalo | d. Ant   |

7. What is in the picture?



- |          |            |
|----------|------------|
| a. Bird  | c. Buffalo |
| b. Snake | d. Mouse   |

8. What are in the picture?



- |           |          |
|-----------|----------|
| a. Kitten | c. Mouse |
| b. Cat    | d. Ant   |

9. What are in the picture?



10. What is in the picture?

- |        |           |
|--------|-----------|
| a. Cat | c. Mouse  |
| b. Ant | d. Kitten |



11. What is in the picture?

- |            |          |
|------------|----------|
| c. Dolphin | c. Mouse |
| b. Fish    | d. Cow   |



12. What is in the picture?

- |                |                |
|----------------|----------------|
| a. Apple tree  | c. Coconut     |
| b. Papaya tree | d. Tomato tree |



13. What is in the picture?

- |                |               |
|----------------|---------------|
| a. Flower      | c. Salak tree |
| b. Papaya tree | d. Durian     |



14. What is in the picture?

- |                |                |
|----------------|----------------|
| a. Cucumber    | c. Banana tree |
| b. Orange tree | d. Salak       |



- |                  |                |
|------------------|----------------|
| a. Rambutan Tree | c. Durian tree |
| b. Flower        | d. Avocado     |

15. What are in the picture?



- |               |                 |
|---------------|-----------------|
| a. Mango Tree | c. Papayas tree |
| b. Rose       | d. Coconut      |

16. What are in the picture?



- |               |            |
|---------------|------------|
| a. Salak Tree | c. Grass   |
| b. Corns tree | d. Flowers |

17. What is in the picture?



- |                 |          |
|-----------------|----------|
| a. Coconut Tree | c. Grass |
| b. Mango tree   | d. Rose  |

18. What is in the picture?



- |               |                |
|---------------|----------------|
| a. Flower     | c. Banana tree |
| b. Peach tree | d. Mango tree  |

19. What is in the picture?



- |                  |               |
|------------------|---------------|
| a. Avocado Tree  | c. Apple tree |
| b. Cucumber tree | d. Roses      |

20. What is in the Picture?



- |                 |           |
|-----------------|-----------|
| a. Mango Tree   | c. Banana |
| b. Coconut tree | d. Stone  |



21. What is in the Picture?



- |             |           |
|-------------|-----------|
| a. Swimming | c. work   |
| b. Run      | d. Boxing |

22. What is in the Picture?



- |              |          |
|--------------|----------|
| a. Wrestling | c. Smile |
| b. Run       | d. Jump  |

23. What is in the Picture?



- |          |             |
|----------|-------------|
| a. Sky   | c. Grass    |
| b. Court | d. Wet rice |

24. What is in the picture?



- |             |             |
|-------------|-------------|
| a. Flying   | c. Diving   |
| b. Sleeping | d. Swimming |

25. What is in the picture?



- |              |           |
|--------------|-----------|
| a. High jump | c. Jump   |
| b. Run       | d. Flying |

26. What is in the picture?



- |           |                |
|-----------|----------------|
| a. Ball   | c. Jump        |
| b. Tennis | d. Tennis ball |

27. What is in the picture?



- |              |           |
|--------------|-----------|
| a. High jump | c. Jump   |
| b. Pole jump | d. Flying |

28. What is in the picture?



- |         |                  |
|---------|------------------|
| a. Ball | c. Running shoes |
| b. Run  | d. Shoes         |

29. What is in the picture?



- |             |             |
|-------------|-------------|
| a. Marathon | c. Jump     |
| b. Run      | d. Swimming |

30. What is in the picture?



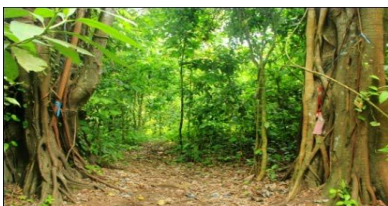
- |           |            |
|-----------|------------|
| a. Tennis | c. Cricket |
| b. Ball   | d. Sleep   |

31. What is in the Picture?



- |              |             |
|--------------|-------------|
| a. Waterfall | c. Mountain |
| b. water     | d. Tree     |

32. What is in the picture?



- |         |           |
|---------|-----------|
| a. Tree | c. Jungle |
| b. Land | d. water  |

33. What is in the picture?

- |          |          |
|----------|----------|
| a. House | c. Lake  |
| b. Land  | d. Beach |



34. What is in the picture?



- |        |            |
|--------|------------|
| a. Car | c. Bicycle |
| b. Bus | d. Land    |

35. What is in the picture?



- |           |         |
|-----------|---------|
| a. Desert | c. Tree |
| b. Land   | d. Salt |

36. What is in the picture?



- |          |         |
|----------|---------|
| a. Plan  | c. Car  |
| b. Train | d. Ship |

37. What is in the picture?



- |             |           |
|-------------|-----------|
| a. Air plan | c. Ship   |
| b. Bicycle  | d. Desert |

38. What is in the picture?

- |            |               |
|------------|---------------|
| a. Bicycle | c. Ship       |
| b. Car     | d. Motorcycle |





39. What is in the Picture?



40. What is in the picture?



41. What is in the picture?



42. What is in the picture?



43. What is in the picture?



44. What is in the picture?

- |          |         |
|----------|---------|
| a. Water | c. Tree |
| b. Sky   | d. Lake |

- |          |          |
|----------|----------|
| a. Water | c. River |
| b. Tree  | d. Stone |

- |         |              |
|---------|--------------|
| a. Eggs | c. Apple     |
| b. Rice | d. Vegetable |

- |          |           |
|----------|-----------|
| a. Water | c. Burger |
| b. Cake  | d. Pizza  |

- |          |           |
|----------|-----------|
| a. Tea   | c. Coffee |
| b. Water | d. Juice  |



45. What is in the picture?

- |           |                |
|-----------|----------------|
| a. Coffee | c. Melon juice |
| b. Water  | d. Coconut ice |



46. What is in the picture?

- |              |                 |
|--------------|-----------------|
| a. Juice     | c. Orange juice |
| b. Water ice | d. Coffee       |



47. What is in the Picture?

- |               |          |
|---------------|----------|
| a. Burger     | c. Water |
| b. Fried rice | d. meat  |



48. What is in the picture?

- |             |         |
|-------------|---------|
| a. Doughnut | c. Rice |
| b. Cake     | d. Slay |



49. What is in the picture?

- |          |               |
|----------|---------------|
| a. Cake  | c. Rice       |
| b. Juice | d. Fried rice |



50. What is in the picture?



- |                  |                 |
|------------------|-----------------|
| a. Avocado juice | c. Coffee       |
| b. Water         | d. Orange Juice |

- |                  |                 |
|------------------|-----------------|
| a. Avocado juice | c. Milk         |
| b. Water         | d. Orange Juice |

**Validator**

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## APPENDIX 4

### Instrument Post-Test

#### Petunjuk:

1. Bacalah pertanyaan berikut dengan seksama!
2. Apabila pertanyaan kurang jelas tanyakan langsung pada pengawas
3. Bulatilah salah satu (a, b, c, atau d)
4. Bulatilah jawaban yang menurut anda benar

1. What is in the picture?



- |               |        |
|---------------|--------|
| a. Bicycle    | c. Bus |
| b. Motorcycle | d. Car |

2. What is the picture?



- |           |             |
|-----------|-------------|
| a. Car    | c. Tricycle |
| b. Racing | d. Ferry    |

3. What is in the picture



- |         |            |
|---------|------------|
| a. Ship | c. Bicycle |
| b. Car  | d. Ferry   |

4. What are in the picture?



- |          |         |
|----------|---------|
| a. Golf  | c. Run  |
| b. Climb | d. Jump |

5. What is in the picture?



- |               |              |
|---------------|--------------|
| a. Tennis     | c. Badminton |
| b. Volleyball | d. Run       |

6. What is in the picture?



- |             |           |
|-------------|-----------|
| a. Climb    | c. Jump   |
| b. Swimming | d. Sprint |

7. What is in the picture?



- |                  |          |
|------------------|----------|
| a. Wall climbing | c. Climb |
| b. Run           | d. Jump  |

8. What are in the picture?



- |            |         |
|------------|---------|
| a. Bicycle | c. Bus  |
| b. Car     | d. Jeep |

9. What are in the picture?



- |            |               |
|------------|---------------|
| a. Horse   | c. Bicycle    |
| b. Scooter | d. Motorcycle |

10. What is in the picture?



11. What is in the picture?

- |             |          |
|-------------|----------|
| a. Tricycle | c. Horse |
| b. Car      | d. Bus   |



12. What is in the picture?



- |        |          |
|--------|----------|
| a. Car | c. Train |
| b. Bus | d. House |

- |         |           |
|---------|-----------|
| a. Jump | c. Tennis |
| b. Golf | d. Ball   |

13. What is in the picture?



- |             |            |
|-------------|------------|
| a. Swimming | c. Singing |
| b. Climbing | d. Jumping |

14. What is in the picture?



- |           |          |
|-----------|----------|
| a. Golf   | c. Chess |
| b. Boxing | d. Run   |

15. What are in the picture?





16. What are in the picture?

- |               |          |
|---------------|----------|
| a. Food ball  | c. Jump  |
| b. Volleyball | d. Climb |



17. What is in the picture?



- |        |            |
|--------|------------|
| a. Run | c. Bus     |
| b. Car | d. Bicycle |

- |           |           |
|-----------|-----------|
| a. Desert | c. Grass  |
| b. Mount  | d. Jungle |

18. What is in the picture?



- |         |        |
|---------|--------|
| a. Boat | c. Car |
| b. Ship | d. Bus |

19. What is in the picture?



- |             |        |
|-------------|--------|
| a. Tricycle | c. Bus |
| b. Taxi     | d. car |

20. What is in the Picture?



21. What is in the Picture?

- |               |             |
|---------------|-------------|
| a. Helicopter | c. Bus      |
| b. Car        | d. Tricycle |



22. What is in the Picture?

- |                     |                |
|---------------------|----------------|
| a. Strawberry juice | c. Salak Juice |
| b. Coffee           | d. Apple       |



- |              |          |
|--------------|----------|
| a. Doughnuts | c. Juice |
| b. Cake      | d. Water |

23. What is in the Picture?



- |              |          |
|--------------|----------|
| a. Juice     | c. Water |
| b. Ice cream | d. Tea   |

24. What is in the picture?



- |          |          |
|----------|----------|
| a. Juice | c. Water |
| b. Rice  | d. Tea   |



25. What is in the picture?



- |                |                |
|----------------|----------------|
| a. Apple juice | c. Mango juice |
| b. Peach juice | d. Juice       |

26. What is in the picture?



- |         |                    |
|---------|--------------------|
| a. Bird | c. Chicken         |
| b. Goat | d. Roasted chicken |

27. What is in the picture?



- |                 |                |
|-----------------|----------------|
| a. Tomato juice | c. Mango juice |
| b. Apple juice  | d. Peach juice |

28. What is in the picture?



- |           |          |
|-----------|----------|
| a. Coffee | c. Juice |
| b. Tea    | d. Water |

29. What is in the picture?



- |          |          |
|----------|----------|
| a. Rice  | c. Apple |
| b. Mango | d. Corn  |

30. What is in the picture?



31. What is in the Picture?



32. What is in the picture?



33. What is in the picture?



34. What is in the picture?



35. What is in the picture?

- |                  |          |
|------------------|----------|
| a. Avocado juice | c. Water |
| b. Apple juice   | d. Tea   |

- |                |           |
|----------------|-----------|
| a. Snake       | c. Monkey |
| b. Caterpillar | d. Fish   |

- |            |           |
|------------|-----------|
| a. Dolphin | c. Dog    |
| b. Snake   | d. Rabbit |

- |                |              |
|----------------|--------------|
| a. Caterpillar | c. Butterfly |
| b. Komodo      | d. Snake     |

- |           |            |
|-----------|------------|
| a. Water  | c. Dolphin |
| b. Monkey | d. Land    |



36. What is in the picture?

- |         |           |
|---------|-----------|
| a. Ant  | c. Fish   |
| b. Bird | d. Spider |



37. What is in the picture?

- |              |          |
|--------------|----------|
| a. Bird      | c. Eagle |
| b. Butterfly | d. Snake |



38. What is in the picture?

- |                |           |
|----------------|-----------|
| a. Snake       | c. Ant    |
| b. Caterpillar | d. Monkey |



39. What is in the Picture?

- |          |         |
|----------|---------|
| a. Camel | c. Seep |
| b. Horse | d. Goat |



- |           |          |
|-----------|----------|
| a. Monkey | c. Tiger |
| b. Fish   | d. Lion  |

40. What is in the picture?



- |            |           |
|------------|-----------|
| a. Giraffe | c. Cat    |
| b. Cow     | d. Monkey |

41. What is in the picture?



- |                    |              |
|--------------------|--------------|
| a. Star fruit tree | c. Apple     |
| b. Mango           | d. Vegetable |

42. What is in the picture?



- |                    |               |
|--------------------|---------------|
| a. Cucumber        | c. Apple tree |
| b. Strawberry tree | d. Pineapple  |

43. What is in the picture?



- |               |               |
|---------------|---------------|
| a. Coconut    | c. guava tree |
| b. Salak tree | d. Melon tree |

44. What is in the picture?



- |                |               |
|----------------|---------------|
| a. Avocado     | c. Melon tree |
| b. Durian tree | d. Coconut    |

45. What is in the picture?



- |               |                |
|---------------|----------------|
| a. Chili tree | c. Orange Tree |
| b. Pineapple  | d. Apple       |

46. What is in the picture?



- |               |          |
|---------------|----------|
| a. Grape tree | c. Water |
| b. Applee     | d. Grass |

47. What is in the Picture?



- |          |             |
|----------|-------------|
| a. Apple | c. Spinach  |
| b. Chili | d. Cucumber |

48. What is in the picture?



- |          |                |
|----------|----------------|
| a. Grass | c. Rose flower |
| b. Tree  | d. Flower      |

49. What is in the picture?



- |            |           |
|------------|-----------|
| a. Tree    | c. Apple  |
| b. Coconut | d. Orange |

50. What is in the picture?



- |            |             |
|------------|-------------|
| a. Avocado | c. Tea tree |
| b. Cactus  | d. Orange   |

## APPENDIX 3

### Instrument Pre-Test

#### Petunjuk:

1. Bacalah pertanyaan berikut dengan seksama!
2. Apabila pertanyaan kurang jelas tanyakan langsung pada pengawas
3. Bulatilah salah satu (a, b, c, atau d)
4. Bulatilah jawaban yang menurut anda benar

1. An animal nothing food but can run, climb.....

- |          |          |
|----------|----------|
| a. Snake | c. Tiger |
| b. Lion  | d. Horse |

2. An animal usually sound out in the morning, to make person wake up .....

- |          |            |
|----------|------------|
| a. Chili | c. Cat     |
| d. Dog   | d. Chicken |

3. An animal a pets of the person, and can Friend with police for searching problem .....

- |            |          |
|------------|----------|
| a. Chicken | c. Dog   |
| b. Goat    | d. Tiger |

4. An animal eat the grass, pets and usually person say lazy bath .....

- |           |         |
|-----------|---------|
| a. Monkey | c. Ant  |
| b. Horse  | d. Goat |

5. An animal eat the grass, pets and usually take the milk.....

- |          |         |
|----------|---------|
| a. Cow   | c. Goat |
| b. Snake | d. Cat  |

6. An animal take the wool for cloth.....

- |            |          |
|------------|----------|
| a. Mouse   | c. Sheep |
| b. Buffalo | d. Ant   |

7. It can fly, many colors, and eat rise, fruits, caterpillar.....

- |          |            |
|----------|------------|
| a. Bird  | c. Buffalo |
| b. Snake | d. Mouse   |

8. The English of cat child.....

- |           |          |
|-----------|----------|
| a. Kitten | c. Mouse |
| b. Cat    | d. Ant   |

9. An animal eat the meat and it pets.....

- |        |           |
|--------|-----------|
| a. Cat | c. Mouse  |
| b. Ant | d. Kitten |

10. It is animal water live, many colors and found in the sea, river, lake.....

- a. Dolphin                      c. Mouse
- b. Fish                          d. Cow

11. A fruit the color red use to sauce.....

- a. Apple tree                      c. Coconut
- b. Papaya tree                      d. Tomato tree

12. A fruit black, there are many thorn.....

- a. Flower                      c. Salak tree
- b. Papaya tree                      d. Durian

13. It is fruit; yellow color, sweet, and the tree there are many thorns.....

- a. Cucumber                      c. Banana tree
- b. Orange tree                      d. Salak

14. It is fruit; red color, the big tree, sweet .....

- a. Rambutan Tree                      c. Durian tree
- b. Flower                      d. Avocado

15. It is fruit yellow color and nothing dried up.....

- a. Mango Tree                      c. Papayas tree
- b. Rose                      d. Coconut

16. What is the English of jagung?.....

- a. Salak Tree                      c. Grass
- b. Corns tree                      d. Flowers

17. It is tree and many functions like water for drink, the fruit for cook .....

- a. Coconut Tree                      c. Grass
- b. Mango tree                      d. Rose

18. A fruit favorite of monkey, yellow color.....

- a. Flower                      c. Banana tree
- b. Peach tree                      d. Mango tree

19. It is fruit the color red and green.....

- a. Avocado Tree                      c. Apple tree
- b. Cucumber tree                      d. Roses

20. What the English of Mangga .....

- a. Mango Tree                      c. Banana
- b. Coconut tree                      d. Stone

21. What is the English of tinju sport.....

- a. Swimming                      c. work
- b. Run                      d. Boxing

22. What the English of Gulat sport.....

- a. Wrestling                      c. Smile
- b. Run                      d. Jump

23. The place for sport .....

- a. Sky                      c. Grass
- b. Court                      d. Wet rice

24. The person into to the sea, it uses oxygen .....

- a. Flying                      c. Diving
- b. Sleeping                      d. Swimming



25. It is sport like jump so far away.....

- a. High jump      c. Jump
- b. Run              d. Flying

26. What is the English of bola tennis.....

- a. Ball              c. Jump
- b. Tennis          d. Tennis ball

27. This sport use pole and jump so high.....

- a. High jump      c. Jump
- b. Pole jump      d. flying

28. It the shoes for running .....

- a. Ball              c. Running shoes
- b. Run              d. Shoes

29. It is run sport, but relax.....

- a. Marathon      c. Jump
- b. Run              d. Swimming

30. The tool for badminton.....

- a. Tennis          c. Cricket
- b. Ball              d. Sleep

31. The water down from high place.....

- a. Waterfall      c. Mountain
- b. water          d. Tree

32. The place so many big trees and many kinds of animal .....

- a. Tree              c. Jungle

- b. Land              d. water

33. The place is beside of sea .....

- a. House          c. Lake
- b. Land              d. Beach

34. The transport for travelling, it is big.....

- a. Car              c. Bicycle
- b. Bus              d. Land

35. The place there is in Saudi Arabic.....

- a. Desert          c. Tree
- b. Land              d. Salt

36. The transport long and there is the specially the street .....

- a. Plan              c. Car
- b. Train              d. Ship

37. The transport can fly and the street in the sky .....

- a. Air plan          c. Ship
- b. Bicycle          d. Desert

38. What is the English of kereta.....

- a. Bicycle          c. Ship
- b. Car              d. Motorcycle

39. The place there water in the create can vocation and travelling.....

- a. Water              c. Tree
- b. Sky              d. Lake



40. There is the water and many big stones.....

- a. Water                      c. River
- b. Tree                        d. Stone

41. The chicken product.....

- a. Eggs                        c. Apple
- b. Rice                        d. Vegetable

42. The food from European .....

- a. Water                      c. Burger
- b. Cake                        d. Pizza

43. What the English of teh.....

- a. Tea                         c. Coffee
- b. Water                      d. Juice

44. A fruit of one tree, there is into water for our ION.....

- a. Coffee                      c. Melon juice
- b. Water                        d. Coconut ice

45. A color yellow, sweet fruit.....

- a. Juice                        c. Orange juice
- b. Water ice                      d. Coffee

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46. It is food there are meat, bread, vegetable and sauce.....

- a. Burger                      c. Water
- b. Fried rice                      d. meat

47. Food for happy birthday.....

- a. Doughnut                      c. Rice
- b. Cake                        d. Slay

48. Rice the yellow color, there is egg and cucumber.....

- a. Cake                        c. Rice
- b. Juice                        d. Fried rice

49. A fruit green color, for clean the skin.....

- a. Avocado juice                      c. Coffee
- b. Water                        d. Orange Juice

50. The product of cow.....

- a. Avocado juice                      c. Milk
- b. Water                        d. Orange Juice

**Validator**

**FitriRayaniSiregar**

**Researcher**

**EliaKasumLubis**

## APPENDIX 4

### Instrument Post-Test

#### Petunjuk:

1. Bacalah pertanyaan berikut dengan seksama!
  2. Apabila pertanyaan kurang jelas tanyakan langsung pada pengawas
  3. Bulatilah salah satu (a, b, c, atau d)
  4. Bulatilah jawaban yang menurut anda benar
- 
- |  |  |
|--|--|
| 1. It is a sport. It drives by one person. It is not mechanical it is.....<br>a. Bicycle                      c. bus<br>b. Motorcycle      d. car                        | 5. That is a sport. It does by five persons for one group. That is.....<br>a. Tennis                      c. badminton<br><br>b. Volleyball      d. run      |
| 2. It is sport. Valentino Rozzy often drives with motorcycle. The name is.....<br><br>a. Car                      c. tricycle<br>b. Racing                      d. Ferry | 6. It is a sport. It does by someone to run. Usually it is race. It is.....<br>a. Climb                      c. run<br><br>b. Swimming      d. sprin         |
| 3. That is transportation in the sea. It gives many good. It is ....<br><br>a. Ship                      b. cycle<br>b. Car                      d. Ferry                | 7. That is sport. We need rope to climb it. It is....<br>a. Wall climbing                      c. climb<br><br>b. Run                      d. jump           |
| 4. That is a sport. It does in the yard. It plays with wood beater. It is.....<br>a. Golf                      c. run<br><br>b. Climb                      d. Jump       | 8. That is a transportation. We need it for travel whenever. That is...<br>a. Bicycle                      c. bus<br><br>b. Car                      d. jeep |

9. It is a transportation for the time being.  
It uses by one person and have not mechanical. It is....  
a. Horse                      c. bicycle  
b. Scooter                    d. motorcycle
10. That is transportation. It have tree wheel. That is ....  
a. Tricycle                    c. horse  
b. Car                          d. bus
11. It is transportation. It have four wheel.  
It is.....  
a. Car                          b. train  
b. Bus                          d. house
12. That is a sport. it plays with base ball in the yard. That is....  
a. Jump                        c. tennis  
b. Golf                          d. ball
13. It is sport. It plays in water. It is....  
a. Swimming                  c. singing  
b. Climbing                    d. jumping
14. That is sport. We play on the wood. That form is box. That has black and white color. That is.....  
a. Golf                          c. cheese  
b. Boxing                      d. jumping
15. That is sport. We need group to play it. There is having eleven people. We play with foot. That is.....  
a. Football                    c. jump  
b. Volleyball                  d. climb
16. That is a sport. It uses by one person.  
That is having two wheels. That is...  
a. run                            c. bus  
b. Car                            d. bicycle
17. It is in the hill. It have top, cauldron and fire. It is....  
a. Desert                        c. grass  
b. Mount                        d. jungle
18. That is transportation. It uses in the sea.  
That is....  
a. boat                          c. car  
b. Ship                          d. bus
19. It is a public transportation. it have blue color. It is....  
a. Tricycle                      c. bus  
b. Taxi                            d. car
20. That is transportation. it ways in the air.  
That is...  
a. Helicopter                  c. bus  
b. Car                            d. tricycle
21. That is drink. The drink color is red and sour. That is....  
a. Strawberry juice            c. apple  
b. salak juice                    d. Coffee
22. That is a cake. That have citronella the variety color. That is...  
a. Doughnut                    c. juice  
b. Cake                            d. water
23. It is a food. It is cold. It is.....  
a. Juice                          c. water  
b. Ice cream                    d. tea
24. That is a food. The color is white. And that eat by one if hungry. It is...

- a. Juice                      c. water  
b. Rice                      d. tea
25. That is a drink. The flavor is sweet. The color is yellow. That is...
- a. Apple juice      c. mango juice  
b. Peach juice      d. grape juice
26. It is a food. That is roast and black color. It is....
- a. Bird      c. chicken  
b. Goat      d. roasted chicken
27. It is a food. Beside juice, it also can to cooks it. It is....
- a. Tomato juice      b. mango juice  
b. Apple juice      d. peach juice
28. It is a drink. It haves brown pure color, and have powder tea. It is...
- a. coffee                      c. juice  
b. tea                      d .water
29. It is food. We must cook it before to eat it. It is....
- a. rise                      c. apple  
b. mango                      d. corn
30. It is a drink. It is thick. And it haves green color. It is....
- a. avocado juice      c. water  
b. apple juice      d. tea
31. That is an animal. It haves two foot. And it can jump in tree. It is...
- a. snake                      c. monkey  
b. caterpillar                      d. fish

32. that is animal. It is so cute and haves fours foot. And it is clean animal and it like carrot. It is.....

- a. dolphin                      c. dog  
b. snake                      d. rabbit

33. It is an animal. it is have big size and crawl. It is....

- a. caterpillar                      c. butterfly  
b. komodo                      d. snake

34. It is animal. it lives in sea and it often help people. It is....

- a. water                      c. dolphin  
b. monkey                      d. land

35. It is animal. Its can dragnet. It is..

- a. ant                      c. fish  
b. bird                      d. spider

36. It is animal. It is can fly and it like flower honey. It is....

- a. bird                      c. eagle  
b. butterfly                      d. snake

37. It is animal. It is small size and it like ate leaf. It is....

- a. snake                      c. ant  
b. caterpillar                      d. monkey

38. It is an animal. It lives in wasteland. It is.....

- a. camel                      c. seep  
b .horse                      d. goat

39. It is king animal. it is....

- a. monkey                      c. tiger
- b. fish                          d. lion

40. It is animal. it haves long nick. It is..

- a. giraffe                      c. cat
- b. Cow                          d. monkey

41.It is a fruit. It is for as star. It is...

- a start fruit tree              apple
- b. mango                      vegetable

42. It is fruit. Sometimes its sour and sweet it have small size. It is....

- a. cucumber                  c. apple tree
- b. Strawberry                  d. pineapple

43.It is fruit. The size same with watermelon

- a. coconut                      guava tree
- b. Salak tree                      melon tree

44. The fruit is haves snipe. It is....

- a. avocado                      c. melon tree
- b. Durian tree                      d. apple

45. It is a vegetable, we must cook it. The flavor is hot. It is....

- a. chili tree      c orange tree
- b. pineapple      d. apple

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46. A fruit haves purple color. And the flavor is sweet. It is...

- a. grape tree                      c. water
- b. Apple tree                      d. grass

47. It is vegetable, we must cooks it before to eat it. It is...

- a. apple                          c. spinach
- b. Chili                              d. cucumber

48. It is a flower. It is beautiful and it haves red color. It is....

- a. grass                              c. rose flower
- b. Tree                                d. flower

49. It is a plant. It haves big and high stem. It is .....

- a. tree                                c. apple
- b. Coconut                          d. orange

50.It is a similar with flower. But it haves spine. It is.....

- a. avocado                          c. tea tree
- b. Cactus                              d. orange

**Validator**

**FitriRayaniSiregar**

**Researcher**

**EliaKasumLubis**

**NIM. 11 340 0052**

## APPENDIX 5

### KEY ANSWER

#### A. KEY ANSWER FOR PRE- TEST

1. A	6. A	11. A	16. D	21. C
2. D	7. D	12. D	17. D	22. A
3. D	8. B	13. A	18. D	23. C
4. A	9. A	14. A	19. D	24. A
5. B	10. A	15. D	20. D	25. A

#### B. KEY ANSWER FOR POS- TEST

1. B	6. C	11. D	16. A	21. D
2. B	7. A	12. B	17. C	22. B
3. B	8. C	13. B	18. B	23. C
4. D	9. D	14. D	19. C	24. B
5. A	10. A	15. B	20. A	25. D

## Appendix 6

## Validity Pre Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Xt	Xt²
1	0	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	15	225
2	1	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	20	400
3	1	1	0	0	1	1	1	0	1	0	1	1	1	1	0	0	0	0	1	1	0	1	1	0	1	16	256
4	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	5	25
5	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	10	100
6	1	1	1	0	1	1	1	1	1	0	1	1	0	1	0	0	1	0	1	1	0	0	1	0	0	14	196
7	1	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	0	18	324
8	1	1	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	7	49
9	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	0	1	0	1	1	0	0	0	0	0	14	196
10	1	1	0	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	19	361
11	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	22	484
12	1	1	0	1	1	1	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1	1	1	0	0	16	256
13	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	4	16
14	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	20	400
15	0	0	0	1	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	16	256
16	1	1	0	1	0	1	0	0	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	18	324
17	1	0	1	1	1	1	0	0	1	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	12	144
18	1	0	0	1	1	1	0	1	0	1	0	1	1	0	1	1	0	0	0	0	1	1	0	0	1	12	144
19	1	0	0	0	1	1	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	1	0	12	144
20	0	1	1	0	1	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	15	225
21	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0	1	0	1	1	17	289
22	1	0	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	0	1	1	0	1	0	1	0	16	256
23	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
24	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
25	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
N=23	19	17	5	13	16	14	13	18	8	18	18	18	15	18	17	15	14	11	18	18	10	16	5	16	13	360	5666
p	0,7	0,6	0,2	0,5	0,7	0,5	0,5	0,7	0,3	0,7	0,7	0,7	0,6	0,7	0,6	0,6	0,5	0,5	0,7	0,7	0,4	0,7	0,2	0,6	0,6	Σxt	Σxt²
q	0.3	0,4	0,8	0,5	0,3	0,5	0,5	0,3	0,7	0,3	0,3	0,3	0,4	0,3	0,4	0,4	0,5	0,5	0,3	0,3	0,6	0,3	0,8	0,4	0,4		



### Validity Pre Test

NO	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Xt	Xt²
1	0	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	15	225
2	1	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	20	400
3	1	1	0	0	1	1	1	0	1	0	1	1	1	1	0	0	0	0	1	1	0	1	1	0	1	16	256
4	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	5	25
5	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	10	100
6	1	1	1	0	1	1	1	1	1	0	1	1	0	1	0	0	1	0	1	1	0	0	1	0	0	14	196
7	1	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	0	18	324
8	1	1	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	7	49
9	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	0	1	0	1	1	0	0	0	0	0	14	196
10	1	1	0	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	19	361
11	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	22	484
12	1	1	0	1	1	1	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1	1	1	0	0	16	256
13	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	4	16
14	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	20	400
15	0	0	0	1	1	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	16	256
16	1	1	0	1	0	1	0	0	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	18	324
17	1	0	1	1	1	1	0	0	1	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	12	144
18	1	0	0	1	1	1	0	1	0	1	0	1	1	0	1	1	0	0	0	0	1	1	0	0	1	12	144
19	1	0	0	0	1	1	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	1	0	12	144
20	0	1	1	0	1	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	15	225
21	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0	1	0	1	1	17	289
22	1	0	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	0	1	1	0	1	0	1	0	16	256
23	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
24	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
25	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
N=																											566
23	19	17	5	13	16	14	13	18	8	18	18	18	15	18	17	15	14	11	18	18	10	16	5	16	13	360	6
p	0,7	0,6	0,2	0,5	0,7	0,5	0,5	0,7	0,3	0,7	0,7	0,7	0,6	0,7	0,6	0,6	0,5	0,5	0,7	0,7	0,4	0,7	0,2	0,6	0,6	$\sum x_t$	$\sum x_t^2$
q	0,3	0,4	0,8	0,5	0,3	0,5	0,5	0,3	0,7	0,3	0,3	0,3	0,4	0,3	0,4	0,4	0,5	0,5	0,3	0,3	0,6	0,3	0,8	0,4	0,4		

### Validity Pre Test

[illegible]

## Appendix 12

### Reliability Pre Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Xt	Xt²
1	0	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	15	225
2	1	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	20	400
3	1	1	0	0	1	1	1	0	1	0	1	1	1	1	0	0	0	0	1	1	0	1	1	0	1	16	256
4	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	5	25
5	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	10	100
6	1	1	1	0	1	1	1	1	1	0	1	1	0	1	0	0	1	0	1	1	0	0	1	0	0	14	196
7	1	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	0	18	324
8	1	1	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	7	49
9	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	0	1	0	1	1	0	0	0	0	0	14	196
10	1	1	0	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	19	361
11	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	22	484
12	1	1	0	1	1	1	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1	1	1	0	0	16	256
13	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	4	16
14	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	20	400
15	0	0	0	0	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	16	256
16	1	1	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	18	324
17	1	0	1	1	1	1	0	0	1	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	12	144
18	1	0	0	1	1	0	0	1	0	1	0	1	1	0	1	1	0	0	0	0	1	1	0	0	1	12	144
19	1	0	0	1	1	0	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	1	0	12	144
20	0	1	1	0	1	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	15	225
21	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0	1	0	1	1	17	289
22	1	0	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	0	1	1	0	1	0	1	0	16	256
23	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
24	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	1	1	0	0	0	14	196
25	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	1	0	1	1	1	0	0	0	14	196
N=23	19	17	5	13	16	14	13	18	8	18	18	18	15	18	17	15	14	11	18	18	10	16	5	16	13	360	566
p	0,6 8	0,6 8	0,2	0,5 4	0,6 4	0,5 6	0,52	0,7 2	0,3 2	0,7 2	0,7 2	0,7 2	0,6	0,7 2	0,6 8	0,6	0,5 6	0,44	0,7 2	0,7 2	0,4	0,6 4	0,2	0,64	0,52	Σxt	Σxt²
q	0.3 2	0.3 2	0,8	0.4 8	0.3 6	0.4 4	0,48	0,2 8	0.6 8	0,28	0.2 8	0.2 8	0,4	0.2 8	0.3 2	0,4	0.4 4	0,56	0.2 8	0.2 8	0,6	0.3 6	0,8	0,36	0,48		
pq	0.2 176	0.2 176	0.1 6	0.2 496	0.2 304	0.2 464	0.24 96	0.2 016	0.2 176	0.2 2016	0.2 016	0.2 016	0.24	0.2 016	0.2 176	0.2 4	0.2 464	0.24 64	0.2 016	0.2 016	0.2 24	0.2 304	0.1 6	0.23 04	0.24 96	5.26 8	

### Reliability Pre Test

NO	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Xt	Xt²
1	0	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	15	225
2	1	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	20	400
3	1	1	0	0	1	1	1	0	1	0	1	1	1	1	0	0	0	0	1	1	0	1	1	0	1	16	256
4	0	1	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	5	25
5	0	0	1	1	0	0	1	1	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	1	0	10	100
6	1	1	1	0	1	1	1	1	1	0	1	1	0	1	0	0	1	0	1	1	0	0	1	0	0	14	196
7	1	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	0	18	324
8	1	1	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	7	49
9	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	0	1	0	1	1	0	0	0	0	0	14	196
10	1	1	0	1	0	1	1	1	0	1	1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	19	361
11	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	22	484
12	1	1	0	1	1	1	1	1	0	0	1	1	0	0	1	1	0	0	1	1	1	1	1	1	0	16	256
13	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	4	16
14	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	20	400
15	0	0	0	0	1	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	16	256
16	1	1	0	1	1	0	0	0	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	18	324
17	1	0	1	1	1	1	0	0	1	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	12	144
18	1	0	0	1	1	0	0	1	0	1	0	1	1	0	1	1	0	0	0	0	1	1	0	0	1	12	144
19	1	0	0	1	1	0	0	1	0	1	0	0	1	1	0	1	1	1	0	0	0	1	0	1	0	12	144
20	0	1	1	0	1	0	0	0	1	1	0	0	1	1	1	1	1	1	1	1	1	0	0	0	1	15	225
21	1	1	0	0	0	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0	1	0	1	1	17	289
22	1	0	1	0	1	1	1	1	1	0	1	1	0	0	1	1	1	0	1	1	0	1	0	1	0	16	256
23	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
24	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
25	1	1	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	14	196
N=																											566
23	19	17	5	13	16	14	13	18	8	18	18	18	15	18	17	15	14	11	18	18	10	16	5	16	13	360	6
p	0,6 8	0,6 8	0,2	0,5 4	0,6 4	0,5 6	0, 52	0,7 2	0,3 2	0, 72	0,7 2	0,7 2	0,6	0,7 2	0,6 8	0,6	0,5 6	0,44	0,7 2	0,7 2	0, 4	0,6 4	0,2	0, 64	0,52	$\sum x_t$	$\sum x_t^2$
q	0,3 2	0,3 2	0,8	0,4 8	0,3 6	0,4 4	0, 48	0,2 8	0,6 8	0, 28	0,2 8	0,2 8	0,4	0,2 8	0,3 2	0,4	0,4 4	0,56	0,2 8	0,2 8	0, 6	0,3 6	0,8	0, 36	0,48		
pq	0.2 176	0.2 176	0.1 6	0.2 496	0.2 304	0.2 464	0. 24 96	0.2 01 6	0.2 176	0. 20 16	0.2 016	0.2 016	0.24	0.2 016	0.2 176	0.2 4	0.2 464	0.24 64	0.2 016	0.2 01 6	0. 24	0.2 304	0.1 6	0. 23 04	0.24 96	5.26 8	

## Appendix 7

**Calculation of  $r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$  in Pre-Test**

### A. Calculation of Pre-Test

#### 1. Means score from score total ( $M_t$ )

$$M_t = \frac{\sum X_t}{N}$$

$$M_t = \frac{360}{25} = 14.40$$

#### 2. Standard Deviation ( $SD_t$ )

$$SD_t = \sqrt{\frac{\sum X_t^2}{N} - \left(\frac{\sum X_t}{N}\right)^2}$$

$$SD_t = \sqrt{\frac{5666}{25} - \left(\frac{360}{25}\right)^2}$$

$$SD_t = \sqrt{226.64 - 14.40^2}$$

$$SD_t = \sqrt{226.56 - 207.36} = \sqrt{19.2} = 4.39$$

#### 3. Means Score ( $M_p$ )

Item 1  $M_{p1} = \frac{\text{the total of students score that true item answer}}{n1}$

$$M_{p1} = \frac{20+16+14+18+7+14+19+22+16+4+20+18+12+12+12+17}{19}$$

$$M_{p1} = \frac{299}{19} = 15.73$$

Item 2  $M_{p2} = \frac{\text{the total of students score that answer true item}}{n2}$

$$M_{p2} = \frac{15+20+16+5+14+18+7+14+19+22+16+20+18+15+17+14+16}{17}$$

$$M_{p2} = \frac{266}{17} = 19$$

Item 3  $M_{p3} = \frac{\text{the total of students score that answer true item}}{n3}$

$$M_{p3} = \frac{10+14+12+15+16}{5}$$

$$M_{p3} = \frac{67}{5} = 13.40$$

Item 4  $M_{p4} = \frac{\text{the total of students score that answer true item}}{n4}$

$$M_{p4} = \frac{20+10+18+7+14+19+22+16+18+12+12+12+14}{13}$$

$$= \frac{194}{13} = 14.92$$

$$\begin{aligned}\text{Item 5 } M_{p5} &= \frac{\text{the total of students score that answer true item}}{n5} \\ M_{p5} &= \frac{16+14+18+14+22+16+20+16+18+12+12+12+15+16+14+16}{16} \\ M_{p5} &= \frac{251}{16} = 15.68\end{aligned}$$

$$\begin{aligned}\text{Item 6 } M_{p6} &= \frac{\text{the total of students score that answer true item}}{n6} \\ M_{p6} &= \frac{20+10+16+14+18+14+19+22+16+20+16+12+17+12}{14} \\ &= \frac{226}{14} = 16.14\end{aligned}$$

$$\begin{aligned}\text{Item 7 } M_{p7} &= \frac{\text{the total of students score that answer true item}}{n7} \\ M_{p7} &= \frac{20+16+10+14+18+14+19+22+16+20+16+17+16}{13} = \\ \frac{218}{13} &= 16.76\end{aligned}$$

$$\begin{aligned}\text{Item 8 } M_{p8} &= \frac{\text{the total of students score that answer true item}}{n8} \\ M_{p8} &= \frac{15+20+5+10+14+18+7+19+22+16+4+20+16+12}{18} \\ &\quad + \frac{12+16+16+12}{18} \\ M_{p8} &= \frac{254}{18} = 14.11\end{aligned}$$

$$\begin{aligned}\text{Item 9 } &= \frac{\text{the total of students score that answer true item}}{n9} \\ M_{p9} &= \frac{16+10+14+18+12+15+17+16}{8} \\ M_{p9} &= \frac{118}{8} = 14.75\end{aligned}$$

$$\begin{aligned}\text{Item 10 } M_{p10} &= \frac{\text{the total of students score that answer true item}}{n10} \\ M_{p10} &= \frac{15+10+5+10+18+7+14+19+22+20+16+18+12+12+15+17+14+16}{18} \\ M_{p10} &= \frac{295}{18} = 16.44\end{aligned}$$

$$\begin{aligned}\text{Item 11 } M_{p11} &= \frac{\text{the total of students score that answer true item}}{n11} \\ M_{p11} &= \frac{15+20+16+10+14+18+14+19+22+16+20+16+18+12+17+16+16+12}{18}\end{aligned}$$

$$M_{p11} = \frac{291}{18} = 16.16$$

$$\text{Item 12 } M_{p12} = \frac{\text{the total of students score that answer true item}}{n12}$$

$$M_{p12} = \frac{15+20+16+5+14+14+22+16+20+16+18+12+12+17+16+14+16+12}{18}$$

$$M_{p12} = \frac{275}{18} = 15.27$$

$$\text{Item 13 } M_{p13} = \frac{\text{the total of students score that answer true item}}{n13}$$

$$M_{p13} = \frac{15+20+16+10+19+22+20+16+18+12+12+15+17+14+16}{17}$$

$$M_{p13} = \frac{242}{15} = 16.13$$

$$\text{Item 14 } M_{p14} = \frac{\text{the total of students score that answer true item}}{n14}$$

$$M_{p14} = \frac{15+20+16+10+14+18+7+14+19+22+4+20+16+18+12+12+15+16+12}{18}$$

$$M_{p14} = \frac{264}{18} = 14.66$$

$$\text{Item 15 } M_{p15} = \frac{\text{the total of students score that answer true item}}{n15}$$

$$M_{p15} = \frac{15+20+18+14+19+22+16+20+16+18+12+12+15+17+16+16+12}{17}$$

$$M_{p15} = \frac{278}{17} = 16.35$$

$$\text{Item 16 } M_{p16} = \frac{\text{the total of students score that answer true item}}{n23}$$

$$M_{p16} = \frac{15+20+18+19+22+16+20+16+18+12+12+15+16+16+12}{15}$$

$$M_{p16} = \frac{247}{15} = 16.46$$

$$\text{Item 17 } M_{p17} = \frac{\text{the total of students score that answer true item}}{n17}$$

$$M_{p17} = \frac{15+20+14+18+14+19+22+20+18+12+15+17+16+16}{14}$$

$$M_{p17} = \frac{236}{14} = 16.85$$

$$\text{Item 18 } M_{p18} = \frac{\text{the total of students score that answer true item}}{n18}$$

$$M_{p18} = \frac{15+20+18+22+20+16+12+15+17+14+12}{11}$$

$$M_{p18} = \frac{181}{11} = 16.45$$

$$\text{Item 19 } M_{p19} = \frac{\text{the total of students score that answer true item}}{n19}$$

$$M_{p19} = \frac{16+14+18+7+14+19+22+16+4+20+16+18+15+17+16+14+16+12}{18}$$

$$M_{p19} = \frac{274}{18} = 16.22$$

$$\text{Item 20 } M_{p20} = \frac{\text{the total of students score that answer true item}}{n20}$$

$$M_{p20} = \frac{15+20+16+14+18+14+19+22+16+20+16+12+16+17+16+14+16+12}{18}$$

$$M_{p20} = \frac{274}{18} = 16.22$$

$$\text{Item 21 } M_{p21} = \frac{\text{the total of students score that answer true item}}{n21}$$

$$M_{p21} = \frac{15+20+16+14+18+14+19+22+16+20+16+12+16+17+16+14+16+12}{18}$$

$$M_{p21} = \frac{293}{18} = 16.27$$

$$\text{Item 22 } M_{p22} = \frac{\text{the total of students score that answer true item}}{n22}$$

$$M_{p22} = \frac{15+20+16+18+19+22+16+16+18+12+12+17+16+14+16+12}{16}$$

$$M_{p22} = \frac{259}{16} = 16.18$$

$$\text{Item 23 } M_{p23} = \frac{\text{the total of students score that answer true item}}{n16}$$

$$M_{p23} = \frac{16+14+16+18+14}{5}$$

$$M_{p23} = \frac{90}{5} = 15.60$$

$$\text{Item 24 } M_{p24} = \frac{\text{the total of students score that answer true item}}{n24}$$

$$M_{p24} = \frac{20+5+10+19+22+20+18+12+12+17+16+14+12}{13}$$

$$M_{p24} = \frac{197}{13} = 16.15$$



$$\begin{aligned}\text{Item 25 } M_{p25} &= \frac{\text{the total of students score that answer true item}}{n_{25}} \\ M_{p25} &= \frac{15+20+16+19+22+20+16+18+12+15+17+14+_16}{13} \\ M_{p25} &= \frac{220}{13} = 16.92\end{aligned}$$

#### 4. Calculation of the Formulation $r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$

$$\text{Item 1 } r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$$

$$r_{pbi} = \frac{15.73 - 14.40}{4.39} \sqrt{\frac{0.7}{0.3}}$$

$$r = \frac{1.33}{4.39} \sqrt{2.3}$$

$$r = 0.304 \times 1.5 = 0.456$$

$$\text{Item 2 } r_{pbi} = \frac{19.00 - 14.40}{4.39} \sqrt{\frac{0.6}{0.4}}$$

$$r = \frac{4.6}{4.39} \sqrt{1.5}$$

$$r = 0.93 \times 1.22 = 1.145$$

$$\text{Item 3 } r_{pbi} = \frac{13.40 - 14.40}{4.39} \sqrt{\frac{0.2}{0.8}}$$

$$r = \frac{-1}{4.39} \sqrt{0.25}$$

$$r = -0.227 \times 0.5 = -0.1135$$

$$\text{Item 4 } r_{pbi} = \frac{14.92 - 14.40}{4.39} \sqrt{\frac{0.5}{0.5}}$$

$$r = \frac{0.52}{4.39} \sqrt{1}$$

$$r = 0.118 \times 1 = 0.118$$

$$\text{Item 5 } r_{\text{pbi}} = \frac{15.68-14.40}{4.39} \sqrt{\frac{0.6}{0.4}}$$

$$r = \frac{1.28}{4.39} \sqrt{1.5}$$

$$r = 0.365 \times 1.22 = 0.447$$

$$\text{Item 6 } r_{\text{pbi}} = \frac{16.14-14.40}{4.39} \sqrt{\frac{0.5}{0.5}}$$

$$r = \frac{1.74}{4.39} \sqrt{1}$$

$$r = 0.397 \times 1 = 0.397$$

$$\text{Item 7 } r_{\text{pbi}} = \frac{16.76-14.40}{4.39} \sqrt{\frac{0.5}{0.5}}$$

$$r = \frac{2.36}{4.39} \sqrt{1}$$

$$r = 0.539 \times 1 = 0.539$$

$$\text{Item 8 } r_{\text{pbi}} = \frac{14.11-14.40}{4.39} \sqrt{\frac{0.7}{0.3}}$$

$$r = \frac{-0.29}{4.39} \sqrt{2.33}$$

$$r = -0.06 \times 1.52 = -0.10$$

$$\text{Item 9 } r_{\text{pbi}} = \frac{14.75-14.40}{4.39} \sqrt{\frac{0.3}{0.7}}$$

$$r = \frac{0.35}{4.39} \sqrt{0.42}$$

$$r = 0.079 \times 0.65 = 0.051$$

$$\text{Item 10 } r_{\text{pbi}} = \frac{16.44-14.40}{4.39} \sqrt{\frac{0.3}{0.7}}$$

$$r = \frac{2.04}{4.39} \sqrt{2.33}$$

$$r = 0.45 \times 1.52 = 0.692$$

$$\text{Item 11 } r_{\text{pbi}} = \frac{16.16 - 14.40}{4.39} \sqrt{\frac{0.7}{0.3}}$$

$$r = \frac{1.76}{4.39} \sqrt{2.33}$$

$$r = 0.40 \times 1.52 = 0.610$$

$$\text{Item 12 } r_{\text{pbi}} = \frac{15.72 - 14.40}{4.39} \sqrt{\frac{0.7}{0.3}}$$

$$r = \frac{1.32}{4.39} \sqrt{2.33}$$

$$r = 0.300 \times 1.52 = 0.457$$

$$\text{Item 13 } r_{\text{pbi}} = \frac{16.13 - 14.40}{4.39} \sqrt{\frac{0.6}{0.4}}$$

$$r = \frac{1.73}{4.39} \sqrt{1.5}$$

$$r = 0.394 \times 1.22 = 0.480$$

$$\text{Item 14 } r_{\text{pbi}} = \frac{14.66 - 14.40}{4.39} \sqrt{\frac{0.7}{0.3}}$$

$$r = \frac{0.26}{4.39} \sqrt{2.33}$$

$$r = 0.59 \times 1.52 = 0.09$$

$$\text{Item 15 } r_{\text{pbi}} = \frac{16.35 - 14.40}{4.39} \sqrt{\frac{0.6}{0.4}}$$

$$r = \frac{1.95}{4.38} \sqrt{1.5}$$

$$r = 0.445 \times 1.22 = 0.541$$

$$\text{Item 16 } r_{\text{pbi}} = \frac{16.46-14.40}{4.39} \sqrt{\frac{0.6}{0.4}}$$

$$r = \frac{2.06}{4.39} \sqrt{1.5}$$

$$r = 0.46 \times 1.22 = 0.572$$

$$\text{Item 17 } r_{\text{pbi}} = \frac{16.85-14.40}{4.39} \sqrt{\frac{0.5}{0.5}}$$

$$r = \frac{2.45}{4.39} \sqrt{1}$$

$$r = 0.558 \times 1 = 0.558$$

$$\text{Item 18 } r_{\text{pbi}} = \frac{16.45-14.40}{4.39} \sqrt{\frac{0.5}{0.5}}$$

$$r = \frac{2.05}{4.39} \sqrt{1}$$

$$r = 0.466 \times 1 = 0.466$$

$$\text{Item 19 } r_{\text{pbi}} = \frac{16.22-14.40}{4.39} \sqrt{\frac{0.7}{0.3}}$$

$$r = \frac{1.82}{4.38} \sqrt{2.33}$$

$$r = 0.410 \times 1.52 = 0.621$$

$$\text{Item 20 } r_{\text{pbi}} = \frac{16.27-14.40}{4.39} \sqrt{\frac{0.7}{0.3}}$$

$$r = \frac{1.87}{4.39} \sqrt{2.33}$$

$$r = 0.425 \times 1.52 = 0.638$$

$$\text{Item 21 } r_{\text{pbi}} = \frac{17.30-14.40}{4.39} \sqrt{\frac{0.4}{0.6}}$$

$$r = \frac{2.9}{4.39} \sqrt{0.66}$$

$$r = 0.66 \times 0.81 = 0.535$$

$$\text{Item 22 } r_{\text{pbi}} = \frac{16.18 - 14.40}{4.39} \sqrt{\frac{0.6}{0.4}}$$

$$r = \frac{1.78}{4.39} \sqrt{1.5}$$

$$r = 0.40 \times 1.22 = 0.494$$

$$\text{Item 23 } r_{\text{pbi}} = \frac{18 - 14.40}{4.39} \sqrt{\frac{0.2}{0.8}}$$

$$r = \frac{3.6}{4.39} \sqrt{0.25}$$

$$r = 0.820 \times 0.5 = 0.410$$

$$\text{Item 24 } r_{\text{pbi}} = \frac{16.15 - 14.40}{4.39} \sqrt{\frac{0.5}{0.5}}$$

$$r = \frac{1.75}{4.39} \sqrt{1}$$

$$r = 0.398 \times 1 = 0.398$$

$$\text{Item 25 } r_{\text{pbi}} = \frac{16.92 - 14.40}{4.39} \sqrt{\frac{0.5}{0.5}}$$

$$r = \frac{2.52}{4.39} \sqrt{1}$$

$$r = 0.574 \times 1 = 0.574$$

## Appendix 10

Calculation of  $r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p_i}{q}}$  in post-test

### B. Calculation of Post-Test

#### 1. Means Score from Score Total ( $M_t$ )

$$M_t = \frac{\sum X_t}{N}$$

$$M_t = \frac{405}{25} = 16.20$$

#### 2. Standard Deviation ( $SD_t$ )

$$SD_t = \sqrt{\frac{\sum X_t^2}{N} - \left(\frac{\sum X_t}{N}\right)^2}$$

$$SD_t = \sqrt{\frac{7189}{25} - \left(\frac{408}{25}\right)^2}$$

$$SD_t = \sqrt{287.56 - 16.20^2}$$

$$SD_t = \sqrt{287.56 - 262.44} = \sqrt{25.12} = 5.01$$

#### 3. Means Score ( $M_p$ )

Item 1  $M_{p1} = \frac{\text{the total of students score that answer true item}}{n1}$

$$M_{p1} = \frac{15+19+15+17+17+16+20+14+21+17+15+17+20+15+22+17+16+22+15+16}{20}$$

$$M_{p1} = \frac{346}{20} = 17.30$$

Item 2  $M_{p2} = \frac{\text{the total of students score that answer true item}}{n2}$

$$M_{p2} = \frac{19+15+17+24+20+17+15+21+20+4+22+22}{12}$$

$$M_{p2} = \frac{220}{12} = 18.33$$

Item 3  $M_{p3} = \frac{\text{the total of students score that answer true item}}{n3}$

$$M_{p3} = \frac{15+19+15+17+24+17+16+20+14+17+15+17+21+20+15+22+17+16+22+15+16}{21}$$

$$M_{p3} = \frac{370}{21} = 17.61$$

Item 4  $M_{p4} = \frac{\text{the total of students score that answer true item}}{n4}$

$$M_{p4} = \frac{15+24+17+6+4+21+17++15+21+20+15+22+17+16+22}{15}$$

$$M_{p4} = \frac{252}{15} = 16.80$$

Item 5  $M_{p5} = \frac{\text{the total of students score that answer true item}}{n5}$

$$M_{p5} = \frac{19+17+24+17+20+14+21+17+21+20+4+22+17+16+22+15+16}{17}$$

$$M_{p5} = \frac{302}{17} = 17.76$$

Item 6  $M_{p6} = \frac{\text{the total of students score that answer true item}}{n6}$

$$M_{p6} = \frac{15+19+17+24+17+16+20+14+17+17+21+20+15+22+17+16+22+15+16}{19} = \frac{340}{19} = 17.89$$

Item 7  $M_{p7} = \frac{\text{the total of students score that answer true item}}{n7}$

$$M_{p7} = \frac{19+24+6+16+20+14+21+17+21+22+16+22+15}{13} = \frac{240}{13} = 18.46$$

Item 8  $M_{p8} = \frac{\text{the total of students score that answer true item}}{n8}$

$$M_{p8} = \frac{15+19+15+17+24+17+16+20+14+21+17+15+17+21+20+15+22+17+16+22+15+16}{22}$$

$$M_{p8} = \frac{391}{22} = 17.77$$

Item 9  $M_{p9} = \frac{\text{the total of students score that answer true item}}{n9}$

$$M_{p9} = \frac{15+24+4+21+21+20+4+22+16+22}{10}$$

$$M_{p9} = \frac{169}{10} = 16.90$$

Item 10  $M_{p10} = \frac{\text{the total of students score that answer true item}}{n10}$

$$M_{p10} = \frac{15+19+17+24+17+20+21+17+15+17+21+20+15+22+17+16+22+15}{18}$$

$$M_{p10} = \frac{330}{18} = 18.33$$

Item 11  $M_{p11} = \frac{\text{the total of students score that answer true item}}{n11}$

$$M_{p11} = \frac{15+19+15+17+24+17+6+16+20+14+21+17+17+21+20+15+22+17+16+22+15+16}{22}$$

$$M_{p11} = \frac{382}{22} = 17.36$$

Item 12  $M_{p12} = \frac{\text{the total of students score that answer true item}}{n12}$

$$M_{p12} = \frac{15+19+15+17+24+17+16+20+14+21+17+15+17+21+20+15+22+17+16+22+15+16}{22}$$

$$M_{p12} = \frac{391}{22} = 17.77$$

Item 13  $M_{p13} = \frac{\text{the total of students score that answer true item}}{n13}$

$$M_{p13} = \frac{24+6+20+4+15+21+15+4+16+22}{10}$$

$$M_{p13} = \frac{147}{10} = 14.70$$

Item 14  $M_{p14} = \frac{\text{the total of students score that answer true item}}{n14}$

$$M_{p9} = \frac{15+19+15+24+17+16+14+21+15+4+22+17+22+15}{14} = \frac{236}{14} = 16.85$$

Item 15  $M_{p15} = \frac{\text{the total of students score that answer true item}}{n15}$

$$M_{p15} = \frac{15+19+17+24+17+20+14+21+17+15+17+21+22+17+22+15+16}{17}$$

$$M_{p15} = \frac{309}{17} = 18.17$$

Item 16  $M_{p16} = \frac{\text{the total of students score that answer true item}}{n16}$

$$M_{p16} = \frac{15+24+16+4+21+22+22+16}{8}$$

$$M_{p16} = \frac{140}{8} = 17.50$$

Item 17  $M_{p17} = \frac{\text{the total of students score that answer true item}}{n17}$

$$M_{p17} = \frac{15+19+15+17+24+17+16+20+21+17+17+20+22+17+22+16}{16}$$

$$M_{p17} = \frac{295}{16} = 18.43$$

Item 18  $M_{p18} = \frac{\text{the total of students score that answer true item}}{n18}$

$$M_{p18} = \frac{19+17+24+17+20+14+21+15+17+21+20+15+22+17+16+22+15+16}{18}$$

$$M_{p18} = \frac{328}{18} = 18.22$$

Item 19  $M_{p19} = \frac{\text{the total of students score that answer true item}}{n19}$

$$M_{p19} = \frac{19+15+17+24+17+16+20+21+17+15+17+21+20+15+22+17+16+22+16}{19}$$

$$M_{p19} = \frac{347}{19} = 18.26$$



$$\text{Item 20 } M_{p20} = \frac{\text{the total of students score that answer true item}}{n_{20}}$$

$$M_{p20} = \frac{15+24+16+21+17+21+20+22}{8}$$

$$M_{p20} = \frac{156}{8} = 19.50$$

$$\text{Item 21 } M_{p21} = \frac{\text{the total of students score that answer true item}}{n_{21}}$$

$$M_{p21} = \frac{15+19+17+24+17+16+20+21+15+21+20+22+17+16}{14}$$

$$M_{p21} = \frac{260}{14} = 18.57$$

$$\text{Item 22 } M_{p22} = \frac{\text{the total of students score that answer true item}}{n_{22}}$$

$$M_{p22} = \frac{15+15+24+6+20+14+21+17+15+17+21+20+22+22+15}{15}$$

$$M_{p22} = \frac{274}{15} = 18.26$$

$$\text{Item 23 } M_{p23} = \frac{\text{the total of students score that answer true item}}{n_{23}}$$

$$M_{p23} = \frac{19+15+17+24+17+16+20+21+17+15+17+21+20+15+22+17+16+22+16}{19}$$

$$M_{p23} = \frac{347}{19} = 18.26$$

$$\text{Item 24 } M_{p24} = \frac{\text{the total of students score that answer true item}}{n_{24}}$$

$$M_{p24} = \frac{15+19+15+17+24+17+16+20+14+21+17+17+21+20+15+22+17+15+16}{19}$$

$$M_{p24} = \frac{338}{19} = 17.78$$

$$\text{Item 25 } M_{p25} = \frac{\text{the total of students score that answer true item}}{n_{25}}$$

$$M_{p25} = \frac{19+15+17+24+6++16+20+14+21+17+15+17+21+20+15+16+22+15+16}{19}$$

$$M_{p25} = \frac{330}{19} = 17.36$$

#### 4. Calculation of the Formulation $r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$

Item 1  $r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$

$$r_{pbi} = \frac{17.30 - 16.20}{5.01} \sqrt{\frac{0.8}{0.2}}$$

$$r = \frac{1.10}{5.01} \sqrt{4}$$

$$r = 0.219 \times 2 = 0.439$$

Item 2  $r_{pbi} = \frac{18.33 - 16.20}{5.01} \sqrt{\frac{0.5}{0.5}}$

$$r_{pbi} = \frac{2.13}{5.01} \sqrt{1}$$

$$r = 0.425 \times 1 = 0.425$$

Item 3  $r_{pbi} = \frac{17.61 - 16.20}{5.01} \sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{1.41}{5.01} \sqrt{4}$$

$$r = 0.281 \times 2 = 0.562$$

Item 4  $r_{pbi} = \frac{16.80 - 16.20}{5.01} \sqrt{\frac{0.6}{0.4}}$

$$r_{pbi} = \frac{0.6}{5.01} \sqrt{1.5}$$

$$r = 0.149 \times 1.22 = 0.182$$

Item 5  $r_{pbi} = \frac{17.76 - 16.20}{5.01} \sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{1.56}{5.01} \sqrt{2.33}$$

$$r = 0.311 \times 1.52 = 0.473$$

$$\text{Item 6 } r_{\text{pbi}} = \frac{17.89-16.20}{5.01} \sqrt{\frac{0.8}{0.2}}$$

$$r_{\text{pbi}} = \frac{1.69}{5.01} \sqrt{4}$$

$$r = 0.337 \times 2 = 0.674$$

$$\text{Item 7 } r_{\text{pbi}} = \frac{18.46-16.20}{5.01} \sqrt{\frac{0.5}{0.5}}$$

$$r_{\text{pbi}} = \frac{2.26}{5.01} \sqrt{1}$$

$$r = 0.451 \times 1 = 0.451$$

$$\text{Item 8 } r_{\text{pbi}} = \frac{17.77-16.20}{5.01} \sqrt{\frac{0.9}{0.1}}$$

$$r_{\text{pbi}} = \frac{1.57}{5.01} \sqrt{9}$$

$$r = 0.313 \times 3 = 0.940$$

$$\text{Item 9 } r_{\text{pbi}} = \frac{16.90-16.20}{5.01} \sqrt{\frac{0.4}{0.6}}$$

$$r_{\text{pbi}} = \frac{0.70}{5.01} \sqrt{0.66}$$

$$r = 0.139 \times 0.182 = 0.025$$

$$\text{Item 10 } r_{\text{pbi}} = \frac{18.33-16.20}{5.01} \sqrt{\frac{0.7}{0.3}}$$

$$r_{\text{pbi}} = \frac{2.13}{5.01} \sqrt{2.33}$$

$$r = 0.425 \times 1.52 = 0.649$$

$$\text{Item 11 } r_{\text{pbi}} = \frac{17.36-16.20}{5.01} \sqrt{\frac{0.9}{0.1}}$$

$$r_{\text{pbi}} = \frac{1.16}{5.01} \sqrt{9}$$

$$r = 0.231 \times 3 = 0.694$$

$$\text{Item 12 } r_{\text{pbi}} = = \frac{17.77-16.20}{5.01} \sqrt{\frac{0.9}{0.1}}$$

$$r_{\text{pbi}} = \frac{1.57}{5.01} \sqrt{9}$$

$$r = 0.313 \times 3 = 0.940$$

$$\text{Item 13 } r_{\text{pbi}} = = \frac{14.70-16.20}{5.01} \sqrt{\frac{0.4}{0.6}}$$

$$r_{\text{pbi}} = \frac{-1.57}{5.01} \sqrt{0.66}$$

$$r = -2.99 \times 0.182 = -0.054$$

$$\text{Item 14 } r_{\text{pbi}} = = \frac{16.85-16.20}{5.01} \sqrt{\frac{0.6}{0.4}}$$

$$r_{\text{pbi}} = \frac{0.65}{5.01} \sqrt{1.5}$$

$$r = 0.129 \times 1.22 = 0.158$$

$$\text{Item 15 } r_{\text{pbi}} = = \frac{18.17-16.20}{5.01} \sqrt{\frac{0.7}{0.3}}$$

$$r_{\text{pbi}} = \frac{1.97}{5.01} \sqrt{2.33}$$

$$r = 0.393 \times 1.52 = 0.597$$

$$\text{Item 16 } r_{\text{pbi}} = = \frac{17.50-16.20}{5.01} \sqrt{\frac{0.3}{0.7}}$$

$$r_{\text{pbi}} = \frac{1.3}{5.01} \sqrt{0.42}$$

$$r = 0.259 \times 0.64 = 0.169$$

$$\text{Item 17 } r_{\text{pbi}} = \frac{18.43-16.20}{5.01} \sqrt{\frac{0.6}{0.4}}$$

$$r_{\text{pbi}} = \frac{2.23}{5.01} \sqrt{1.5}$$

$$r = 0.445 \times 1.22 = 0.543$$

$$\text{Item 18 } r_{\text{pbi}} = \frac{18.22-16.20}{5.01} \sqrt{\frac{0.7}{0.3}}$$

$$r_{\text{pbi}} = \frac{2.02}{5.01} \sqrt{2.33}$$

$$r = 0.403 \times 1.52 = 0.612$$

$$\text{Item 19 } r_{\text{pbi}} = \frac{18.26-16.20}{5.01} \sqrt{\frac{0.8}{0.2}}$$

$$r_{\text{pbi}} = \frac{2.06}{5.01} \sqrt{4}$$

$$r = 0.411 \times 2 = 0.822$$

$$\text{Item 20 } r_{\text{pbi}} = \frac{19.50-16.20}{5.01} \sqrt{\frac{0.3}{0.7}}$$

$$r_{\text{pbi}} = \frac{3.3}{5.01} \sqrt{0.42}$$

$$r = 0.658 \times 0.64 = 0.421$$

$$\text{Item 21 } r_{\text{pbi}} = \frac{18.57-16.20}{5.01} \sqrt{\frac{0.6}{0.4}}$$

$$r_{\text{pbi}} = \frac{2.37}{5.01} \sqrt{1.5}$$

$$r = 0.473 \times 1.22 = 0.577$$

$$\text{Item 22 } r_{\text{pbi}} = \frac{18.26-16.20}{5.01} \sqrt{\frac{0.6}{0.4}}$$

$$r_{\text{pbi}} = \frac{2.06}{5.01} \sqrt{1.5}$$

$$r = 0.412 \times 1.22 = 0.503$$

$$\text{Item 23 } r_{\text{pbi}} = \frac{18.26-16.20}{5.01} \sqrt{\frac{0.8}{0.2}}$$

$$r_{\text{pbi}} = \frac{2.06}{5.01} \sqrt{4}$$

$$r = 0.411 \times 2 = 0.822$$

$$\text{Item 24 } r_{\text{pbi}} = \frac{17.78-16.20}{5.01} \sqrt{\frac{0.8}{0.2}}$$

$$r_{\text{pbi}} = \frac{1.58}{5.01} \sqrt{4}$$

$$r = 0.315 \times 2 = 0.630$$

$$\text{Item 25 } r_{\text{pbi}} = \frac{17.76-16.20}{5.01} \sqrt{\frac{0.8}{0.2}}$$

$$r_{\text{pbi}} = \frac{1.168}{5.01} \sqrt{4}$$

$$r = 0.233 \times 2 = 0.466$$

## Appendix 8

Table Validity of Pre- Test

Number of Item	$M_p$	$M_t$	$SD_t$	P	Q	$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$	$r_t$ on 5% significant	Interpretation
1.	15.73	14.40	4.39	0.7	0.3	0.456	0.381	Valid
2.	19.00	14.40	4.39	0.6	0.4	1.145	0.381	Valid
3.	13.40	14.40	4.39	0.2	0.8	- 0.113	0.381	Invalid
4.	14.92	14.40	4.39	0.6	0.4	0.118	0.381	Invalid
5.	15.68	14.40	4.39	0.5	0.5	0.447	0.381	Valid
6.	16.14	14.40	4.39	0.5	0.5	0.397	0.381	Valid
7.	16.76	14.40	4.39	0.5	0.5	0.539	0.381	Valid
8.	14.11	14.40	4.39	0.7	0.3	- 0.100	0.381	Invalid
9.	14.75	14.40	4.39	0.3	0.7	0.051	0.381	Invalid
10.	16.44	14.40	4.39	0.7	0.3	0.692	0.381	Valid
11.	16.16	14.40	4.39	0.7	0.3	0.610	0.381	Valid
12.	15.72	14.40	4.39	0.7	0.3	0.457	0.381	Valid
13.	16.13	14.40	4.39	0.6	0.4	0.480	0.381	Valid
14.	14.66	14.40	4.39	0.7	0.3	0.090	0.381	Invalid
15.	16.35	14.40	4.39	0.6	0.4	0.541	0.381	Valid
16.	16.46	14.40	4.39	0.6	0.4	0.572	0.381	Valid
17.	16.85	14.40	4.39	0.5	0.5	0.558	0.381	Valid
18.	16.45	14.40	4.39	0.4	0.6	0.466	0.381	Valid
19.	16.22	14.40	4.39	0.7	0.3	0.621	0.381	Valid
20.	16.22	14.40	4.39	0.7	0.3	0.638	0.381	Valid
21.	16.27	14.40	4.39	0.4	0.6	0.535	0.381	Valid
22.	16.18	14.40	4.39	0.6	0.4	0.494	0.381	Valid
23.	15.60	14.40	4.39	0.2	0.8	0.410	0.381	Valid
24.	16.15	14.40	4.39	0.5	0.5	0.398	0.381	Valid
25.	16.92	14.40	4.39	0.5	0.5	0.574	0.381	Valid
26.	15.73	14.40	4.39	0.7	0.3	0.456	0.381	Valid
27.	19.00	14.40	4.39	0.6	0.4	1.145	0.381	Valid
28.	13.40	14.40	4.39	0.2	0.8	- 0.113	0.381	Invalid
29.	14.92	14.40	4.39	0.6	0.4	0.118	0.381	Invalid
30.	15.68	14.40	4.39	0.5	0.5	0.447	0.381	Valid
31.	16.14	14.40	4.39	0.5	0.5	0.397	0.381	Valid
32.	16.76	14.40	4.39	0.5	0.5	0.539	0.381	Valid

33.	14.11	14.40	4.39	0.7	0.3	- 0.100	0.381	Invalid
34.	14.75	14.40	4.39	0.3	0.7	0.051	0.381	Invalid
35.	16.44	14.40	4.39	0.7	0.3	0.692	0.381	Valid
36.	16.16	14.40	4.39	0.7	0.3	0.610	0.381	Valid
37.	15.72	14.40	4.39	0.7	0.3	0.457	0.381	Valid
38.	16.13	14.40	4.39	0.6	0.4	0.480	0.381	Valid
39.	14.66	14.40	4.39	0.7	0.3	0.090	0.381	Invalid
40.	16.35	14.40	4.39	0.6	0.4	0.541	0.381	Valid
41.	16.46	14.40	4.39	0.6	0.4	0.572	0.381	Valid
42.	16.85	14.40	4.39	0.5	0.5	0.558	0.381	Valid
43.	16.45	14.40	4.39	0.4	0.6	0.466	0.381	Valid
44.	16.22	14.40	4.39	0.7	0.3	0.621	0.381	Valid
45.	16.22	14.40	4.39	0.7	0.3	0.638	0.381	Valid
46.	16.27	14.40	4.39	0.4	0.6	0.535	0.381	Valid
47.	16.18	14.40	4.39	0.6	0.4	0.494	0.381	Valid
48.	15.60	14.40	4.39	0.2	0.8	0.410	0.381	Valid
49.	16.15	14.40	4.39	0.5	0.5	0.398	0.381	Valid
50	16.92	14.40	4.39	0.5	0.5	0.574	0.381	Valid



## Appendix 11

**Table Validity of Post- Test**

Number of Item	$M_p$	$M_t$	$SD_t$	P	Q	$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$	$r_t$ on 5% significant	Interpretation
1.	17.30	16.20	5.01	0.8	0.2	0.439	0.381	Valid
2.	18.33	16.20	5.01	0.5	0.5	0.425	0.381	Valid
3.	17.61	16.20	5.01	0.8	0.2	0.562	0.381	Valid
4.	16.80	16.20	5.01	0.6	0.4	0.182	0.381	Invalid
5.	17.76	16.20	5.01	0.4	0.6	0.473	0.381	Valid
6.	17.89	16.20	5.01	0.8	0.2	0.674	0.381	Valid
7.	18.46	16.20	5.01	0.5	0.5	0.451	0.381	Valid
8.	17.77	16.20	5.01	0.9	0.1	0.940	0.381	Valid
9.	16.90	16.20	5.01	0.7	0.7	0.025	0.381	Invalid
10.	18.33	16.20	5.01	0.7	0.3	0.649	0.381	Valid
11.	17.36	16.20	5.01	0.9	0.1	0.694	0.381	Valid
12.	17.77	16.20	5.01	0.4	0.6	0.940	0.381	Valid
13.	14.70	16.20	5.01	0.9	0.1	-0.054	0.381	Invalid
14.	16.85	16.20	5.01	0.6	0.4	0.158	0.381	Invalid
15.	18.17	16.20	5.01	0.7	0.3	0.597	0.381	Valid
16.	17.50	16.20	5.01	0.7	0.3	0.169	0.381	Invalid
17.	18.43	16.20	5.01	0.6	0.4	0.543	0.381	Valid
18.	18.22	16.20	5.01	0.3	0.7	0.612	0.381	Valid
19.	18.26	16.20	5.01	0.8	0.8	0.822	0.381	Valid
20.	19.50	16.20	5.01	0.3	0.7	0.421	0.381	Valid
21.	18.57	16.20	5.01	0.6	0.4	0.577	0.381	Valid
22.	18.26	16.20	5.01	0.6	0.4	0.503	0.381	Valid
23.	18.26	16.20	5.01	0.8	0.2	0.822	0.381	Valid
24.	17.78	16.20	5.01	0.8	0.2	0.630	0.381	Valid
25.	17.36	16.20	5.01	0.8	0.8	0.466	0.381	Valid
26.	17.30	16.20	5.01	0.8	0.2	0.439	0.381	Valid
27.	18.33	16.20	5.01	0.5	0.5	0.425	0.381	Valid
28.	17.61	16.20	5.01	0.8	0.2	0.562	0.381	Valid
29.	16.80	16.20	5.01	0.6	0.4	0.182	0.381	Invalid
30.	17.76	16.20	5.01	0.4	0.6	0.473	0.381	Valid
31.	17.89	16.20	5.01	0.8	0.2	0.674	0.381	Valid
32.	18.46	16.20	5.01	0.5	0.5	0.451	0.381	Valid

33.	17.77	16.20	5.01	0.9	0.1	0.940	0.381	Valid
34.	16.90	16.20	5.01	0.7	0.7	0.025	0.381	Invalid
35.	18.33	16.20	5.01	0.7	0.3	0.649	0.381	Valid
36.	17.36	16.20	5.01	0.9	0.1	0.694	0.381	Valid
37.	17.77	16.20	5.01	0.4	0.6	0.940	0.381	Valid
38.	14.70	16.20	5.01	0.9	0.1	-0.054	0.381	Invalid
39.	16.85	16.20	5.01	0.6	0.4	0,158	0.381	Invalid
40.	18.17	16.20	5.01	0.7	0.3	0.597	0.381	Valid
41.	17.50	16.20	5.01	0.7	0.3	0.169	0.381	Invalid
42.	18.43	16.20	5.01	0.6	0.4	0.543	0.381	Valid
43.	18.22	16.20	5.01	0.3	0.7	0.612	0.381	Valid
44.	18.26	16.20	5.01	0.8	0.8	0.822	0.381	Valid
45.	19.50	16.20	5.01	0.3	0.7	0.421	0.381	Valid
46.	18.57	16.20	5.01	0.6	0.4	0.577	0.381	Valid
47.	18.26	16.20	5.01	0.6	0.4	0.503	0.381	Valid
48.	18.26	16.20	5.01	0.8	0.2	0.822	0.381	Valid
49.	17.78	16.20	5.01	0.8	0.2	0.630	0.381	Valid
50.	17.36	16.20	5.01	0.8	0.8	0.466	0.381	Valid

## Appendix 9

### Validity Post Test

N O	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Xt	Xt²
1	1	0	1	1	0	1	0	1	0	1	1	1	0	1	1	0	1	0	0	0	1	1	0	1	0	15	225
2	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	1	19	361
3	1	1	1	0	0	0	0	1	0	0	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	15	225
4	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1	1	0	1	0	1	1	1	17	289
5	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	576
6	1	0	1	1	1	0	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	0	17	289
7	0	0	0	1	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	6	36
8	1	0	1	0	0	1	1	1	0	0	1	1	0	1	0	1	1	0	1	1	1	0	1	1	1	16	256
9	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1	20	400
10	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	0	0	1	0	0	0	1	0	1	1	14	196
11	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	4	16
12	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	21	441
13	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	0	1	0	1	0	0	1	1	1	1	17	289
14	1	1	1	1	1	0	0	1	0	1	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	15	225
15	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1	1	1	0	1	1	1	1	17	289
16	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1	1	21	441
17	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	20	400
18	1	0	1	1	1	1	0	1	0	1	1	1	1	1	0	0	0	1	1	0	0	0	1	1	1	15	225
19	0	1	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	16
20	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	22	484
21	1	0	1	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	0	17	289
22	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	0	0	0	1	0	1	16	256
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	22	484
24	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	0	0	1	0	1	1	15	225
25	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1	1	1	1	0	1	0	1	1	1	16	256
N=25	20	12	21	15	17	19	13	22	17	18	22	22	10	14	17	8	16	18	19	8	14	15	19	19	19	405	7189
P	0.8	0.5	0.8	0.6	0.7	0.8	0.5	0.9	0.7	0.7	0.9	0.9	0.4	0.6	0.7	0.3	0.8	0.7	0.8	0.6	0.3	0.6	0.8	0.8	0.8	Σxt	Σxt²
Q	0.2	0.5	0.2	0.4	0.4	0.2	0.5	0.3	0.3	0.3	0.1	0.1	0.6	0.4	0.3	0.7	0.2	0.3	0.2	0.4	0.7	0.4	0.2	0.2	0.2		

### Validity Post Test

N O	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Xt	Xt²
1	1	0	1	1	0	1	0	1	0	1	1	1	0	1	1	0	1	0	0	0	1	1	0	1	0	15	225
2	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	1	19	361
3	1	1	1	0	0	0	0	1	0	0	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	15	225
4	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1	1	0	1	0	1	1	1	17	289
5	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	576
6	1	0	1	1	1	0	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	0	17	289
7	0	0	0	1	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	6	36
8	1	0	1	0	0	1	1	1	0	0	1	1	0	1	0	1	1	0	1	1	1	0	1	1	1	16	256
9	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1	20	400
10	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	0	0	1	0	0	0	1	0	1	1	14	196
11	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	4	16
12	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	21	441
13	1	1	1	1	1	1	1	1	0	1	1	1	0	0	1	0	1	0	1	0	0	1	1	1	1	17	289
14	1	1	1	1	1	0	0	1	0	1	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	15	225
15	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1	1	1	0	1	1	1	1	17	289
16	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1	1	21	441
17	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	20	400
18	1	0	1	1	1	1	0	1	0	1	1	1	1	1	0	0	0	1	1	0	0	0	1	1	1	15	225
19	0	1	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	16
20	1	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	22	484
21	1	0	1	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	0	17	289
22	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	1	0	0	0	1	0	1	16	256
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	22	484
24	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	0	0	1	0	1	1	15	225
25	1	0	1	0	1	1	0	1	1	0	1	1	0	0	1	1	1	1	1	0	1	0	1	1	1	16	256
N= 25	20	12	21	15	17	19	13	22	17	18	22	22	10	14	17	8	16	18	19	8	14	15	19	19	19	405	7189
P	0.8	0.5	0.8	0.6	0.7	0.8	0.5	0.9	0.7	0.7	0.9	0.9	0.4	0.6	0.7	0.3	0.8	0.7	0.8	0.6	0.3	0.6	0.8	0.8	0.8	$\sum x_t$	$\sum x_t^2$
Q	0.2	0.5	0.2	0.4	0.4	0.2	0.5	0.3	0.3	0.3	0.1	0.1	0.6	0.4	0.3	0.7	0.2	0.3	0.2	0.4	0.7	0.4	0.2	0.2	0.2		

## Validity Post Test

N O	51	52	53	54	55	56	57	58	59	60															Xt	Xt²
1	1	0	1	1	0	1	0	1	0	1															15	225
2	1	1	1	0	1	1	1	1	1	1															19	361
3	1	1	1	0	0	0	0	1	0	0															15	225
4	1	1	1	0	1	1	0	1	1	1															17	289
5	0	1	1	1	1	1	1	1	1	1															24	576
6	1	0	1	1	1	0	0	1	1	1															17	289
7	0	0	0	1	0	1	1	0	0	0															6	36
8	1	0	1	0	0	1	1	1	0	0															16	256
9	1	1	1	0	1	1	1	1	1	1															20	400
10	1	0	1	0	1	1	1	1	1	0															14	196
11	0	0	0	1	0	0	0	0	0	0															4	16
12	1	0	0	1	1	0	1	1	1	1															21	441
13	1	1	1	1	1	1	1	1	0	1															17	289
14	1	1	1	1	1	0	0	1	0	1															15	225
15	1	0	1	0	1	1	0	1	1	1															17	289
16	0	1	1	1	1	1	1	1	1	1															21	441
17	1	1	1	1	1	1	0	1	1	1															20	400
18	1	0	1	1	1	1	0	1	0	1															15	225
19	0	1	0	0	0	0	0	0	1	0															4	16
20	1	1	1	1	0	1	1	1	1	1															22	484
21	1	0	1	1	0	1	0	1	1	1															17	289
22	1	0	1	1	1	1	1	1	1	1															16	256
23	1	1	1	1	1	1	1	1	1	1															22	484
24	1	0	1	0	1	1	1	1	1	1															15	225
25	1	0	1	0	1	1	0	1	1	0															16	256
N=25	20	12	21	15	17	19	13	22	17	18															405	7189
P	0.8	0.5	0.8	0.6	0.7	0.8	0.5	0.9	0.7	0.7															Σxt	Σxt²
Q	0.2	0.5	0.2	0.4	0.4	0.2	0.5	0.3	0.3	0.3																

# Appendix 13

## Reliability Post Test

N O	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	Xt	Xt²
1	1	0	1	1	0	1	0	1	0	1	1	1	0	1	1	0	1	0	0	0	1	1	0	1	0	15	225
2	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	1	19	361
3	1	1	1	0	0	0	0	1	0	0	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	15	225
4	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1	1	0	1	0	1	1	1	17	289
5	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	576
6	1	0	1	1	1	0	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	0	17	289
7	0	0	0	1	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	6	36
8	1	0	1	0	0	1	1	1	0	0	1	1	0	1	0	1	1	0	1	1	1	0	1	1	1	16	256
9	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1	20	400
10	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	0	0	1	0	0	0	1	0	1	1	14	196
11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4	16
12	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	21	441
13	1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	0	1	0	1	0	0	1	1	1	1	17	289
14	1	1	1	1	0	0	0	1	0	1	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	15	225
15	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1	17	289
16	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1	1	21	441
17	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	20	400
18	1	0	1	1	0	1	0	1	0	1	1	1	1	1	0	0	0	1	1	0	0	0	1	1	1	15	225
19	0	1	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	16
20	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	22	484
21	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1	0	17	289
22	1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	0	0	0	1	0	1	16	256
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	22	484
24	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	1	0	1	1	15	225
25	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	0	1	0	1	1	1	16	256
N= 25	20	12	21	15	17	19	13	22	17	18	22	22	10	14	17	8	16	18	19	8	14	15	19	19	19	405	7189
P	0.8	0.5	0.8	0.6	0.7	0.8	0.5	0.9	0.7	0.7	0.9	0.9	0.4	0.6	0.7	0.7	0.8	0.7	0.8	0.6	0.3	0.6	0.8	0.8	0.8	Σxt	Σxt²
Q	0.2	0.5	0.2	0.4	0.3	0.2	0.5	0.1	0.3	0.3	0.1	0.1	0.6	0.4	0.3	0.3	0.2	0.3	0.2	0.4	0.7	0.4	0.2	0.2	0.2		
Pq	0.1 6	0.2 496	0.1 344	0.2 4	0.2 176	0.1 824	0.2 49 6	0.1 10 56	0.2 21 76	0.1 20 16	0.1 056	0.1 056	0.24	0.2 464	0.2 176	0.2 016	0.2 304	0.21 76	0.1 824	0.2 17 6	0.2 24 64	0.2 4	0.1 824	0.1 824	0.18 24	4.97 9	

### Reliability Post Test

N O	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	X <sub>t</sub>	X <sub>t</sub> <sup>2</sup>
1	1	0	1	1	0	1	0	1	0	1	1	1	0	1	1	0	1	0	0	0	1	1	0	1	0	15	225
2	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	1	19	361
3	1	1	1	0	0	0	0	1	0	0	1	1	0	1	0	1	1	0	1	1	0	1	1	1	1	15	225
4	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1	1	0	1	0	1	1	1	17	289
5	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	576
6	1	0	1	1	1	0	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	0	17	289
7	0	0	0	1	0	1	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	1	6	36
8	1	0	1	0	0	1	1	1	0	0	1	1	0	1	0	1	1	0	1	1	1	0	1	1	1	16	256
9	1	1	1	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0	1	1	1	1	1	20	400
10	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	0	0	1	0	0	0	1	0	1	1	14	196
11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4	16
12	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	21	441
13	1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	0	1	0	1	0	0	1	1	1	1	17	289
14	1	1	1	1	0	0	0	1	0	1	0	1	1	0	1	0	0	1	1	0	1	1	1	0	1	15	225
15	1	0	1	0	1	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	0	1	1	1	1	17	289
16	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1	1	21	441
17	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	20	400
18	1	0	1	1	0	1	0	1	0	1	1	1	1	1	0	0	0	1	1	0	0	0	1	1	1	15	225
19	0	1	0	0	1	0	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	4	16
20	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	0	22	484
21	1	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	0	1	1	0	17	289
22	1	0	1	1	1	1	1	1	1	1	1	1	0	1	0	0	0	1	1	0	0	0	1	0	1	16	256
23	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	0	1	22	484
24	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	0	0	1	0	1	1	15	225
25	1	0	1	0	1	1	0	1	1	0	1	1	0	1	1	1	1	1	1	0	1	0	1	1	1	16	256
N= 25	20	12	21	15	17	19	13	22	17	18	22	22	10	14	17	8	16	18	19	8	14	15	19	19	19	405	718 9
P	0.8	0.5	0.8	0.6	0.7	0.8	0.5	0. 9	0. 7	0. 7	0.9	0.9	0.4	0.6	0.7	0.7	0.8	0.7	0.8	0.6	0. 3	0.6	0.8	0.8	0.8	Σ <sub>Xt</sub>	Σ <sub>Xt</sub> <sup>2</sup>
Q	0.2	0.5	0.2	0.4	0.3	0.2	0.5	0. 1	0.3	0. 3	0.1	0.1	0.6	0.4	0.3	0.3	0.2	0.3	0.2	0.4	0. 7	0.4	0.2	0.2	0.2		
Pq	0.1 6	0.2 496	0.1 344	0.2 4	0.2 176	0.1 824	0.2 49 6	0. 10 56	0. 21 76	0. 20 16	0.1 056	0.1 056	0.24	0.2 464	0.2 176	0.2 016	0.2 304	0.21 76	0.1 824	0.2 17 6	0. 24 64	0.2 4	0.1 824	0.1 824	0.18 24	4.97 9	





## Appendix 14

### Reliability Pre Test

To get reliability of the test, the researcher uses formula KR-20:

$$R_{11} = \left( \frac{n}{n-1} \right) \left( \frac{S_t^2 - \sum pq}{S_t^2} \right)$$

$$N = 25$$

$$\sum X_t = 360$$

$$\sum X_t^2 = 5666$$

$$\sum pq = 5.268$$

$$\begin{aligned} S_t^2 &= \sum X_t^2 - \left( \frac{\sum X_t}{N} \right)^2 \\ &= 5666 - \left( \frac{360}{25} \right)^2 = 5666 - \frac{129600}{25} = 5666 - 5184 = 482 \end{aligned}$$

$$S_t^2 = \frac{\sum X_t^2}{N} = \frac{482}{25}$$

$$S_t^2 = 19.28$$

$$R_{11} = \left( \frac{n}{n-1} \right) \left( \frac{S_t^2 - \sum pq}{S_t^2} \right)$$

$$R_{11} = \left( \frac{25}{25-1} \right) \left( \frac{19.28 - 5.268}{19.28} \right) = \left( \frac{25}{24} \right) \left( \frac{14.012}{19.28} \right)$$

$$= (1.04) (0.72)$$

$$= .75 \quad (r_{11} > 0.70 = \text{reliable})$$

Test is reliable if  $r_{\text{count}} > r_{\text{tabel}}$ . Based on calculation above, the test have very high reliable.

## Appendix 15

### Reliability Post Test

To get reliability of the test, the researcher uses formula KR-20:

$$R_{11} = \left( \frac{n}{n-1} \right) \left( \frac{S_{t^2} - \sum pq}{S_{t^2}} \right)$$

$$N = 25$$

$$\sum X_t = 405$$

$$\sum X_t^2 = 7189$$

$$\sum pq = 4.979$$

$$\begin{aligned} S_t^2 &= \sum X_t^2 - \left( \frac{\sum X_t}{N} \right)^2 \\ &= 7189 - \left( \frac{405}{25} \right)^2 = 7189 - \frac{164025}{25} = 7189 - 6561 = 628 \end{aligned}$$

$$S_t^2 = \frac{\sum X_t^2}{N} = \frac{628}{25}$$

$$S_t^2 = 25.12$$

$$R_{11} = \left( \frac{n}{n-1} \right) \left( \frac{S_{t^2} - \sum pq}{S_{t^2}} \right)$$

$$R_{11} = \left( \frac{25}{25-1} \right) \left( \frac{25.12 - 4.979}{25.12} \right) = \left( \frac{25}{24} \right) \left( \frac{20.141}{25.12} \right)$$

$$= (1.04) (0.80)$$

$$= 0.83 \text{ (} r_{11} > 0.70 = \text{reliable)}$$

## Appendix 18

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

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

45	45	45	45	50	50	50	55	55	55
55	55	60	60	60	60	60	65	65	65
65	65	65	65	70	70	70	75	75	

2. High = 75

Low = 45

Range = High – Low

$$= 75 - 45$$

$$= 35$$

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

$$= 1 + 3,3 \log (29)$$

$$= 1 + 3,3 ( 1,76)$$

$$= 1 + 5.80$$

$$= 6.80$$

$$= 7$$

4. Length of Classes =  $\frac{range}{totalofclass} = \frac{35}{7} = 5$

5. Mean

Interval Class	F	X	x'	fx'	x' <sup>2</sup>	fx' <sup>2</sup>
45 – 49	3	47	4	12	16	64
50 – 54	4	52	3	12	9	27
55 – 59	5	57	2	10	4	20
60 – 64	5	62	1	5	1	5
65 – 69	7	<b>67</b>	0	0	0	0
70 – 74	3	72	-1	-3	1	3
75 – 79	2	77	-2	-4	4	8
<i>i</i> = 5	29	-	-	33	-	127

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

$$= 67 + 5 \left( \frac{33}{29} \right)$$

$$= 67 + 5 (1.13)$$

$$= 67 + (5.65)$$

$$= 72.65$$

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

$$= \sqrt{\frac{127}{29} - \left( \frac{33}{29} \right)^2}$$

$$= \sqrt{4.37 - (1.13)^2}$$

$$= \sqrt{4.37 - 1.27}$$

$$= \sqrt{3.1}$$

$$= 5 (1.76)$$

$$= 8.8$$

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	$f_h$	$f_0$	$\frac{(f_0-f_h)}{f_h}$
75—79	79,5	0.77	0.2794				
70 – 74	74,5	0.21	0.0832	0.19	5,51	2	0.63
65 – 69	69,5	-0.35	0.36317	-0.27	-7.88	3	-1.38
60 – 64	64,5	-0.92	0.17879	-0.18	-5.12	7	-2.37
55 – 59	59,5	-1.49	0.06811	-0.11	-3.19	5	-0.56
50 – 54	54,5	-2.06	0.01970	0.4	11.6	5	-0.56
45 – 49	49,5	-2.63	0.00427	0.02	0.58	3	4.17
	44,5	-3.19	0.00071	0.00	0	4	4.00
$X^2$							3.93

Based on table above, reseracher found that  $x^2_{count} = 3.93$  while  $x^2_{table}=5.991$  cause  $x^2_{count} < x^2_{table}$  ( $3.93 < 5.991$ ) with degree of freedom  $dk = 5 - 3 = 2$  and significat level  $\alpha = 5\%$ . So distribution of VIII-1 class (Pre-test) is normal.

## 6. Median

No	Interval of Classes	F	Fk
1	45 – 49	4	4
2	50 - 54	3	7
3	55 - 59	5	12
4	60 - 64	5	17
5	<b>65 - 69</b>	<b>7</b>	24
6	70 - 74	3	27
7	75 - 79	2	29

Position of Me in the interval of classes is number 5, that:

$$Bb = 64.5$$

$$F = 5$$

$$fm = 7$$

$$i = 5$$

$$n = 29$$

$$1/2n = 14.5$$

So :

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

$$= 64.5 + 5 \left( \frac{14.5 - 5}{7} \right)$$

$$= 64.5 + 5 (1.35)$$

$$= 64.5 + 6.75$$

$$= 71.25$$

7. Modus

No	Interval of Classes	F	Fk
1	45 – 49	4	4
2	50 - 54	3	7
3	55 - 59	5	12
4	60 - 64	5	17
5	<b>65 - 69</b>	<b>7</b>	24
6	70 - 74	3	27
7	75 - 79	2	29

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

$$L = 64.5$$

$$d_1 = 2$$

$$d_2 = 4$$

$$i = 5$$

$$\begin{aligned}
 M_o &= 64.5 + \frac{2}{2+4} 5 \\
 &= 64.5 + 0.33 (5) \\
 &= 64.5 + 1.65 \\
 &= 66.15
 \end{aligned}$$

## 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:

45	45	50	50	50	55	55	55	55	55
60	60	60	60	60	60	60	60	65	65
65	65	65	70	70	70	75	75	75	

8. High = 75

Low = 45

Range = High – Low

$$= 75 - 45$$

$$= 35$$

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

$$= 1 + 3,3 \log (29)$$

$$= 1 + 3,3 ( 1,76)$$

$$= 1 + 5.80$$

$$= 6.80$$

$$= 7$$

2. Length of Classes =  $\frac{range}{total\ of\ class} = \frac{35}{7} = 5$

3. Mean

Interval Class	F	X	x'	fx'	x' <sup>2</sup>	fx' <sup>2</sup>
45 – 49	2	47	4	6	9	18
50 – 54	3	52	3	12	16	48
55 – 59	5	57	2	10	4	20
60 – 64	8	<b>62</b>	0	0	0	0
65 – 69	5	67	-1	-5	1	5
70 – 74	3	72	-2	-6	4	18
75 – 79	3	77	-3	-9	9	27
<i>i</i> = 5	29	-	-	17	-	109



$$\begin{aligned}
M_x &= M^1 + i \frac{\Sigma fx^1}{N} \\
&= 62 + 5 \left( \frac{17}{29} \right) \\
&= 62 + 5 (0.58) \\
&= 62 + (2.9) \\
&= 69.9
\end{aligned}$$

$$\begin{aligned}
SD_t &= i \sqrt{\frac{\Sigma fx'^2}{N} - \left[ \frac{\Sigma fx'}{N} \right]^2} \\
&= \sqrt[5]{\frac{109}{29} - \left( \frac{17}{29} \right)^2} \\
&= \sqrt[5]{3.75 - (0.58)^2} \\
&= \sqrt[5]{3.75 - 0.33} \\
&= \sqrt[5]{3.42} \\
&= 5 (1.84) \\
&= 9.2
\end{aligned}$$

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	$f_h$	$f_0$	$\frac{(f_0-f_h)}{f_h}$
75—79	79,5	1.08	0.3599				
70 – 74	74,5	0.54	0.2054	0.15	4.4	3	0.3
65 – 69	69,5	0	0.0000	0.2	5.8	5	0.37
60 – 64	64,5	-0.54	0.29460	-0.3	-8.7	8	-1.57
55 – 59	59,5	-1.08	0.14007	0.2	5.8	3	-0.48
50 – 54	54,5	-1.63	0.05155	0.08	2.32	5	1.15
45 – 49	49,5	-2.17	0.01500	0.03	0.87	2	1.29
	44,5	-2.71	0.00336	0.0	0	3	3.00
$X^2$							4.06

Based on table above, reseracher found that  $x^2_{count} = 4.06$  while  $x^2_{table} = 5.991$  cause  $x^2_{count} < x^2_{table}$  ( $4.06 < 5.991$ ) with degree of freedom  $dk = 5 - 3 = 2$  and significat level  $\alpha = 5\%$ . So distribution of VIII-2 class (Pre-test) is normal.

#### 4. Median

No	Interval of Classes	F	Fk
1	45 – 49	3	3
2	50 - 54	2	5
3	55 - 59	5	10
4	60 - 64	8	18
5	65 - 69	5	23
6	70 - 74	3	26
7	75 - 79	3	29

Position of Me in the interval of classes is number 5, that:

$$Bb = 59.5$$

$$F = 5$$

$$fm = 8$$

$$i = 5$$

$$n = 29$$

$$1/2n = 14.5$$

So :

$$\begin{aligned}
 Me &= Bb + i \left( \frac{n/2 - F}{fm} \right) \\
 &= 59.5 + 5 \left( \frac{14.5 - 5}{8} \right) \\
 &= 59.5 + 5 (1.19) \\
 &= 59.5 + 5.95 \\
 &= 65.45
 \end{aligned}$$

### 5. Modus

No	Interval of Classes	F	Fk
1	45 – 49	2	2
2	50 - 54	3	5
3	55 - 59	5	10
4	<b>60 - 64</b>	<b>8</b>	18
5	65 - 69	5	23
6	70 - 74	3	26
7	75 - 79	3	29

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

$$L = 69.5$$

$$d_1 = 3$$

$$d_2 = 5$$

$$i = 5$$

$$\begin{aligned}
 M_o &= 69.5 + \frac{3}{3+5} 5 \\
 &= 69.5 + 0.38 (5) \\
 &= 69.5 + 1.9 \\
 &= 71.4
 \end{aligned}$$

## RESULT OF NORMALITY TEST IN PRE TEST

### RESULT OF THE NORMALITY TEST OF VIII-3 IN PRE-TEST

1. The score of VIII-3 class in pre test from low score to high score:

45	50	50	55	60	65	65	65	65	65
65	65	65	70	70	70	70	70	70	75
75	75	75	75	75					

10. High = 75

Low = 45

Range = High – Low

$$= 75 - 45$$

$$= 35$$

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

$$= 1 + 3,3 \log (29)$$

$$= 1 + 3,3 ( 1,76)$$

$$= 1 + 5.80$$

$$= 6.80$$

$$= 7$$

2. Length of Classes =  $\frac{range}{totalofclass} = \frac{35}{7} = 5$

3. Mean

Interval Class	F	X	x	fx	x <sup>2</sup>	fx <sup>2</sup>
45 – 49	1	47	4	8	16	32
50 – 54	2	52	3	9	9	27
55 – 59	1	57	2	12	4	24
60 – 64	1	62	1	4	1	4
65 – 69	8	<b>67</b>	0	0	0	0
70 – 74	6	72	-1	-6	1	6
75 – 79	6	77	-2	-12	4	24
<i>i</i> = 5	25	-	-	15	-	117

$$M_x = M^1 + i \frac{\Sigma f x^1}{N}$$

$$= 67 + 5 \left( \frac{15}{25} \right)$$

$$= 67 + 5 (0.42)$$

$$= 67 + (2.1)$$

$$= 69.1$$

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

$$= \sqrt[5]{\frac{117}{25} - \left( \frac{15}{25} \right)^2}$$

$$= \sqrt[5]{3.34 - (0.42)^2}$$

$$= \sqrt[5]{3.34 - 0.17}$$

$$= \sqrt[5]{3.17}$$

$$= 5 (1.78)$$

$$= 8.9$$

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	$f_h$	$f_0$	$\frac{(f_0-f_h)}{f_h}$
75–79	79,5	1.16	0.3770				
70 – 74	74,5	0.60	0.2257	0.15	5.25	6	0.14
65 – 69	69,5	0.04	0.0160	0.20	7	6	-0.14
60 – 64	64,5	-0.51	0.30854	-30	-10	8	-0.2
55 – 59	59,5	-1.07	0.14231	0.16	5.6	1	-0.28
50 – 54	54,5	-1.64	0.05050	0.09	3.15	1	0.90
45 – 49	49,5	-2.20	0.01390	0.03	1.05	2	1.85
	44,5	-2.76	0.00289	0.01	0.35	1	4.71
$X^2$							6.98

Based on table above, reseracher found that  $x^2_{count} = 6.98$  while  $x^2_{table} = 5.991$  cause  $x^2_{count} < x^2_{table}$  ( $6.98 > 5.991$ ) with degree of freedom  $dk = 5 - 3 = 2$  and significat level  $\alpha = 5\%$ . So distribution of VIII-3 class (Pre-test) is not normal.

#### 4. Median

No	Interval of Classes	F	Fk
1	45 – 49	1	1
2	50 - 54	2	3
3	55 - 59	1	4
4	60 - 64	1	5
5	<b>65 - 69</b>	<b>8</b>	13
6	70 - 74	6	19
7	75 - 79	6	25

Position of Me in the interval of classes is number 5, that:

$$Bb = 64.5$$

$$F = 4$$

$$fm = 8$$

$$i = 5$$

$$n = 25$$

$$1/2n = 12.5$$

$$\begin{aligned}
 \text{So : Me} &= Bb + i \left( \frac{n/2 - F}{fm} \right) \\
 &= 64.5 + 5 \left( \frac{12.5 - 4}{8} \right) \\
 &= 64.5 + 5 (1.68) \\
 &= 64.5 + 8.4 \\
 &= 72.9
 \end{aligned}$$



### 5. Modus

No	Interval of Classes	F	Fk
1	45 – 49	1	1
2	50 - 54	2	3
3	55 - 59	1	4
4	60 - 64	1	5
5	<b>65 - 69</b>	<b>8</b>	13
6	70 - 74	6	19
7	75 - 79	6	25

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

$$L = 64.5$$

$$d_1 = 6$$

$$d_2 = 1$$

$$i = 5$$

$$\begin{aligned}
 M_o &= 64.5 + \frac{6}{6+1} 5 \\
 &= 64.5 + 0.66 (5) \\
 &= 64.5 + 3.3 \\
 &= 67.8
 \end{aligned}$$

## Appendix 19

### HOMOGENEITY TEST (PRE-TEST)

Calculation of parameter to get variant of the first class as experimental class<sub>1</sub> sample by showing picture and variant of the second class as experimental class<sub>2</sub> sample by using puzzle are used homogeneity test by using formula:

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

Hypotheses:

$$H_0 : \sigma_1^2 = \sigma_2^2$$

$$H_1 : \sigma_1^2 \neq \sigma_2^2$$

A. Variant of the VIII-1class is:

NO	Xi	Xi <sup>2</sup>
1	45	2025
2	45	2025
3	45	2025
4	45	2025
5	50	2500
6	50	2500
7	50	2500
8	55	3025
9	55	3025
10	55	3025
11	55	3025
12	55	3025
13	60	3600
14	60	3600
15	60	3600
16	60	3600
17	60	3600
18	65	4225
19	65	4225
20	65	4225

21	65	4225
22	65	4225
23	65	4225
24	65	4225
25	70	4900
26	70	4900
27	70	4900
28	75	5625
29	75	5625
	1720	104250

$$n = 29$$

$$\sum xi = 1720$$

$$\sum_{xi}^2 = 104250$$

So:

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

$$= \frac{29(104250) - (1720)^2}{29(29-1)}$$

$$= \frac{3023250 - 2958400}{29(28)}$$

$$= \frac{64850}{812}$$

$$= 79.86$$

B. Variant of the VIII-2 class is:

NO	Xi	Xi <sup>2</sup>
1	45	2025
2	45	2025
3	45	2025
4	50	2500
5	50	2500
6	55	3025
7	55	3025
8	55	3025
9	55	3025
10	55	3025
11	60	3600
12	60	3600
13	60	3600
14	65	4225
15	65	4225
16	65	4225
17	65	4225
18	65	4225
19	70	4900
20	70	4900
21	70	4900
22	70	4900
23	70	4900
24	70	4900
25	70	4900
26	70	4900
27	75	5625
28	75	5625
29	75	5625
	1800	114200

$$n = 29$$

$$\sum xi = 1800$$

$$\sum_{xi}^2 = 114200$$

So:

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

$$\begin{aligned}
& \frac{29(114200) - (1800)^2}{29(29 - 1)} \\
&= \frac{3311800 - 3240000}{29(28)} \\
&= \frac{71800}{812} \\
&= 88.42
\end{aligned}$$

C. Variant of the VIII- 3 class is:

NO	Xi	Xi <sup>2</sup>
1	45	2025
2	45	2025
3	50	2500
4	50	2500
5	50	2500
6	55	3025
7	55	3025
8	55	3025
9	55	3025
10	55	3025
11	55	3025
12	60	3600
13	60	3600
14	60	3600
15	60	3600
16	65	4225
17	65	4225
18	65	4225
19	65	4225
20	65	4225
21	65	4225
22	65	4225
23	65	4225
24	70	4900
25	70	4900
	2200	141050

$$\begin{aligned}n &= 25 \\ \sum xi &= 2200 \\ \sum xi^2 &= 141050\end{aligned}$$

So:

$$\begin{aligned}S^2 &= \frac{n\sum xi^2 - (\sum xi)^2}{n(n-1)} \\ &= \frac{25(141050) - (2200)^2}{25(25-1)} \\ &= \frac{4936750 - 4840000}{25(24)} \\ &= \frac{96750}{2400} \\ &= 40.31\end{aligned}$$

The Formula was used to test hypothesis was:

1. VIII-2 and VIII -1 :

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

So:

$$F = \frac{88.42}{79.86}$$

$$= 1.10$$

After doing the calculation, researcher found that  $F_{\text{count}} = 1.10$  with  $\alpha = 5\%$  and  $dk = 29$  from the distribution list F, researcher found that  $F_{\text{table}} = 2.052$ , cause  $F_{\text{count}} < F_{\text{table}}$  ( $1.10 < 2.052$ ). So, there is no difference the variant between the VIII-2 class and VIII-1 class. It means that the variant is homogenous.

2. VIII -2 and VIII -3 :

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

So:

$$\begin{aligned} F &= \frac{88.42}{81.30} \\ &= 1.08 \end{aligned}$$

After doing the calculation, researcher found that  $F_{\text{count}} = 1.08$  with  $\alpha$  5 % and dk = 29 from the distribution list F, researcher found that  $F_{\text{table}} = 2.052$ , cause  $F_{\text{count}} < F_{\text{table}}$  ( $1.08 < 2.052$ ). So, there is no difference the variant between the VIII-2 class and VIII-3 class. It means that the variant is homogenous.

3. VIII -3 and VIII - 1 :

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

So:

$$\begin{aligned} F &= \frac{81.30}{79.86} \\ &= 1.01 \end{aligned}$$

After doing the calculation, researcher found that  $F_{\text{count}} = 1.01$  with  $\alpha$  5 % and dk = 25 and 29 from the distribution list F, researcher found that  $F_{\text{table}} = 2.042$  &  $2.052$ , cause  $F_{\text{count}} < F_{\text{table}}$  ( $1.01 < 2.042$  &  $2.052$ ). So, there is no difference the variant between the VIII-3 class and VIII-1 class. It means that the variant is homogenous.

## Appendix 20

### RESULT OF THE NORMALITY TEST OF EXPERIMENT CLASS IN POST TEST

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

65	65	65	70	70	75	75	75	80	80
80	80	80	80	85	85	85	85	85	85
85	85	85	85	90	90	90	95	95	

2. High = 95

Low = 65

Range = high – low

= 95- 65

= 35

3. Total of classes =  $1 + 3,3 \log (n)$   
 $= 1 + 3,3 \log (29)$   
 $= 1 + 3,3 ( 1.76)$   
 $= 1 + 5.80$   
 $= 6.80$   
 $= 7$

4. Length of Classes =  $\frac{range}{total\ of\ class} = \frac{35}{7} = 5$

5. Mean

Interval Class	F	X	x'	fx'	x' <sup>2</sup>	fx' <sup>2</sup>
65 – 69	3	52	4	12	16	48
70 – 74	2	57	3	6	9	18
75 – 79	3	62	2	6	4	12
80 – 84	6	67	1	6	1	6
85 – 89	10	<b>72</b>	0	0	0	0
90 – 94	3	77	-1	-3	1	3
95 – 99	2	82	-2	-4	4	8
<i>i</i> =5	29	-	-	23	-	95



$$\begin{aligned}
 Mx &= M^1 + i \frac{\Sigma fx^1}{N} \\
 &= 83 + 5 \left( \frac{23}{29} \right) \\
 &= 83 + 5(0.79) \\
 &= 83 + (3.95) \\
 &= 86.95
 \end{aligned}$$

$$\begin{aligned}
 SD_t &= i \sqrt{\frac{\Sigma fx'^2}{N} - \left[ \frac{\Sigma fx'}{N} \right]^2} \\
 &= \sqrt[5]{\frac{95}{29} - \left( \frac{23}{29} \right)^2} \\
 &= \sqrt[5]{3.27 - (0.79)^2} \\
 &= \sqrt[5]{3.27 - (0.62)} \\
 &= \sqrt[5]{2.65} \\
 &= 5 (1.62) \\
 &= 8,1
 \end{aligned}$$

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	f <sub>h</sub>	f <sub>0</sub>	$\frac{(f_0-f_h)}{f_h}$
95-99	99.5	2.90	0.4981	0.00	0	2	0
	94.5	2.29	0.4890				
90-94	89.5	1.67	0.4525	0.03	1	3	2
	84.5	1.05	0.3531				
85-89	79.5	0.43	0.1664	0.09	2.61	10	2.8
	74.5	-0.17	0.43251				
80-84	74.5	-0.17	0.43251	0.18	5.2	6	0.15
	69.5	-0.79	0.21476				
75-79	69.5	-0.79	0.21476	-0.26	-8	3	-1.4
	64.5	-1.29	0.09853				
70-74	64.5	-1.29	0.09853	0.21	6.09	2	-0.7
	59.5	-1.79	0.03599				
65-69	59.5	-1.79	0.03599	0.11	3.19	3	-0.06
	54.5	-2.29	0.01054				
X <sup>2</sup>							2.79

Based on table above, reseracher found that  $x^2_{\text{count}} = 2.79$  while  $x^2_{\text{table}} = 5.991$  cause  $x^2_{\text{count}} < x^2_{\text{table}}$  ( $2.79 < 5.991$ ) with degree of freedom  $dk = 5 - 3 = 2$  and significat level  $\alpha = 5\%$ . So distribution of experiment class (Post-test) was normal

## 6. Median

No	Interval Class	F	Fk
1	65 - 69	3	3
2	70 - 74	2	5
3	75 - 79	3	8
4	80 - 84	6	14
5	85 - 89	<b>10</b>	24
6	90 - 94	3	27
7	95 - 99	2	29

Position of Me in the interval of classes is number 2, that:

$$Bb = 84.5$$

$$F = 6$$

$$fm = 10$$

$$i = 5$$

$$n = 29$$

$$1/2n = 14.5$$

So :

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

$$= 84.5 + 5 \left( \frac{14.5 - 6}{10} \right)$$

$$= 84.5 + 5 (0.85)$$

$$= 84.5 + 4.25$$

$$= 88.75$$

## 7. Modus

No	Interval Class	F	Fk
1	65 - 69	3	3
2	70 - 74	2	5
3	75 - 79	3	8
4	80 - 84	6	14
5	85 - 89	<b>10</b>	24
6	90 - 94	3	27
7	95 – 99	2	29

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

$$L = 84.5$$

$$d_1 = 4$$

$$d_2 = 7$$

$$i = 5$$

$$\begin{aligned}
 M_o &= 84.5 + \frac{4}{4+7} 5 \\
 &= 84.5 + 0.36 (5) \\
 &= 84.5 + 1.8 \\
 &= 86.3
 \end{aligned}$$

## Appendix 21

### RESULT OF THE NORMALITY TEST OF EXPERIMENT CLASS IN POST TEST

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

50	50	50	55	55	60	60	60	60	65
65	65	65	65	70	70	70	70	70	70
70	75	75	75	75	75	80	80	85	

2. High = 80

Low = 50

$$\begin{aligned}\text{Range} &= \text{High} - \text{Low} \\ &= 85 - 50 \\ &= 35\end{aligned}$$

3. Total of Classes =  $1 + 3,3 \log (n)$   
 $= 1 + 3,3 \log (29)$   
 $= 1 + 3.3 (1.76)$   
 $= 6.80$   
 $= 7$

$$4. \text{ Length of Classes} = \frac{\text{range}}{\text{total of class}} = \frac{35}{7} = 5$$

5. Mean

Interval Class	F	X	x'	fx'	x' <sup>2</sup>	fx' <sup>2</sup>
50 – 54	3	52	4	12	16	24
55 – 59	2	57	3	6	9	18
60 – 64	4	62	2	8	4	16
65 – 69	5	67	1	5	1	5
70 – 74	7	<b>72</b>	0	0	0	0
75 – 79	5	77	-1	-5	1	5
80 – 85	3	82	-2	-6	4	12
<i>i</i> = 5	29	-	-	20	-	80

$$\begin{aligned}
M_x &= M^1 + i \frac{\Sigma f x^1}{N} \\
&= 67 + 5 \left( \frac{20}{29} \right) \\
&= 67 + 5(0.68) \\
&= 67 + (3.4) \\
&= 70.4
\end{aligned}$$

$$\begin{aligned}
SD_t &= i \sqrt{\frac{\Sigma f x'^2}{N} - \left[ \frac{\Sigma f x'}{N} \right]^2} \\
&= \sqrt[5]{\frac{80}{29} - \left( \frac{20}{29} \right)^2} \\
&= \sqrt[5]{2.75 - (0.68)^2} \\
&= \sqrt[5]{2.75 - (0.46)} \\
&= \sqrt[5]{2.29} \\
&= 5 (1.51) \\
&= 7.55
\end{aligned}$$

Table of Normality Data Test with Chi Kuadrad Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	f <sub>h</sub>	f <sub>0</sub>	$\frac{(f_0-f_h)}{f_h}$
80 - 84	84.5	1.20	0.3849	0.18	5.2	3	-0.42
	79.5	0.54	0.2054				
75 – 79	74.5	-0.11	0.45620	-0.25	-7.3	5	-1.58
	70 – 74	69.5	-0.78				
65 – 69	64.5	-1.44	0.07493	-0.4	-11.6	4	-1.34
	60– 64	59.5	2.10				
55- 59	54.5	-2.76	0.00289	0.47	13.6	2	0.8
	50 – 54	50.5	-3.29				
X <sup>2</sup>							1.96

Based on table above, reseracher found that  $x^2_{count} = 1.96$  while  $x^2_{table} = 5.991$  cause  $x^2_{count} < x^2_{table}$  ( $1.96 < 5.991$ ) with degree of freedom  $dk = 5 - 3 = 2$  and significat level  $\alpha = 5\%$ . So distribution of experiment class (Post-test) was normal.

## 6. Median

No	Interval Class	F	Fk
1	50 – 54	3	3
2	55 - 59	2	5
3	60 - 64	4	9
4	65 - 69	5	14
5	70 - 74	7	21
6	75 - 79	5	26
7	80 – 84	3	29

Position of Me in the interval of classes is number 2, that:

$$Bb = 69.5$$

$$F = 5$$

$$fm = 7$$

$$i = 5$$

$$n = 29$$

$$1/2n = 14.5$$

So :

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

$$= 69.5 + 5 \left( \frac{14.5 - 5}{7} \right)$$

$$= 69.5 + 5 (1.35)$$

$$= 69.5 + 6.75$$

$$= 76.25$$



## 7. Modus

No	Interval Class	F	Fk
1	50 – 54	3	3
2	55 - 59	2	5
3	60 - 64	4	9
4	65 - 69	5	14
5	70 - 74	<b>7</b>	21
6	75 - 79	5	26
7	80 – 84	3	29

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

$$L = 69.5$$

$$d_1 = 2$$

$$d_2 = 2$$

$$i = 5$$

$$\begin{aligned}
 M_o &= 69.5 + \frac{2}{2+2} 5 \\
 &= 69.5 + 0.5 (5) \\
 &= 69.5 + 2.5 \\
 &= 72
 \end{aligned}$$

## Appendix 22

### HOMOGENEITY TEST (POST TEST)

#### 1. EXPERIMENT CLASS<sub>1</sub>

NO	Xi	Xi <sup>2</sup>
1	65	4225
2	65	4225
3	65	4225
4	70	4900
5	70	4900
6	75	5625
7	75	5625
8	75	5625
9	80	6400
10	80	6400
11	80	6400
12	80	6400
13	80	6400
14	80	6400
15	85	7225
16	85	7225
17	85	7225
18	85	7225
19	85	7225
20	85	7225
21	85	7225
22	85	7225
23	85	7225
24	85	7225
25	90	8100
26	90	8100
27	90	8100
28	95	9025
29	95	9025
	2350	192350

$$\begin{aligned}n &= 29 \\ \sum xi &= 2350 \\ \sum_{xi}^2 &= 192350\end{aligned}$$

So:

$$\begin{aligned} S^2 &= \frac{n\sum xi^2 - (\sum xi)^2}{n(n-1)} \\ &= \frac{29(192350) - (2350)^2}{29(29-1)} \\ &= \frac{5578150 - 5522500}{29(28)} \\ &= \frac{55650}{812} \\ &= 68.53 \end{aligned}$$

## 2. EXPERIMENT CLASS<sub>2</sub>

NO	Xi	Xi <sup>2</sup>
1	50	2500
2	50	2500
3	50	2500
4	55	3025
5	55	3025
6	60	3600
7	60	3600
8	60	3600
9	60	3600
10	65	4225
11	65	4225
12	65	4225
13	65	4225
14	65	4225
15	70	4900
16	70	4900
17	70	4900
18	70	4900
19	70	4900
20	70	4900
21	70	4900
22	75	5625

23	75	5625
24	75	5625
25	75	5625
26	75	5625
27	80	6400
28	80	6400
29	80	6400
	1930	130700

$$n = 29$$

$$\sum xi = 1930$$

$$\sum_{xi}^2 = 130700$$

So:

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

$$= \frac{29(130700) - (1930)^2}{29(29-1)}$$

$$= \frac{3790300 - 3724900}{29(28)}$$

$$= \frac{65400}{812}$$

$$= 80.54$$

The Formula was used to test hypothesis was:

4. VIII-2 and VIII-1 :

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

So:

$$F = \frac{80.54}{68.53}$$

$$= 1.17$$

After doing the calculation, researcher found that  $F_{\text{count}} = 1.17$  with  $\alpha$  5 % and  $dk = 29 \ \& \ 29$  from the distribution list F, researcher found that  $F_{\text{table}} = 2.052 \ \& \ 2.052$ , cause  $F_{\text{count}} < F_{\text{table}}$  ( $1.17 < 2.052 \ \& \ 2.052$ ). So, there is no difference the variant between the VIII-1 class and VIII-2 class. It means that the variant is homogenous.

## Appendix 23

### $T_{\text{test}}$ OF THE BOTH AVERAGES IN PRE-TEST

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

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

So:

$$\begin{aligned} S &= \sqrt{\frac{(29-1)88.42 + (29-2)79.86}{29+29-2}} \\ &= \sqrt{\frac{28(88.42) + 27(79.86)}{56}} \\ &= \sqrt{\frac{2475.76 + 2156.22}{56}} \\ &= \sqrt{\frac{4631.98}{56}} \\ &= \sqrt{82.713} \\ &= 9.09 \end{aligned}$$

So:

$$\begin{aligned} t &= \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \\ t &= \frac{72.65 - 69.9}{9.09 \sqrt{\frac{1}{29} + \frac{1}{29}}} \\ &= \frac{2.75}{9.09 \sqrt{0.034 + 0.034}} \end{aligned}$$

$$\begin{aligned}
&= \frac{2.75}{9.09 (0.26)} \\
&= \frac{2.75}{2.36} \\
&= 1.16
\end{aligned}$$

Based on researcher calculation result of the homogeneity test of the both averages, researcher found that  $t_{\text{count}} = 1.16$  with opportunity  $(1 - \alpha) = 1 - 5\% = 95\%$  and  $dk = n_1 + n_2 - 2 = 29 + 29 - 2 = 56$ , researcher found that  $t_{\text{table}} = 2.000$ , cause  $t_{\text{count}} < t_{\text{table}} (1.16 < 2.000)$ . So,  $H_0$  was rejected, it means no difference the average between the first class as experimental class and the second class as experiment class in this research.

## Appendix 24

### **T<sub>test</sub> OF THE BOTH AVERAGES IN POST – TEST**

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

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

So:

$$\begin{aligned} S &= \sqrt{\frac{(29-1) 80.54 + (29-2) 68.53}{29+29-2}} \\ &= \sqrt{\frac{28 (80.54) + 27 (68.53)}{56}} \\ &= \sqrt{\frac{2255.12 + 1850.31}{56}} \\ &= \sqrt{\frac{4105.43}{56}} \\ &= \sqrt{73.31} \\ &= 8.56 \end{aligned}$$

So:

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



$$\begin{aligned}
t &= \frac{75.95 - 75.4}{8.56 \sqrt{\frac{1}{29} + \frac{1}{29}}} \\
&= \frac{16.55}{8.56 \sqrt{0.034 + 0.034}} \\
&= \frac{16.55}{8.56 (0.068)} \\
&= \frac{16.55}{0.58} \\
&= 28.53
\end{aligned}$$

Based on researcher calculation result of the homogeneity test of the both averages, researcher found that  $t_{\text{count}} = 28.53$  with opportunity  $(1 - \alpha) = 1 - 5\% = 95\%$  and  $dk = n_1 + n_2 - 2 = 29 + 29 - 2 = 56$ , researcher found that  $t_{\text{table}} = 2.000$ , cause  $t_{\text{count}} > t_{\text{table}} (28.53 > 2.000)$ . So,  $H_a$  was accepted, it means there was the difference average between the first class as experimental class and the second class as experiment class in this research.

## Appendix 16

### Score of Experimental Class and Control Class Pre Test

#### 1. Score of Experimental Class I Pre Test Before Using Puzzle And Picture Media

No	The Initial Name of Students (n)	Pre- Test
1	AM	50
2	ARY	55
3	AR	75
4	AF	50
5	BHS	60
6	CR	65
7	DY	65
8	DS	70
9	FM	65
10	FR	60
11	FN	65
12	IH	45
13	IM	65
14	IEL	55
15	JL	75
16	KS	60
17	MH	60
18	NA	60
19	NAH	70
20	NAI	65
21	NF	50
22	RA	55
23	RMPT	70
24	SI	55
25	SFF	75
26	SMH	45
27	SM	55
28	SN	65
29	WM	50
	Total	1720

## 2. Score of Experiment Class II Pre Test

No	The Initial Name of Students (n)	Pre- Test
1	AN	70
2	AK	55
3	AY	65
4	AAH	50
5	AP	55
6	AH	50
7	AA	65
8	DAF	70
9	DRH	70
10	FH	75
11	HS	75
12	LN	60
13	MB	70
14	MP	50
15	MJ	55
16	ML	75
17	MR	65
18	MU	70
19	NMZ	65
20	NP	70
21	PS	70
22	PA	65
23	RI	45
24	RR	60
25	RU	60
26	SR	55
27	UM	60
28	YP	45
29	YKP	70
	Total	1800

## Appendix 17

### Score of Experimental Class and Control Class Post Test

#### 1. Score of Experimental Class Post Test After Using Puzzle And Picture Media

No	The Initial Name of Students (n)	Pos- Test
1	AM	70
2	ARY	75
3	AR	95
4	AF	80
5	BHS	85
6	CR	75
7	DY	65
8	DS	70
9	FM	75
10	FR	85
11	FN	95
12	IH	80
13	IM	85
14	IEL	80
15	JL	85
16	KS	65
17	MH	85
18	NA	90
19	NAH	80
20	NA	85
21	NF	80
22	RA	85
23	RMPT	85
24	SI	90
25	SFF	85
26	SMH	80
27	SM	85
28	SN	70
29	WM	95
	Total	2350

## 2. Score of Experiment Class II Post Test

No	The Initial Name of Students (n)	Pos- Test
1	AN	60
2	AK	65
3	AY	75
4	AAH	70
5	AP	60
6	AH	60
7	AA	75
8	DAF	65
9	DRH	70
10	FR	75
11	HS	70
12	LN	55
13	MB	50
14	MP	70
15	MJ	65
16	ML	75
17	MR	80
18	MU	75
19	NMZ	70
20	NP	70
21	PS	60
22	PA	75
23	RI	65
24	RR	50
25	RU	80
26	SR	55
27	UM	65
28	YP	70
29	YKP	80
	Total	1930



## APPENDIX 25

**Chi-Square Table**

dk	Significant level					
	50%	30%	20%	10%	5%	1%
<b>1</b>	0,455	1,074	1,642	2,706	3,841	6,635
<b>2</b>	1,386	2,408	3,219	4,605	<b>5,991</b>	9,210
<b>3</b>	2,366	3,665	4,642	6,251	7,815	11,341
<b>4</b>	3,357	4,878	5,989	7,779	9,488	13,277
<b>5</b>	4,351	6,064	7,289	9,236	11,070	15,086
<b>6</b>	5,348	7,231	8,558	10,645	12,592	16,812
<b>7</b>	6,346	8,383	9,803	12,017	14,067	18,475
<b>8</b>	7,344	9,524	11,030	13,362	15,507	20,090
<b>9</b>	8,343	10,656	12,242	14,684	16,919	21,666
<b>10</b>	9,342	11,781	13,442	15,987	18,307	23,209
<b>11</b>	10,341	12,899	14,631	17,275	19,675	24,725
<b>12</b>	11,340	14,011	15,812	18,549	21,026	26,217
<b>13</b>	12,340	15,119	16,985	19,812	22,362	27,688
<b>14</b>	13,339	16,222	18,151	21,064	23,685	29,141
<b>15</b>	14,339	17,222	19,311	22,307	24,996	30,578
<b>16</b>	15,338	18,418	20,465	23,542	26,296	32,000
<b>17</b>	16,338	19,511	21,615	24,769	27,587	33,409
<b>18</b>	17,338	20,601	22,760	25,989	28,869	34,805
<b>19</b>	18,338	21,689	23,900	27,204	30,144	36,191
<b>20</b>	19,337	22,775	25,038	28,412	31,410	37,566
<b>21</b>	20,337	23,858	26,171	29,615	32,671	38,932
<b>22</b>	21,337	24,939	27,301	30,813	33,924	40,289
<b>23</b>	22,337	26,018	28,429	32,007	35,172	41,638
<b>24</b>	23,337	27,096	29,553	33,196	35,415	42,980
<b>25</b>	24,337	28,172	30,675	34,382	37,652	44,314
<b>26</b>	25,336	29,246	31,795	35,563	38,885	45,642
<b>27</b>	26,336	30,319	32,912	36,741	40,113	46,963
<b>28</b>	27,336	31,391	34,027	37,916	41,337	48,278
<b>29</b>	28,336	32,461	35,139	39,087	42,557	49,588
<b>30</b>	29,336	33,530	36,250	40,256	43,773	50,892

**APPENDIX 26****Z-Table**

<b>Z</b>	<b>0.00</b>	<b>0.01</b>	<b>0.02</b>	<b>0.03</b>	<b>0.04</b>	<b>0.05</b>	<b>0.06</b>	<b>0.07</b>	<b>0.08</b>	<b>0.09</b>
<b>-3.9</b>	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00003
<b>-3.8</b>	0.00007	0.00007	0.00007	0.00006	0.00006	0.00006	0.00006	0.00005	0.00005	0.00005
<b>-3.7</b>	0.00011	0.00010	0.00010	0.00010	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008
<b>-3.6</b>	0.00016	0.00015	0.00015	0.00014	0.00014	0.00013	0.00013	0.00012	0.00012	0.00011
<b>-3.5</b>	0.00023	0.00022	0.00022	0.00021	0.00020	0.00019	0.00019	0.00018	0.00017	0.00017
<b>-3.4</b>	0.00034	0.00032	0.00031	0.00030	0.00029	0.00028	0.00027	0.00026	0.00025	0.00024
<b>-3.3</b>	0.00048	0.00047	0.00045	0.00043	0.00042	0.00040	0.00039	0.00038	0.00036	0.00035
<b>-3.2</b>	0.00069	0.00066	0.00064	0.00062	0.00060	0.00058	0.00056	0.00054	0.00052	0.00050
<b>-3.1</b>	0.00097	0.00094	0.00090	0.00087	0.00084	0.00082	0.00079	0.00076	0.00074	0.00071
<b>-3.0</b>	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100
<b>-2.9</b>	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139
<b>-2.8</b>	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193
<b>-2.7</b>	0.00347	0.00336	0.00326	0.00317	0.00307	0.00298	0.00289	0.00280	0.00272	0.00264
<b>-2.6</b>	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.03680	0.00357
<b>-2.5</b>	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480
<b>-2.4</b>	0.00820	0.00798	0.00776	0.00755	0.00734	0.00714	0.00695	0.00676	0.00657	0.00639
<b>-2.3</b>	0.01072	0.01044	0.01017	0.00990	0.00964	0.00939	0.00914	0.00889	0.00866	0.00842
<b>-2.2</b>	0.01390	0.01355	0.01321	0.01287	0.01255	0.01222	0.01191	0.01160	0.01130	0.01101
<b>-2.1</b>	0.01786	0.01743	0.01700	0.01659	0.01618	0.01578	0.01539	0.01500	0.01463	0.01426
<b>-2.0</b>	0.02275	0.02222	0.02169	0.02118	0.02068	0.02018	0.01970	0.01923	0.01876	0.01831
<b>-1.9</b>	0.02872	0.02807	0.02743	0.02680	0.02619	0.02559	0.02500	0.02442	0.02385	0.02330
<b>-1.8</b>	0.03593	0.03515	0.03438	0.03362	0.03288	0.03216	0.03144	0.03074	0.03005	0.02938
<b>-1.7</b>	0.04457	0.04363	0.04272	0.04182	0.04093	0.04006	0.03920	0.03836	0.03754	0.03673
<b>-1.6</b>	0.05480	0.05370	0.05262	0.05155	0.05050	0.04947	0.04846	0.04746	0.04648	0.04551



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

**Z-Table**

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

[illegible]

# APPENDIX 27

## Percentage Points of the t Distribution

Two Tail Test						
	0,50	0,20	0,10	0,05	0,02	0,01
One Tail Test						
dk	0,25	0,10	0, 005	0,025	0,01	0,05
1	1,000	3,078	6,314	12,706	31,821	63,657
2	0,816	1,886	2,920	4,303	6,965	9,925
3	0,765	1,638	2,353	3,182	4,541	5,841
4	0,741	1,533	2,132	2,776	3,747	4,604
5	0,721	1,486	2,015	2,571	3,365	4,032
6	0,718	1,440	1,943	2,447	3,143	3,707
7	0,711	1,415	1,895	2,365	2,998	3,499
8	0,706	1,397	1,860	2,306	2,896	3,355
9	0,703	1,383	1,833	2,262	2,821	3,250
10	0,700	1,372	1,812	2,228	2,764	3,165
11	0,697	1,363	1,796	2,201	2,718	3,106
12	0,695	1,356	1,782	2,178	2,681	3,055
13	0,692	1,350	1,771	2,160	2,650	3,012
14	0,691	1,345	1,761	2,145	2,624	2,977
15	0,690	1,341	1,753	2,132	2,623	2,947
16	0,689	1,337	1,746	2,120	2,583	2,921
17	0,688	1,333	1,743	2,110	2,567	2,898
18	0,688	1,330	1,740	2,101	2,552	2,878
19	0,687	1,328	1,729	2,093	2,539	2,861
20	0,687	1,325	1,725	2,086	2,528	2,845
21	0,686	1,323	1,721	2,080	2,518	2,831
22	0,686	1,321	1,717	2,074	2,508	2,819
23	0,685	1,319	1,714	2,069	2,500	2,807
24	0,685	1,318	1,711	2,064	2,492	2,797
25	0,684	1,316	1,708	2,060	2,485	2,787
26	0,684	1,315	1,706	2,056	2,479	2,779
27	0,684	1,314	1,703	<b>2,052</b>	2,473	2,771
28	0,683	1,313	1,701	2,048	2,467	2,763
29	0,683	1,311	1,699	2,045	2,462	2,756
30	0,683	1,310	1,697	<b>2,042</b>	2,457	2,750
40	0,681	1,303	1,684	2,021	2,423	2,704
60	0,679	1,296	1,671	<b>2,000</b>	2,390	2,660
120	0,677	1,289	1,658	1,980	2,358	2,617
∞	0,674	1,282	1,645	1,960	2,326	2,576