THE EFFECT OF USING DIRECT METHOD ON STUDENTS' VOCABULARY MASTERY AT GRADE VIII OF SMP NEGERI 5 PADANGSIDIMPUAN

A THESIS

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

By:

FITRIYANTI
Reg. No. 11 340 0011

ENGLISH EDUCATION DEPARTMENT

TARBIYAH AND TEACHER TRAINING FACULTY
STATE INSTITUTE FOR ISLAMIC STUDIES
PADANGSIDIMPUAN
2015

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Assalamu'alaikum Wr.Wb.

After Reading, studying and giving advice for necessary revision on thesis belongs to Fitriyanti, entitled "The Effect of Using Direct Method on Students' Vocabulary Mastery at Grade VIII of SMP Negeri 5 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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ABSTRACT

This research focused about the effect of Direct Method on Students' Vocabulary Mastery at Grade VIII of SMP Negeri 5 Padangsidimpuan. The problems of this research were most of students get low achievement in vocabulary mastery, and students had lack of motivation in learning vocabulary, and also students did not have good method in vocabulary or they did not know the method. The purpose of this research was to find out the effect of direct method on students' vocabulary mastery at grade VIII of SMP Negeri 5 Padangsidimpuan.

This research employed experimental research. The population of this research was the eighth grade of SMP Negeri 5 Padangsidimpuan. The total of population were twelfth classes. Then, the sample of the research was 2 classes, experiment class (VIII-1) and control class VIII-3). It was taken randomly after conducting normality and homogeneity test. To collect the data, researcher used test for measuring students' vocabulary mastery. 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 class was higher than control class (81.15> 65), and the score of t_{count} was bigger than t_{table} (32.35 > 2.000). It means that the hypothesis alternative (H_a) was accepted. It was concluded that there was the significant effect of using direct method on Students' Vocabulary Mastery at Grade VIII of SMP Negeri 5 Padangsidimpuan..

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I realize this thesis cannot be considered perfect without critiques and suggestions. Therefore, it is such a pleasure for me to get critiques and suggestions from the readers to make this thesis better.

Padangsidimpuan, 07 September 2015
Researcher

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CHAPTER I

INTRODUCTION

A. Background of the Problem

Vocabulary is an important component of language in learning a language, especially as basic of language. Vocabulary an essential role in creating understanding of language through what a student hears and reads in school. Vocabulary becomes all the more important than grammar, as it is this vocabulary that helps the student to communicate successfully. Besides, vocabulary is one element that links the four skills they are: listening, speaking, reading and writing. On the other hand, if the students have a good ability in vocabulary, they will be successful in their study. Without proportional amount of vocabulary anyone will get trouble in her reading, speaking, writing and listening.

Vocabulary has a lot of significances to four skills; first, vocabulary is important in reading comprehension because vocabulary helps learners in comprehending the text. Vocabulary not only aids us in understanding other people but also essential in comprehending the books and articles we read. By having a good skill in vocabulary, the students will be easy to get information from many sources from books, magazine, newspaper, brochure, and computer. On the other hand, if the students have a good ability in vocabulary, they will be successful in their study because they understand what the text about.

Second, Vocabulary is important in speaking comprehension, because vocabulary facilitates the learners to explain their ideas orally. We use spoken and written words everyday to communicate ideas, thoughts, and emotions to those around us. Sometimes we communicate successfully, and sometimes we're not quite so successful. However, a good vocabulary can help us say what we mean. Vocabulary can make us understand what people say.

Third, vocabulary is important in writing comprehension because it helps them to expand their ideas based on the topic sentence that they want. Writing is the process of giving information by texts that involved in generating the letters, words and sentences.

Fourth, Vocabulary is important in listening comprehension because they comprehend and understand what other person speaks. Without proportional amount of vocabulary anyone will get trouble in her listening.

Based on the illustration above, it is undeniably that vocabulary is important for everybody. However, vocabularies still a problem in school, especially at SMP 5 Padangsidimpuan. It can be seen based on illustration below.

First, based on interview with the teacher. Students' vocabulary mastery achievement is unsatisfactory. Based on the constitution of National Education System (Sisdiknas) No. 20 in 2003, passing grade of English in junior high school is 75 for all subjects and skills. However, the data found in SMP N 5 Padangsidimpuan asserts the average of students' vocabulary mastery

achievement of grade VIII is about 65-72.[1] Therefore students' vocabulary achievement does not fulfill the expectation.

Second, many students are lack motivation and attention about the important of vocabulary. Students are seldom to practice because students cannot master and memorize vocabulary well.

Finally, most of them do not have the strategies in vocabulary mastery. They do not have the tricks or technique to make easier. Teachers teach vocabulary just opening the dictionary method in finding out new vocabulary or teachers' performance including their teaching method.

To solve the problem in vocabulary, there are some alternative vocabularies teaching activity that available and applicable. As researcher knew, there are many techniques, strategies or methods that can increase the students' vocabulary mastery. In this research, the researcher employs the method in teaching Vocabulary.

TPR (Total Physical Response) is involves the giving of commands to which the students react; GTM is a way of analysis a language that approaches the language first through detailed analysis of its grammar rules, followed by application of this knowledge to the task of translating sentences and texts into out of the target language; Direct Method is the method promotes the use of introducing vocabulary as if the students has no previous knowledge of what is

[1] Buku Kumpulan Nilai SMP Negeri.5 Padangsidimpuan, *Private Document,* (SMP Negeri 5 Padangsidimpuan: November 19th, 2014 at 11.30 a.m).

might be called even in his or her native language. These methods theoretically judged to be good to apply in mastering vocabulary.

From the three alternative methods above, the researcher was choose to employ direct method (DM) and it gave some reason about this strategy. First, direct method makes the learning of English interesting and lively by establishing direct bond between a word and its meaning. Accordingly, by understanding word, students will be able to understand the meaning.

Second, through direct method the students will be more active in developing vocabulary because they will not depend on their teacher. The students are very actives, their oral communication skills are emphasized, and they have to speak a lot in direct method. In direct method, the vocabulary is learned through practice everyday.

Finally, through direct method students are able to understand what they learn, think about it and then express their own ideas in correct English about what they have read and learnt because the teacher must use pictures, gestures, pantomimes or the target language that is familiar to the students to explain a word.

Based on the background above, to solve the problems the researcher interested to conduct a experimental research through the title " THE EFFECT OF USING DIRECT METHOD ON STUDENTS' VOCABULARY MASTERY AT GRADE VIII OF SMP NEGERI 5 PADANGSIDIMPUAN**".**

B. Identification of the Problem

Vocabulary mastery is one of the main skills have to be mastered by students. Without mastering vocabulary, students are not able to get the best of English languages skills, such as reading, writing, speaking, and listening. In addition, teaching vocabulary is significant to learned; in teaching vocabulary of English language is different ways with foreign languages, because the lettering differs with the pronunciation.

To teach vocabulary especially for junior high school, teacher should find an appropriate strategies, media, and method; because students need an interesting way to learn so they can cover the entire of learning message. Especially at SMP N 5 Padangsidimpuan, researcher found that there are some problems in vocabulary mastery at grade VIII of SMP N 5 Padangsidimpuan as following are: 1) students low achievement in vocabulary mastery, 2) students have lack motivation in learning vocabulary, 3) students did not have good method in vocabulary or they did know the method.

C. Limitation of the Problem

As mention above, the factor to teach vocabulary mastery teacher should find an approach, strategies, media and method. Here, the researcher does not discuss all the factors. The researcher discusses one factor only that is the method.

There are many methods in teaching vocabulary such as, total physical response (TPR), grammar translation method (GTM) and direct method. The researcher chooses direct method to do this research.

In this research, the researcher want to focuses about finding and getting the effect of direct method on students' vocabulary mastery at grade VIII of SMP N 5 Padangsidimpuan. In this research the researcher will research about profession, illness, animals, fruits and sports.

D. Formulation of the Problem

The formulation of the problem of this research as follow: "was there a significant effect of using direct method to students' vocabulary mastery at grade VIII of SMP Negeri 5 Padangsidimpuan?"

E. Purpose of the Research

From the formulation above, the purpose of this research was to examine the significant effect of direct method to students' vocabulary mastery at grade VIII of SMP N 5 Padangsidimpuan.

F. Significances of the Research

This research was expected to be useful at least in three domains, for the science of education, for teachers and for future researchers. The significances of research can be described as follow:

1. Head master of the school, to motivate the English teachers' to teach English in a good way.
2. English teachers, to develop the teaching English especially in vocabulary.

3. Students and readers, to know the way to learn English will be better.

G. Systematic of the Thesis

The systematic of this research is divided into five chapters. Each chapter consists of many sub chapters with detail as follow: in chapter one, it is consist of background of the problem, identification of the problem, limitation of the problem,formulation of the problem, purpose of research, significances of the research, and systematic of the thesis.

In chapter two, it is consist of the theoretical description, which consists of sub chapters such as theoretical consists of description of direct method, and description of vocabulary. Then, review of related findings, conceptual of frame work and hypothesis.

In chapter three, it is consist of research methodology which consist of time and place of the research, research methodology, population and sample, instrument of research, the techniques of data collection and the last the techniques of data analysis and outline of the thesis.

In chapter four, it is the result of the research talking about the analysis of data. This chapter four, it is consist of description of data, hypothesis testing, discussion and the threats of research.

Finally, in chapter five consist of conclusion that is giving conclusion about the result of research and suggestion that given suggestion to students and teacher by researcher.

CHAPTER II

THEORITICAL DESCRIPTION

A. Theoretical Description

1. Vocabulary

a. The Definition of Vocabulary

Vocabulary is one aspect should be owned by every student to make them understand and master English language. It is a part of language that so important to all aspect in life. Howard Jackson said "Vocabulary is a representative collection of the words that exist in English language".[1] Then, Hornby says "Vocabulary is all the words that a person knows or use, the words that people use when they are telling about particular subject".[2] .And then, Penny Ur also definite vocabulary as the words we teach in foreign language".[3] Next, Caroline says "vocabulary is the collection of words that an individual known".[4] According to the definitions above it can be concluded that vocabulary is a stock of words in a language, written or spoken, with meaning that considered as cultural meaning used by group or individual community.

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[1] Howard Jackson, *Words, Meaning and Vocabulary* (London: Casell, 2000) p. 118.
[2] A. S. Hornby, *Op.,Cit.* p.1506.
[3] Penny Ur, *A Course in Language Teaching* (United Kingdom: University Press, 2000) p. 60.
[4] Caroline T. Linse, *Practical English Language Teaching: Young Learners.*(New York: McGraw-Hill,2005),p.121.

According to Jack C. Richard and Willy A Renandya says "Vocabulary is a core component of language proficiency and provides much of the basis for how well learners speak, listen, read and write".[5] It means words can be noun, verbs, adjectives, adverbs, preposition, and conjunction to use language. Then language has some words or vocabulary for speaking, writing, reading and listening.

So, it can be concluded that vocabulary as all words that people know or use and also as the core component of words that is list in the alphabetical order.

b. Kinds of vocabulary

According to Thornbury in Harmer, there are two kinds of vocabulary, as follows: Receptive vocabulary or Passive vocabulary and Productive vocabulary or Active vocabulary.[6] The further explanation 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 to memorize all the vocabularies of a certain language but someone can understand the ideas of the utterance contextually not word by word.

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

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

2) Productive Vocabulary or Active Vocabulary

Productive vocabulary involves of knowing how to pronounce the word, how to write and spell it, how to use it in correct grammatical patterns along with the words that usually collocate with.[7]

Based on the quotation above, the researcher take a conclusion about receptive or passive vocabulary will be easy understand by using listening and reading to remember words or vocabularies, while productive or active vocabulary will be easy understand by using concentration patterns and grammatical word to get vocabulary.

According to Haycraft, vocabulary can be classified into two kinds. They are:

1) Active vocabulary
   Active vocabulary is the words which the student understands, can pronounce correctly and use constructively in speaking and writing.
2) Passive vocabulary
   Passive vocabulary is the words which the student recognizes and understands when they occur in a context, but which he cannot produce correctly himself.[8]

Based on the quotation above, the researcher takes a conclusion about kinds of vocabulary. Active vocabulary refers to the words the students should use in speaking and writing, while passive vocabulary means words they needs only to comprehend especially

[7] *Ibid*., p. 159.
[8] Jhon Haycraft, *An Introduction to English Language Teaching* (London: Group Ltd, 1986) p.44.

in reading and listening. Vocabulary is very useful for anyone who is studying a foreign language.

So, vocabulary must be introduced in many methods, because if the students have many words, they can make the sparkling communication with others.

c. Teaching Vocabulary

1) Background to the Teaching of Vocabulary

Vocabulary teaching and learning must fit into the broader framework of a language course. One way to make sure that there is a balanced range of learning opportunities is to see a language course as consisting of four stands, they are as follows:

a) Learning from meaning-focused input
The "learning from meaning-focused input" stands involves learning from listening and reading. For vocabulary learning to occur in this stand, learners need to know 98 percent of the running words already. That means that, at most, there should be only one unknown word every word in every fifty running words. This one unknown word in fifty is something that can be learned through guessing from context and which does not stop comprehension of the text.

b) Deliberate learning
The deliberate learning stand is sometimes called from-focused instruction, language-focused learning, or language study. It involves paying deliberate attention to language features such as sounds, spelling, vocabulary, grammar, or discourse that are presented out of context. The most obvious deliberate learning technique is learning new vocabulary by memorizing their first language translations.

c) Learning from meaning-focused output
The "learning from meaning-focused output" stand involves learning through speaking and writing where the learners' main attention is on communicating messages. It may seem a

little strange to see the productive skills as source of vocabulary learning, but using vocabulary productively can strengthen learning and can push learners to focus on aspect of vocabulary knowledge that they did not need to attend to when listening and reading

d) Fluency development
Vocabulary must not only be known, it must be readily available for use. The fluency development stand of a course aims at helping learners make the best use of what they already know. It is important to see fluency as being related to each of the four skills of listening, speaking, reading, and writing with fluency needing to be development independently in each of these skills.[9]

Vocabulary is very important. If we master the vocabulary so we will not master four skill that are listening, speaking, reading and writing. Therefore, there is teaching vocabulary.

2) The status of vocabulary in the curriculum

For much of this century, the principal focus of language teaching has been on the grammar of the language. While grammar translation approaches to the teaching of language provided a balanced diet of grammar and vocabulary, audio-linguistics suggested that the emphasis should be strongly on the acquisition of the basic grammatical patterns of the language. One of the most influential structural linguistic of the day went so far as to argue

[9] David Nunan, *Practical English Language Teaching,* (New York: MC Grow Hill, 2003), p. 133-134.

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. This has come about partly as a result of the development of communicative approaches to language teaching, and partly through the stimulus of comprehension based methods such as the Natural Approach.

In 1983, River argued that the acquisition of an adequate vocabulary is essential for successful second language use because, without an extensive vocabulary, it will be unable to use the structures and functions we may have learned the comprehensible communication.[10]

The consensus of opinion seems to be that the development of a rich vocabulary is an important element in the acquisition of second language.

3) Principle for Teaching Vocabulary

Learners see vocabulary as being a very important part of language learning and one of the difficulties in planning vocabulary component of a course is making sure that it does not overwhelm other essential parts of the course. The best way to avoid this is for the teacher and course designer to have a set of

[10] David Nunan, *Language Teaching Methodology,* (Malaysia: Longman, 1998), p. 117.

guiding principles that can be applied in variety of teaching and learning situations. They are:

a) Focus on the most useful vocabulary first
   The most useful vocabulary that every English language learners needs whether they use language for listening, speaking, writing, or whether they use the language in formal and informal situations, is the most frequent 1000 word families of English. This vocabulary is so useful that it covers around 75 percent of the running words in academic texts and news papers, over 80 percent of the running words in novels, and about 85 percent of the running words in conversation. It contains most of the 176 function word families (words like *a, the, of, because, could*), and words like *keep, kind, know, lack,* and *land*. It is possible to say and write a lot using only the first English.
b) Focus on the vocabulary in the most appropriate way
   There are four most important *vocabulary* learning strategies, they are using word parts, guessing from context, using word cards, and using dictionaries. Using word cards is one of the appropriate strategies for children to help them memorize the new words.
c) Give attention to the high frequency words across the four stands of course
   High frequency vocabulary needs to occur in all four stands of a course. It should get deliberate attention through teaching and study and should be met and used in communicating messages in listening, speaking, reading, and writing. High frequency vocabulary should also be fluently accessible for receptive and productive use.
d) Encourage learners to reflect on and take responsibility for learning
   There is an important principle that lies behind choosing and learning and that is that learners that they must be responsible for their own learning. Taking this responsibility requires:
   (1) Knowledge of what to learn and the range of option for learning vocabulary,
   (2) Skill in choosing the best option, and
   (3) The ability to monitor and evaluate progress with those options.[11]

[11] *Ibid*, p. 135-140.

Based on explanation, the more principles how the way teaching vocabulary that the students memorize vocabulary rapidly. But in this research, the researcher uses direct method.

d. How to Present New Vocabulary

Vocabulary is basic communication. If the people do not recognize the meaning of the key words used by those who address them, they will not be able to participate in the conversation. If they want to express ideas or ask for information, they must be able to produce words to convey their meaning. Thus vocabulary learning is very crucial in developing competence in a second or foreign language.

In teaching vocabulary, the teachers are hoped to have some techniques in order to make students familiar with the vocabulary so that they understand new word easily. The techniques functions not only to help the students grasp the meaning of new words quite easily, but also to vary the teaching activity in order to avoid the boredom on the part of students. Harmer mentions that the following aids can help to explain new vocabulary are:[12]

[12] Jeremy Harmer, *Op.Cit.,*p.85-86.

1) Realia

One way of presenting words is to bring the things they represent into the classroom by bringing “realia” into the room. Words like “postcards”, “ruler”, “pen”, “ball”, etc. can obviously be presented in this way. The teacher holds up the object (or points to it), says the word and then gets students to repeat it.

2) Pictures

Bringing a pen into the classroom is not a problem. Bringing in a car, however, is. One solution is the use of pictures. Pictures can be board drawings, wall pictures, and charts, flashcards, magazine pictures and any other non-technical visual Representation. Pictures can be used to explain the meaning of vocabulary items: teachers can draw things on the board or bring in pictures. They can illustrate concepts such as above and opposite just as easily hats, coats, walking, sticks, cars, smiles and frown.

3) Mime, Action, Gesture

It is often impossible to explain the meaning of words and grammar either through the use of realia or in pictures. Actions, in particular, are probably better explained by mime. Concepts like running or jumping are easy to present in this way; so are ways of walking, expressions, prepositions and times.

4) Contrast

We saw how words exist because of their sense relations and this can be used to teach meaning. We can present the meaning of “empty” by contrasting it with “full”, “cold” by contrasting it with “hot”.

5) Enumeration

The world “vegetable” is difficult to be explained visually. If the teacher rapidly lists or enumerates a number of vegetables, the meaning will become clear. The same is true of a word like “clothes”.

6) Explanation

Explanation the meaning of vocabulary items can be extremely difficult just as grammatical explanation. It will be important in giving such explanation to make sure that the explanations include information about when the item can be used. For example, it would be unsatisfactory just to say that “mate” is a word for “friend” unless you point out that it is colloquial informal English and only be used in certain context.

7) Translation

For many years, translation went out of fashion and was considered as something of sin. Clearly, if the teacher is always

translating this will impede the students' learning since that want to hear and use the target language.

Based on explanation above, there are some techniques to present new vocabulary. The students will be helped to mastering the vocabulary. Therefore, there is one of good strategies to improve students' vocabulary mastery in the classroom individually.

e. Vocabulary Evaluation

After researcher gives the lesson to the students through direct method, it is important to know how far their ability about the lesson, especially in vocabulary mastery. Teacher needs to know their ability; therefore, the vocabulary test will be designed in order to measure the students' vocabulary mastery at grade VIII of SMP N 5 Padangsidimpuan. Researcher uses completion question to know their ability in vocabulary mastery.

The topics evaluations are:

a) Identify the profession
b) Identify the illness
c) Identify the animals
d) Identify the fruits
e) Identify the sports

From the explanation above the researcher take a conclusion the meaning of vocabulary that vocabulary is very important. Vocabulary as all words that people know or use and also as the core component of words that are list in the alphabetical order and core component of language proficiency and provides much of the basis for how well learners speak, listen, read and write. This research, the researcher wants to focuses about the identify profession, illness, animals, fruits, and sports.

2. Direct Method

a. Definition of Direct Method

According to Freeman "the direct method has one very basic rule: no translation is allowed".[13] In fact, the direct method receives its name from the fact that meaning is to be conveyed *directly* in the target language through the use of demonstration and visual aids, with no recourse to the students' native language. In addition, according to Brown" the method would include lots of oral interaction, spontaneous use of the language, no translation between first and second language and little or no analysis of grammatical rules."[14]

[13] Diane Larsen – Freeman, *Techniques and Principles in Language Taeching*, (Oxford: University Press, 2000),p.23.

[14] H. Douglas Brown, *Teaching by Principles: An Interactive Approach to Language Pedagogy*.(London: Prentice Hall Regents,1994),p.55.

Based on definition above it can be conclude direct method is the method that is used in teaching a language by using the target language without going through the translation to the native language. The teacher must use pictures, gestures, pantomimes or the target language that is familiar to the students to explain a word.

Therefore, direct method can make students more active in learning vocabulary. Direct method is suitable done by students, because in this method the every students demand that they can build imagination from the word with connecting background knowledge. Direct method is not only to help students understand the text but also the students can remember learning material, especially in comprehending the difficulties the words.

b. Characteristic of Direct Method

Basically, there are same of characteristic of learning vocabulary through direct methods are:

1) The teacher introduces a new target language word or phrases, he demonstrates it's meaning through the use of realia, pictures, or pantomime; he never translates it into the students' native language.
2) Students speak in the target language a great deal and communicate as if they were in real situation.
3) Grammar is taught inductively; that is, the students are presented with examples. An explicit grammar rule may never be given.
4) Students practice vocabulary by using new words in complete sentences.[15]

[15] Diane Larsen – Freeman, *Op. Cit.,*p. 29.

c. Principles of Direct Method

Principle is one of hand grip for teacher to teach in the classroom. All of subjects have principles; there are some principles of direct method in learning vocabulary mastery.

Basically, Richards shows the principles of the direct method as follows:

1) Classroom instruction was conducted exclusively in the target language.
2) Only everyday vocabulary and sentences were taught.
3) Oral communication skills were built up in a carefully traded progression organized around question-and-answer exchanges between teachers and students in small, intensive classes.
4) Grammar was taught inductively.
5) New teaching points were taught through modeling and practice.
6) Concrete vocabulary was taught through demonstration, objects, and pictures; abstract vocabulary was taught by association of ideas.
7) Both speech and listening comprehension were taught.
8) Correct pronunciation and grammar were emphasized.[16]

Based on explanation above, many principles in learning vocabulary, but the purpose of the experts is same. Principles can be used by teacher to avoid misunderstanding in teaching vocabulary mastery in the classroom. Therefore, the teacher should know the principles in teaching, especially vocabulary.

d. Technique of Direct Method

According Freeman, there are some technique that can be used in teaching English by using the direct method, they are:[17]

[16] Jack C.Richards & Theodore S. Rogers, *Approaches and Methods in Language Teaching, a Description Analysis.* (New York: Cambridge University Press, 2001),p. 9-10.

1) **Reading aloud**

The students take turns reading section of a passage, play, or dialog out loud. At the end of each student's turn, the teacher uses gestures, pictures, realia, examples, or other means to make the meaning of the section clear.

2) **Question and answer exercise**

This exercise is conducted only in the target language. Students are asked questions and answer in full sentences so that they practice new words and grammatical structures. They have the opportunity to ask questions as well as answer them.

3) **Getting students to self-correct**

The teacher of this class has the students self-correct by asking them to make a choice between what they said and an alternative answer he supplied. There are, however, other ways of getting students to self-correct. For example, a teacher might simply repeat what a student has just said, using a questioning voice to signal to the student that something was wrong with it. Another possibility is for the teacher to repeat what the student said, stopping just before error. The student knows that the next word was wrong.

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[17] Diane Larsen – Freeman, *Op. Cit.,p.30-32.*

4) Conversation Practice

The teacher asks students a number of questions in the target languages, which the students have to understand to be able answer correctly. In the class observed, the teacher asked individual students questions about themselves. The questions contained a particular grammar structure. Later, the students were able to ask each other their own questions using the same grammatical structure.

5) Fill-in-the-Blank exercise

This technique has already been discussed in the Grammar-Translation Method, but differs in its application in the direct method. All the items are in the target language; furthermore, no explicit grammar rule would be applied. The students would have induced the grammar rule they need to fill in the blanks from examples and practices with earlier parts of the lesson.

6) Dictation

The teacher reads the passage three times. The first time the teacher reads it at a normal speed, while the students just listen. The second time he reads the passage phrase by phrase, pausing long enough to allow students to write down what they have heard. The last time the teacher again reads at a normal speed, and the students check their work.

7) Map Drawing

Have a completely labeled map if they followed his instruction correctly. The students then instructed the teacher to do the same thing with a map he had drawn on the blackboard. Each student could have a turn giving the teacher instruction for finding and labeling one geographical feature.

8) Paragraph Writing

The teacher in this class asked the students to write a paragraph in their own words on the major geographical features of the United States. They could have done this from memory, or they could have used the reading passage in the lesson as a model.

By using direct method in the classroom can make teaching and learning process more active between teacher and students. Moreover, direct method can help the teacher to know how far the students comprehend about the vocabulary when they read text. The researcher chooses reading aloud to solve the vocabulary problem at grade VIII of SMP Negeri 5 Padangsidimpuan.

e. Procedures of Direct Method

Basically, according to Ahmad Nurul Furqon there some procedure can apply in the classroom. They are:

1) The teacher greets the students

2) The teacher show the pictures to the students and ask them to guess what it is; or the teacher gives the students a reading text and then asks the students to read the text.
3) The teacher asks the questions related to the text or the pictures
4) The students response the teacher's question
5) The teacher pronounces a new words
6) The teacher gives the time to the student to ask the question about the words they don't know and the teacher answer by using the target language, pictures or gesture
7) The teacher asks the students to ask a question to other friends related to the text or pictures and other students give the answer.
8) The teacher closes the meeting.[18]

Based on quotation above, there are some procedures of applying direct method in the classroom have different activities. It can be looked from the procedures that direct method is also to make teacher and student active in teaching learning process in the classroom, especially in learning vocabulary.

f. Material Development

Materials are visible product of activity, regardless of whether such activity is useful or even necessary.[19] Materials help to organize the teaching-learning process, by providing a path through the complex mass of a language to be learnt. Good materials should provide a clear and coherent unit structure which will guide teacher and learner through various activities in such a way as to maximize the chances of learning.

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[18] Ahmad Nurul Furqon " *Using Direct Method in Teaching Vocabulary at First Grade of Private Junior High School Muhammadiyah 44 Pamulang,* (A Skripsi, English Department Faculty of Tarbiyah and Teacher Training Syarif Hidayatullah State Islamic University, 2007), p.

[19] Tom Hutchinson and Alan Wateers. *English for Specific Purpose,* (New York:University Press,),p. 106.

So that before making lesson plan, we need discuss about the material development of the teaching below, the material development by using direct method are:

1) The list vocabulary picture that will be explained to the students.
2) The list of vocabulary about the profession, animal, fruits, illness and sports.

From the explanation above the researcher take a conclusion meaning of direct method in here is used in teaching a language by using the target language without going through the translation to the native language. The teacher must use pictures, gestures, pantomimes or the target language that is familiar to the students to explain a word.

The indicator this research, the researcher chooses about the meaning of the word and the topic about identifies the professions, identify the illness, identify the animals, identify the fruits and identify sports.

3. Conventional Method in Teaching

Conventional method is the method that usually used by the teachers to teach the text to students.[20] In addition, it uses the traditional way in teaching and learning process. The researcher concluded that conventional

[20] Jhon Deriden. *Conventional Strategy (http://www.britannia.com/EBchecked/topic/421797/n nuclear-strategy/52993/conventional-strategy),* retrieved on October 17, 2014 at 08.00 p.m.

method is the way that is used by the teachers in teaching a material based on the agreement of the teacher at school.

a. Definition of Conventional

Conventional or traditional teaching is concerned with the teacher being the controller of the learning environment. Power and responsibility are held by the teacher and they play the role of instructor and decision maker they regard students as having 'knowledge holes' that need to be filled with information.[21] According to Hudson that "conventional teaching is a method that used by the teachers based on mutual agreement in a school.[22]. In addition, it uses traditional way in teaching and learning process. In short the traditional teacher views that it is the teacher that causes learning to occur.

b. The classification of conventional teaching

As we know that there are many kinds of teaching method that can be applied by teacher. One of the teaching methods is conventional or traditional method. Conventional method can be divided in some kinds. They are: lecturer method, project method, catechize method, discuss method, lecture discussion, problem solving method, homework,

[21] Belias Dimitrios. *2013.Traditional Teaching Method.*(Online). Vol.9. No. 28. (Http://olam. Ed.asu.edu/epaa/,diakses 27 April 2015).

[22]Hudson. *The meaning of Conventional Teaching.*(Online).(http://www.conventional-strategy/topic/ 54372-strategy), retrieved on April 27, 2015).

recitation method, demonstration and experiment method, role play method, and so on.[23] But the most traditional in teaching method is:

1) Lecturer method

Lecturer method is traditional method because this method had be used long since is as an oral communication tool between teacher and students in interaction educative. Moreover in educative and traditional teaching it is like in rural that have weakness in learning facilities and teacher.[24]

According to Abu Ahmadi, there are some the strength and weakness of this method:

a) The strength

(1) In short time teacher is able to convoy the material as many as possible.
(2) The organization of class is more simple, it is not important to group of students like other method
(3) Teacher can master the overall of class goodly
(4) Teacher is as lecturer go through goodly, so it can make the spirit and creative
(5) Flexible

b) The weakness

(1) Teacher is difficult to know the student's comprehension with the material had been given.
(2) Sometimes teacher wants to convoy the material as many as possible until it is characteristic of pump.
(3) Students is passive

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[23]Syaiful Bahri Djamarah. *Strategy Belajar-Mengajar*.(Jakarta: PT.Asdi Mahasatya,2006).p.83

[24] Syaiful Bahri Djamarah. *Guru dan Anak Didik(Dalam Interaksi Edukatif)*. (Jakarta:PT. Rineka Cipta,2000).p.205

(4) If teacher do not pay attention the students' aspect psychology, may be the lecturer will be boring.[25]

So, it can conclude that the strangeness of this method is teacher has a freehand in organizing the time allocate and the facilities of learning that done for finishing demand of syllabus whereas the weakness of this method is that students is looking passive when they follow the learning process. The interactions of learning reflect a one direction communication. Students are depend at the material what presented by teacher. So the teachers' ability in learning is just demand a material what taught in syllabus.

2) The steps of lecturer method

There are some steps before showing this method, they are:

(a) Preparation (Create the learning condition to students)

(b) Implementation (Teacher convoys the material then give opportunity to students for connecting and comparing the material of lecturer that had accepted through catechizing)

(c) Evaluation (Give a test to students for looking students' comprehension about material that had learned).[26]

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[25] Abu Ahmadi and Joko Tri Prasetya. *Strategy Belajar Mengjar*(Bandung:CV Pustaka Setia,2005).p.55-56

[26] Syaiful Bahri Djamarah,.*Op-cit*.p. 99

c. The Principles of conventional teaching

There are some principles of teaching conventional that to be approach, it can be applied in teaching process. They are:

1) There is not theory that formulated to discuss the learning activity in traditional education system
2) Motivation is based of punishment, reward or prize and rivalry
3) Study with memorizing and save the information without inscription
4) The behavioral psychology has the clear significant
5) The cognitive psychology does not give the significant
6) In general, the learning process in traditional education system is not generated by the certain theory
7) The learning dominant is teacher center.[27]

From above explanation, the conventional teaching method is traditional teaching method that often applied by teacher. The one of conventional teachings is lecturer method which a teaching style that is used for conveying information about some subject. . The researcher concluded that conventional method is the way that is used by the teachers in teaching a material based on the agreement of the teacher at school.

Based on the explanation above, the researcher concludes that the procedure used by the English teachers at SMP N 5 Padangsidimpuan, are as follows:

a. Explain the subject matter

b. Identify the difficult words

[27]adnan unm. *pendidikatradisional*, (online), (https://www.scribd.com/doc/45067367/Pendidikan-Tradisional#scribd). retrieve on may 16,2015.

c. Ordering the students translate in target language.

d. Ordering the students to memorize

B. Review of Related Findings

There are some related findings related to this research. The first is Ahmadin Azhar "The Effect of Using Media Video Dora the Explorer to Students' Vocabulary Mastery at SD Negeri 200201/4 Padangsidimpuan". He concluded that there is the effect of using media video Dore The Explorer, where the mean score is 93.26 and control class is 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.[28]

Second, Sri Nardani Hasibuan is" The Effect of Watching Film to Students' Vocabulary Mastery at Grade XI SMK Negeri 1 Padangsidimpuan". 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.[29]

The second is "The Effect of Total Physical Response (TPR) on Grade V Students' Vocabulary Mastery". The result is the score of experimental group is

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[28] Ahmadin Azhari, "*The Effect of Using Media Video DoraThe Explorer to students' vocabulary Mastery at SD Negeri 200201/4 Padangsidimpuan 2011/2012 Academic Year "* (A Thesis, STAIN Padangsidimpuan, 2012), p. 74.

[29] Sri Nardani Hasibuan, "The Effect of Watching Film to Students' Vocabulary Mastery at Grade XI SMK Negeri 1 Padangsidimpuan" (A thesis, IAIN Padangsidimpuan, 2014), p.60.

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).[30] So, there was a significant effect of Total Physical Response (TPR) on V grade students' vocabulary mastery at SD Negeri 142612 Panyabungan.

In summary, from the description above, the researcher concludes that strategy or methods can increase the students' vocabulary mastery. So, the researcher hopes that Direct Method can increase the students' vocabulary mastery and this research will complete and contribute previous findings. Moreover, the researcher wants to research about "The Effect on Direct Method to students' Vocabulary Mastery at Grade VIII of SMP N 5 Padangsidimpuan.

C. Conceptual Frame Work

The successful of vocabulary mastery depend on many factors. One of them is how the teacher teaches vocabulary to the students. The suitable method is very important to teach vocabulary. So, the students' must have the vocabulary strategies. Vocabulary strategy is the strategy that used while the students memorize the vocabulary. So, they can more easily to memorize the words. Direct Method is one of the vocabulary method has the effect in vocabulary mastery. The relation of direct method on vocabulary mastery can be seen as the diagram follow:

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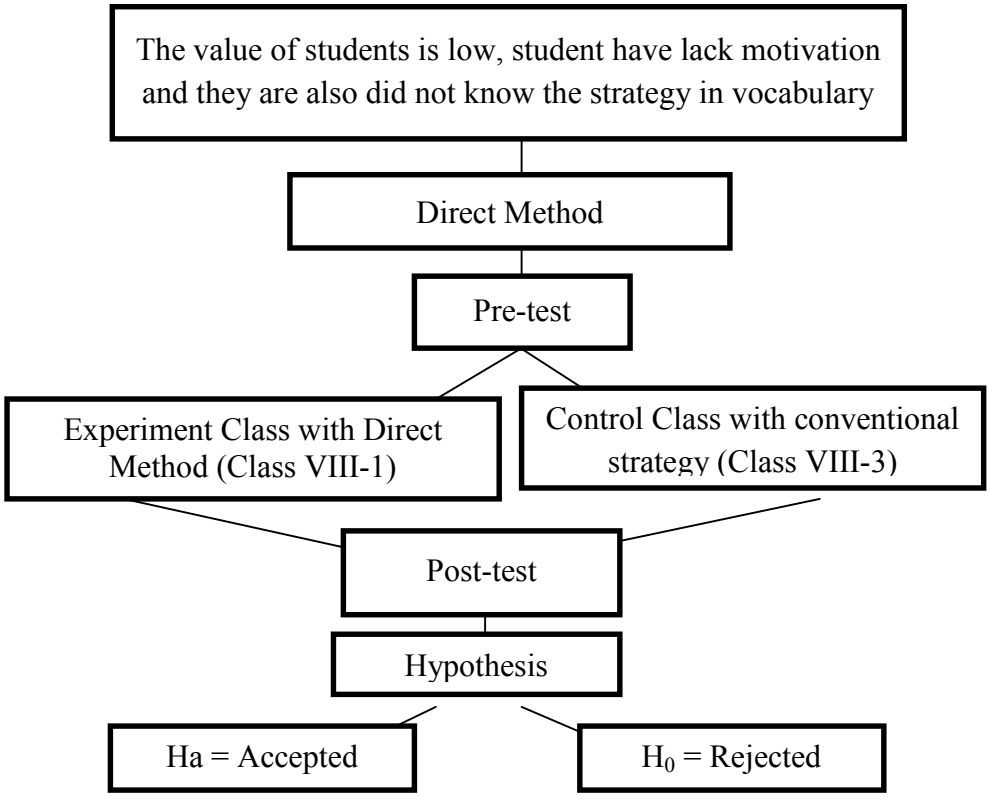
[30] Muhammad Yusuf, *The Effect of Total Physical Response (TPR) on Grade V Students' Vocabulary Mastery*,(Padangsidimpuan: np,2011) p. 33.



D. Hypothesis

Hypothesis is a provisional result of the research.[31] While according to L.R. Gay says, "A hypothesis is a tentative prediction result of the research findings."[32] The purpose of hypothesis of hypothesis is to answer a certain specific question. For the hypothesis in this research, the writer formulates the hypothesis as Alternative hypothesis (Ha) "Students' vocabulary mastery achievement by using Direct Method is better than conventional method."

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[31] Suharsimi Arikunto. *Prosedur Penelitian Suatu Pendekatan Praktik* (Jakarta: RinekaCipta, 2006), p. 71.

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

CHAPTER III

RESEARCH METHODOLOGY

A. Research Methodology

1. Place and Time of the research

The location of the research is SMP Negeri 5 Padangsidimpuan. It is located on Perintis Kemerdekaan Street, no 65 Padangsidimpuan.

The time of this research had been done from October 2014 up to September 2015. The subject of this research is the eighth grade of students.

2. Research Design

The kind of this research is quantitative research with experimental method in this research. L. R Gay said, "Experimental research is the only type of research that test hypothesis to establish cause and effect."[1] And then, Creswell said, "Experimental research included the experiment with the random assignment of subject to treatment condition as well as quasi experiment that use none randomized.[2]

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

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[1] *Ibid,* p. 367.

[2]Jhon Creswell. *Research Design Qualitative, Quantitative and Mixed Methods Approaches Second Edition* (USA: Prentice hall., 2000), p.14.

In this research, the researcher uses two classes, as an experiment class and as a control class. The experiment class is the class that taught with direct method, as a treatment. Meanwhile the control class is the class that taught with using conventional strategy or without treatment. It can be seen from the table:

Table I
Table of design instrument

Class		Treatment	
Treatment class	Pre Test	Teaching vocabulary about profession, animal, fruits, vegetable and sports by using direct method	Post Test
Control class	Pre Test	Teaching vocabulary about profession, animal, fruits, vegetable and sports by using conventional method	Post Test

3. Population and Sample

a. Population

According to Gay, population is the group of interest to the researcher, the group to which she or he would like the result of the study to be generalizable.[3] Meanwile, Suharsimi Arikunto said, "A population is a set (collection) of all elements processing one or more attributes of interest."[4] So, the population is the whole of the students at grade VIII of SMP N 5 Padangsidimpuan.

[3] L. R. Gay and Peter Airasian. *Op. Cit.*, p. 122.
[4]Suharsimi Arikunto. *Op. Cit.*, p. 108.

Based on the Quotation above, the research will be done for the grade VIII students of SMPN 5 Padangsidimpuan. The population of research consists of 12 classes with 327 students. It can be seen from the table follow:

Table II

The population of the grade VIII students of SMPN 5 Padangsidimpuan:

NO	Class	Total students
1.	VIII-1	35
2.	VIII-2	28
3.	VIII-3	27
4.	VIII-4	35
5.	VIII-5	28
6.	VIII-6	25
7.	VIII-7	24
8.	VIII-8	25
9.	VIII-9	25
10.	VIII-10	24
11.	VIII-11	26
12.	VIII-12	25
Total of Students		327

The researcher will do an experimental research by using direct method to know the effect of direct method on students' vocabulary mastery at grade VIII of SMPN 5 Padangsidimpuan.

b. Sample

According to Gay and Airasian, "Sample comprises the individuals, items, or events selected from a larger group referred to as a population." Then, Muhammad Ali stated that sample is partial taken from the whole subject and representative of the population. So, Sample is the part of population that is chosen as respondent of the research.

Experimental research decides to take two classes as a sample. They are experimental class and control class. So, the researcher takes two classes as sample. So that, one class is experimental class and the other is control class. Then, the researcher selects the sample by using random sampling technique. The tricks to use random sampling are using a lottery, ordinal, random number table or computer.

In this research, the researcher uses random sampling. The researcher chooses two classes. The researcher chooses VIII-1 consists of 35 students and VIII-3 consists of 27 students. Therefore, total samples are 62 students. Before use random sampling, the writer uses normality and homogeneity test, they are:[5]

1. Normality test

   The function of normality test is to know whether the data of research is normal or not. The research is normal or not. The researcher uses normality test with using *Chi-Quadrate* formula, as follow:[6]

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

   Where:

   x^2 =Chi-Quadrate

[5]Mardalis, Metode Penelitian: Suatu Pendekatan Proposal (Jakarta: Bumi Aksara, 2003), p. 85

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

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

2. 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 is can be called homogeneous. Homogeneity is the similarity of variance of the group will be compared. So, the function of homogeneity test is to find out whether the data homogeny or not. It use Harley test, as follow:[7]

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

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

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

Hypothesis is rejected if $F \leq F\frac{1}{2}\ a(n_1\text{-}1)$ (1= n_2-1), while if $F_{count} > F_{table}$ hypothesis is accepted. It determined with significant

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

level 5% (0, 05) and dk numerator was (n_1-1), while dk detominators is (n_2-1).

Based on explanation above, the population is the twelve classes, two classes are selected randomly in order to be an experimental or control class. In this research, the experimental class is VIII-1 and control class is VIII-3. The researcher chooses VIII-1 consists of 35 students and VIII-3 consists of 27 students. Therefore, total samples are 62 students.

After comparing the normality and homogeneity test of the third classes in pre-test, the researcher found that all the classes are homogenous and the normal classes are VIII-1, VIII-3, and VIII-4 is not normal. So, the researcher concluded that VIII-1 and VIII-3 are the sample of this research. The researcher chose these classes because they have similar competence based on their result in pre-test. In this research, the experimental class is VIII-1 and control class is VIII- 3. The researcher chose VIII-1 consists of 35 students and VIII-3 consists of 27 students. Therefore, total of samples are 62 students.

Table III:
Sample of the Research

Experimental Class	Control class	Total
VIII-1 = 35	VIII-3= 27	62

3. The Definition of Operation Variables

Based from explanation before, the writer had convoyed some theory of each variable. Therefore, writer can conclude the both of variables as follow:

a. Vocabulary: vocabulary as all words that people know or use and also as the core component of words that are list in the alphabetical order and core component of language proficiency and provides much of the basis for how well learners speak, listen, read and write.

b. Direct method: Direct method is used in teaching a language by using the target language without going through the translation to the native language. The teacher must use pictures, gestures, pantomimes or the target language that is familiar to the students to explain a word.

4. Instrument of Collecting Data

Good instruments certify the validity of the data. The researcher uses instrument of validity and reliability for the taking the valid data. The research uses test as instrumentation. Test is some of question or view or other tool used for measure skill, knowledge, intelligence and ability.

The researcher will collect by giving completion question (write in the missing word). In this research, before validity the test consist of 100 questions, where 50 for pre-test, and 50 for post-test. This test gives to both group, experiment and control class.

Table IV:
There are the indicators of Vocabulary mastery Pre-Test

No	Indicator	Topic	Number of Items	Items
1	Meaning of the word	Profession	9,10,11,12,13,14,15,16	8
2		Illness	17,18,19,20,21,22,23,24	8
3		Animals	1,2,3,4,5,6,7,8	8
4		Fruits	33,34,35,36,37,38,39,40	8
5		Sports	25,26,27,28,29,30,31,32	8
Total				40

Table V:
There are the indicators of vocabulary mastery Post-Test

No	Indicator	Topic	Number of Items	Items
1	Meaning of the word	Profession	33,34,35,36,37,38,39,40	8
2		Illness	17,18,19,20,21,22,23,24	8
3		Animals	9,10,11,12,13,14,15,16	8
4		Fruits	25,26,27,28,29,30,31,32	8
5		Sports	1,2,3,4,5,6,7,8,	8
Total				40

5. Validity and Reliability Instrument

a. Validity

Anas Sudijono stated that Validity is a characteristic of the good test. To get the validity of an achievement test can be used two ways:[8]

1) Totality of the test validity

2) Item validity

[8]Anas Sudijono,*Op.Cit.,*p. 163.

In this research, the researcher uses item validity to get the validity of instrumentation. Item validity is a part of the test as a totality to measure the test by items. Where, the test consists of 100 completion test tests that will be divided in to two groups. They are 50 for pre-test and 50 for post-test.

To know the validity of the each question will be refer to list *r* biserial with r_{t} *in 5% significant*: 0, 361 and 1% significant: 0, 463. So, if $r_{account} > r_{table}$ the test is classified valid.

So, to get the validity of the test, the formula of *r pointbiserial* can be used as follow:

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

Where:

r_{pbi} : coefficient item validity

M_p : mean score of the total sore

SD_t : Standard Deviation of the total score

p :presentation of the right answer of the item tested validity.

q : presentation of the wrong answer of the item tested validity.

From the result of the analysis fifty instrument test, where fifty for pre-test and fifty for post-test. Researcher concluded that for

pre-test only forty are categorized valid and ten are categorized invalid. (See the appendix 8). Then, for the post-test also forty were categorized valid, and ten categorized invalid. The calculation of how to get it can be seen in the appendix 11. So, researcher conducted forty items for each group (Appendix 3 and 4). So, researcher conducted forty items for each class

b. Reliability of The Test

An instrument of the research must be reliable. A reliable test is consistent and dependable.[9] 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.[10]

The formula:

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

Where:

R_{11} : Reliability of the Instrument

N : Total of Question

St^2 : Variants Total

P : Proporsi Subject who is right Answer(1) / N

Q : Proporsi Subject who is Wrong Answer (0) / N

[9]H. Douglas Brown. *Language Assessment Practical and language Practice*, (San Francisco: Longman, 2003), p. 21.

[10]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 $r_{count} > r_{table}$ by using formulation KR-20 with r_{table} 0.70.

Criteria of test reliability is as follows:[11]

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

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

r_{11} < 0,70 low correlation (un- reliable)

1. Technique of Data Collecting

In collecting data, the research conducts twice of test for these classes. They are pre-test and post-test like in the table below:

Table VI
Table of the Design of Collecting Data

Class	Pre-test	Treatment	Post-test
Experimental Class	✓	✓	✓
Control Class	✓	×	✓

The process of data collection as follow:

1. 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 mean scores of the experimental class and control class before the researcher gave

[11] Anas Sudijono.*Op.Cit.,*p. 209.

treatment. In this case, the researcher hoped that the whole students' vocabulary mastery, or if there is a difference between those classes, the difference is hopefully not significant.

2. Treatment

The experimental group and the control group give same material, which consist of communication aspects that take by the teacher in different ways. The experimental class is give treatment, it take by using direct method and the control class only translate by dictionary.

3. Post Test

After giving the treatment, the researcher conducts a post-test. 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 writer analyzed the data.

7. Technique of Data Analysis

In this research, the researcher uses the technique of data analysis as follow:

1. Requirement Test

a) Normality test by using *Chi – Quadrat* formula, as follow:

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

Where:

x^2 =Chi-Quadrate

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

f_h = Frequency is gotten from the sample as image from frequency is hoped from the population

b) Homogeneity test

To test the data whether homogeny or not, the researcher uses Harley rest, as follow:[12]

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

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

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

2. Hypothesis test

Based on the hypothesis, the analysis of the data will be done to find out the ability of two groups that have been divided into experiment class and control class. From the hypothesis is to answer the result of the research. So, the data will be analyzed by using the following *t-test* formula:[13]

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

[12] Agus Irianto, *Op.Cit*., p. 276.
[13]Suharsimi Arikunto, *Op. Cit*., p. 311.

$H_o : \mu_1 \leq \mu_2$

If $H_{a:} \mu_1 > \mu_2$, it means the result of students' vocabulary mastery by using direct method at grade VIII SMPN 5 Padangsidimpuan is better than conventional method. But, if the $H_0: \mu_1 \leq \mu_2$, it means the result of students' vocabulary mastery by using direct method at grade VIII SMPN 5 Padangsidimpuan was not better than conventional method. To test the hypothesis, researcher uses the formula as follow:[14]

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

Where:

$\overline{x_1}$ = Mean of experimental class sample

$\overline{x_2}$ = Mean of control class sample

n_1 = Total of experimental class sample

n_2 = Total of control class sample

[14] Sugiyono.*Statistika untuk Penelitian.* (Bandung: Alfabeta, 2011), p. 138-139.

CHAPTER IV

DATA ANALYSIS

This chapter presents research result. In this case, it discussed the effect of direct method on students' vocabulary mastery. 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 Using Direct Method

a. Score of Pre-Test Experimental Class

In pre-test experimental class, 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 VII
The score of Experimental Class in Pre-Test

Total	2175
Highest score	75
Lowest score	45
Mean	70
Median	72.3
Modus	67.5
Range	30
Interval	5
Standart deviation	9.5
Varians	99.4

Based on the table above the total score of experiment class in pre-test was 2175, mean was 70, standart deviation was 9.5, varians was 99.4,

median was 72.3, range was 30, modus was 67.5, 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 VIII
Frequency Distribution of Students' Score

No	Interval	Mid Point	Frequency	Percentages
1	45 – 49	47	3	8.57%
2	50 – 54	52	4	11.42%
3	55 – 59	57	4	11.42%
4	60 – 64	62	5	14.28%
5	65 – 69	67	8	22.85%
6	70 – 74	72	6	17.14%
7	75 – 79	77	5	14.28%
$i = 5$			35	100%

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

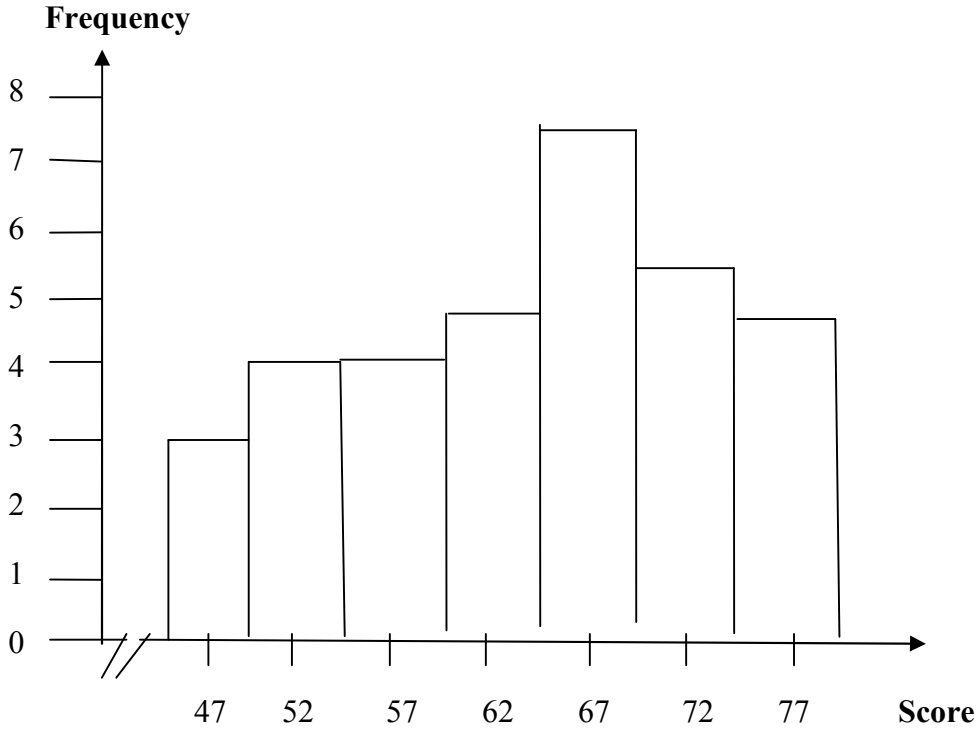

Figure 1: Description Data Pre Test of Experimental Class

b. Score of Pre Test Control Class

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

Tabel IX
The Score of Control Class in PreTest

Total	1675
Highest score	75
Lowest score	45
Mean	70.3
Median	72.4
Modus	67.5
Range	30
Interval	5
Standart deviation	9.05
Varians	88.96

Based on the table above the total score of control class in pre-test was 1675, mean was 70.3, median was 72.4, modus was 67.5, range was 30, interval was 5, standart deviation was 9.05, varians was 88.96. 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 X
Frequency Distribution of Students' Score

No	Interval Class	Mid Point	F	Percentages
1	45 – 49	47	2	7.40%
2	50 – 54	52	3	11.11%
3	55 – 59	57	4	14.81%
4	60 – 64	62	4	14.81%
5	65 – 69	67	6	22.22%
6	70 – 74	72	5	18.51%
7	75 – 79	77	3	11.11%
$i = 5$			27	100%

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

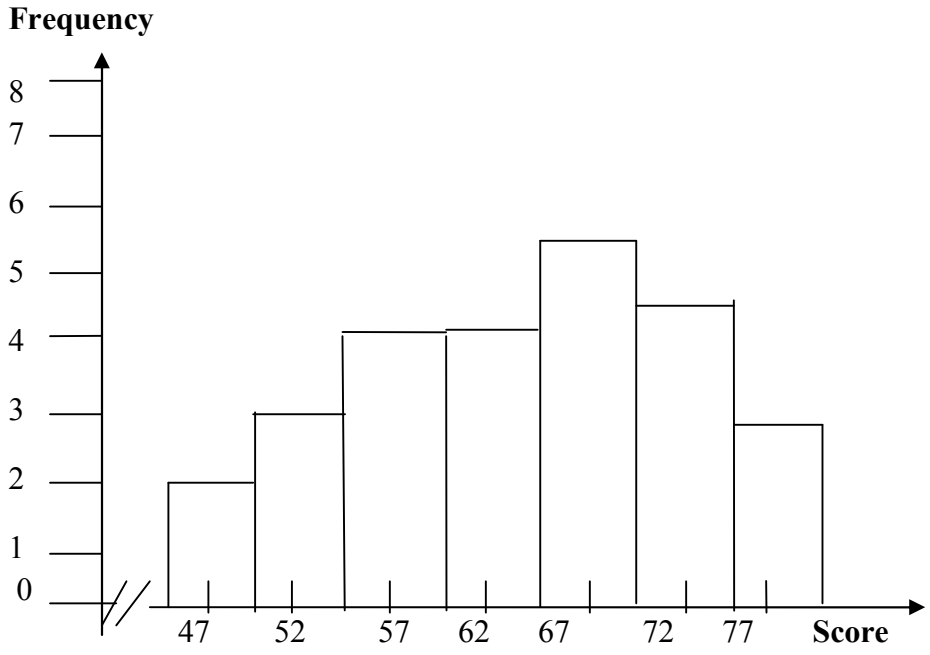

Figure 2: Description Data Pre test of Control Class

2. Description of Data After Using Direct Method

a. Score Post-Test of Experimental Class

Tabel XI
Score of Experimental Class in Post-Test

Total	2825
Highest score	95
Lowest score	65
Mean	81.15
Median	7.7
Modus	81.75
Range	30
Interval	5
Standart deviation	8.2
Varians	64.91

Based on the table above the total score of experiment class in post-test was 2825, mean was 81.15, median was 7.7, modus was

81.75, range was 30, interval was 5, standart deviation was 8.2, varians was 64.91. 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 XII
The Frequency Distribution of Students' Score

No	Interval Class	Mid Point	F	Percentages
1	65 – 69	67	2	5.71%
2	70 – 74	72	4	11.42%
3	75 – 79	77	5	14.28%
4	80 – 84	82	10	28.57%
5	85 – 89	87	6	17.14%
6	90 – 94	92	5	14.28%
7	95 – 99	97	3	8.57%
$i = 5$			35	100%

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

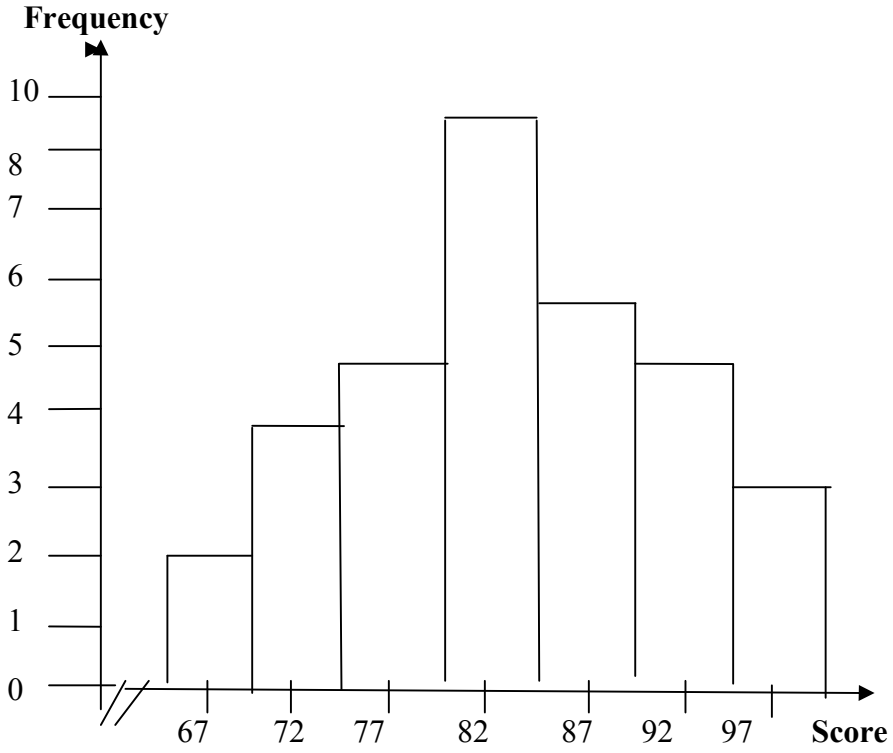

Figure 3: Description Data Post test Experimental Class

b. Score of Control Class in Post-Test

Tabel XIII
The Score of Control Class in Post-Test

Total	1810
Highest score	80
Lowest score	50
Mean	65
Median	72
Modus	66.35
Range	30
Interval	5
Standart deviation	8.4
Varians	73.50

Based on the table above the total score of control class in post-test was 1810 ,mean was 65, standart deviation was 8.4, varians was 73.50, median was 72, modus was 66.35, 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 XIV
Frequency Distribution of Students' Score

No	Interval Class	Mid Point	F	Percentages
1	50 – 54	52	2	7.40%
2	55 – 59	57	2	7.40%
3	60 – 64	62	3	11.11%
4	65 – 69	67	7	25.92%
5	70 – 74	72	5	18.51%
6	75 – 79	77	5	18.51%
7	80 – 84	82	3	11.11%
$i = 5$			27	100%

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

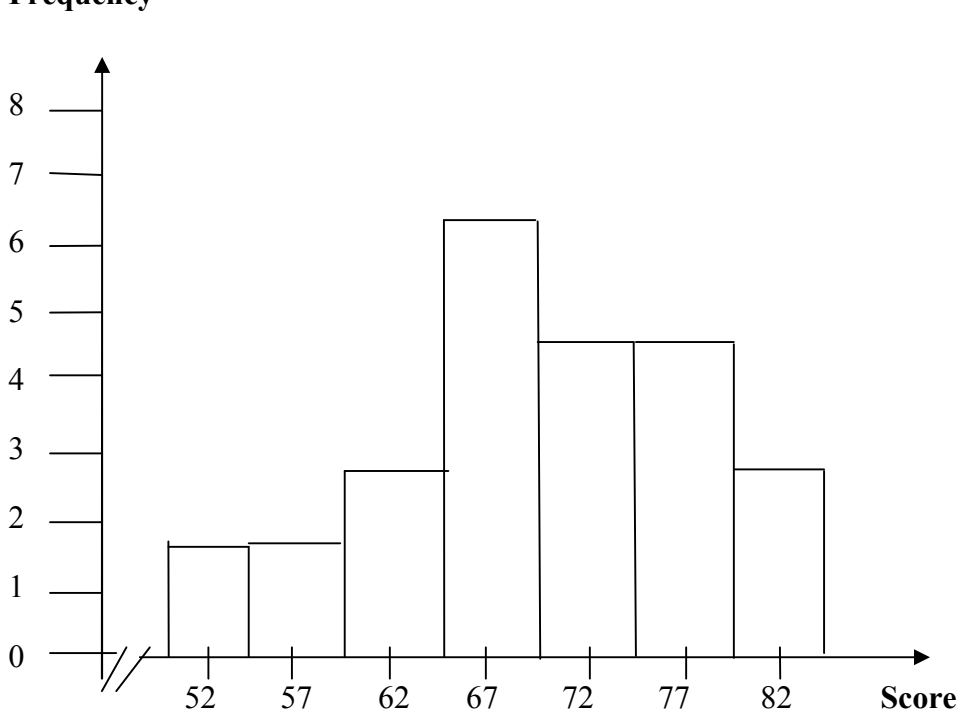

Figure 4: Description Data Post test Control Class

c. Technique of Data Analysis

1. Requirement test

a. Normality and Homogeneity Pre-Test

1) Normality of Experimental Class and Control Class in Pre-Test

Tabel XV
Normality and Homogenity in Pre-Test

Class	Normality Test		Homogeneity Test	
	t_{count}	t_{table}	t_{count}	t_{table}
Experiment Class	3.56	5.991	1.11< 2.042	
Control Class	1.91	5.991		

Based on the table above researcher calculation, the score of exsperiment class Lo=3.56<Lt=5.991 with n =35 and control class Lo=1.91< Lt=5.991 with n =27, and real level α 0.05. Cause $_{Lo}$ < Lt in the both class. So, H_a was accepted. It mean that experiment class and control class were distributed normal. It can be seen in appendix 18 and 19.

2) Homogeneity of Experimental Class and Control Class in Pre-test

The coefficient of F_{count} = 1.11 was compared with F table. Where F table was determined at real α =0.05, and the different numerator dk =N-1= 35-1=34 and denominator dk N-1= 27–1= 26 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} (1.11)< F_{table} (2.042 & 2.052). So, the researcher concluded that the variant from the data of the students' Vocabulary Mastery at SMPN 5 Padangsidimpuan by experimental and control class was homogen. The calculation can be seen on the appendix 19.

b. Normality and Homogeneity Post Test

1) Normality of experimental class and control class in Post-test

Tabel XVI
Normality and homogenity in post-test

Class	Normality Test		Homogeneity Test	
	t_{count}	t_{table}	t_{count}	t_{table}
Experiment Class	2.28	5.991	1.13 < 2.042	
Control Class	3.11	5.991		

Based on the table above, the score of eksperimental class Lo=2.28< Lt=5.991 with n =35 and control class Lo=3.11< Lt=5.991 with n=27, real level α was 0.05, Cause $_{Lo}$ < Lt in the both class. So, H_a was accepted, it mean that experiment class and control class were distributed normal. It can be seen on appendix 20 and 22.

2) Homogenity of Experimental Class and Control Class in Post-Test

The coefficient of F_{count} =1.13 was compared with F table. Where F table was determined at real α =0.05, and the different numerator dk=N-1= 35-1=34 and denominator dk N-1= 27–1=26 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_{count} (1.13) < F_{table} (2.042 & 2052). So, the researcher concluded that the variant from the data of the students' Vocabulaary Masterty at SMPN 5 Padangsidimpuan by exsperimental and control class 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. Hypothesis alternative (H_a) of research was "There was the effect of Direct Method on Students' Vocabulary Mastery. The calculation can be seen on the appendix 24

Table XVII
Result of T-test from the Both Averages

Pre-test		Post-test	
t_{count}	t_{table}	t_{count}	t_{table}
1.59	2.000	32.35	2.000

H_a: $\mu_1 > \mu_2$

Where:

H_a: $\mu_1 > \mu_2$ " Direct Method better than conventional strategy on Students' Vocabulary Mastery."

Based on researcher calculation, researcher found that t_{count} 32.35. while t_{table} 2.000. With opportunity (1 - α) = 1-5% = 95% and dt = (n_1 + n_2 – 2) = (35+ 27– 2) = 60, cause t_{count}>t_{table} (32.35>2.000). It means that hypothesis (H_a) was accepted. So, there is the significant effect of Direct Method on Students' Vocabulary Mastery. In this case, the mean score of experiment class by using Direct Method was 81.15, and mean score of control class was 65. The calculation can be seen on the appendix 23 and 24.

d. Discussion

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 Padangsidimpuan". 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 Padangsidimpuan". 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).[1] 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 hypothesis alternative (H_a) was accepted and hypothesis zero (H_0) was rejected. It was

[1] Muhammad Yusuf, The Effect of Total Physical Response (TPR) on Grade V Students' Vocabulary Mastery (Padangsidimpuan: np,2011) p. 33.

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).

Based on the explanation above, the researcher concluded that hypotheses alternative was accepted and there was effect of direct method on students' vocabulary mastery.

e. Threats 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 can not reach the validity of trustworthiness data.

CURRICULUM VITAE

A. Identity

Name	: FITRIYANTI
Nim	: 11 340 0011
Place and Birthday	: Purwodadi, 5th Mei 1993
Sex	: Female
Religion	: Moslem
Address	: Purwodadi, Kec. Padangsidimpuan Batunadua

B. Parent

1. Father's name : Kliwon
2. Mother's name : Wagirah

C. Educational Background

1. Elementary School	: SD N 200309 Purwodadi	(2005)
2. Junior High School	: SMP S Nurul 'Ilmi Padangsidimpuan	(2008)
3. Senior High School	: SMA S Nurul 'Ilmi Padangsidimpuan	(2011)
4. Institute	: IAIN Padangsidimpuan	(2015)

Appendix 1

Experimental Class

RENCANA PELAKSANAAN PEMBELAJARAN

(RPP)

Nama Sekolah : SMP Negeri 5 Padangsidimpuan

Mata Pelajaran : Bahasa Inggris

Kelas/Semester : VIII[1] (Delapan)/I

Alokasi Waktu : 4 x 40 menit

Standar Kompetensi : Memahami makna kosakata kosakata pada teks yang berkaitan dengan lingkungan sekitar..

Kompetensi Dasar :

- Mampu mengucapkan kosakata dengan benar
- Memahami kosakata yang dipelajari
- Mampu mengunakan kosakata yang dipelajari dalam percakapan

A. Indikator : Mampu memahami kosakata di bawah ini

Doctor, grapes, football, cat, dolphin, banana, rabbit, chicken, crocodile, snake, bird, apple, orange, avocado, swim, basket ball, badminton, tennis, strawberry, star fruit, tailor, cheap, pilot, gardener, papaya, nurse, photographer, toothache, stomachache, sprained the ankle, fever, headache,

B. Tujuan pembelajaran :

- Siswa mampu merespon dan mengucapkan makna kosakata dalam text dengan benar.

Karakter siswa yang diharapkan:

- Dapat dipercaya (*Trustworthiness*)
- Rasa hormat dan perhatian (*Respect*)
- Tekun (*Diligence*)

C. Metode Pembelajaran : Direct Method

D. Langkah-langkah Pembelajaran

Pertemuan Pertama

NO	KEGIATAN PEMBELAJARAN	WAKTU
1	Pendahuluan a. Greeting/salam b. Absensi c. Berdo'a d. Menjelaskan indikator dan memberi motivasi	10 Minutes
2	Kegiatan Inti - Eksplorasi: Menggunakan beragam pendekatan pembelajaran, media pembelajaran, dan sumber belajar lain. a. Guru menyajikan bahan vocabulary mengenai profession, illness, sports, fruits and animals. b. Guru menerangkan vocabulary yang berkaitan melalui picture. c. Guru menyuruh siswa menyebutkann nama sesuai dengan benda yang ditunjuknya secara oral dan individual. - Konfirmasi: Guru Berfungsi sebagai narasumber dan fasilitator dalam menjawab pertanyaan peserta didik yang menghadapi kesulitan	60 Minutes
3	Kegiatan Penutup: membuat rangkuman/simpulan pelajaran Salam	10 Minutes

Pertemuan Kedua

NO	KEGIATAN PEMBELAJARAN	WAKTU
1	Kegiatan Pendahuluan a. Greeting/salam b. Absensi c. Berdo'a d. Menjelaskan indikator dan memberi motivasi	10 minutes
2	Kegiatan Inti Elaborasi: Memfasilitasi peserta didik melalui pemberian tugas, diskusi dan lain-lain a. Siswa menjawab soal yang akan diberikan guru b. Guru memberikan penghargaan yang diberikan kepada kelompok yang mendapatkan poin	60 minutes

	tertinggi Konfirmasi: Guru Berfungsi sebagai narasumber dan fasilitator dalam menjawab pertanyaan peserta didik yang menghadapi kesulitan	
3	Kegiatan penutup: salam dan guru menyimpulkan pembelajaran	10 minutes

E. Sumber Belajar :

- Buku yang berkaitan

F. Media : - internet

- Picture
- Realia

G. Penilaian : The amount of correct answer in completion

Indikator pencapaian kompetensi	Teknik penilaian	Bentuk instrument	Instrument soal
1. The meaning of the profession 2. The meaning of the illness 3. The meaning of the animal 4. The meaning of the fruits 5. The meaning of the sports	Tes tulisan	Completion	Completion question

Padangidimpuan, Juli 2015

Mengetahui:

Validator Peneliti

Sojuangon Rambe., S. S., M. Pd
NIP. 19790815 200604 1 003

Fitriyanti
Nim. 11 340 0011

Appendix 2

Control Class

RENCANA PELAKSANAAN PEMBELAJARAN

(RPP)

Nama Sekolah	: SMP Negeri 5 Padangsidimpuan
Mata Pelajaran	: Bahasa Inggris
Kelas/Semester	: VIII^3 (Delapan)/I
Alokasi Waktu	: 4 x 40 menit

Standar Kompetensi : Memahami makna kosakata kosakata pada teks yang berkaitan dengan lingkungan sekitar.

Kompetensi dasar : Merespon makna kosakata kosakata yang terdapat dalam teks sangat sederhana secara akurat,lancar dan berterima yang berkaitan dengan lingkungan sekitar

A. Indikator : Mampu memahami kosakata di bawah ini

Doctor = dokter, grapes = anggur, football = sepak bola, rabbit = kelinci, papaya = pepaya, rabbit = kelinci, chicken = ayam, crocodile = buaya, snake = ular , bird = burung, apple = apel, orange = jeruk, avocado = pokat, swimming = berenang, basket ball = bola basket, badminton = bulu tangkis. Toothache = sakit gigi, stomachache = sakit perut, fever = demam, headache= sakit kepala

B. Tujuan Pembelajaran :

- Siswa mampu merespon dan mengucapkan makna kosakata dalam text dengan benar.

Karakter siswa yang diharapkan:

- Dapat dipercaya (*Trustworthiness*)
- Rasa hormat dan perhatian (*Respect*)
- Tekun (*Diligence*)

C. Metode Pembelajaran : Conventional method in teaching

D. Langkah-langkah Kegiatan

Pertemuan pertama

NO	KEGIATAN PEMBELAJARAN	WAKTU
1	Pre Activities a. Greeting/salam b. Absensi c. Berdo'a d. Menjelaskan indikator dan memberi motifasi	10 minutes
2	Main Activities - Eksplorasi :Memfasilitasi terjadinya interaksi antar peserta didik, antara peserta didik dengan guru,lingkungan dan sumber belajar lain a. Guru menyajikan pelajaran. - Elaborasi: Memfasilitasi peserta didik mengenai materi vocabulary yaitu tentang profession, illness, fruits, sports and animals b. Guru mengartikan kosakata-kosakata tersebut dengan menggunakan bahasa ibu. - Konfirmasi : Guru Berfungsi sebagai narasumber dan fasilitator dalam menjawab pertanyaan peserta didik yang menghadapi kesulitan.	60 minutes
3	Post Activity a. Salah satu siswa memberi kesimpulan b. Siswa lain merespon	10 minutes

Pertemuan kedua

NO	KEGIATAN PEMBELAJARAN	WAKTU
1	Pre Activities a. Greeting/salam b. Absensi c. Berdo'a d. Menjelaskan indikator dan memberi motivasi	10 minutes
2	Main Activities - Eksplorasi :Memfasilitasi terjadinya interaksi antar peserta didik, antara peserta didik dengan guru,lingkungan dan sumber belajar lain a. Siswa menjawab soal yang diberikan guru b. Guru memberikan penghargaan - Konfirmasi : Guru Berfungsi sebagai narasumber dan fasilitator dalam menjawab pertanyaan peserta didik yang menghadapi kesulitan	60 minutes
3	Post Activity Kegiatan penutup: salam dan guru menyimpulkan pembelajaran	10 minutes

E. Sumber Belajar :

- Buku yang berkaitan
- Kamus Bahasa Inggris
- Internet

F. Penilaian **:** The amount of correct answer completion question!

Indikator pencapaian kompetensi	Teknik penilaian	Bentuk instrument	Instrument soal
1.The meaning of the professions 2.The meaning of the illness 3.The meaning of the animals 4.The meaning of the fruits 5.The meaning of the sports	Tes tulisan	Completion	Completion

Padangisidimpuan, 07 Juli 2015

Mengetahui:

Guru Bahasa Inggris Kelas VIII-3 Peneliti

Nurhayati Siregar,S.Pd **Fitriyanti**
NIP. 19651106 199003 2 002 **Nim. 11 340 0011**

Kepala Sekolah SMP Negeri 5 Padangsidimpuan

Drs. M. Idris
NIP. 19570625 198303 1 004

Appendix 3

INSTRUMENT FOR PRE TEST

Name :

Kelas :

Petunjuk:

- *Isilah titik-titik kalimat dibawah ini.*
- *Jawablah pertanyaan dengan kemampuan anda.dan jangan bertanya kepada teman*

1. Animal have a pocket comes from Australia is……
2. A chicken produce…….
3. ……is the animal from Komodo Island and this animal is a reptile animal
4. The animal always lives in water is ……
5. …… animal have 8 feet's and can make home like nets.
6. The biggest fish on the ocean has sharp teeth and can eats human is…….
7. A cow produce…… to be a consumption by us and it has high calcium
8. The animal which likes banana and climbs to tree is…….
9. ……work in the hospital. She helps a doctor and then she wears a white uniform.
10. ……..work in the restaurant. He cooks some food in the restaurant.
11. My uncle is an English ……at SMP 5. He also gives private lesson in his house.
12. ……..work in the garden. He keeps garden clean and beautiful
13. The……are operating a patient and nurse helps them
14. I've got a toothache, I will go to the ……..
15. The……..works in airplane. He flies the plan.
16. The name of profession works in the school and teaches English is ……..
17. You can drink Komix, if you have a …….and I suggest you to stop drinking ice to much

18. I’ve got a …… I will go to the dentist.

19. Please stop eating chili to much, because you have a……..

20. I’ve got a ……..and my body feels cold.

21. Andi can not play football because he sprained the ……., he can not kick a football

22. The rujak was very tasty, I ate too much, the next morning I got a……..

23. Please stop eating candy to much. You will get a ……..

24. I feel so cold and I want to sneeze, it means I get a …….

25. ……..have eleven players in game. One of the players keeps the goal. He is a goalkeeper. All the players must work together to make goal to win the game.

26. …….is a sport played by two teams of five person on a rectangular court. Each eams throw a ball into own basket.

27. Susi Susanti is the championship from……..

28. ……..need a racket, shuttlecock and net to do it.

29. ……..need a table, a ball and a net

30. Football has …… players in the game.

31. …… is one of sport not difficult to do, we can do everyday. We can do surround the yard or anywhere.

32. We can ……. In the pool’s Libers, Kincir and Daya Mulia

33. Has to be imported to other countries and known as Malang Apple……..

34. The fruit like star shape. The name of fruit is……

35. One of the fruits that become icon Padangsidimpuan city is……

36. Apple has two colors they are:…….. and…….

37. ……..is the favorite monkey

38. Kismis and beer sourced from…….

39. You have a cough. I suggest you to eat…… this fruit is one of the herbal and this fruit it's so sour.

40. Orange contain vitamin……

Padangsidimpuan, 2015
Validator

Sojuangon Rambe, S. S, M. Pd
NIP. 19790815 200604 1 003

Appendix 4

INSTRUMENT FOR POST TEST

Name :

Kelas :

Petunjuk:

- ✓ *Isilah titik-titik kalimat dibawah ini.*
- ✓ *Jawablah pertanyaan dengan kemampuan anda dan jangan bertanya kepada teman*

1. ……..have eleven players in game. One of the players keeps the goal. He is a goalkeeper. All the players must work together to make goal to win the game.
2. …….is a sport played by two teams of five person on a rectangular court. Each eams throw a ball into own basket.
3. Susi Susanti is the championship from……..
4. ……..need a racket, shuttlecock and net to do it.
5. ……..need a table, a ball and a net
6. Football has …… players in the game.
7. We can ……. In the pool's Libers, Kincir and Daya Mulia
8. …… is alwys played by two person
9. Animal have a pocket comes from Australia is……
10. A chicken produce…….
11. ……is the animal from Komodo Island and this animal is a reptile animal
12. …… are the mammals with long legs, a big lipped, a humped back and we can found in the Arabian Desert or Mekkah.
13. …… animal have 8 feet's and can make home like nets.
14. The biggest fish on the ocean has sharp teeth and can eats human is…….
15. A cow produce…… to be a consumption by us and it has high calcium

16. …….is the largest member of the cat family, has fur color varies from orange to yellow and black, has a long body, a short neck and that contains a set of sharp teeth.
17. You can drink Komix, if you have a …….and I suggest you to stop drinking ice to much
18. I’ve got a …… I will go to the dentist.
19. You will get a …….when you feel pain in your head.
20. I’ve got a ……..and my body feels cold.
21. Andi can not play football because he sprained the ……., he can not kick a football
22. The rujak was very tasty, I ate too much, the next morning I got a……..
23. You will get a ……..when you feel pain in your ear and you can not hear what people say.
24. Please stop eating candy to much. You will get a ……..
25. The fruit like star shape. The name of fruit is……
26. One of the fruits that become icon Padangsidimpuan city is……
27. ……..is the favorite monkey
28. Kismis and beer sourced from…….
29. You have a cough. I suggest you to eat……. This fruit is one of the herbal and this fruit it’s so sour.
30. This fruit is soft, red plump and heart-shaped. Consist of a cluster of small fruit steam. The name of fruit is ……..
31. ……..have red or yellow. Flesh is soft, juicy, sweet and have much seed.
32. Orange contain vitamin ……

33. ……work in the hospital. She helps a doctor and then she wears a white uniform

34. ……..work in the restaurant. He cooks some food in the restaurant.

35. Miss yuni is a ……..she works at the Fitri's tailor.

36. ……..work in the garden. He keeps garden clean and beautiful.

37. The……are operating a patient and nurse helps them

38. The …….. is delivering passenger

39. The ……works in airplane. He flies the plane

40. The name of profession works in the school and teaches English is ……..

Padangsidimpuan, 2015
Validator

Sojuangon Rambe, S. S, M. Pd
NIP. 19790815 200604 1 003

Appendix 5

Key Answer for Pre test

1.	Kangaroo	9. Nurse	17. Cough	25. Football	33. Apple
2.	Egg	10. Chef	18. Toothache	26. Basketball	34. Star Fruit
3.	Komodo	11. Teacher	19. Stomachache	27. Badminton	35. Zalacca
4.	Fish	12. Gardener	20. Fever	28. Badminton	36. Red and green
5.	Spider	13. Doctor	21. Ankle	29. Table Tennis	37. Banana
6.	Shark	14. Dentist	22. Stomachache	30. Eleven	38. Grapes
7.	Milk	15. Pilot	23. Toothache	31. Running	39. Lemon
8.	Monkey	16. Teacher	24. Influenza	32. Swim	40. C

Key Answer for Post test

1.	Football	9. Kangaroo	17.Cough	25. Star Fruit	33. Nurse
2.	Basketball	10. Egg	18. Toothache	26. Zalacca	34. Chef
3.	Badminton	11. Komodo	19. Headache	27.Banana	35. Tailor
4.	Badminton	12. Camels	20. Fever	28. Grapes	36. Gardener
5.	Table tennis	13. Spider	21. Ankle	29 Lemon	37. Doctor
6.	Eleven	14. Shark	22. Stomachache	30. Strawberry	38. Driver
7.	Swim	15. Milk	23. Earache	31. Watermelon	39. Pilot
8.	Chess	16. Tiger	24. Toothache	32. C	40. Teacher

Appendix 6

Validity Pre Test

NO	NO ITEM																																																		Xt	Xt^2
	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	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		
1	0	1	0	1	0	0	0	1	1	1	1	1	1	0	1	1	1	0	0	1	1	1	0	0	1	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	30	900
2	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	40	1600
3	1	1	1	0	0	1	1	0	1	0	1	1	1	1	0	0	0	0	1	1	0	1	1	0	1	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0	1	32	1024
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	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	100
5	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	0	1	0	0	0	0	0	1	0	1	0	1	0	1	0	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	400
6	1	1	1	0	1	1	1	0	1	1	1	1	0	1	0	0	1	0	1	1	0	0	1	0	0	1	0	0	0	0	1	1	1	1	0	0	1	0	1	1	0	1	0	1	1	1	1	1	0	0	28	784
7	1	1	1	1	0	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	0	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	36	1296
8	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	13	169
9	1	1	1	0	0	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	0	0	0	0	0	1	0	0	0	1	1	1	0	0	1	1	1	0	1	1	0	1	0	1	1	1	1	0	0	0	29	841
10	1	1	0	0	0	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	38	1444
11	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	1	1`	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	43	1849
12	1	1	1	0	0	1	1	0	0	1	1	1	0	0	1	1	0	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	0	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	0	33	1089
13	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	8	64
14	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	1	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	40	1600
15	0	0	1	1	0	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1	0	1	1	0	0	1	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	1	0	0	1	32	1024
16	1	1	0	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	36	1296
17	1	0	1	0	1	1	0	0	1	0	1	1	0	1	1	0	0	1	0	1	0	0	0	1	0	0	0	0	1	1	1	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0	0	0	24	576
18	1	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1	0	1	0	0	1	1	0	0	1	0	1	0	1	1	0	0	1	0	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0	1	25	625
19	1	0	1	1	0	1	0	1	1	1	0	0	1	0	0	1	1	0	0	0	0	1	0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	1	1	1	1	1	1	0	0	1	1	0	0	1	24	576
20	0	1	1	1	1	0	0	1	1	0	0	0	1	1	1	1	1	0	1	1	1	0	0	0	1	1	1	0	1	1	0	0	0	1	0	0	0	1	1	0	1	1	1	0	1	1	1	0	0	1	30	900
21	1	1	0	1	0	1	1	1	0	0	1	1	1	1	1	0	1	0	1	1	0	1	0	1	1	1	0	0	0	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	34	1156
22	1	0	1	0	1	1	1	1	0	0	1	1	0	1	1	1	1	0	1	1	0	1	0	1	0	0	1	0	0	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0	0	31	961
23	1	1	1	1	0	0	0	1	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1	1	0	1	0	1	0	0	0	0	0	0	1	1	0	1	0	0	1	1	1	1	1	1	1	1	28	784
24	1	1	1	0	0	0	0	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	0	0	1	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	0	0	1	31	961
25	0	0	0	1	0	1	0	1	1	0	1	1	0	0	1	1	0	0	1	1	0	1	0	1	0	0	1	0	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0	0	0	0	25	625
N=25	20	17	15	11	5	16	13	18	18	18	18	18	15	8	17	15	14	13	18	18	10	16	5	14	13	17	17	4	11	14	14	13	18	7	18	17	18	17	19	19	15	14	11	18	18	20	20	5	3	15	720	22644
P	0,8	0,6	0,7	0,5	0,2	0,5	0,5	0,7	0,7	0,7	0,7	0,7	0,6	0,3	0,6	0,6	0,5	0,5	0,7	0,7	0,4	0,7	0,2	0,5	0,6	0.6	0.6	0.1	0.4	0.5	0.5	0.5	0.7	0.2	0.7	0.6	0.7	0.6	0.7	0.8	0.6	0.5	0.5	0.7	0.7	0.8	0.8	0.2	0.1	0.6	∑xt	∑xt²
Q	0.2	0,4	0,3	0,5	0,8	0,5	0,5	0,3	0,3	0,3	0,3	0,3	0,4	0,7	0,4	0,4	0,5	0,5	0,3	0,3	0,6	0,3	0,8	0,5	0,4	0.4	0.4	0.9	0.6	0.5	0.5	0.5	0.3	0.8	0.3	0.4	0.3	0.4	0.3	0.2	0.4	0.5	0.5	0.3	0.3	0.8	0.2	0.8	0.9	0.4		

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
1	0	1	0	1	0	0	0	1	1	1	1	1	1	0	1	1	1	0	0	1	1	1	0	0	1
2	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	1
3	1	1	1	0	0	1	1	0	1	0	1	1	1	1	0	0	0	0	1	1	0	1	1	0	1
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	0	0	0	0	1	0	1	1	1	1	1	0	1	1	0	0	0	1	0	0	0	0	0	1	0
6	1	1	1	0	1	1	1	0	1	1	1	1	0	1	0	0	1	0	1	1	0	0	1	0	0
7	1	1	1	1	0	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1	1	0	1	0
8	1	1	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
9	1	1	1	0	0	1	1	1	1	0	1	1	0	0	1	0	1	1	1	1	0	0	0	0	0
10	1	1	0	0	0	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0	1	1
11	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1
12	1	1	1	0	0	1	1	0	0	1	1	1	0	0	1	1	0	1	1	1	1	1	1	0	0
13	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
14	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	1
15	0	0	1	1	0	0	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	1	0	0	1
16	1	1	0	0	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1
17	1	0	1	0	1	1	0	0	1	0	1	1	0	1	1	0	0	1	0	1	0	0	0	1	0
18	1	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1	0	1	0	0	1	1	0	0	1
19	1	0	1	1	0	1	0	1	1	1	0	0	1	0	0	1	1	0	0	0	0	1	0	1	0
20	0	1	1	1	1	0	0	1	1	0	0	0	1	1	1	1	1	0	1	1	1	0	0	0	1
21	1	1	0	1	0	1	1	1	0	0	1	1	1	1	1	0	1	0	1	1	0	1	0	1	1
22	1	0	1	0	1	1	1	1	0	0	1	1	0	1	1	1	1	0	1	1	0	1	0	1	0
23	1	1	1	1	0	0	0	1	0	1	0	1	1	0	0	0	0	1	1	1	0	1	1	1	1
24	1	1	1	0	0	0	0	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	0	0	1
25	0	0	0	1	0	1	0	1	1	0	1	1	0	0	1	1	0	0	1	1	0	1	0	1	0
N=25	20	17	15	11	5	16	13	18	18	18	18	18	15	8	17	15	14	13	18	18	10	16	5	14	13
P	0,8	0,6	0,7	0,5	0,2	0,7	0,5	0,7	0,7	0,7	0,7	0,7	0,6	0,3	0,6	0,6	0,5	0,5	0,7	0,7	0,4	0,7	0,2	0,5	0,6
Q	0.2	0,4	0,3	0,5	0,8	0,3	0,5	0,3	0,3	0,3	0,3	0,3	0,4	0,7	0,4	0,4	0,5	0,5	0,3	0,3	0,6	0,3	0,8	0,5	0,4
pq	0.16	0.24	0.21	0.25	0.16	0.21	0.25	0.21	0.21	0.21	0.21	0.21	0.24	0.21	0.24	0.24	0.25	0.25	0.21	0.21	0.24	0.21	0.16	0.25	0.24

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	Xt^2
1	1	1	0	0	0	0	0	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	0	0	1	30	900
2	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	40	1600
3	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	0	0	0	1	1	1	1	1	0	1	32	1024
4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	100
5	1	0	1	0	1	0	1	1	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	20	400
6	1	0	0	0	0	1	1	1	1	0	0	1	0	1	1	0	1	0	1	1	1	1	1	0	0	28	784
7	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	36	1296
8	0	0	0	0	1	0	0	1	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	13	169
9	1	0	0	0	1	1	1	0	0	1	1	1	0	1	1	0	1	0	1	1	1	1	0	0	0	29	841
10	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	0	1	38	1444
11	1	1	0	0	1	1	1`	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	43	1849
12	1	1	0	0	1	1	1	1	0	1	1	1	1	0	1	1	0	0	1	1	1	1	1	0	0	33	1089
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	8	64
14	1	1	0	1	0	1	1	1	0	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	40	1600
15	0	1	1	0	0	1	1	1	0	1	1	1	1	1	0	1	0	1	1	1	1	1	0	0	1	32	1024
16	1	1	1	1	0	0	0	1	0	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	36	1296
17	0	0	0	1	1	1	0	0	1	1	1	1	0	1	1	0	0	0	1	1	1	1	0	0	0	24	576
18	0	1	0	1	1	0	0	1	0	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0	1	25	625
19	0	1	0	0	1	0	0	1	0	0	0	0	1	1	1	1	1	1	0	0	1	1	0	0	1	24	576
20	1	1	0	1	1	0	0	0	1	0	0	0	1	1	0	1	1	1	0	1	1	1	0	0	1	30	900
21	1	0	0	0	1	1	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	0	0	1	34	1156
22	0	1	0	0	0	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0	0	31	961
23	1	0	1	0	1	0	0	0	0	0	0	1	1	0	1	0	0	1	1	1	1	1	1	1	1	28	784
24	1	1	0	0	0	0	0	1	0	1	1	1	1	1	1	1	1	0	1	1	0	1	0	0	1	31	961
25	0	1	0	1	0	1	0	1	0	1	1	1	1	1	0	1	0	1	1	1	1	0	0	0	0	25	625
N=25	17	17	4	11	14	14	13	18	7	18	17	18	17	19	19	15	14	11	18	18	20	20	5	3	15	720	22644
P	0.6	0.6	0.1	0.4	0.5	0.5	0.5	0.7	0.2	0.7	0.6	0.7	0.6	0.7	0.8	0.6	0.5	0.5	0.7	0.7	0.8	0.8	0.2	0.1	0.6	∑xt	∑xt²
Q	0.4	0.4	0.9	0.6	0.5	0.5	0.5	0.3	0.8	0.3	0.4	0.3	0.4	0.3	0.2	0.4	0.5	0.5	0.3	0.3	0.2	0.2	0.8	0.9	0.4		
pq	0.24	0.24	0.09	0.24	0.25	0.25	0.25	0.21	0.16	0.21	0.24	0.21	0.24	0.21	0.16	0.24	0.25	0.25	0.21	0.21	0.16	0.16	0.16	0.09	0.24	10.61	∑pq

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)

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

$$M_t = \frac{720}{25} = 28.80$$

2. Standard Deviation (SD_t)

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

$$SD_t = \sqrt{\frac{22664}{25} - \left(\frac{720}{25}\right)^2}$$

$$SD_t = \sqrt{906.56 - 28.80^2}$$

$$SD_t = \sqrt{906.56 - 829.44} = \sqrt{77.12} = 8.78$$

3. Means Score (M_p)

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

$$M_{p1} = \frac{40+32+28+36+13+29+38+43+33+8+40+32+36+24+25+24+34+31+28+31}{20}$$

$$M_{p1} = \frac{616}{20} = 30.80$$

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

$$M_{p2} = \frac{30+40+32+10+28+36+13+29+38+43+33+40+36+30+34+28+31}{17}$$

$$M_{p2} = \frac{551}{17} = 32.41$$

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

$$M_{p3} = \frac{32+28+36+29+43+33+40+32+24+25+24+30+31+28+31}{15}$$

$$M_{p3} = \frac{491}{15} = 32.73$$

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

$$M_{p4} = \frac{30+40+36+43+40+32+24+30+34+28+25}{11}$$

$$M_{p4} = \frac{362}{11} = 32.90$$

Item 5 $M_{p5} = \frac{\text{the total of students score that answer true item}}{n5}$

$M_{p5} = \frac{20+28+24+30+31}{5}$

$M_{p5} = \frac{133}{5} = 26.60$

Item 6 $M_{p6} = \frac{\text{the total of students score that answer true item}}{n6}$

$M_{p6} = \frac{40+32+28+36+29+38+43+33+40+36+24+25+24+34+31+25}{16}$

$= \frac{518}{16} = 32.37$

Item 7 $M_{p7} = \frac{\text{the total of students score that answer true item}}{n7}$

$M_{p7} = \frac{40+32+20+28+36+29+38+43+33+40+32+34+31}{13}$

$= \frac{436}{13} = 33.53$

Item 8 $M_{p8} = \frac{\text{the total of students score that answer true item}}{n8}$

$M_{p8} = \frac{30+40+10+20+36+13+29+38+43+40+32+36+25+24+30+34+28+31}{18}$

$M_{p8} = \frac{567}{18} = 31.50$

Item 9 $M_{p9} = \frac{\text{the total of students score that answer true item}}{n9}$

$M_{p9} = \frac{30+40+32+20+28+36+13+29+38+43+8+40+36+24+24+30+31=25}{18}$

$M_{p9} = \frac{583}{18} = 32.38$

Item 10 $M_{p10} = \frac{\text{the total of students score that answer true item}}{n10}$

$M_{p10} = \frac{30+40+10+20+28+36+13+38+43+33+8+40+32+25+24+31+31+25}{18}$

$M_{p10} = \frac{535}{18} = 29.72$

Item 11 $M_{p11} = \frac{\text{the total of students score that answer true item}}{n11}$

$M_{p11} = \frac{30+40+32+20+28+36+29+38+43+33+40+32+36+24+34+31+31+25}{18}$

$M_{p11} = \frac{582}{18} = 32.33$

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

$$M_{p12} = \frac{30+40+32+10+28+29+43+33+40+32+36+24+25+34+31+28+31+25}{18}$$

$$M_{p12} = \frac{561}{18} = 31.16$$

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

$$M_{p13} = \frac{30+40+32+20+38+43+40+32+36+25+24+30+34+28+31}{17}$$

$$M_{p13} = \frac{483}{15} = 32.20$$

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

$$M_{p14} = \frac{32+20+28+40+24+30+34+31}{8}$$

$$M_{p14} = \frac{239}{8} = 29.87$$

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

$$M_{p15} = \frac{30+40+36+29+38+43+33+40+32+36+24+25+30+34+31+31+25}{17}$$

$$M_{p15} = \frac{557}{17} = 32.76$$

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

$$M_{p16} = \frac{30+40+36+38+43+33+40+32+36+25+24+30+31+31+25}{15}$$

$$M_{p16} = \frac{494}{15} = 32.93$$

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

$$M_{p17} = \frac{30+40+28+36+29+38+43+40+36+24+30+34+31+31}{14}$$

$$M_{p17} = \frac{470}{14} = 33.57$$

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

$$M_{p18} = \frac{40+20+36+13+29+10+43+33+32+36+24+25+28}{13}$$

$$= \frac{369}{13} = 28.38$$

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

$$M_{p19} = \frac{32+28+36+13+29+38+43+33+8+40+32+36+30+34+31+28+31+25}{18}$$

$$M_{p19} = \frac{567}{18} = 31.50$$

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

$$M_{p20} = \frac{30+40+32+28+36+29+38+43+33+40+32+24+30+34+31+28+31+25}{18}$$

$$M_{p20} = \frac{584}{18} = 32.44$$

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

$$M_{p21} = \frac{30+40+36+38+43+33+40+32+25+30}{10}$$

$$M_{p21} = \frac{347}{10} = 34.70$$

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

$$M_{p22} = \frac{30+40+32+36+38+43+33+32+36+25+24=34+31+28+31+25}{16}$$

$$M_{p22} = \frac{518}{16} = 32.37$$

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

$$Mp_{23} = \frac{32+28+33+36+28}{5}$$

$$M_{p23} = \frac{157}{5} = 31.40$$

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

$$M_{p24} = \frac{40+10+20+36+38+43+40+36+24+24+34+31+28+25}{14}$$

$$M_{p24} = \frac{453}{14} = 32.35$$

Item 25 $M_{p25} = \frac{\text{the total of students score that answer true item}}{n25}$

$$M_{p25} = \frac{30+40+32+38+43+40+32+36+25+30+34+28+31}{13}$$

$$M_{p25} = \frac{439}{13} = 33.76$$

Item 26 $M_{p26=}\frac{\text{the total of students score that true item answer}}{n26}$

$$M_{p126} = \frac{30+40+32+10+20+28+36+29+38+43+33+40+36+30+34+28+31}{17}$$

$$M_{p126} = \frac{562}{17} = 33.05$$

Item 27 $M_{p27} = \frac{\text{the total of students score that answer true item}}{n27}$

$$M_{p27} = \frac{30+40+36+29+38+43+33+40+32+36+24+25+30+34+31+31+25}{17}$$

$$M_{p27} = \frac{557}{17} = 32.76$$

Item 28 $M_{p28} = \frac{\text{the total of students score that answer true item}}{n28}$

$$M_{p28} = \frac{20+32+36+28}{4}$$

$$M_{p28} = \frac{116}{4} = 29.00$$

Item 29 $M_{p29} = \frac{\text{the total of students score that answer true item}}{n29}$

$$Mp_{29} = \frac{40+32+38+43+33+40+36+24+25+30+25}{11}$$

$$M_{p48} = \frac{366}{11} = 33.27$$

Item 30 $M_{p30} = \frac{\text{the total of students score that answer true item}}{n30}$

$$M_{p30} = \frac{40+20+36+13+29+38+43+33+24+25+24+30+34+28}{14}$$

$$M_{p30} = \frac{457}{14} = 32.64$$

Item 31 $M_{p31} = \frac{\text{the total of students score that answer true item}}{n31}$

$$M_{p6} = \frac{40+32+28+36+29+38+43+33+40+32+24+34+31+25}{14}$$

$$= \frac{465}{14} = 33.21$$

Item 32 $M_{p32} = \frac{\text{the total of students score that answer true item}}{n32}$

$$M_{p32} = \frac{40+32+20+28+36+29+38+43+33+40+32+34+31}{13}$$

$$= \frac{436}{13} = 33.53$$

Item 33 $M_{p33} = \frac{\text{the total of students score that answer true item}}{n33}$

$$M_{p33} = \frac{30+40+32+20+28+36+29+38+43+33+40+40+32+36+25+34+31+31+25}{18}$$

$$M_{p33} = \frac{583}{18} = 32.38$$

Item 34 $M_{p34} = \frac{\text{the total of students score that answer true item}}{n34}$

$$M_{p34} = \frac{32+20+28+24+30+34+31}{7}$$

$$M_{p34} = \frac{199}{7} = 28.42$$

Item 35 $M_{p35} = \frac{\text{the total of students score that answer true item}}{n35}$

$$M_{p35} = \frac{30+40+32+20+36+29+38+43+40+32+36+25+24+30+34+28+31+25}{18}$$

$$M_{p35} = \frac{573}{18} = 31.83$$

Item 36 $M_{p36} = \frac{\text{the total of students score that answer true item}}{n36}$

$$M_{p36} = \frac{30+40+32+20+36+29+38+43+33+40+32+36+24+34+31+31+25}{17}$$

$$M_{p36} = \frac{554}{17} = 32.58$$

Item 37 $M_{p37} = \frac{\text{the total of students score that answer true item}}{n37}$

$$M_{p37} = \frac{30+40+32+36+28+29+38+43+33+40+32+36+24+25+34+31+28+31}{18}$$

$$M_{p37} = \frac{590}{18} = 32.77$$

Item 38 $M_{p38} = \frac{\text{the total of students score that answer true item}}{n38}$

$$M_{p38} = \frac{30+40+32+36+38+43+33+32+36+25+24+30+34+31+28+31+25}{17}$$

$$M_{p38} = \frac{548}{17} = 32.23$$

Item 39 $M_{p39} = \frac{\text{the total of students score that answer true item}}{n39}$

$$M_{p39} = \frac{30+40+32+36+20+28+36+13+29+38+43+40+36+32+24+30+34+31+25}{19}$$

$$M_{p39} = \frac{597}{19} = 31.42$$

Item 40 $M_{p40} = \frac{\text{the total of students score that answer true item}}{n40}$

$$M_{p40} = \frac{40+30+28+36+13+29+38+43+33+8+40+36+24+25+24+34+31+28+31}{19}$$

$$M_{p40} = \frac{571}{19} = 30.05$$

Item 41 $M_{p41} = \frac{\text{the total of students score that answer true item}}{n41}$

$$M_{p16} = \frac{30+40+36+38+43+33+40+32+36+25+24+30+31+31+25}{15}$$

$$M_{p16} = \frac{494}{15} = 32.93$$

Item 42 $M_{p42} = \frac{\text{the total of students score that answer true item}}{n42}$

$$M_{p17} = \frac{30+40+28+36+29+38+43+40+36+24+30+34+31+31}{14}$$

$$M_{p17} = \frac{470}{14} = 33.57$$

Item 43 $M_{p43} = \frac{\text{the total of students score that answer true item}}{n43}$

$$M_{p43} = \frac{30+40+36+43+40+32+24+30+34+28+25}{11}$$

$$M_{p43} = \frac{362}{11} = 32.90$$

Item 44 $M_{p44} = \frac{\text{the total of students score that answer true item}}{n44}$

$$M_{p44} = \frac{40+32+28+36+29+38+43+33+8+40+32+36+30+34+31+28+31+25}{18}$$

$$M_{p44} = \frac{587}{18} = 32.61$$

Item 45 $M_{p45} = \frac{\text{the total of students score that answer true item}}{n45}$

$$M_{p45} = \frac{30+40+32+28+36+29+38+43+33+40+32+24+30+34+31+28+31+25}{18}$$

$$M_{p20} = \frac{584}{18} = 32.44$$

Item 46 $M_{p46} = \frac{\text{the total of students score that answer true item}}{n46}$

$$M_{p46} = \frac{30+40+32+28+36+29+38+43+33+40+32+36+24+25+24+30+34+31+28+25}{20}$$

$$M_{p46} = \frac{638}{20} = 31.90$$

Item 47 $M_{p47} = \frac{\text{the total of students score that answer true item}}{n47}$

$$M_{p47} = \frac{30+40+32+28+36+29+38+43+33+40+32+36+24+25+24+30+34+31+28+31}{20}$$

$$M_{p47} = \frac{644}{20} = 32.20$$

Item 48 $M_{p48} = \frac{\text{the total of students score that answer true item}}{n48}$

$$M_{p48} = \frac{32+28+33+36+28}{5}$$

$$= \frac{157}{5} = 31.40$$

Item 49 $M_{p49} = \frac{\text{the total of students score that answer true item}}{n49}$

$$M_{p49} = \frac{40+36+28}{3}$$

$$M_{p49} = \frac{104}{3} = 34.66$$

Item 50 $M_{p50} = \frac{\text{the total of students score that answer true item}}{n50}$

$$M_{p50} = \frac{30+40+32+20+38+43+40+32+36+25+24+30+34+28+31}{13}$$

$$M_{p50} = \frac{483}{15} = 32.20$$

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

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

$$r_{pbi} = \frac{30.80-28.80}{8.78}\sqrt{\frac{0.8}{0.2}}$$

$$r = \frac{2.00}{8.78}\sqrt{4}$$

$$r = 0.227 \text{ x } 2 = 0.455$$

Item 2 $r_{pbi} = \frac{32.41-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{3.61}{8.78}\sqrt{1.5}$$

$$r = 0.411 \text{ x } 1.22 = 0.501$$

Item 3= $r_{pbi} = \frac{32.75-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{3.93}{8.78}\sqrt{1.5}$$

r = 0.447 x 1.2 = 0.546

Item 4 $r_{pbi} = \frac{32.90-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$$r = \frac{4.1}{8.78}\sqrt{1}$$

r = 0.466 x 1 = 0.466

Item 5 $r_{pbi} = \frac{26.60-28.80}{8.78}\sqrt{\frac{0.2}{0.8}}$

$$r = \frac{-2.2}{8.78}\sqrt{0.25}$$

r = - 0.250 x 0.5 = -0.125

Item 6 $r_{pbi} = \frac{32.37-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{3.57}{8.78}\sqrt{2.32}$$

r = 0.406 x 1.5 = 0.620

Item 7= $r_{pbi} = \frac{33.53-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$$r = \frac{4.73}{8.78}\sqrt{1}$$

r = 0.538 x 1 = 0.538

Item 8 $r_{pbi} = \frac{31.50-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{2.70}{8.78}\sqrt{2.33}$$

r = 0.307 x 1.5 = 0.461

Item 9 $r_{pbi} = \frac{32.38-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{3.58}{8.78}\sqrt{2.3}$$

r = 0.407 x 1.52 = 0.611

Item 10 $r_{pbi} = \frac{0.92}{8.78}\sqrt{2.33}$

r = 0.104 x 1.5 = 0.109

Item 11= $r_{pbi} = \frac{32.33-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{3.53}{8.78}\sqrt{2.33}$$

r = 0.402 x 1.5 = 0.603

Item 12 $r_{pbi} = \frac{31.16-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{2.36}{8.78}\sqrt{2.33}$$

r = 0.268 x 1.5 = 0.408

Item 13= $r_{pbi} = \frac{32.20-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{3.40}{8.78}\sqrt{1.5}$$

r = 0.387 x 1.2= 0.464

Item 14 $r_{pbi} = \frac{29.87-28.80}{8.78}\sqrt{\frac{0.3}{0.7}}$

$$r = \frac{1.07}{8.78}0.42$$

r = 0.121 x 0.65 = 0.072

Item 15 $r_{pbi} = \frac{32.76-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{3.96}{8.78}\sqrt{1.5}$$

r = 0.451 x 1.2 = 0.541

Item 16 $r_{pbi} = \frac{32.93-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$r = \frac{4.13}{8.78}\sqrt{1.5}$

r = 0.470 x 1.2 = 0.564

Item 17 $r_{pbi} = \frac{33.57-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$r = \frac{4.77}{8.78}\sqrt{1}$

r = 0.543 x 1 = 0.543

Item 18 $r_{pbi} = \frac{28.38-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$r = \frac{0.42}{8.78}\sqrt{1}$

r = - 0.047 x 1 = 0.047

Item 19 $r_{pbi} = \frac{30.38-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$r = \frac{2.70}{8.78}\sqrt{2.33}$

r = 0.307 x 1.52 = 0.467

Item 20 $r_{pbi} = \frac{32.44-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$r = \frac{3.64}{8.78}\sqrt{2.33}$

r = 0.414 x 1.52 = 0.630

Item 21 $r_{pbi} = \frac{34.70-28.80}{8.78}\sqrt{\frac{0.4}{0.6}}$

$r = \frac{5.9}{8.78}\sqrt{0.6}$

r = 0.671 x 0.816 = 0.548

Item 22 $r_{pbi} = \frac{32.37-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{3.57}{8.78}\sqrt{2.3}$$

$$r = 0.406 \times 1.52 = 0.618$$

Item 23 $r_{pbi} = \frac{31.40-28.80}{8.78}\sqrt{\frac{0.8}{0.2}}$

$$r = \frac{2.60}{8.78}\sqrt{0.25}$$

$$r = 0.296 \times 0.5 = 0.455$$

Item 24 $r_{pbi} = \frac{32.35-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$$r = \frac{3.55}{8.78}\sqrt{1.5}$$

$$r = 0.404 \times 1.2 = 0.485$$

Item 25= $r_{pbi} = \frac{M_p - M_t}{SD_t}\sqrt{\frac{p}{q}}$

$$r_{pbi} = \frac{33.76-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$$

$$r = \frac{4.96}{8.78}\sqrt{1.5}$$

$$r = 0.564 \times 1.2 = 0.677$$

Item 26 $r_{pbi} = \frac{33.05-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{4.25}{8.78}\sqrt{1.5}$$

$$r = 0.484 \times 1.22 = 0.580$$

Item 27 $r_{pbi} = \frac{32.76-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{3.96}{8.78}\sqrt{1.5}$$

$$r = 0.451 \times 1.2 = 0.541$$

Item 28 $r_{pbi} = \frac{29-28.80}{8.78}\sqrt{\frac{0.1}{0.9}}$

$$r = \frac{0.2}{8.78}\sqrt{0.11}$$

r = 0.022 x 0.3 = 0.007

Item 29 $r_{pbi} = \frac{33.27-28.80}{8.78}\sqrt{\frac{0.4}{0.6}}$

$$r = \frac{4.47}{8.78}\sqrt{0.6}$$

r = 0.509 x 0.81 = 0.412

Item 30 $r_{pbi} = \frac{32.64-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$$r = \frac{3.84}{8.78}\sqrt{1}$$

r = 0.437 x 1 = 0.437

Item 31 $r_{pbi} = \frac{33.21-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$$r = \frac{4.41}{8.78}\sqrt{1}$$

r = 0.502 x 1 = 0.502

Item 32 $r_{pbi} = \frac{33.53-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$$r = \frac{4.73}{8.78}\sqrt{1}$$

r = 0.538 x 1 = 0.538

Item 33 $r_{pbi} = \frac{32.38-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{3.58}{8.78}\sqrt{2.3}$$

r = 0.408 x 1.2 = 0.490

Item 34 $r_{pbi} = \frac{28.42-28.80}{8.78}\sqrt{\frac{0.2}{0.8}}$

$$r = \frac{-0.38}{8.78}\sqrt{0.25}$$

r = - 0.043 x 0.5 = - 0.021

Item 35 $r_{pbi} = \frac{31.83-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{3.03}{8.78}\sqrt{2.3}$$

r = 0.345 x 1.5 = 0.526

Item 36 $r_{pbi} = \frac{32.58-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{3.78}{8.78}\sqrt{1.5}$$

r = 0.431 x 1.2 = 0.527

Item 37 $r_{pbi} = \frac{32.77-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{3.92}{8.78}\sqrt{2.3}$$

r = 0.452 x 1.5 = 0.678

Item 38 $r_{pbi} = \frac{32.23-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{3.43}{8.78}\sqrt{1.5}$$

r = 0.390 x 1.22 = 0.468

Item 39 $r_{pbi} = \frac{31.42-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$$r = \frac{2.62}{8.78}\sqrt{2.3}$$

r = 0.298 x 1.5 = 0.447

Item 40 $r_{pbi} = \frac{30.05-28.80}{8.78}\sqrt{\frac{0.8}{0.2}}$

$$r = \frac{1.25}{8.78}\sqrt{4}$$

r = 0.142 x 2 = 0.282

Item 41 $r_{pbi} = \frac{32.93-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$$r = \frac{4.13}{8.78}\sqrt{1.5}$$

r = 0.470 x 1.2 = 0.564

Item 42 $r_{pbi} = \frac{33.57-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$r = \frac{4.77}{8.78}\sqrt{1}$

r = 0.543 x 1 = 0.543

Item 43 $r_{pbi} = \frac{32.90-28.80}{8.78}\sqrt{\frac{0.5}{0.5}}$

$r = \frac{4.10}{8.78}\sqrt{1}$

r = 0.468 x 1 = 0.468

Item 44 $r_{pbi} = \frac{32.61-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$r = \frac{3.81}{8.78}\sqrt{2.3}$

r = 0.434 x 1.5 = 0.651

Item 45 $r_{pbi} = \frac{32.44-28.80}{8.78}\sqrt{\frac{0.7}{0.3}}$

$r = \frac{3.64}{8.78}\sqrt{2.3}$

r = 0.414 x 1.5 = 0.621

Item 48 $r_{pbi} = \frac{31.90-28.80}{8.78}\sqrt{\frac{0.8}{0.2}}$

$r = \frac{3.1}{8.78}\sqrt{2}$

r = 0.353 x 2 = 0.706

Item 47 $r_{pbi} = \frac{32.20-28.80}{8.78}\sqrt{\frac{0.8}{0.2}}$

$r = \frac{3.40}{8.78}\sqrt{4}$

r = 0.387 x 2 = 0.774

Item 49 $r_{pbi} = \frac{34.66-28.80}{8.78}\sqrt{\frac{0.1}{0.9}}$

$r = \frac{5.86}{8.78}\sqrt{0.11}$

r = 0.668 x 0.3 = 0.222

Item 50 $r_{pbi} = \frac{32.20-28.80}{8.78}\sqrt{\frac{0.6}{0.4}}$

$r = \frac{3.4}{8.78}\sqrt{1.5}$

r = 0.387 x 1.2 = 0.473

Appendix 10

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

B. Calculation of Post-Test

1. **Means Score from Score Total (M_t)**

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

$M_t = \frac{813}{25} = 32.64$

2. **Standard Deviation (SD_t)**

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

$SD_t = \sqrt{\frac{29176}{25} - \left(\frac{813}{25}\right)^2}$

$SD_t = \sqrt{1167.04 - 32.64^2}$

$SD_t = \sqrt{1167.04 - 1065.36} = \sqrt{101.68} = 10.08$

3. **Means Score (M_p)**

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

$M_{p1} = \frac{30+48+30+34+34+32+40+28+42+34+32+34+40+32+44+34+32+44+30+32}{20}$

$M_{p1} = \frac{696}{20} = 34.80$

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

$M_{p2} = \frac{38+30+34+48+40+34+32+44+40+8+44+44}{12}$

$M_{p2} = \frac{466}{12} = 38.27$

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

$M_{p3} = \frac{30+38+30+34+48+34+32+40+28+34+32+34+44+40+32+44+34+32+44+30+32}{21}$

$M_{p3} = \frac{746}{21} = 35.52$

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

$M_{p4} = \frac{30+48+34+12+8+42+34+32+14+40+32+44+34+32+44}{15}$

$M_{p4} = \frac{480}{15} = 32.00$

Item 5 $M_{p5} = \frac{\text{the total of students score that answer true item}}{n5}$

$$M_{p5} = \frac{38+34+48+34+40+28+42+34+32+34+44+40+32+32+44+30+32}{17}$$

$$M_{p5} = \frac{618}{17} = 36.35$$

Item 6 $M_{p6} = \frac{\text{the total of students score that answer true item}}{n6}$

$$M_{p6} = \frac{30+38+34+48+12+32+40+28+34+34+44+40+32+44+34+32+44+30+32}{19}$$

$$M_{p6} = \frac{662}{19} = 34.84$$

Item 7 $M_{p7} = \frac{\text{the total of students score that answer true item}}{n7}$

$$M_{p7} = \frac{38+48+12+32+40+28+42+34+44+44+32+44+30}{13}$$

$$M_{p7} = \frac{498}{13} = 38.30$$

Item 8 $M_{p8} = \frac{\text{the total of students score that answer true item}}{n8}$

$$M_{p8} = \frac{48+12+40+8+32+44+32+8+32+44}{10}$$

$$M_{p8} = \frac{300}{10} = 30.00$$

Item 9 $= \frac{\text{the total of students score that answer true item}}{n9}$

$$M_{p9} = \frac{30+38+30+34+48+34+32+40+28+42+34+34+44+40+32+44+34+30+32}{19}$$

$$M_{p9} = \frac{686}{19} = 36.10$$

Item 10 $M_{p10} = \frac{\text{the total of students score that answer true item}}{n10}$

$$M_{p10} = \frac{30+38+34+48+34+40+42+34+32+34+44+40+32+44+34+32+44+30+32}{18}$$

$$M_{p10} = \frac{698}{18} = 38.77$$

Item 11 $M_{p11} = \frac{\text{the total of students score that answer true item}}{n11}$

$$M_{p11} = \frac{30+38+30+34+48+34+12+32+40+28+42+34+34+44+40+32+44+34+32+44+30+32}{22}$$

$$M_{p11} = \frac{768}{22} = 34.90$$

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

$$M_{p12} = \frac{30+38+30+34+48+34+32+40+28+42+34+32+34+44+40+32+44+34+32+44+30+32}{22}$$

$$M_{p12} = \frac{788}{22} = 35.81$$

Item 8 $M_{p13} = \frac{\text{the total of students score that answer true item}}{n13}$

$$M_{p13}= \frac{30+38+30+34+48+34+32+40+28+42+34+32+34+44+40+32+44+34+32+44+30+32}{22}$$

$$M_{p13} = \frac{754}{22} = 34.27$$

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

$$M_{p9} = \frac{30+38+30+48+34+32+28+42+32+8+44+34+44+30}{14}$$

$$M_{P14} = \frac{474}{14} = 33.85$$

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

$$M_{p15} = \frac{30+38+34+48+34+40+28+42+34+32+34+44+44+34+44+30+32}{17}$$

$$M_{p15} = \frac{622}{17} = 36.58$$

Item 16 $M_{p16} = \frac{\text{the total of students score that answer true item}}{n16}$

$$Mp_{16} = \frac{38+30+34+48+34+32+40+42+34+32+34+44+40+32+44+34+32+44+32}{19}$$

$$M_{p16} = \frac{700}{19} = 36.84$$

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

$$M_{p17} = \frac{30+38+30+34+48+34+32+40+42+34+34+40+44+34+44+32}{16}$$

$$M_{p17} = \frac{590}{16} = 36.87$$

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

$$M_{p18} = \frac{38+34+48+34+40+28+42+32+34+44+40+32+44+34+32+44+30+32}{18}$$

$$M_{p18} = \frac{662}{18} = 36.77$$

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

$$M_{p19} = \frac{30+48+32+8+42+44+44+30+32}{8}$$

$$M_{p19} = \frac{310}{8} = 38.75$$

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

$$M_{p20} = \frac{30+48+32+42+34+44+40+44}{8}$$

$$M_{p20} = \frac{314}{8} = 39.25$$

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

$$M_{p21} = \frac{30+38+34+48+34+32+40+42+32+44+40+44+34+32}{14}$$

$$M_{p21} = \frac{524}{14} = 37.42$$

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

$$M_{p22} = \frac{30+30+48+12+40+28+42+34+32+34+44+40+44+44+30}{15}$$

$$M_{p22} = \frac{570}{15} = 38.00$$

Item 23 $M_{p23} = \frac{\text{the total of students score that answer true item}}{n23}$

$$M_{p23} = \frac{38+30+34+48+34+32+40+42+34+32+34+44+40+32+44+34+32+44+32}{19}$$

$$M_{p23} = \frac{700}{19} = 36.84$$

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

$$M_{p24} = \frac{30+48+8+42+44+40+8+44+32+44}{10}$$

$$M_{p24} = \frac{340}{10} = 34.00$$

Item 25 $M_{p25} = \frac{\text{the total of students score that answer true item}}{n25}$

$$M_{p25} = \frac{38+30+34+48+12+32+40+28+42+34+32+34+44+48+32+32+44+30+32}{19}$$

$$M_{p25} = \frac{666}{19} = 35.05$$

Item 26 $M_{p126} = \frac{\text{the total of students score that answer true item}}{n26}$

$$M_{p126} = \frac{30+48+30+34+34+32+40+28+42+34+32+34+40+32+44+34+32+44+30+32}{20}$$

$$M_{p126} = \frac{696}{20} = 34.80$$

Item 27 $M_{p27} = \frac{\text{the total of students score that answer true item}}{n27}$

$$M_{p27} = \frac{38+30+34+48+12+32+40+28+42+34+32+34+44+40+32+32+44+30+32}{19}$$

$$M_{p27} = \frac{658}{12} = 34.66$$

Item 28 $M_{p28} = \frac{\text{the total of students score that answer true item}}{n28}$

$$M_{p28}=\frac{30+38+30+34+48+34+32+40+28+34+32+34+44+40+32+44+34+32+44+30+32}{21}$$

$$M_{p28}=\frac{746}{21}=35.52$$

Item 29 $M_{p4}=\frac{\text{the total of students score that answer true item}}{n29}$

$$M_{p4}=\frac{30+48+34+48+34+32+40+28+34+34+44+40+32+44+34+32+44+30+32}{19}$$

$$M_{p4}=\frac{684}{19}=36.00$$

Item 30 $M_{p30}=\frac{\text{the total of students score that answer true item}}{n30}$

$$M_{p30}=\frac{38+48+8+42+44+40+8+44+32+44}{10}$$

$$M_{p30}=\frac{340}{10}=34.00$$

Item 31 $M_{p31}=\frac{\text{the total of students score that answer true item}}{n31}$

$$M_{p31}=\frac{30+48+34+12+8+42+34+32+44+40+32+44+34+32+44}{15}$$

$$M_{p31}=\frac{510}{15}=34.00$$

Item 32 $M_{p32}=\frac{\text{the total of students score that answer true item}}{n32}$

$$M_{p32}=\frac{38+48+12+40+28+42+34+44+44+32+44+30}{12}$$

$$M_{P32}=\frac{448}{12}=37.33$$

Item 33 $M_{p33}=\frac{\text{the total of students score that answer true item}}{n33}$

$$M_{p33}=\frac{30+38+30+34+48+34+32+40+28+42+34+32+34+44+40+32+44+34+32+44+30+32}{22}$$

$$M_{p33}=\frac{788}{22}=35.81$$

Item 34 $M_{p34}=\frac{\text{the total of students score that answer true item}}{n34}$

$$M_{p34}=\frac{48+12+40+8+32+44+32+8+32+44}{10}$$

$$M_{p34}=\frac{300}{10}=30.00$$

Item 35 $M_{p35}=\frac{\text{the total of students score that answer true item}}{n35}$

$$M_{p35}=\frac{30+38+34+48+34+40+42+34+32+34+44+40+32+44+34+32+44+30+32}{18}$$

$$M_{p35}=\frac{698}{18}=38.77$$

Item 36 $M_{p36}=\frac{\text{the total of students score that answer true item}}{n36}$

$$M_{p36}=\frac{30+38+30+34+48+34+12+32+40+28+42+34+34+44+40+32+44+34+32+44+30+32}{22}$$

$$M_{p36}=\frac{768}{22}=34.90$$

Item 37 $M_{p\,37}=\frac{\text{the total of students score that answer true item}}{n37}$

$$M_{p37}=\frac{30+38+30+34+48+34+32+40+28+42+34+34+44+40+32+44+34+30+32}{19}$$

$$M_{p37}=\frac{680}{19}=35.78$$

Item 38 $M_{p38}=\frac{\text{the total of students score that answer true item}}{n38}$

$$M_{p38}=\frac{30+38+30+34+48+34+32+40+28+42+34+32+34+44+40+32+44+34+32+44+30+32}{22}$$

$$M_{p38}=\frac{788}{22}=35.81$$

Item 39 $M_{p39}=\frac{\text{the total of students score that answer true item}}{n39}$

$$M_{p39}=\frac{30+30+48+12+40+28+42+34+32+34+44+40+44+44+30}{15}$$

$$M_{p39}=\frac{540}{15}=36.00$$

Item 40 $M_{p40}=\frac{\text{the total of students score that answer true item}}{n40}$

$$M_{p40}=\frac{30+38+34+48+34+40+28+42+34+32+34+44+44+34+44+30+32}{17}$$

$$M_{p40}=\frac{622}{17}=36.58$$

Item 41 $M_{p41}=\frac{\text{the total of students score that answer true item}}{n41}$

$$Mp_{41}=\frac{38+30+34+48+34+32+40+42+34+32+34+44+40+32+44+34+32+44+32}{19}$$

$$M_{p41}=\frac{700}{19}=36.84$$

Item 42 $M_{p42}=\frac{\text{the total of students score that answer true item}}{n42}$

$$M_{p42}=\frac{30+38+30+34+48+34+32+40+42+34+32+34+44+40+32+44+34+44+32}{19}$$

$$M_{p42}=\frac{698}{19}=36.73$$

Item 43 $M_{p43}=\frac{\text{the total of students score that answer true item}}{n43}$

$$M_{p43}=\frac{38+48+32+8+42+44+44+32}{8}$$

$$M_{p43}=\frac{280}{8}=35.00$$

Item 44 $M_{p44}=\frac{\text{the total of students score that answer true item}}{n44}$

$$M_{p44}=\frac{38+34+38+34+40+28+42+32+34+44+40+32+44+34+32+44+30+32}{18}$$

$$M_{p44} = \frac{662}{18} = 36.77$$

Item 45 $M_{p45} = \frac{\text{the total of students score that answer true item}}{n45}$

$$M_{p45} = \frac{30+38+34+48+34+32+40+42+32+44+40+44+34+32}{14}$$

$$M_{p45} = \frac{524}{14} = 37.42$$

Item 46 $M_{p46} = \frac{\text{the total of students score that answer true item}}{n46}$

$$M_{p46} = \frac{30+48+32+42+34+44+40+44}{8}$$

$$M_{p46} = \frac{314}{8} = 39.25$$

Item 47 $M_{p47} = \frac{\text{the total of students score that answer true item}}{n47}$

$$M_{p47 =} \frac{30+38+30+48+34+32+28+42+32+8+44+34+44+30}{14}$$

$$M_{p47} = \frac{474}{14} = 33.85$$

Item 48 $M_{p48} = \frac{\text{the total of students score that answer true item}}{n48}$

$$M_{p48} = \frac{38+30+34+48+34+32+40+42+34+32+34+44+40+32+44+34+32+44+32}{19}$$

$$M_{p48} = \frac{700}{19} = 36.84$$

Item 49 $M_{p49} = \frac{\text{the total of students score that answer true item}}{n49}$

$$M_{p49} = \frac{38+34+48+34+40+28+42+34+44+40+8+44+34+32+44+30+32}{17}$$

$$M_{p49} = \frac{606}{17} = 35.64$$

Item 50 $M_{p50} = \frac{\text{the total of students score that answer true item}}{n50}$

$$M_{p50} = \frac{38+30+34+48+40+34+32+44+40+8+44+44}{11}$$

$$M_{p50} = \frac{436}{11} = 39.63$$

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

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

$$r_{pbi} = \frac{34.80-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$$

$$r = \frac{2.16}{10.08}\sqrt{4}$$

r = 0.214 x 2 = 0.428

Item 2 $r_{pbi} = \frac{38.83-32.64}{10.08}\sqrt{\frac{0.5}{0.5}}$

$$r_{pbi} = \frac{6.193}{10.08}\sqrt{1}$$

r = 0.614 x 1 = 0.614

Item 3 $r_{pbi} = \frac{35.52-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{2.88}{10.08}\sqrt{4}$$

r = 0.285 x 2 = 0.571

Item 4 $r_{pbi} = \frac{32.00-32.64}{10.08}\sqrt{\frac{0.6}{0.4}}$

$$r_{pbi} = \frac{-0.64}{10.08}\sqrt{1.5}$$

r = - 0.06 x 1.22 = - 0.076

Item 5 $r_{pbi} = \frac{36.35-32.24}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{3.71}{10.08}\sqrt{2.33}$$

r = 0.368 x 1.52 = 0.552

Item 6 $r_{pbi} = \frac{34.84-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{2.2}{10.08}\sqrt{4}$$

r = 0.218 x 2 = 0.436

Item 7 $r_{pbi} = \frac{38.30-32.64}{10.08}\sqrt{\frac{0.5}{0.5}}$

$$r_{pbi} = \frac{5.66}{10.08}\sqrt{1}$$

r = 0.562 x 1 = 0.562

Item 8 $r_{pbi} = \frac{30-32.64}{10.08}\sqrt{\frac{0.4}{0.6}}$

$$r_{pbi} = \frac{-2.64}{10.08}\sqrt{0.66}$$

r = - 2.6 x 0.186 = -0.213

Item 9 $r_{pbi} = \frac{36.10-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{3.46}{10.08}\sqrt{4}$$

r = 0.343 x 2 = 0.686

Item 10 $r_{pbi} = \frac{38.77-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{6.13}{10.08}\sqrt{2.33}$$

r = 0.608x 1.52= 0.912

Item 11 $r_{pbi} = \frac{34.90-32.64}{10.08}\sqrt{\frac{0.9}{0.1}}$

$$r_{pbi} = \frac{2.26}{10.08}\sqrt{9}$$

r = 0.224 x 3 = 0.912

Item 12 $r_{pbi} = \frac{35.81-32.64}{10.08}\sqrt{\frac{0.9}{01}}$

$$r_{pbi} = \frac{3.17}{10.08}\sqrt{9}$$

r = 0.314 x 3 = 0.943

Item 13 $r_{pbi} = \frac{34.27-32.64}{10.08}\sqrt{\frac{0.9}{0.1}}$

$$r_{pbi} = \frac{1.63}{10.08}\sqrt{9}$$

r = 0.161 x 3 = 0.485

Item 14 $r_{pbi} = \frac{33.85-32.64}{10.08}\sqrt{\frac{0.6}{0.4}}$

$$r_{pbi} = \frac{1.21}{10.08}\sqrt{1.5}$$

r = 0.120 x 1.22 = 0.144

Item 15 $r_{pbi} = \frac{36.58-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{3.94}{10.08}\sqrt{2.33}$$

r = 0.390 x 1.52 = 0.586

Item 16 $r_{pbi} = \frac{36.84-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{4.2}{10.08}\sqrt{4}$$

r = 0.416 x 2 = 0.833

Item 17 $r_{pbi} = \frac{36.87-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{4.23}{10.08}\sqrt{2}$$

r = 0.419 x2 = 0.839

Item 18 $r_{pbi} = \frac{36.77-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$r_{pbi} = \frac{4.13}{10.08}\sqrt{2.33}$

r = 0.409 x 1.52 = 0.614

Item 19 $r_{pbi} = \frac{38.75-32.64}{10.08}\sqrt{\frac{0.3}{0.7}}$

$r_{pbi} = \frac{6.18}{10.08}\sqrt{0.42}$

r = 0.618 x 0.64 = 0.396

Item 20 $r_{pbi} = \frac{39.25-32.64}{10.08}\sqrt{\frac{0.3}{0.7}}$

$r_{pbi} = \frac{6.61}{5.01}\sqrt{0.42}$

r = 0.655 x 0.64 = 0.426

Item 21 $r_{pbi} = \frac{37.42-32.64}{10.08}\sqrt{\frac{0.6}{0.4}}$

$r_{pbi} = \frac{4.78}{10.08}\sqrt{1.5}$

r = 0.474 x 1.22 = 0.569

Item 22 $r_{pbi} = \frac{38-32.64}{10.08}\sqrt{\frac{0.6}{0.4}}$

$r_{pbi} = \frac{5.36}{10.08}\sqrt{1.5}$

r = 0.531 x 1.22 = 0.630

Item 23 $r_{pbi} = \frac{36.84-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$r_{pbi} = \frac{4.2}{10.08}\sqrt{4}$

r = 0.416 x 2 = 0.833

Item 24 $r_{pbi} = \frac{34-32.64}{10.08}\sqrt{\frac{0.4}{0.6}}$

$r_{pbi} = \frac{1.36}{10.08}\sqrt{0.66}$

r = 0.134x 0.186 = 0.110

Item 25 $r_{pbi} = \frac{35.05-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$r_{pbi} = \frac{2.41}{10.08}\sqrt{4}$

r = 0.239 x 2= 0.478

Item 26 $r_{pbi} = \frac{34.8-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$r = \frac{2.16}{10.08}\sqrt{4}$

r = 0.214 x 2 = 0.428

Item 27 $r_{pbi} = \frac{34.66-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$r_{pbi} = \frac{2.01}{10.08}\sqrt{4}$

r = 0.199 x 2 = 0.398

Item 28 $r_{pbi} == \frac{36.00-32.64}{10.08}\sqrt{\frac{0.6}{0.4}}$

$r_{pbi} = \frac{3.36}{10.08}\sqrt{1.5}$

r = 0.333 x 1.22 = 0.399

Item 29 $r_{pbi} = \frac{36.00-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$r_{pbi} = \frac{3.36}{10.08}\sqrt{1.5}$

r = 0.333 x 2 = 0.666

Item 30 $r_{pbi} = \frac{34.00-32.24}{10.08}\sqrt{\frac{0.4}{0.6}}$

$r_{pbi} = \frac{1.36}{10.08}\sqrt{0.66}$

r = 0.134 x 0.816 = 0.109

Item 31 $r_{pbi} = \frac{34.00-32.64}{10.08}\sqrt{\frac{0.6}{0.4}}$

$r_{pbi} = \frac{1.36}{10.08}\sqrt{1.5}$

r = 0.134 x 1.2 = 0.160

Item 32 $r_{pbi} = \frac{37.33-32.64}{10.08}\sqrt{\frac{0.5}{0.5}}$

$r_{pbi} = \frac{4.69}{10.08}\sqrt{1}$

r = 0.465 x 1 = 0.465

Item 33 $r_{pbi} = \frac{35.81-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$r_{pbi} = \frac{3.17}{10.08}\sqrt{4}$

r = 0.314 x 2 = 0.628

Item 34 $r_{pbi} = \frac{30.00-32.64}{10.08}\sqrt{\frac{0.4}{0.6}}$

$r_{pbi} = \frac{-2.64}{10.08}\sqrt{0.66}$

r = - 0.261 x 0.816 = - 0.231

Item 35 $r_{pbi} = \frac{38.77-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{6.13}{10.08}\sqrt{2.33}$$

r = 0.608x 1.52= 0.912

Item 36 $r_{pbi} = \frac{34.90-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{2.26}{10.08}\sqrt{4}$$

r = 0.224 x 2 = 0.448

Item 37 $r_{pbi} = \frac{35.78-32.64}{10.08}\sqrt{\frac{0.8}{02}}$

$$r_{pbi} = \frac{3.14}{10.08}\sqrt{4}$$

r = 0.311 x 2 = 0.623

Item 38 $r_{pbi} = \frac{35.52-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{2.88}{10.08}\sqrt{4}$$

r = 0.285 x 2 = 0.571

Item 39 $r_{pbi} = \frac{35.81-32.64}{10.08}\sqrt{\frac{0.9}{0.1}}$

$$r_{pbi} = \frac{3.17}{10.08}\sqrt{9}$$

r = 0.314 x 3 = 0.943

Item 40 $r_{pbi} = \frac{36.00-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{3.36}{10.08}\sqrt{2.33}$$

r = 0.333 x 1.52 = 0.499

Item 41 $r_{pbi} = \frac{36.84-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{4.2}{10.08}\sqrt{2.3}$$

r = 0.416 x 1.5 = 0.625

Item 42 $r_{pbi} = \frac{36.73-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{4.09}{10.08}\sqrt{2.3}$$

r = 0.405 x 1.5 = 0.608

Item 43 $r_{pbi} = \frac{35.00-32.64}{10.08}\sqrt{\frac{0.3}{0.7}}$

$$r_{pbi} = \frac{2.36}{10.08}\sqrt{0.42}$$

r = 0.234 x 0.6 = 0.153

Item 44 $r_{pbi} = \frac{36.77-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{4.13}{10.08}\sqrt{2.32}$$

r = 0.409 x 1.5 = 0.614

Item 45 $r_{pbi} = \frac{37.42-32.64}{10.08}\sqrt{\frac{0.6}{0.4}}$

$$r_{pbi} = \frac{4.78}{10.08}\sqrt{1.5}$$

r = 0.474 x 1.2 = 0.568

Item 46 $r_{pbi} = \frac{39..25-32.64}{10.08}\sqrt{\frac{0.4}{0.6}}$

$$r_{pbi} = \frac{6.61}{10.08}\sqrt{0.66}$$

r = 0.655 x 0.816 = 0.535

Item 47 $r_{pbi} = \frac{33.85-32.64}{10.08}\sqrt{\frac{0.5}{0.5}}$

$$r_{pbi} = \frac{1.21}{10.08}\sqrt{1}$$

r = 0.120 x 1 = 0.120

Item 48 $r_{pbi} = \frac{36.84-32.64}{10.08}\sqrt{\frac{0.8}{0.2}}$

$$r_{pbi} = \frac{4.2}{10.08}\sqrt{4}$$

r = 0.416 x 2 = 0.833

Item 49 $r_{pbi} = \frac{35.64-32.64}{10.08}\sqrt{\frac{0.7}{0.3}}$

$$r_{pbi} = \frac{3.00}{10.08}\sqrt{2.32}$$

r = 0.297 x 1.5 = 0.446

Item 50 $r_{pbi} = \frac{39.63-32.64}{10.08}\sqrt{\frac{0.5}{0.5}}$

$$r_{pbi} = \frac{6.99}{10.08}\sqrt{1}$$

r = 0.694 x 1= 0.694

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.	30.80	28.80	8.78	0.8	0.2	0.455	0.396	Valid
2.	32.41	28.80	8.78	0.6	0.4	0.501	0.396	Valid
3.	32.73	28.80	8.78	0.5	0.5	0.546	0.396	Valid
4.	32.90	28.80	8.78	0.6	0.4	0.466	0.396	Valid
5.	26.60	28.80	8.78	0.2	0.8	- 0.125	0.396	Invalid
6.	32,37	28.80	8.78	0.5	0.5	0.620	0.396	Valid
7.	33.53	28.80	8.78	0.5	0.5	0.538	0.396	Valid
8.	31.50	28.80	8.78	0.7	0.3	0.461	0.396	Valid
9.	32.38	28.80	8.78	0.7	0.3	0.611	0.396	Valid
10.	29.72	28.80	8.78	0.7	0.3	-0.109	0.396	Invalid
11.	32.33	28.80	8.78	0.7	0.3	0.603	0.396	Valid
12.	31.16	28.80	8.78	0.7	0.3	0.408	0.396	Valid
13.	32.20	28.80	8.78	0.6	0.4	0.464	0.396	Valid
14.	29.87	28.80	8.78	0.3	0.7	0.072	0.396	Invalid
15.	32.76	28.80	8.78.	0.6	0.4	0.541	0.396	Valid
16.	32.93	28.80	8.78	0.6	0.4	0.564	0.396	Valid
17.	33.57	28.80	8.78	0.5	0.5	0.543	0.396	Valid
18.	28.38	28.80	8.78	0.4	0.6	- 0.047	0.396	Invalid
19.	31.50	28.80	8.78	0.7	0.3	0.467	0.396	Valid
20.	32.44	28.80	8.78	0.7	0.3	0.630	0.396	Valid
21.	34.70	28.80	8.78	0.4	0.6	0.548	0.396	Valid
22.	32.37	28.80	8.78	0.6	0.4	0.618	0.396	Valid
23.	31.40	28.80	8.78	0.2	0.8	0.148	0.396	Invalid
24.	32.35	28.80	8.78	0.5	0.5	0.485	0.396	Valid
25.	33.76	28.80	8.78	0.5	0.5	0.677	0.396	Valid
26.	33.05	28.80	8.78	0.6	0.4	0.580	0.396	Valid
27.	32.76	28.80	8.78	0.6	0.4	0.541	0.396	Valid
28.	29.00	28.80	8.78	0.1	0.9	0.007	0.396	Invalid
29.	33.27	28.80	8.78	0.4	0.6	0.412	0.396	Valid
30.	32.64	28.80	8.78	0.5	0.5	0.437	0.396	Valid
31.	33.21	28.80	8.78	0.5	0.5	0.502	0.396	Valid
32.	33.53	28.80	8.78	0.5	0.5	0.538	0.396	Valid
33.	32.38	28.80	8.78	0.7	0.3	0.490	0.396	Valid
34.	28.42	28.80	8.78	0.2	0.8	- 0.021	0.396	Invalid
35.	31.83	28.80	8.78	0.7	0.3	0.526	0.396	Valid
36.	32.58	28.80	8.78	0.6	0.4	0.527	0.396	Valid
37.	32.77	28.80	8.78	0.7	0.3	0.678	0.396	Valid
38.	32.23	28.80	8.78	0.6	0.4	0.468	0.396	Valid
39.	31.42	28.80	8.78	0.7	0.3	0.447	0.396	Valid
40.	30.05	28.80	8.78	0.8	0.2	0.284	0.396	Invalid
41.	32.93	28.80	8.78	0.6	0.3	0.564	0.396	Valid
42.	33.57	28.80	8.78	0.5	0.5	0.543	0.396	Valid
43.	32.90	28.80	8.78	0.5	0.5	0.468	0.396	Valid
44.	32.61	28.80	8.78	0.7	0.3	0.651	0.396	Valid
45.	32.44	28.80	8.78	0.7	0.3	0.621	0.396	Valid
46.	31.90	28.80	8.78	0.8	0.2	0.706	0.396	Valid
47.	32.20	28.80	8.78	0.8	0.2	0.774	0.396	Valid
48.	31.40	28.80	8.78	0.2	0.8	0.148	0.396	Invalid
49.	34.66	28.80	8.78	0.1	0.9	0.222	0.396	Invalid
50.	32.20	28.80	8.78	0.6	0.4	0.473	0.396	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.	34.80	32.64	10.08	0.8	0.2	0.428	0.396	Valid
2.	38.27	32.64	10.08	0.5	0.5	0.614	0.396	Valid
3.	35.52	32.64	10.08	0.8	0.2	0.571	0.396	Valid
4.	32.00	32.64	10.08	0.6	0.4	- 0.076	0.396	Invalid
5.	36.35	32.64	10.08	0.4	0.6	0.552	0.396	Valid
6.	35.84	32.64	10.08	0.8	0.2	0.436	0.396	Valid
7.	38.30	32.64	10.08	0.5	0.5	0.562	0.396	Valid
8.	30.00	32.64	10.08	0.9	0.1	-0.213	0.396	Invalid
9.	36.10	32.64	10.08	0.8	0.2	0.686	0.396	Valid
10.	38.77	32.64	10.08	0.7	0.3	0.912	0.396	Valid
11.	34.90	32.64	10.08	0.9	0.1	0.912	0.396	Valid
12.	35.81	32.64	10.08	0.4	0.6	0.943	0.396	Valid
13.	34.27	32.64	10.08	0.9	0.1	0.485	0.396	Valid
14.	33.85	32.64	10.08	0.6	0.4	0,144	0.396	Invalid
15.	36.58	32.64	10.08	0.7	0.3	0.586	0.396	Valid
16.	36.84	32.64	10.08	0.8	0.8	0.833	0.396	Valid
17.	36.87	32.64	10.08	0.6	0.4	0.839	0.396	Valid
18.	36.77	32.64	10.08	0.3	0.7	0.614	0.396	Valid
19.	38.75	32.64	10.08	0.7	0.3	0.393	0.396	Invalid
20.	39.25	32.64	10.08	0.3	0.7	0.426	0.396	Valid
21.	37.42	32.64	10.08	0.6	0.4	0.569	0.396	Valid
22.	38.00	32.64	10.08	0.6	0.4	0.630	0.396	Valid
23.	36.84	32.64	10.08	0.8	0.2	0.833	0.396	Valid
24.	34.00	32.64	10.08	0.7	0.3	0.110	0.396	Invalid
25.	35.05	32.64	10.08	0.8	0.2	0.478	0.396	Valid
26.	34.80	32.64	10.08	0.8	0.2	0.428	0.396	Valid
27.	34.66	32.64	10.08	0.8	0.2	0.398	0.396	Valid
28.	35.52	32.64	10.08	0.8	0.2	0.571	0.396	Valid
29.	36.00	32.64	10.08	0.7	0.3	0.666	0.396	Valid
30.	34.00	32.64	10.08	0.4	0.6	0.109	0.396	Invalid
31.	34.00	32.64	10.08	0.6	0.4	0.160	0.396	Invalid
32.	37.33	32.64	10.08	0.5	0.5	0.465	0.396	Valid
33.	35.81	32.64	10.08	0.8	0.2	0.628	0.396	Valid
34.	30.00	32.64	10.08	0.4	0.6	- 0.231	0.396	Invalid
35.	38.77	32.64	10.08	0.7	0.3	0.912	0.396	Valid
36.	34.90	32.64	10.08	0.9	0.1	0.448	0.396	Valid
37.	35.78	32.64	10.08	0.8	0.2	0.623	0.396	Valid
38.	35.81	32.64	10.08	0.9	0.1	0.843	0.396	valid
39.	36.00	32.64	10.08	0.6	0.4	0.399	0.396	Valid
40.	36.58	32.64	10.08	0.7	0.3	0.499	0.396	Valid
41.	36.84	32.64	10.08	0.8	0.2	0.625	0.396	Valid
42.	36.73	32.64	10.08	0.8	0.2	0.608	0.396	Valid
43.	35.00	32.64	10.08	0.3	0.7	0.153	0.396	Invalid
44.	36.77	32.64	10.08	0.7	0.3	0.614	0.396	Valid
45.	37.42	32.64	10.08	0.5	0.5	0.568	0.396	Valid
46.	39.25	32.64	10.08	0.3	0.7	0.535	0.396	Valid
47.	33.85	32.64	10.08	0.5	0.5	0.120	0.396	Invalid
48.	36.84	32.64	10.08	0.8	0.2	0.833	0.396	Valid
49.	35.64	32.64	10.08	0.7	0.3	0.446	0.396	Valid
50.	39.63	32.64	10.08	0.4	0.6	0.694	0.396	Valid

Appendix 9

Validity Post Test

NO	NO ITEM																																																		Xt	Xt^2
	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	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		
1	1	0	1	1	0	1	0	0	1	1	1	1	1	1	1	0	1	0	0	0	1	1	0	1	0	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	0	0	1	0	1	0	0	0	30	900
2	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	1	38	1444
3	1	1	1	0	0	0	0	0	1	0	1	1	1	1	0	1	1	0	1	1	0	1	1	0	1	1	1	1	0	0	0	0	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1	0	1	30	900
4	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1	0	1	1	1	0	1	1	0	0	1	1	1	34	1156
5	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	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	48	2304
6	1	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	0	34	1156
7	0	0	0	1	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	1	1	0	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	12	144
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9	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	0	1	1	1	40	1600
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11	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	8	64
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13	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	0	0	0	0	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	0	0	0	0	0	1	0	1	34	1156
14	1	1	1	1	1	0	0	1	0	1	0	1	1	0	1	1	0	1	0	0	1	1	1	0	1	1	1	1	0	0	1	0	1	1	1	0	0	1	1	1	1	1	0	1	1	0	0	1	0	1	32	1024
15	1	0	1	0	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1	1	1	1	1	0	1	0	1	0	1	1	0	34	1156
16	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	44	1936
17	1	1	1	1	1	1	0	0	1	0	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	0	1	1	1	0	1	1	1	40	1600
18	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	1	0	0	0	0	1	0	0	1	1	1	1	0	1	0	1	1	1	1	1	1	0	0	1	1	0	1	0	0	1	1	0	0	32	1024
19	0	1	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	8	64
20	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	44	1936
21	1	0	1	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	0	34	1156
22	1	0	1	1	1	1	1	1	0	0	1	1	1	0	0	1	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	0	1	0	0	1	0	0	0	1	1	0	32	1024
23	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1	1	1	44	1936
24	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	0	0	0	1	0	0	1	0	1	0	30	900
25	1	0	1	0	1	1	0	0	1	0	1	1	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	0	0	1	0	0	1	1	1	0	1	1	1	1	1	1	0	0	1	1	0	32	1024
N=25	20	12	21	15	17	19	13	10	19	18	22	22	22	14	17	19	16	18	8	8	14	15	19	10	19	20	19	21	19	10	15	13	22	10	18	22	19	22	15	17	19	19	8	18	14	8	14	19	17	11	816	29176
P	0,8	0,5	0,8	0,6	0,7	0,8	0,5	0,4	0,8	0,7	0,9	0,9	0.9	0,6	0,7	0,8	0,8	0,7	0,3	0,3	0,6	0,6	0,8	0,4	0,8	0.8	0.8	0.8	0.7	0.4	0.6	0.5	0.8	0.4	0.7	0.8	0.7	0.6	0.6	0.7	0.8	0.8	0.3	0.7	0.6	0.3	0.6	0.8	0.7	0.4	∑xt	∑xt²
Q	0.2	0,5	0,2	0,4	0,3	0,2	0,5	0,6	0,2	0,3	0,1	0,1	0.1	0,4	0,3	0,2	0,2	0,3	0,7	0,7	0,4	0,4	0,2	0,6	0,2	0.2	0.2	0.2	0.3	0.6	0.4	0.5	0.2	0.6	0.3	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.7	0.3	0.4	0.7	0.4	0.2	0.3	0.6		

Appendix 13

Reliability Post Test

NO	NO ITEM																																																		Xt	Xt^2
	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	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		
1	1	0	1	1	0	1	0	0	1	1	1	1	1	1	1	0	1	0	0	0	1	1	0	1	0	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	0	0	1	0	1	0	0	0	30	900
2	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	0	0	1	1	0	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	1	38	1444
3	1	1	1	0	0	0	0	0	1	0	1	1	1	1	0	1	1	0	1	1	0	1	1	0	1	1	1	1	0	0	0	0	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1	1	0	1	30	900
4	1	1	1	0	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	0	1	0	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	0	0	1	1	1	0	1	1	0	1	1	1	1	34	1156
5	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	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	48	2304
6	1	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	34	1156
7	0	0	0	1	0	1	1	1	0	1	1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	1	0	0	0	1	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	12	144
8	1	0	1	0	0	1	1	0	1	1	1	1	1	1	0	1	1	0	1	1	1	0	1	0	1	1	1	1	1	0	0	1	1	0	0	1	1	0	1	0	1	1	1	0	1	1	1	1	0	0	32	1024
9	1	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	0	1	1	1	0	1	1	1	1	1	0	0	1	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	1	1	1	40	1600
10	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	0	0	1	0	0	0	1	0	0	0	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	0	0	0	1	0	0	1	0	1	0	28	784
11	0	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	8	64
12	1	0	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	42	1764
13	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	0	0	0	0	1	1	0	1	1	1	1	1	0	1	1	1	0	1	1	1	1	0	1	1	1	0	0	0	0	1	1	0	1	34	1156
14	1	1	1	1	1	0	0	1	0	1	0	1	1	0	1	1	0	1	0	0	1	1	1	0	1	1	1	1	0	0	1	0	1	1	1	0	0	1	0	1	1	1	0	1	1	0	1	1	0	1	32	1024
15	1	0	1	0	1	1	0	0	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	0	0	0	1	0	1	1	1	1	0	1	1	1	0	1	0	1	1	1	1	0	34	1156
16	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1	1	1	1	44	1936
17	1	1	1	1	1	1	0	0	1	0	1	1	1	0	0	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	1	40	1600
18	1	0	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	1	0	0	0	0	1	0	0	1	1	1	1	0	1	0	1	1	1	1	1	0	1	0	1	1	0	1	0	0	1	1	0	0	32	1024
19	0	1	0	0	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	1	8	64
20	1	1	1	1	0	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	44	1936
21	1	0	1	1	0	1	0	0	1	0	1	1	1	1	1	1	1	1	0	0	1	0	1	0	1	1	0	1	1	0	1	0	1	0	1	1	1	0	1	1	1	1	0	1	1	0	1	1	1	0	34	1156
22	1	0	1	1	1	1	1	1	0	0	1	1	1	0	0	1	0	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	1	0	0	1	0	0	1	1	1	0	32	1024
23	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1	1	1	44	1936
24	1	0	1	0	1	1	1	0	1	1	1	1	1	1	1	0	0	1	1	0	0	1	0	0	1	1	1	1	1	0	0	1	1	0	1	1	1	1	1	1	0	0	0	1	0	0	1	0	1	0	30	900
25	1	0	1	0	1	1	0	0	1	0	1	1	1	0	1	1	1	1	1	0	1	0	1	0	1	1	1	1	1	0	0	0	1	0	0	1	1	0	0	1	1	1	1	1	1	0	1	1	1	0	32	1024
N=25	20	12	21	15	17	19	13	10	19	18	22	22	22	14	17	19	16	18	8	8	14	15	19	10	19	20	19	21	19	10	15	13	22	10	18	22	19	15	14	17	19	19	8	18	14	8	14	19	17	11	816	29176
P	0,8	0,5	0,8	0,6	0,7	0,8	0,5	0,4	0,8	0,7	0,9	0,9	0.9	0,6	0,7	0,8	0,8	0,7	0,3	0,3	0,6	0,6	0,8	0,4	0,8	0.8	0.8	0.8	0.7	0.4	0.6	0.5	0.8	0.4	0.7	0.8	0.7	0.6	0.6	0.7	0.8	0.8	0.3	0.7	0.6	0.3	0.6	0.8	0.7	0.4	∑xt	∑xt²
Q	0.2	0,5	0,2	0,4	0,3	0,2	0,5	0,6	0,2	0,3	0,1	0,1	0.1	0,4	0,3	0,2	0,2	0,3	0,7	0,7	0,4	0,4	0,2	0,6	0,2	0.2	0.2	0.2	0.3	0.6	0.4	0.5	0.2	0.6	0.3	0.2	0.3	0.4	0.4	0.3	0.2	0.2	0.7	0.3	0.4	0.7	0.4	0.2	0.3	0.6		
Pq	0.16	0.25	0.16	0.24	0.21	0.16	0.25	0.24	0.16	0.21	0.09	0.09	0.09	0.24	0.21	0.16	0.16	0.21	0.21	0.21	0.24	0.24	0.16	0.24	0.16	0.16	0.16	0.16	0.21	0.24	0.24	0.25	0.16	0.24	0.21	0.16	0.21	0.24	0.24	0.21	0.16	0.16	0.21	0.21	0.24	0.21	0.24	0.16	0.21	0.24	9.907	∑pq

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

$\sum Xt = 720$

$\sum Xt^2 = 22644$

$\sum pq = 10.61$

$$S_t^2 = \sum Xt^2 - \left(\frac{\sum xt}{N}\right)^2$$

$$= 22644 - \left(\frac{720}{25}\right)^2 = 22644 - \frac{518400}{25} = 22644 - 20736 = 1908$$

$$S_t^2 = \frac{\sum Xt2}{N} = \frac{1908}{25}$$

$$S_t^2 = 76.32$$

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

$$R_{11} = \left(\frac{25}{25-1}\right)\left(\frac{76.32-10.61}{76.32}\right) = \left(\frac{25}{24}\right)\left(\frac{65.71}{76.32}\right)$$

$$= (1.04)\ (0.86)$$

$$= .0.89\ (r_{11} > 0.70 = \text{reliable})$$

Test is reliable if $r_{count} > r_{tabel}$. 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

$\sum Xt$ =816

$\sum Xt^2$= 29176

$\sum pq$ = 9.907

$$S_t^2 = \sum Xt^2 - \left(\frac{\sum xt}{N}\right)^2$$

$$= 29176 - \left(\frac{816}{25}\right)^2 = 29176 - \frac{665856}{25} = 29176 - 26634 = 2542$$

$$S_t^2 = \frac{\sum Xt2}{N} = \frac{2542}{25}$$

$$S_t^2 = 101.68$$

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

$$R_{11} = \left(\frac{25}{25-1}\right)\left(\frac{101.68-9.907}{101.68}\right) = \left(\frac{25}{24}\right)\left(\frac{91.773}{101.68}\right)$$

= (1.04) (0. 90)

= 0.93 (r_{11} > 0.70 = reliable)

Appendix 16

Score of Experimental Class and Control Class Pre Test

1. Score of Experimental Class Pre Test before using Direct Method

No	The Initial Name of Students (n)	Pre-Test	No	The Initial Name of Students (n)	Pre-Test
1	Adella Erfina Siregar	45	19	Novita Andriani Karo-Karo	65
2	Aman Reskeisen	60	20	Nurfadilah Sitompul	55
3	Bang Harahap	70	21	Patar	55
4	Bayu	50	22	Rahmat	60
5	Beatrik Jwita Tambunan	75	23	Riko Sanjaya Pane	65
6	Deli Karnella W.	75	24	Rizky Irham Saputra	70
7	Elsa Rezqi Sari Tanjung	50	25	Ruth Intan Syalomita sinaga	45
8	Era Zunisyah Pane	55	26	Sri yunita	70
9	Eva Mutiara	70	27	Suryana Siagian	60
10	Fatimah Tanjung	65	28	Tomi Abdillah	70
11	Fillia Delvia Nainggolan	65	29	Vina Vanduwinata	70
12	Hironimus Willy Febrian	55	30	Warni	65
13	Irpan	60	31	Wita siagian	75
14	Khoirul Alfi	60	32	Yuni Kholidah	50
15	Marga Sinaga Nauli Basa	45	33	Yuli Haryani	50
16	Najwa Afif Lubis	75	34	Yuli Hartati	65
17	Nesa Zam Zam Lubis	65	35	Yoopi	75
18	Nora Khairani	65			
	Total			2175	

2. Score of Control Class Pre Test

No	The Initial Name of Students (n)	Pre-Test	No	The Initial Name of Students (n)	Pre-Test
1	Abdul Rohim	75	15	Malik Abdul Azis	65
2	Adryansyah	45	16	Mansur Al-Azis	70
3	Ahmad Gunawan	50	17	Nia Merianti	65
4	Alvin Ardiyan	60	18	Putri Halimatussakdiyah	50
5	Annisa Khairani	50	19	Rahmayuni	65
6	Ardriyansyah	55	20	Razwati Zulfa Hsb	70
7	Ariani Azra Absi	55	21	Seri Anggina	55
8	Dendi Wahyudi	70	22	Sri Wahyuni	70
9	Fahri Maulana	55	23	Sri Wulan Siagian	65
10	Fazrika Hummisyah	60	24	Sukma Diandra	75
11	Gunawan	75	25	Tetti Mei Linda	65
12	Gustini	60	26	Ulfa Fauziah Harahap	70
13	Indah Aliana	60	27	Yuli Yanti	45
14	Junita Puspa Ningrum	65			
	Total			1675	

Appendix 17

Score of Experimental Class and Control Class Post Test

1. Score of Experimental Class Post Test after using Direct Method

No	The Initial Name of Students (n)	Pre-Test	No	The Initial Name of Students (n)	Pre-Test
1	Adella Erfina Siregar	85	19	Novita Andriani Karo-Karo	80
2	Aman Reskeisen	90	20	Nurfadilah Sitompul	65
3	Bang Harahap	75	21	Patar	95
4	Bayu	90	22	Rahmat	90
5	Beatrik Jwita Tambunan	85	23	Riko Sanjaya Pane	70
6	Deli Karnella W.	75	24	Rizky Irham Saputra	80
7	Elsa Rezqi Sari Tanjung	80	25	Ruth Intan Syalomita sinaga	70
8	Era Zunisyah Pane	75	26	Sri yunita	80
9	Eva Mutiara	80	27	Suryana Siagian	95
10	Fatimah Tanjung	75	28	Tomi Abdillah	70
11	Fillia Delvia Nainggolan	80	29	Vina Vanduwinata	90
12	Hironimus Willy Febrian	75	30	Warni	70
13	Irpan	80	31	Wita siagian	80
14	Khoirul Alfi	85	32	Yuni Kholidah	80
15	Marga Sinaga Nauli Basa	95	33	Yuli Haryani	85
16	Najwa Afif Lubis	85	34	Yuli Hartati	85
17	Nesa Zam Zam Lubis	90	35	Yoopi	65
18	Nora Khairani	80			
	Total			2825	

2. Score of Control Class Post Test

No	The Initial Name of Students (n)	Pre-Test	No	The Initial Name of Students (n)	Pre-Test
1	Abdul Rohim	75	15	Malik Abdul Azis	60
2	Adryansyah	60	16	Mansur Al-Azis	75
3	Ahmad Gunawan	80	17	Nia Merianti	50
4	Alvin Ardiyan	70	18	Putri Halimatussakdiyah	65
5	Annisa Khairani	75	19	Rahmayuni	65
6	Ardriyansyah	50	20	Razwati Zulfa Hsb	60
7	Ariani Azra Absi	65	21	Seri Anggina	80
8	Dendi Wahyudi	55	22	Sri Wahyuni	65
9	Fahri Maulana	70	23	Sri Wulan Siagian	70
10	Fazrika Hummisyah	65	24	Sukma Diandra	65
11	Gunawan	75	25	Tetti Mei Linda	80
12	Gustini	70	26	Ulfa Fauziah Harahap	55
13	Indah Aliana	75	27	Yuli Yanti	65
14	Junita Puspa Ningrum	70			
	Total			1810	

Appendix 18

RESULT OF NORMALITY TEST IN PRE TEST

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

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

45	45	45	50	50	50	50	55	55	55
55	60	60	60	60	60	65	65	65	65
65	65	65	65	70	70	70	70	70	70
75	75	75	75	75					

2. High = 75

   Low = 45

   Range = High – Low

   = 75 – 45

   = 30

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

   = 1 + 3,3 log (35)

   = 1 + 3,3 (1,54)

   = 1 + 5.08

   = 6.08

   = 7

4. Length of Classes $= \frac{range}{total\ of\ class} = \frac{30}{6} = 5$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
45 – 49	3	47	4	12	16	48
50 – 54	4	52	3	12	9	36
55 – 59	4	57	2	8	4	16
60 – 64	5	62	1	5	1	5
65 – 69	8	**67**	0	0	0	0
70 – 74	6	72	-1	-6	1	6
75 – 79	5	77	-2	-10	4	20
i = 5	35	-	-	21	-	131

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

$= 67 + 5\ (\frac{21}{35})$

$= 67 + 5\ (0.6)$

$= 67 + (3)$

$= 70$

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

$= \sqrt[5]{\frac{131}{35} - \left(\frac{21}{35}\right)^{2}}$

$= \sqrt[5]{3.74 - (0.6)^{2}}$

$= \sqrt[5]{3.74 - 0.36}$

$= \sqrt[5]{3.38}$

$= 5\ (1.83)$

$= 9.15$

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_h	f_0	$\frac{(f_0-f_h)}{f_h}$
75─79	79.5	1.03	0.3485				
				0.16	5.6	5	-0.10
70 – 74	74,5	0.49	0.1879				
				-0.27	-9.45	6	-0.36
65 – 69	69,5	-0.10	0.46017				
				0.18	6.3	8	0
60 – 64	64,5	-0.60	0.27425				
				0.14	4.9	5	0.02
55 – 59	59,5	-1.14	0.12714				
				0.08	2.8	4	0.42
50 – 54	54,5	-1.69	0.04551				
				0.03	1.05	4	2.80
45 – 49	49,5	-2.24	0.01255				
				0.009	0.34	3	0.78
	44,5	-2.78	0.00272				
						X^2	3.56

Based on table above, reseracher found that x^2_{count} = 3.56 while x^2_{table}=5.991 cause $x^2_{cause} < x^2_{table}$ (3.56 < 5.991) with degree of freedom dk = 5 – 3 = 2 and significat level α = 5%. So distribution of VIII-1 class (Pre-test) is normal.

6. Median

No	Interval of Classes	F	Fk
1	45 – 49	3	3
2	50 - 54	4	7
3	55 - 59	4	11
4	60 - 64	5	16
5	**65 - 69**	**8**	24
6	70 - 74	6	30
7	75 - 79	5	35

Position of Me in the interval of classes is number 5, that:

Bb = 64.5

F = 5

fm = 8

i = 5

n = 35

1/2n =17.5

So :

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

$$= 64.5 + 5\left(\frac{17.5-5}{8}\right)$$

$$= 64.5 + 5\ (1.56)$$

$$= 64.5 + 7.8$$

$$= 72.3$$

7. Modus

No	Interval of Classes	F	Fk
1	45 – 49	3	3
2	50 - 54	4	7
3	55 - 59	4	11
4	60 - 64	5	16
5	**65 - 69**	**8**	24
6	70 - 74	6	30
7	75 - 79	5	35

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

L = 64.5

d_1 = 3

d_2 = 2

i = 5

$M_o = 64.5 + \frac{3}{3+2}\, 5$

= 64.5 + 0.6 (5)

= 64.5 + 3

= 67.5

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	45	50	50	50	55	55	55	55
60	60	60	60	65	65	65	70	70
70	70	70	70	75	75	75	75	75

2. High = 75

   Low = 45

   Range = High – Low

   = 75 – 45

   = 30

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

   = 1 + 3,3 log (27)

   = 1 + 3,3 (1,43)

   = 1 + 4.72

   = 5.72

   = 6

4. Length of Classes $= \frac{range}{total\ of\ class}$ $= \frac{30}{6} = 5$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
45 – 49	2	47	4	8	16	32
50 – 54	3	52	3	9	9	27
55 – 59	4	57	2	8	4	16
60 – 64	4	62	1	4	1	4
65 – 69	6	**67**	0	0	0	0
70 – 74	5	72	-1	-5	1	5
75 – 79	3	77	-2	-6	4	12
i = 5	27	-	-	18	-	96

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

$= 67 + 5\ (\frac{18}{27}\ )$

$= 67 + 5\ (0.66)$

$= 67 + (3.3)$

$= 70.3$

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

$= \sqrt[5]{\frac{96}{27} - \left(\frac{18}{27}\right)^{2}}$

$= \sqrt[5]{3.55 - (0.66)^{2}}$

$= \sqrt[5]{3.55 - 0.43}$

$= \sqrt[5]{3.12}$

$= 5\ (1.76)$

$= 8.8$

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_h	f_0	$\frac{(f_0-f_h)}{f_h}$
75─79	79.5	1.04	0.3508				
				0.17	5.95	3	-0.49
70 – 74	74,5	0.47	0.1808				
				-0. 28	-9.8	5	-0.48
65 – 69	69,5	-0.09	0.46414				
				-0.20	-7	6	-0.14
60 – 64	64,5	-0.65	0.25785				
				0.14	4.2	4	-0.04
55 – 59	59,5	-1.22	0.11123				
				0.07	2.8	4	0.64
50 – 54	54,5	-1.79	0.03673				
				0.02	0.7	3	0.42
45 – 49	49,5	-2.36	0.00914				
				0.00	0	2	2.00
	44,5	-2.93	0.00169				
						X^2	1.91

Based on table above, reseracher found that $x^2_{count} = 1.91$ while $x^2_{table} = 5.991$ cause $x^2_{cause} < x^2_{table}$ $(1.91 < 5.991)$ with degree of freedom dk = 5 – 3 = 2 and significat level α = 5%. So distribution of VIII-3 class (Pre-test) is normal.

6. Median

No	Interval of Classes	F	Fk
1	45 – 49	2	2
2	50 - 54	3	5
3	55 - 59	4	9
4	60 - 64	4	13
5	**65 - 69**	**6**	19
6	70 - 74	5	24
7	75 - 79	3	27

Position of Me in the interval of classes is number 5, that:

Bb = 64.5

F = 4

fm = 6

i = 5

n = 27

1/2n =13.5

So :

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

$$= 64.5 + 5\left(\frac{13.5-4}{6}\right)$$

$$= 64.5 + 5\ (1.58)$$

$$= 64.5 + 7.9$$

$$= 72.4$$

7. Modus

No	Interval of Classes	F	Fk
1	45 – 49	2	2
2	50 - 54	3	5
3	55 - 59	4	9
4	60 - 64	4	13
5	**65 - 69**	**6**	19
6	70 - 74	5	24
7	75 - 79	3	27

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

L = 64.5

d_1 = 2

d_2 = 1

i = 5

$M_o = 64.5 + \frac{2}{2+1}\, 5$

= 64.5 + 0.6 (5)

= 64.5 + 3

= 67.5

RESULT OF NORMALITY TEST IN PRE TEST

RESULT OF THE NORMALITY TEST OF VIII-4 IN PRE-TEST

1. The score of VIII-4 class in pre test from low score to high score:

45	45	50	50	50	55	55	55	55	55
55	60	60	60	60	65	65	65	65	65
65	65	65	70	70	70	70	70	70	75
75	75	75	75	75					

2. High = 75

   Low = 45

   Range = High – Low

   = 75 – 45

   = 30

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

   = 1 + 3,3 log (35)

   = 1 + 3,3 (1,54)

   = 1 + 5.08

   = 6.08

   = 7

4. Length of Classes $= \frac{range}{total\ of\ class} = \frac{30}{6} = 5$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
45 – 49	2	47	4	8	16	32
50 – 54	3	52	3	9	9	27
55 – 59	6	57	2	12	4	24
60 – 64	4	62	1	4	1	4
65 – 69	8	**67**	0	0	0	0
70 – 74	6	72	-1	-6	1	6
75 – 79	6	77	-2	-12	4	24
i = 5	35	-	-	15	-	117

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

$= 67 + 5\ (\frac{15}{35})$

$= 67 + 5\ (0.42)$

$= 67 + (2.1)$

$= 69.1$

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

$= \sqrt[5]{\frac{117}{35} - \left(\frac{15}{35}\right)^{2}}$

$= \sqrt[5]{3.34 - (0.42)^{2}}$

$= \sqrt[5]{3.34 - 0.17}$

$= \sqrt[5]{3.17}$

$= 5\ (1.78)$

$= 8.9$

Table of Normality Data Test with Chi Kuadrad 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				
				0.15	5.25	6	0.14
70 – 74	74,5	0.60	0.2257				
				0.20	7	6	-0.14
65 – 69	69,5	0.04	0.0160				
				-30	-10	8	-0.2
60 – 64	64,5	-0.51	0.30854				
				0.16	5.6	4	-0.28
55 – 59	59,5	-1.07	0.14231				
				0.09	3.15	6	0.90
50 – 54	54,5	-1.64	0.05050				
				0.03	1.05	3	1.85
45 – 49	49,5	-2.20	0.01390				
				0.01	0.35	2	4.71
	44,5	-2.76	0.00289				
						X^2	6.98

Based on table above, reseracher found that x^2_{count} = 6.98 while x^2_{table}=5.991 cause $x^2_{cause} < x^2_{table}$ (6.98 < 5.991) with degree of freedom dk = 5 – 3 = 2 and significat level α = 5%. So distribution of VIII-4 class (Pre-test) is not normal.

6. Median

No	Interval of Classes	F	Fk
1	45 - 49	2	2
2	50 - 54	3	5
3	55 - 59	6	11
4	60 - 64	4	15
5	**65 - 69**	**8**	23
6	70 - 74	6	29
7	75 - 79	6	35

Position of Me in the interval of classes is number 5, that:

Bb = 64.5

F = 4

fm = 8

i = 5

n = 35

1/2n =17.5

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

$= 64.5 + 5 \left(\frac{17.5-4}{8} \right)$

$= 64.5 + 5 (1.68)$

$= 64.5 + 8.4$

$= 72.9$

7. Modus

No	Interval of Classes	F	Fk
1	45 – 49	2	2
2	50 - 54	3	5
3	55 - 59	6	11
4	60 - 64	4	15
5	**65 - 69**	**8**	23
6	70 - 74	6	29
7	75 - 79	6	35

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

L = 64.5

d_1 = 4

d_2 = 2

i = 5

$M_o = 64.5 + \frac{4}{4+2}\, 5$

= 64.5 + 0.66 (5)

= 64.5 + 3.3

= 67.8

Appendix 19

HOMOGENEITY TEST (PRE-TEST)

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

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

Hypotheses:

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

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

A. Variant of the VIII-1class is:

NO	Xi	Xi^2
1	45	2025
2	45	2025
3	45	2025
4	50	2500
5	50	2500
6	50	2500
7	50	2500
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	60	3600
17	65	4225
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	70	4900
29	70	4900
30	70	4900
31	75	5625
32	75	5625
33	75	5625
34	75	5625
35	75	5625
	2175	138535

n = 35

$\sum xi = 2175$

$\sum_{xi} 2 = 137500$

So:

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

$$\frac{35(138535) - (2175)^2}{35(35-1)}$$

$$= \frac{4848725 - 4730625}{35(34)}$$

$$= \frac{118100}{1190}$$

$$= 99.24$$

B. Variant of the VIII-3 class is:

NO	Xi	Xi^2
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	60	3600
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	65	4225
20	70	4900
21	70	4900
22	70	4900
23	70	4900
24	70	4900
25	75	5625
26	75	5625
27	75	5625
	1670	106225

n = 27

$\sum xi$= 1675

$\sum_{xi} 2$ = 106225

So:

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

$$\frac{27(106225) - (1675)^2}{27(27-1)}$$

$$= \frac{2868075 - 2805625}{27(26)}$$

$$= \frac{62450}{702}$$

$$= 88.96$$

C. Variant of the VIII- 4 class is:

NO	**Xi**	**Xi^2**
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

26	70	4900
27	70	4900
28	70	4900
29	70	4900
30	75	5625
31	75	5625
32	75	5625
33	75	5625
34	75	5625
35	75	5625
	2200	141050

n = 35
$\sum xi$= 2200
$\sum_{xi} 2$ = 141050

So:

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

$$\frac{35(141050) - (2200)^2}{35(35-1)}$$

$$= \frac{4936750 - 4840000}{35(34)}$$

$$= \frac{96750}{1190}$$

$$= 81.30$$

The Formula was used to test hypothesis was:

1. VIII-1 and VIII -3 :

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

So:

$$F = \frac{99.24}{88.96}$$

$$= 1.11$$

After doing the calculation, researcher found that F_{count} = 1.11 with α 5 % and dk = 35 from the distribution list F, researcher found that F_{table} = 2.042, cause $F_{count} < F_{table}$ (1.11< 2.042). So, there is no difference the variant between the VIII-1 class and VIII-3 class. It means that the variant is homogenous**.**

2. VIII -1 and VIII -4 :

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

So:

$$F = \frac{99.24}{81.30}$$

$$= 1.22$$

After doing the calculation, researcher found that F_{count} = 1.22 with α 5 % and dk = 35 from the distribution list F, researcher found that F_{table} = 2.042, cause $F_{count} < F_{table}$ (1.22 < 2.042). So, there is no difference the variant between the VIII-1 class and VIII-4 class. It means that the variant is homogenous**.**

3. VIII -3 and VIII - 4 :

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

So:

$$F = \frac{88.96}{81.30}$$

$$= 1.09$$

After doing the calculation, researcher found that F_{count} = 1.09 with α 5 % and dk = 35 and 27 from the distribution list F, researcher found that F_{table} = 2.042 & 2.052, cause $F_{count} < F_{table}$ (1.09 < 2.042 & 2.052). So, there is no difference the variant between the VIII-3 class and VIII-4 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 experiment class in post test from low score to high score:

65	65	70	70	70	70	75	75	75	75
75	80	80	80	80	80	80	80	80	80
80	85	85	85	85	85	85	90	90	90
90	90	95	95	95					

2. High = 95

   Low = 65

   Range = High – Low

   = 95 – 65

   = 30

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

   = 1 + 3,3 log (35)

   = 1 + 3,3 (1.54)

   = 1 + 5.08

   = 6.08

   = 7

4. Length of Classes $= \frac{range}{total\ of\ class}$ $= \frac{30}{6} = 5$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
65 – 69	2	67	3	6	9	18
70 – 74	4	72	2	8	4	16
75 – 79	5	77	1	5	1	5
80 – 84	10	82	0	0	0	0
85 – 89	6	87	-1	-6	1	6
90 – 94	5	92	-2	-10	4	20
95 – 99	3	97	-3	-9	9	27
i = 5	35	-		-6		92

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

$= 82 + 5(\frac{-6}{35})$

$= 82 + 5(-0.17)$

$= 82 + (-0.85)$

$= 81.15$

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

$= \sqrt[5]{\frac{85}{35} - \left(\frac{-6}{35}\right)^{2}}$

$= \sqrt[5]{2.42 - (-0.17)^{2}}$

$= \sqrt[5]{2.42 - 0.028}$

$= \sqrt[5]{2.392}$

$= 5\ (1.54)$

$= 7.7$

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_h	f_0	$\frac{(f_0-f_h)}{f_h}$
	99.5	2.38	0.4913				
95–99				0.03	1.05	3	2.00
	94.5	1.73	0.4582				
90– 94				0.10	3.5	4	0.14
	89.5	1.08	0.3599				
85 – 89				0.19	6.65	4	-0.39
	84.5	0.43	0.1664				
80 – 84				-0.25	-8.75	10	0.14
	79.5	-0.21	0.41683				
75 – 79				0.22	7.7	6	-0.22
	74.5	-0.86	0.19489				
70 – 74				0.12	4.2	5	0.19
	69.5	-1.51	0.06552				
65 – 69				0.05	1.4	2	0.42
	64.5	-2.16	0.01539				
						X^2	2.28

Based on table above,reseracher found that x^2_{count} = 2.28 while x^2_{table}=5,991 cause $x^2_{cause} < x^2_{table}$ (2.28<5.991) with degree of freedom dk = 5 – 3 = 2 and significat level α = 5%. So distribution of experiment class (Post Test) was normal.

6. Median

No	Interval of Classes	F	Fk
1	65 – 69	2	2
2	70 - 74	4	6
3	75 - 79	5	11
4	80 - 84	10	21
5	85 - 89	6	27
6	90 - 94	5	32
7	95 - 99	3	35

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

Bb = 79.5

F = 5

fm = 10

i = 5

n = 35

1/2n =17.5

So :

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

$$= 79.5 + 5\left(\frac{17.5-5}{10}\right)$$

$$= 79.5 + 5(1.25)$$

$$= 79.5 + 6.25$$

$$= 85.75$$

7. Modus

No	Interval of Classes	F	fk
1	65 – 69	2	2
2	70 - 74	4	6
3	75 - 79	5	11
4	80 - 84	10	21
5	85 - 89	6	27
6	90 - 94	5	32
7	95 - 99	3	35

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

L = 79.5

d_1 = 5

d_2 = 6

i = 5

$M_o = 79.5 + \frac{5}{5+6}\, 5$

= 79.5+ 0.45(5)

= 79.5+ 2.25

= 81.75

Appendix 21

RESULT OF THE NORMALITY TEST OF CONTROL CLASS IN POST TEST

1. The score of control class in post test from low score to high score:

50	50	55	55	60	60	60	65	65
65	65	65	65	65	70	70	70	70
70	75	75	75	75	75	80	80	80

2. High = 80

   Low = 50

   Range = High – Low
   = 80 – 50
   = 30

3. Total of Classes = 1 + 3,3 log (n)
   = 1 + 3,3 log (27)
   = 1 + 3,3 (1.43)
   = 1 + 4.7
   = 5.7
   = 6

4. Length of Classes = $\frac{range}{total\ of\ class}$ = $\frac{30}{6}$ = 5

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
50 – 54	2	52	3	6	9	18
55 – 59	2	57	2	4	4	8
60 – 64	3	62	1	3	1	3
65 – 69	7	**67**	0	0	0	0
70 – 74	5	72	-1	-5	1	5
75 – 79	5	77	-2	-10	4	20
80 – 84	3	82	-3	-9	9	27
i =5	27	-	-	-11	-	81

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

$= 67 + 5\left(\frac{-11}{27}\right)$

$= 67 + 5(-0.40)$

$= 67 + (-2)$

$= 65$

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

$= \sqrt[5]{\frac{81}{27} - \left(\frac{-11}{27}\right)^{2}}$

$= \sqrt[5]{3 - (-0.40)^{2}}$

$= \sqrt[5]{3 - (-0.16)}$

$= \sqrt[5]{2.84}$

$= 5\ (1.68)$

$= 8.4$

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_h	f_0	$\frac{(f_0-f_h)}{f_h}$
	84.5	2.32	0.4898				
80 - 84				0.03	0.81	3	2.70
	79.5	1.72	0.4573				
75 – 79				0.09	2.43	5	1.05
	74.5	1.11	0.3665				
70 – 74				0.16	4.32	5	0.15
	69.5	0.53	0.2019				
65 – 69				-0.27	-7.29	7	-0.03
	64.5	-0.05	0.48006				
60– 64				0.22	5.94	3	-0.49
	59.5	-0.65	0.25785				
55- 59				0.15	4.05	2	-0.50
	54.5	-1.25	0.10565				
50 – 54				0.06	1.62	2	0.23
	50.5	-1.70	0.04457				
						X^2	3.11

Based on table above,reseracher found that $x^2_{count} = 3.11$ while $x^2_{table} = 5.991$cause $x^2_{cause} < x^2_{table}$ (3.11<5.991) with degree of freedom dk = 5 – 3 = 2 and significat level α = 5%. So distribution of control class (Post-test) was normal.

6. Median

No	Interval Class	F	fk
1	50 – 54	2	2
2	55 - 59	2	4
3	60 - 64	3	7
4	65 - 69	**7**	14
5	70 - 74	5	19
6	75 - 79	5	24
7	80 – 84	3	27

Position of Me in the interval of classes is number 2, that:

Bb = 64.5

F = 3

fm = 7

i = 5

n = 27

1/2n =13.5

So :

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

$$= 64.5 + 5\left(\frac{\mathbf{13.5-3}}{\mathbf{7}}\right)$$

$$= 64.5 + 5\ (1.5)$$

$$= 64.5 + 7.5$$

$$= 72$$

7. Modus

No	Interval Class	F	fk
1	50 – 54	2	2
2	55 - 59	2	4
3	60 - 64	3	7
4	65 - 69	**7**	14
5	70 - 74	5	19
6	75 - 79	5	24
7	80 – 84	3	27

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

L = 64.5

d_1 = 3

d_2 = 5

i = 5

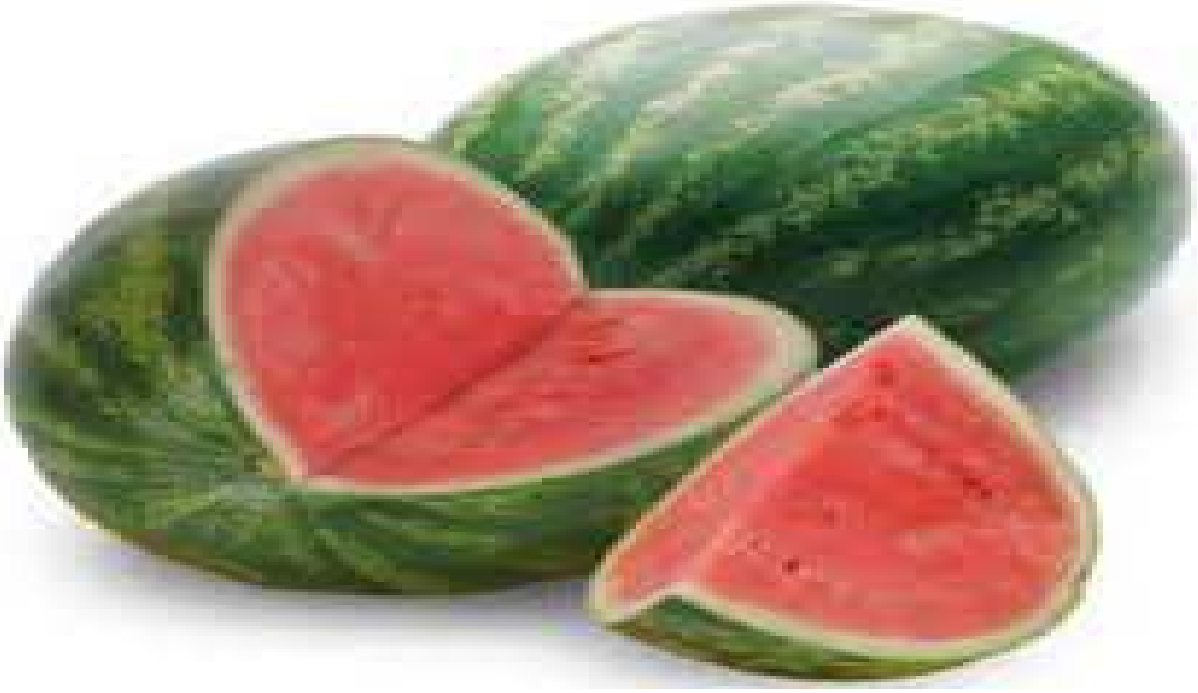
$M_o = 64.5 + \frac{3}{3+5}\ 5$

= 64.5 + 0.37 (5)

= 64.5 + 1.85

= 66.35

LEARNING MATERIAL



Appendix 22

HOMOGENEITY TEST (POST TEST)

1. EXPERIMENT CLASS

NO	Xi	Xi^2
1	85	7225
2	90	8100
3	80	6400
4	90	8100
5	85	7225
6	75	5625
7	80	6400
8	75	5625
9	80	6400
10	75	5625
11	80	6400
12	75	5625
13	80	6400
14	85	7225
15	95	9025
16	85	7225
17	90	8100
18	80	6400
19	80	6400
20	65	4225
21	95	9025
22	90	8100
23	70	4900
24	80	6400
25	70	4900
26	80	6400
27	95	9025
28	70	4900
29	90	8100
30	70	4900
31	80	6400
32	80	6400
33	80	6400

34	80	6400
35	65	4225
	2825	230225

n = 35

$\sum xi = 2825$

$\sum_{xi} 2 = 230225$

So:

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

$$= \frac{35(230225) - (2825)^2}{35(35-1)}$$

$$= \frac{8057875 - 7980625}{35(34)}$$

$$= \frac{77250}{1190}$$

$$= 64.91$$

2. CONTROL CLASS

NO	Xi	Xi^2
1	75	5625
2	60	3600
3	80	6400
4	70	4900
5	75	5625
6	50	2500
7	65	4225
8	55	3025
9	70	4900
10	65	4225
11	75	5625
12	70	4900
13	75	5625
14	70	4900
15	60	3600
16	75	5625
17	50	2500
18	65	4225
19	65	4225
20	60	3600
21	80	6400
22	65	4225
23	70	4900
24	65	3600
25	80	6400
26	55	3025
27	65	3600
	1810	123250

n = 27

$\sum xi$ = 1810

$\sum_{xi}$ 2 = 123250

So:

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

$$= \frac{27(123250) - (1810)^2}{27(27-1)}$$

$$= \frac{3327750 - 3276100}{27(26)}$$

$$= \frac{51650}{702}$$

$$= 73.57$$

The Formula was used to test hypothesis was:

1. VIII-1 and VIII-3 :

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

So:

$$F = \frac{73.57}{64.91}$$

$$= 1.13$$

After doing the calculation, researcher found that F_{count} = 1.13 with α 5 % and dk = 35 & 27 from the distribution list F, researcher found that F_{table} = 2.042 & 2.052, cause $F_{count} < F_{table}$ (1.13 < 2.042 & 2.052). So, there is no difference the variant between the VIII-1 class and VIII-3 class. It means that the variant is homogenous**.**

Appendix 23

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

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

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

So:

$$S = \sqrt{\frac{(35-1)\ 99.24+(27-2)88.96}{35+27-2}}$$

$$= \sqrt{\frac{34\ (99.24)+25\ (88.96)}{60}}$$

$$= \sqrt{\frac{3374.16+2224}{60}}$$

$$= \sqrt{\frac{5598.16}{60}}$$

$$= \sqrt{93.30}$$

$$= 9.65$$

So:

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

$$t = \frac{70.85-69.85}{9.65\sqrt{\frac{1}{35}+\frac{1}{27}}}$$

$$= \frac{1}{9.65\sqrt{0.028+0.037}}$$

$$= \frac{1}{9.65\ (0.065)}$$

$$= \frac{1}{0.627}$$

$$= 1.59$$

Based on researcher calculation result of the homogeneity test of the both averages, researcher found that t_{count}= 1.59 with opportunity (1-α) = 1 – 5% = 95% and dk = n_1 + n_2 -2 = 35 + 27 – 2 = 60 , reseracher found that t_{table} = 2.000, cause t_{count}< t_{table}(1.59 < 2.000). So, H_a is accepted, it means no difference the average between the first class as experimental class and the second class as control class in this research.

Appendix 24

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

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

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

So:

$$S = \sqrt{\frac{(35-1)\,64.91+(27-2)73.57}{35+27-2}}$$

$$= \sqrt{\frac{35\,(64.91)+27\,(73.57)}{60}}$$

$$= \sqrt{\frac{2271.85+1986.39}{60}}$$

$$= \sqrt{\frac{4258.24}{60}}$$

$$= \sqrt{70.97}$$

$$= 8.42$$

So:

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

$$t = \frac{82.7 - 65}{8.42\sqrt{\frac{1}{35} + \frac{1}{27}}}$$

$$= \frac{17.7}{8.42\sqrt{0.028 + 0.037}}$$

$$= \frac{17.7}{8.42\ (0.065)}$$

$$= \frac{17.7}{0.547}$$

$$= 32.35$$

Based on researcher calculation result of the homogeneity test of the both averages, researcher found that t_{count}= 32.35 with opportunity (1-α) = 1 – 5% = 95% and dk = n_1 + n_2 -2 = 35+ 27 – 2 = 60 , reseracher found that t_{table} = 2.000, cause t_{count}> t_{table}(32.35 > 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 control class in this research.

APPENDIX 25

Chi-Square Table

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

APPENDIX 26

Z-Table

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.9	0.00005	0.00005	0.00004	0.00004	0.00004	0.00004	0.00004	0.00004	0.00003	0.00003
-3.8	0.00007	0.00007	0.00007	0.00006	0.00006	0.00006	0.00006	0.00005	0.00005	0.00005
-3.7	0.00011	0.00010	0.00010	0.00010	0.00009	0.00009	0.00008	0.00008	0.00008	0.00008
-3.6	0.00016	0.00015	0.00015	0.00014	0.00014	0.00013	0.00013	0.00012	0.00012	0.00011
-3.5	0.00023	0.00022	0.00022	0.00021	0.00020	0.00019	0.00019	0.00018	0.00017	0.00017
-3.4	0.00034	0.00032	0.00031	0.00030	0.00029	0.00028	0.00027	0.00026	0.00025	0.00024
-3.3	0.00048	0.00047	0.00045	0.00043	0.00042	0.00040	0.00039	0.00038	0.00036	0.00035
-3.2	0.00069	0.00066	0.00064	0.00062	0.00060	0.00058	0.00056	0.00054	0.00052	0.00050
-3.1	0.00097	0.00094	0.00090	0.00087	0.00084	0.00082	0.00079	0.00076	0.00074	0.00071
-3.0	0.00135	0.00131	0.00126	0.00122	0.00118	0.00114	0.00111	0.00107	0.00104	0.00100
-2.9	0.00187	0.00181	0.00175	0.00169	0.00164	0.00159	0.00154	0.00149	0.00144	0.00139
-2.8	0.00256	0.00248	0.00240	0.00233	0.00226	0.00219	0.00212	0.00205	0.00199	0.00193
-2.7	0.00347	0.00336	0.00326	0.00317	0.00307	0.00298	0.00289	0.00280	0.00272	0.00264
-2.6	0.00466	0.00453	0.00440	0.00427	0.00415	0.00402	0.00391	0.00379	0.03680	0.00357
-2.5	0.00621	0.00604	0.00587	0.00570	0.00554	0.00539	0.00523	0.00508	0.00494	0.00480
-2.4	0.00820	0.00798	0.00776	0.00755	0.00734	0.00714	0.00695	0.00676	0.00657	0.00639
-2.3	0.01072	0.01044	0.01017	0.00990	0.00964	0.00939	0.00914	0.00889	0.00866	0.00842
-2.2	0.01390	0.01355	0.01321	0.01287	0.01255	0.01222	0.01191	0.01160	0.01130	0.01101
-2.1	0.01786	0.01743	0.01700	0.01659	0.01618	0.01578	0.01539	0.01500	0.01463	0.01426
-2.0	0.02275	0.02222	0.02169	0.02118	0.02068	0.02018	0.01970	0.01923	0.01876	0.01831
-1.9	0.02872	0.02807	0.02743	0.02680	0.02619	0.02559	0.02500	0.02442	0.02385	0.02330
-1.8	0.03593	0.03515	0.03438	0.03362	0.03288	0.03216	0.03144	0.03074	0.03005	0.02938
-1.7	0.04457	0.04363	0.04272	0.04182	0.04093	0.04006	0.03920	0.03836	0.03754	0.03673
-1.6	0.05480	0.05370	0.05262	0.05155	0.05050	0.04947	0.04846	0.04746	0.04648	0.04551

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

Z-Table

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

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

APPENDIX 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	**2,052**	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	**2,042**	2,457	2,750
40	0,681	1,303	1,684	2,021	2,423	2,704
60	0,679	1,296	1,671	**2,000**	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

Appendix 28

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