



**THE EFFECT OF TOTAL PHYSICAL RESPONSE ON STUDENTS
VOCABULARY MASTERY AT THE GRADE XI STUDENTS
SMA N 6 PADANGSIDIMPUAN**

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

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STATE INSTITUTE FOR ISLAMIC STUDIES
PADANGSIDIMPUAN**

2020



**THE EFFECT OF TOTAL PHYSICAL RESPONSE ON STUDENTS
VOCABULARY MASTERY AT THE GRADE XI STUDENTS
SMA N 6 PADANGSIDIMPUAN**

A THESIS

*Submitted to the State Institute for Islamic Studies Padangsidimpuanas a
Partial Fulfillment of the Requirement for Proposal Seminar
in English Education Department*

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Assalamu a'laikum warahmatullah wabarakatuh

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Wassalamu a'laikum warahmatullah wabarakatuh

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ABSTRACT

This research focuses on the effect of total physical response on students vocabulary mastery at the grade students XI of SMA Negeri 6 Padangsidempuan. The problems of students in vocabulary mastery were: 1) The students have problem to keep their vocabularies. 2) The students get difficulties in using words. 3) Students feel boring on lesson and activity of teaching learning. They did not interest to comprehend text because there is no variation in teaching learning English. The teacher still used conventional strategy in teaching vocabulary. The purpose of this research is to know whether there is the effect of Total Physical Response on vocabulary mastery at the grade XI students of SMA Negeri 6 Padangsidempuan.

The method that is used in this research is experimental research. Two classes were chosen randomly as the sample. They were XI IPA- 2 as experimental class that consisted of 22 students and XI IPA-3 as control class that consisted of 22 students. It was taken after conducting normality and homogeneity test. The data were derived from pre test and post test. To analyze the data, the researcher used t-test formula.

After analyzing the data, the researcher found that the mean score of experimental class after Total Physical Response method was higher than control class. Mean score of experimental class before using Total Physical Response method was 71.3 and mean score after using TPR was and it had gain 99.61 . The effect of Total Physical Response method on students' vocabulary mastery was with t_{count} was higher than t_{table} ($7.926 > 1.671$). It meant that H_a was accepted and H_0 was rejected. There was effect of Total Physical Response on students vocabulary mastery at grade XI SMA N 6 Padangsidempuan.

Key Words: Total Physical Response Method, and Vocabulary Mastery

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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.

Padangsidempuan, November 2020
Researcher

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CHAPTER I

INTRODUCTION

A. Background of the Problem

As international English language, English an interesting subject to be learned by many people especially who really wants to master English. English has become important as a way to be success in many aspect of our life such as relationship among countries, social cultural process, education career development for people. The people learning English with aim that Indonesian people can communicate with other overseas by using international language.

In 2013 curriculum, English is important subject because students of junior high school up to the senior high school obligated to learn it. It is considered as one of compulsory subject in junior high school to senior high school level. English is one subject that must be based on educational curriculum.

In teaching and learning process, they are many materials of English teaching. They are listening skill, speaking skill, reading skill, and writing skill. Beside that is another aspect in material of English teaching is vocabulary. Teaching vocabulary is very important in junior high school.

Vocabulary is all the words in language list of words in lesson or books, all the word that one person knows and vocabulary is the knowledge of meanings of words.

The important of vocabulary as a support or as a tool for communication with another people. Vocabulary can make easier to understand what the people's speech or writing and easier to be able to express the contents of the mind, without vocabulary anyone will get trouble in her listening, speaking, reading, and writing. They are also can not communicate effectively.

There are some efforts that has been done. *First*, the government changed the curriculum based on KTSP become K13. It hope the students can develop full their potential especially English lesson. *The second* the school prepare learning facilities to guide the teacher to effective in learning process. It can be make the teacher more easier to teach in the class. *The third*, English teacher must use media to make the student more understand material. It can make the student higher enthusiasm in learning and active in classroom. Students do not get bored in learning English, especially vocabulary.

Condition of English vocabulary mastery in eleventh students of SMA Negeri 6 Padangsidimpuan is poor. Based on with the teacher in SMA Negeri 6 Padangsimpuan.

The teacher said somestudents had less vocabulary, it was caused by some of students by some of students at grade XI when they were at Senior High School. As the result, some of them did not have good ability in doing English language activities. The second the teacher said that student are not interest studying English and students have low motivation, when the teacher give exercise or material in classroom.¹

¹Efrilda Malik, *English Teacher at Grade XI of SMA n 6 Padangsidimpuan*, Private interview,(SMA 6 Padangsidimpuan: March 15 – 2018 at 10.15 Wib)

The researcher also interviewed some of students in eleventh of SMA Negeri 6 Padangsidempuan.

First, Efrilda Malik. She said, English teacher taught English without method but only asked them to open book and dictionary. That make she felt bored the lesson.² Next, did to Maya. she said. she did not interest with to vocabulary because English teacher gave them must vocabulary that made them bored to study English.³ The last is Rulihe said could not to remember about vocabulary and practice.⁴

Based on interview at school, the researcher made conclusion the problem is the students felt in learning vocabulary, because the teacher do not creative in teaching vocabulary and students vocabulary still poor. Students only opening dictionary method in finding out new vocabulary. So that, students need method to improve their spirit and motivation. By using method to improve their spirit and motivation. By using method, the students was happy learning vocabulary with use Total Physical Response method than book and dictionary.

There are factors of influence vocabulary are listening ability , speaking ability, students interest, psychological such as (motivation, courage and culture) and method.⁵ Method is the stimulation, guidance, direction encouragement for learning. It can used to create learning situation in which effective communication can take place between the teacher and the learner.

The kinds of teaching vocabulary method such as Drill method, Recitation , and Total Physical Response method. That media can to improving students vocabularies and make teaching vocabulary more

²*Ibid.*

³Maya, *Interview*, Friday 20 March 2018, 10.15 a.m

⁴Ruli, *interview*, Friday 20 March 2018, 10.30 a.m

⁵SerlyOctavianaPutri, Factors Affecting Language Student, p.157- 158. journal student.uny.ac.id

interesting and effectively than conventional way. The researcher interested to use Total Physical Response as method to teach vocabulary in senior high school.

Total physical Response method is a language teaching method built around coordination of speech and action. it is so funny way method. Researcher discusses only one media namely Total Physical Response method.

The some reason the researcher choose Total Physical Response method. First, Total Physical Response is method can facilitate students with the meaning in real context. Second, it is to help learners achieve fluency faster in learning language because fun easy and memorable. And the last, Total Physical Response method can benefits the struggling students in the classroom.

The role of Total Physical Response method in improve teaching vocabulary to motivate the students to learn and develop their vocabulary. it also help the teacher in the learning process in the class. Total Physical Response method greatly facilitate teacher's teaching and effectiveness. So that material delivered can be well absorbed by all students.

Based on explanation above, to solve the problem researcher interested to conduct a experimental research through the tittle **“The Effect of Total Physical Response on Students Vocabulary Mastery at Grade XI SMA N 6 Padangsidimpuan.**

B. Identification of the Problem

Vocabulary is all the words in language list of words lesson or book, all the word that one person knows and vocabulary is the knowledge of meanings of words.

Based on the problems above there are some factors influencing the students vocabulary mastery are listening ability, speaking ability , students interest, psychological such as (motivation, courage and culture) and method.

C. Limitation of the Problem

As mentioned above, there are some factors that influencing the the students vocabulary mastery are listening ability, speaking ability , students interest, psychological such as (motivation, courage and cultur) and method. In this research the researcher wants to make a about how a teach vocabulary for student in senior high school with method.

There are many methods that can be use in teaching vocabulary as mention above, but the researcher did not discuss all of the method .researcher discusses only one method Total Physical Response. The some reason the researcher choose Total Physical Response method. First, Total Physical Response is method can facilitate students with the meaning in real context. Second, it is to help learners achieve fluency faster in learning language because fun easy and memorable. And the last, Total Physical Response method can benefits the struggling students in the classroom.

D. Formulation of the Problem

The formulations of the problem in this research are:

1. How is the students vocabulary mastery before using Total Physical Response method at grade XI SMA 6 Padangsidempuan?
2. How is the students vocabulary mastery after using Total Physical Response method at grade XI SMA 6 Padangsidempuan?
3. Isthere any significant effect TPR (Total Physical Response)on students vocabulary at grade XI SMA Negeri 6 Padangsidempuan ?

E. Purpose of the Problem

From the formulation of the problem above, the purpose of this research are:

1. To describe the vocabulary mastery before using TPR (Total Physical Response) at grade XI SMA Negeri 6 Padangsidempuan.
2. To describe the vocabulary mastery after using TPR (Total Physical Response) at grade XI SMA Negeri 6 Padangsidempuan.
3. To examine wheter there is significant effect of using TPR (Total Physical Response) on vocabulary mastery at grade XI SMA Negeri 6 Padangsidempuan.

F. Significances of the Study

The result of the research is expected give more information used to:

1. This research was expected to be useful for the teacher as an information and a source of teaching English in SMA Negeri 6 Padangsidempuan.

2. This research was expected to be useful in the classroom. The teachers can use the strategy for teaching English in the classroom.
3. Research was expected to be useful to headmaster. Headmaster was expected to develop English teacher in SMA Negeri 6 Padangsidimpuan.

G. Definition of Operational Variables.

There are some words that are important to define to avoid misunderstanding.

1. TPR (Total Physical Response) method is language teaching method created around the coordination of speech and action, it attempts to teach language physical activity.⁶
2. Vocabulary Mastery is defined as list of words. It is an important part in supporting all English skill⁷. Mastery is accomplishing success in understanding or expert skill or knowledge⁸. So, vocabulary mastery refers to the great knowledge of words or the gaining of great skill in vocabulary.

H. The Outline of Thesis

The systematic of this research is divided into five chapters. Each chapter consists of many sub chapters. It will explain next paragraph.

⁶Dorothy Grant Henning, *Communication In Action: Teaching the Language Art*, (Boston: Houghton Mifflin Company, 1986), .87.

⁷Eka Sustris Harida, "Using Mind Mapping Technique to Teach Vocabulary", in *English Education*, Volume 3, No.1, January 2015, p. 9.

⁸David Alan Herzog, *Webster's New World Essential Vocabulary* (USA : Wiley, 2005),p. 154.

In chapter one, there are eight sub chapter. It consists of background of the problems, identification of the problems, formulation of the problem, limitation of problems, purpose of the research, significances of the research, definition of operational variables, and the outline of thesis.

In chapter two, consists of the theoretical description, which the sub chapters consists of the theoretical description of the make TPR (TotalPhysical Response) and explain about vocabulary mastery. Then review of related findings, and conceptual framework, and hypothesis.

In chapter three, it consist of research methodology, which consist of place and time of research, research design, population and sample, instrument of collecting data, validity and reliability of instrument, procedures of research, and the techniques of data analysis.

In chapter four, it consists of the result of the research. It is about the result of what we find from research. It consists about description of the data, hypothesis testing, discussion of the research, and threats of research.

In five chapter, It consists of the conclusion and suggestions. Researcher gives conclusion and suggestion of the research to students and teacher.

CHAPTER II

LITERATUR REVIEW

A. The theoretical Description

The theoretical review involves the systematic identification, location and analysis of documents containing information related to the research problems. This research describes the theories of Total Physical Response Method, and the last the theories of vocabulary.

1. Vocabulary Mastery

a. Definition of Vocabulary

Vocabulary is one aspect which own by every students to make them understand and master English language. It is a part of language thats so important to all aspect in life. Hornby said”Vocabulary is all the words that person know or use, the words that people use when they are telling about particular subject”.⁹ Then, Jack C. Richards and Willy A Renandya said” Vocabulary is a core component of language proficiency and provides much of the basic for how well learners speak, read, listen, and write. It means, word can be noun, verb, adverd, adjectives, preposition and conjunction to use language”.¹⁰ The language is some words or vocabulary for speak. Listen, read, and write.

⁹A.S Hornby, *Oxford Advanced Learners' Dictionary* (New York: Oxford University Press, 1995),p.1506.

¹⁰Jack C Richards & Willy A Renandya , *Methodology in Language Teachingand Anthology of Current Practice*(USA: Cambridge University Press,2000),p.255.

According to Ur Penny “Vocabulary is the words we teach in foreign language. It means vocabulary is the list of words that work in language and it is taught by the teacher based on the students level”.¹¹ Then, according to Jackson “Vocabulary is representative collection of the words that exist in the English language”.¹² Vocabulary is the words that are known and used by human. Vocabulary is so important for the students because it is the core part of the language and has the link to each skill in English.

Based on quotation above, it can be concluded that vocabulary is a collection of words that are understood and used to communicate in a language.

b. Purpose of Vocabulary

Purpose of vocabulary is to increase learners’ ability in language and to have knowledge about words and its elements. Julie Meltzer and Edmund quote from Allen as follows:

According to Allen, teachers in each content area should implement purposeful vocabulary instruction to: 1) increase reading comprehension, 2) develop knowledge of new concepts, 3) improve range and specificity in writing, 4) help students communicate more effectively, and 5) develop deeper understanding of words and concepts with which students are normally familiar.¹³

The quotation shows that vocabulary relates to learners’ activities in the learning process. Additionally, John and Shane say one reason teachers are

¹¹Penny Ur, *A course in Language Teaching*(United Kingdom:University Press,2000),p.60.

¹²Howard Jackson, *Words, Meaning and Vocabulary*(London: Casell,2000),p.118.

¹³ Julie Meltzer and Edmund T Hamman, *Meeting the Literacy Development Needs of Adolescent English Language Learning Through Content Area Learning* (The education Alliance Brown University,2005),p.5.

concerned about teaching vocabulary is to facilitate the comprehension of a text that students will be assigned to read. If the students don't know the meaning of the words that they will encounter in a text their comprehension of that selection is likely to be compromised.¹⁴ It can be concluded that teaching vocabulary can develop the students' understanding of words element.

Based on curriculum 2013 the purpose of vocabulary in senior high school (SMA/MA) "is to increase students' vocabulary mastery every time they learn new chapter, to identifying words in dialog or text, to identifying a meaning of word."¹⁵

c. Kinds of Vocabulary

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

1. Receptive Vocabulary or Passive Vocabulary

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

¹⁴ John J Pikulsi and Shane Templeton, *Teaching and Developing Vocabulary: key to long-Term Reading Success*, (USA: Houghton Mifflin Company, 2004), p.5.

¹⁵ Ning Setiawati, *Silabus Bahasa Inggris SMA Kelas XI Kurikulum 2013*

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.¹⁶

According to Schail says that there are types of vocabulary, they are:

- 1) Active Vocabulary
- 2) Reserve Vocabulary
- 3) Passive Vocabulary.¹⁷

According to Azimar Enang that there are two types of vocabulary, they are:

- 1) General Vocabulary
- 2) Special Vocabulary.¹⁸

Based on the explanation above, there are some types of vocabulary. They are: active vocabulary, passive vocabulary, reserve vocabulary, general vocabulary, and special vocabulary.

In this discussion research limits the types of vocabulary into two points:

First, active vocabulary refers to the words that are used in speaking and writing. It means that involves of knowing how to

¹⁶ Fitri Rayani Siregar, Improving Students' Vocabulary Mastery Through Crossword Puzzle Technique At SD Muhammadiyah 1 Padangsidempuan, *Jurnal Bahasa Inggris IAIN Padangsidempuan* Vol. 04 No. 1 June 2018, <http://jurnal.iain-padangsidempuan.ac.id/index.php/TZ>. Accessed on Monday 14th of December 2020, P.94.

¹⁷ Schail, *Seven days to Faster Reading*, (New York: Oxford University Press, 1967), p.53.

¹⁸ Azimar Enang *Kinds of Vocabulary*, (Bandung: PT. Pustaka Media, 2001), p. 203.

pronounce the word, how to write and spell it, how to use it in correct grammatical patterns along with the words that usually collocated.

Second, passive vocabulary means that words that are used in reading and listening. Someone can understand the ideas of the utterance contextually not word by word.

d. Choosing Vocabulary

Vocabulary consist understand consist of the words we understand when we hear or read the (receptive vocabulary) and words we speak or write vocabulary (expressive vocabulary). It build vocabulary by picking up words that we read or hear a variety of words is important for language development and reading comprehension.

Ricahard in KamilahSiswati stated that:

- a) Coverage or range of context where the word can be found
- b) Convenience or how easy a word is learned
- c) Familiarity, meaning the word is often found, meaningful and concrete.¹⁹

Harmer in KamilahSiswati stated that:

- a) At senior high school, the word concrete is usually taught before the abstract word. Such as the word window, door, are taught first than abstract words like sad, happy and wind.
- b) Word that often appear or are often used according to students' need.
- c) The context in which the vocabulary emerges is also important to consider.
- d) Exercise related to words that have been learn are proven to help students' memory and assignments such as changing the form from adjective to noun, adverb or vice versa will be highly recommended given to students.²⁰

¹⁹KamilahSiswati, Efektivitas Model PembelajaranPenguasaanKosakata,(PascaSarjana : UMP,2012), p.19-20. [Http://www.repoostory.ump.ac.id](http://www.repoostory.ump.ac.id). Accessed on 16th A pril 2019 at 7.30 p.m in Sihitang, Padangsidempuan Tenggara

²⁰KamilahSiswati, Efektivitas Model PembelajaranPenguasaanKosakata,(PascaSarjana : UMP,2012), p.19-21.

Based on explanation above the researcher conclude choosing vocabulary for senior high school begin from the concrete words like potato, table, pencil, and not begin from the abstract words like air, wind, sad, and happy. After that, the students will be easy to learn to concrete word, because the students can touch and hold the thing.

e. Types of Vocabulary

There are four types of vocabulary. Children begin to acquire listening and vocabularies many years before the start to build reading and writing vocabularies.

There are four types of vocabulary, they were:

a) Listening Vocabulary

The words we are hear and understand. Starting in the womb, fetuses can detect sounds as early as 16 weeks. By the time we reach adulthood, most of us will recognize and understand close to 50.000 words. Children who are completely deaf do not exposed to a listening vocabulary.

b) Speaking Vocabulary

The words we are use when we are speak. Our speaking vocabulary is relatively limited. Most adult use a more 5.000 to 10.000 to all their conversations and intructions. This number is much less than our listening vocabulary most likely due to ease of use.

c) Reading Vocabulary

The words we understand when we are read text. We can read and understand many words that we do not use in our speaking vocabulary.

d) Writing Vocabulary

The word we are can retrieve when we are write to express ourselves. We are generally find it easier to explain ourselves orally, using facial expression and intonation to help and get our ideas across, then to find just the right words to communicate the same ideas in writing.

Writing vocabulary is strongly influenced by the words we are can spell.²¹

²¹Judy K. Montgomery, "The Bridge of Vocabulary: Evidence-Based Activities for Academic Succes," 2007, www.srsdeaf.org/Downloads/Bridge_of-Vocabulary.pdf.

From the definition above, it can be concluded that type of vocabulary is listening vocabulary, speaking vocabulary, reading vocabulary and writing vocabulary can use in junior high school. But, based on curriculum used to speaking vocabulary more than another.

f. Principles of Teaching Vocabulary

Vocabulary is one of the language elements that should be mastered by students and also has difficulties in teaching planning. The best way to avoid this is for the teacher and course designer to have a set guiding principles that can be applied in a variety of teaching and learning situations. They are:

1) Focus on the most useful vocabulary first

The most useful vocabulary that every English language learner needs whether they use the language listening, speaking, reading, or writing, or whether they use the language in formal and informal situation, 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 newspaper, over 80 percent of the running words in novels, and 85 percent of the running word of the conversation. It contains most of 176 function word families (word 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.

2) Focus on the vocabulary in the most appropriate way there are four most important vocabulary learning strategies, they are using word part, guessing from context using word card, and using dictionaries. Using word cards is one of the appropriate strategies for children to help them memorize the new word.

3) Give attention to the high frequency words across the four strands of a course. High frequency vocabulary needs to occur in all four strands 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.

4) 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:

a) Knowledge of what to learn and the range of options for learning vocabulary.

- b) Skill in choosing the best option
- c) The ability to monitor and evaluate progress with those options.²²

Based on the above explanation these types must be understood by the teachers, in line with the method, strategy, and media that they use.

g. The Material of Teaching Vocabulary

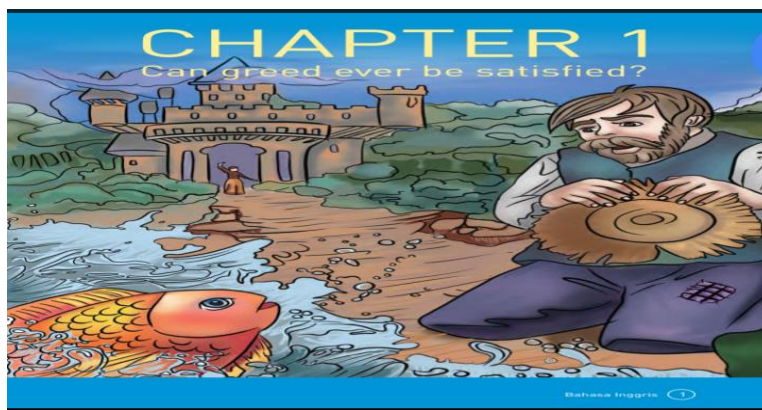
In syllabus of eleventh grade of senior high school in curriculum 2013 there is no specific materials for teaching vocabulary but vocabulary only hitches on other lessons like, speaking, listening, writing and reading. Their divided vocabulary materials mean here are the vocabulary that include in speaking lesson such vocabulary in the topic “Stop Bullying Now” (Stand Up and Speak Up). It divided into eight chapters, chapter one is study about offer and suggestion, chapter two is study about opinions and thoughts, chapter three is study about party time, chapter four is study about national disaster-An Exposition, chapter five is study about letter writing, chapter six is study about cause and effect, chapter seven is study about meaning through music, chapter eight is study about explain this!.

In SMA 6 Padangsidempuan, the material of teaching vocabulary is based on syllabus given by government who has the authority. “the topic of vocabularies does not mention explicitly in the material. The topic does not explain specifically, but the vocabularies include in writing, speaking and reading material. There are some examples of material of teaching vocabulary in SMA 6 Padangsidempuan:

²²Linse, Caroline T., *Practical English Language Teaching Young Learners* (North America: McGraw Hill, 2005), p.138.

1. Vocabulary material in speaking

The researcher choose chapter one to find out speaking vocabulary. In this topic we can find vocabulary about useful expression for suggestion and Offer, expression of suggestion such as solution, advice, plan, idea and expression of offer such as, can be in terms food, money, solutions, friendship, or a bargain.




Building Blocks

Suggest and Offer

Suggest means to present a suggestion that is to introduce or propose an idea or a plan for consideration.

Suggestions are abstract and can be in form of solutions, advice, plan, and idea.

Suggest means to propose a plan. It can be accepted or refused.

For example:
-Let's finish our homework first.
-Let's go home.

Expressions/Gambits

When making suggestions we often use the following expressions:

- Let's
- Why don't we
- We could
- What about
- How about
- I suggest that
- You might want to change
- I think
- I don't think

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2. The first, the teacher said that students learn about suggest and offer and how it is used in every life. The second, the teacher strengthens

students understanding with questions and explanations about offer and suggestion. The third, the teacher explain the material about offer and suggestion expression with action. The last, student repeat what the teacher is practice with action.

Some examples of collocations used to suggest and offer:

- Bring tea.
- Make room.
- Make an effort.
- Do laundry.
- Come early.
- Come prepared.
- Go study.
- Want a hand.
- Eat cake.
- Have a cookie.
- Read "Laskar Pelangi".

DID YOU KNOW?

Collocations are a combination of words (noun+ verb or verb+ noun, adjective + noun, verb + adverb) that are commonly used together.

2. Total physical Response

a. Defeniton of Total physical Response

According to Jack Richards and Theodore S Rodgers that, Total Physical Response is a learning method created around the coordination of speech and action.²³ Then according to James Asher a Professor psychology University, California. It draws on several traditions, including develop

²³Jack Richards and Theodore S Rodgers, *Approach and Methods in Language Teaching: Description and Analysis* Cambridge: Cambridge University), p.78.

mental psychology, learning the theory and humanistic pedagogy.²⁴ According to Jeremy Harmer, Total Physical Response method is harmony the human biological program because uses body movements before and after speech appears and it does not require the learner to speak before he is ready, when the students call respond to command correctly, one of them can start giving instruction to other classmates.²⁵ In others book, according to Jeanne Machova says that” The Total Physical Response is a succesfull method achieving very good results in teaching English in vocabulary to young pupils; it makes long term recall of vocabulary easier.²⁶

From the definition above, it can be concluded that total physical response is great method in created around the coordination of speech and action. Total Physical Response is a language teaching method built around the coordination of speech and action. it attempts to teach language through physical activity.

b. Purpose of Total Physical Response

Total physical Response is a language learning method based on the coordination of speech and action that is conclude in the type of total physical response or physical body movement that can be used in the

²⁴James Asher, *Learning Another Guide – Book*(Los Gatos, Calif: Sky Oaks Production),p.17.

²⁵Jeremy Harmer, *English Language Teaching*, (Adinburg Gate: Person Education Limited:2011),p.90.

²⁶Jeanne Machova, *Early Childhood Experience in Language Art Early Literacy*(Washington Graphic World, 2007), p.37.

development of vocabulary. Beside that, total physical response method also have some purpose in learning process. They are:

- 1) To teach oral proficiency at beginning level. Grammatical structures and vocabulary are emphasised embedded with imperatives.
- 2) To teach basic speaking skills (based upon the way children learn their native language).
- 3) To reduce the stress people feel when studying a foreign language.
- 4) The teacher is director of students behaviour, the students are imitators.²⁷

Based on explanation above, the grammatical structural and vocabulary are considered the main purpose of vocabulary since the idea of vocabulary are to able the listeners.

c. The Procedures of Total Physical Response Method

The teacher in Total Physical Response method should foster an atmosphere of general euphoria. It is important to ease as much as possible the tension of performing the commands in front of their peers. According to James Asher, some procedure of Total Physical Response are:

- 1) Using hand signals, motion four students to come up to the front of the classroom.
- 2) Then gesture for two students to sit on either side of you facing the class.
- 3) Other students in the class are often seated in semi-circle so that there is a rather large space for the action.
- 4) Then teacher say "stand up" and immediately stand up as you motion the students seated on either side of you to stand up.
- 5) Next say "Sit down" and immediately sit down along with the four students. If any student tries to repeat what you have said, signal silence by touching lips with your index finger.
- 6) Then say "stand up" and the group, including the instructor, should stand up, and then "sit down" each followed by the appropriate action all respond confidently, without hesitation.²⁸

²⁷Jack C. Richard and Theodore S. Rodgers, *Approaches and Methods in Language Teaching* (Cambridge: Cambridge Language Teaching Library), p.12.

²⁸James Asher, ..., p.133.

So, it can be concluded that the procedure above is the beginning activities in teaching English vocabulary. The teacher introduced two verb of commands "stand up" and "sit down". These two verbs are easy to be presented. After the learners can respond the command confidently, the learners may practice giving the command among them.

d) The Advantages of Total Physical Response

Total Physical Response can help to make students speak fluently and listen to respond instructors' command. Student can get across the meaning of word, therefore it can be help student understand the words of the target language and use the words for communication. Asher believes that TPR is suitable for all levels of ages and also believes that TPR is beneficial to build student confident.

According to Asher in Jack Theodore S Rodger some advantages in Total Physical Response are:

1. It is a fun and easy. Students can enjoy getting of out of their chairs and moving around.
2. Simple TPR activities do not require a great deal of preparation on the part of the teacher. However, some other more complex application might.
3. It is good for kinesthetic learners who need to be active in the class.
4. It is good tool for building vocabulary.
5. Class size need not be a problem.
6. TPR seems to work effectively for children and adults.

From the advantages above, it can be concluded that use of Total Physical Response method in teaching learning process has good effect

to activate understanding and make student easy to memorize the materials.

e) **The Disadvantages of Total Physical Response**

Disadvantages of Total Physical Response students are not generally given the opportunity to express their own thoughts in creative way. As the result, it can be challenge for shy students in teaching English vocabulary because use body movement.

According James Asher said that " there are some disadvantages of TPR are:

1. It is mainly in the imperative mode, generally excluding the rest of the target language.
2. It is often focused on phrases or single vocabulary words.
3. It foster only passive language skills.
4. It takes along time.
5. TPR method seems to be especially effective in the beginning level of language proficiency.²⁹

From some disadvantages above, there six disadvantages of TPR method above. It concludthat Total Physical Response methodare takes a long time in teaching vocabulary in classroom.

f) **Teaching Vocabulary by Using Total Physical Response Method**

The use of Total Physical Response Method in teaching vocabulary to help the teacher and the students and the learning process. There are some activities in teaching vocabulary with total physical response which can be applied in the classroom. Activities of for using total physical response, they are:

²⁹Larsen, Freeman, *techniques and Principles in Language Teaching*(Oxford: Oxford University Press,2000), p.396.

1) The process in pre- teaching : first, teacher come in to the class and open the class. Second, teacher ask the students to pray based on their belief. Third, teacher checks students attendance. Fourth, teacher asked the last material and teacher asked the students to open book the next lesson.

2) While- Teaching

This activity to make the students easy in teaching vocabulary mastery as follows; first, the teacher introduce the subject matter. Second, the teacher ask to the students to be volunteer at the front of class, with the students who be volunteer seated on either side of the teacher. And the teacher say “ stand up “ and the teacher along with her/his students. Next the said “ sit down” the teacher and students sit down. It means the instructor is the director of a stage play in which the students are the actors“. It is the teacher who decides what to teach, who selects supporting materials for classroom use. Third, after several demonstration of stand and sit down, nex model walk , stop turn, jump, and ect. When the audience has observed teacher and the students of the teacher act and response to commands, the observers are also internalizing the meaning of the spoken language. After modelling a sequence such as stand up, stop, ect. For a number of times, the students become ready to act alone without the teacher. At this point, the teacher invites an individual students who was performing with the

teacher to try alone. The teacher utter direction such as, stand up, stop, and individual student act alone response to each command. One student are responding rapidly with confidence to sequence of commands. The last, the teacher give new word and expansions as "walk to the chair", "walk to the blackboard" as student become more and more comfortable and confident they understand everything. Teacher are saying in the target language, then recombine constituents to create imperative direction, ones the student have never heard before but understand perfectly.

3) Post- Teaching

Teacher gives feedback, asked the students about what they do not understand and summarize the lesson about the lesson. The teacher also asked the students to conclude the lesson. The activities as follow:

First, teacher give feedback to the process. Second, teacher and students homework. Fourth, teacher informs the next material and the last teacher close the class.

Table.1
Teaching vocabulary by using total physical response method

No	Learning activity	Teacher activities	Procedures	Students Activities
1	Pre-teaching	1. Teacher come in to the class and open the class. 2. Teacher prepare the method in learning process.		1. Student sit on the chair. 2. Pray based on their belief. 3. Listen and pay attention 4. Students full attention.
2	While-Teaching	<p><u>Observing</u></p> 1. Teacher prepare the other position of position of total physical response method, in order can be seen by all students.	1. Using hand signals, students come up to the front of classroom.	1. The students pay attention to the teacher . 2. The students make good position or in order can be looked the total physical response.
		<p><u>Associating</u></p> 1. The teacher ask the students to make the group.	2. Then gesture for two students to sit on either side of you facing the class.	1. The students listen the teacher. 2. The students do what teacher say. 3. The students make the group.
		<p><u>Communicating</u></p> 1. The teacher explain the material. 2. Teacher ask the students to say what the students see the material based on total physical response method about.	3. Other students in the class are often seated in semi-circle	1. Student listen teacher explanation. 2. The students do what teacher ask to them. 3. The students together action what teacher command.
		<p><u>Exploring</u></p> 1. Teacher showing the total physical response with the explanation based on material.	4. Teacher say “stand up” and immediately stand up as you motion. students seated on either side of you to stand up.	1. Students pay attention to the teacher explanation. 2. The students write down the important point from the explanation. 3. The students make the other example based on the material. 4. The students tell their

				other example based on the material one by one.
		<p><u>Questioning</u></p> <p>1. Teacher gives to the students to asking some question.</p>	5. Students ask the teacher	<p>1. Students ask to the teacher about the material that have not their comprehend.</p> <p>2. Students write down the conclusion based on material.</p> <p>3. The students stand in front of their chair and tell the onclusion from the lesson.</p>
3	Post – teaching	<p>1. The teacher gives feedback.</p> <p>2. Teacher ge the homework.</p> <p>3. Teacher informs the next materialand the teacher close the class.</p>	4. Student appropriate action all respond confidently.	<p>1. Students listen to the teacher.</p> <p>2. Students response to the teacher command.</p> <p>3. The students do their homework in their home.</p> <p>4. Students listen to the teacher.</p> <p>5. Students discuss the next material in outclass with their freinds.</p>

Based on table above, there are some procedures of applying to teaching Total Physical Response in the classroom. It can be looked from the procedures that total physical response to make teacher and student active and have interaction in teaching learning process in the classroom, especially in learning vocabulary.

4. Conventional Method

a. Defenition of Conventional

According to Hudson that “conventional teaching is a method that used by the teachers based on mutual agreement in a school.³⁰ It used traditional way in teaching and learning process where the teacher will use the common way in teaching and learning. Conventional or traditional teaching is concered with the teacher being the controller of the learning environment. The teacher actually is the leader in the class.

b. Characteristics of coventional method

- 1) Lesson material is presented to groups of students in the class as a whole without regard to student individually.
- 2) Learning activities generally take the form teacher center.
- 3) Students are generally passive because must have to listen the teacher explanation.
- 4) Learning succes is generally determined by teacher subjectively.

³⁰ Hudson, The meaning of Conventional Teaching, accessed on <http://www.conventional-strategy/topic/54372-strategy>, retrieved on november, 29-11-2018.

c. Procedure of conventional method in the classroom

- 1) The teacher gives a text.
- 2) The teacher shows the related vocabulary.
- 3) The teacher ask students to look up the meaning of the vocabulary to be learned in the dictionary.
- 4) The teacher ask students to memorize the vocabulary that have learned in the dictionary.
- 5) Then the teacher gives questions to students and then translates.

B. Review of related Finding

This research, there are many previous studies which support it. These previous studies as follow:

The first, research with title “The Effect of Total Physical Response on students vocabulary Mastery at Grade XI SMA N 6 Padangsidimpuan. This research finding shows the average score of control group’s before treatment (60,23). After treatment was (70.50), the experimental group’s average before treatments is (63.40) and after treatment is (78.60). There are difference score between students taught using total physical response method and taught the total physical response method. So, it is showed the mean of experimental class higher than control class ($78.60 > 70.50$). On the other hand, the test of hypothesis using t-test formula shows the value of the t-test is higher than the value of the t-table. The hypothesis is accepted.³¹ The

³¹ Diana Misyuarni “*The Use of Total Physical Response plus Writing in Improving Students’ Writing Procedural Text Ability*”(A thesis, Universitas Pasundan, 2015),p.15.

³¹Rosdiana“ *Developing Students’ Ability in using Imperative Sentences through Total Physical Response* (A Thesis UinSyarifHidayatullah Jakarta, 2011),p.4.

second, research is conducted by entitled "Developing Students Ability In using Imperative Sentences Through Total Physical Response to the first year 1 class of Mts Sawangan in academic years 2011" is conducted by Rosdiana. The result of the pretest shows that the average score of experimental group is 52.21 and the average score of control group is 60.83. Then, The result of the post test. How that the average score for experimental group is higher that the average score of control group. The average score of experimental group is 75. and the average score of control group is 75.21. This indicates that the gain of vocabulary means score of experimental group is significantly higher than the gain of vocabulary means score of control group. So, *H₀* was rejected and *H_a* was accepted.

The third, research with title "The Influence of Total Physical Response Toward Listening Skill to the third grade students of Sabilillah Elementary school, Sampang Madura in academic years 2011" is conducted by Mellya Junita Ulfa Salimah. The result of the experimental group got 66.68 in average and 67% in percentage of achievement. Then, the control group got 69.65 in average and 70 % in percentage. It proved that the experimental group got better than the control group. The t-test application to the scores showed that the estimated t value (20.16) was higher than critical t value (1.004). Therefore, there was significant difference between the students who were taught without using make a Total Physical Response method.

³¹MellyaJunitaUlfaSalimah "The Influence of Total Physical Response Toward Listening Skill" (AThesisUniversitasAirlangga)

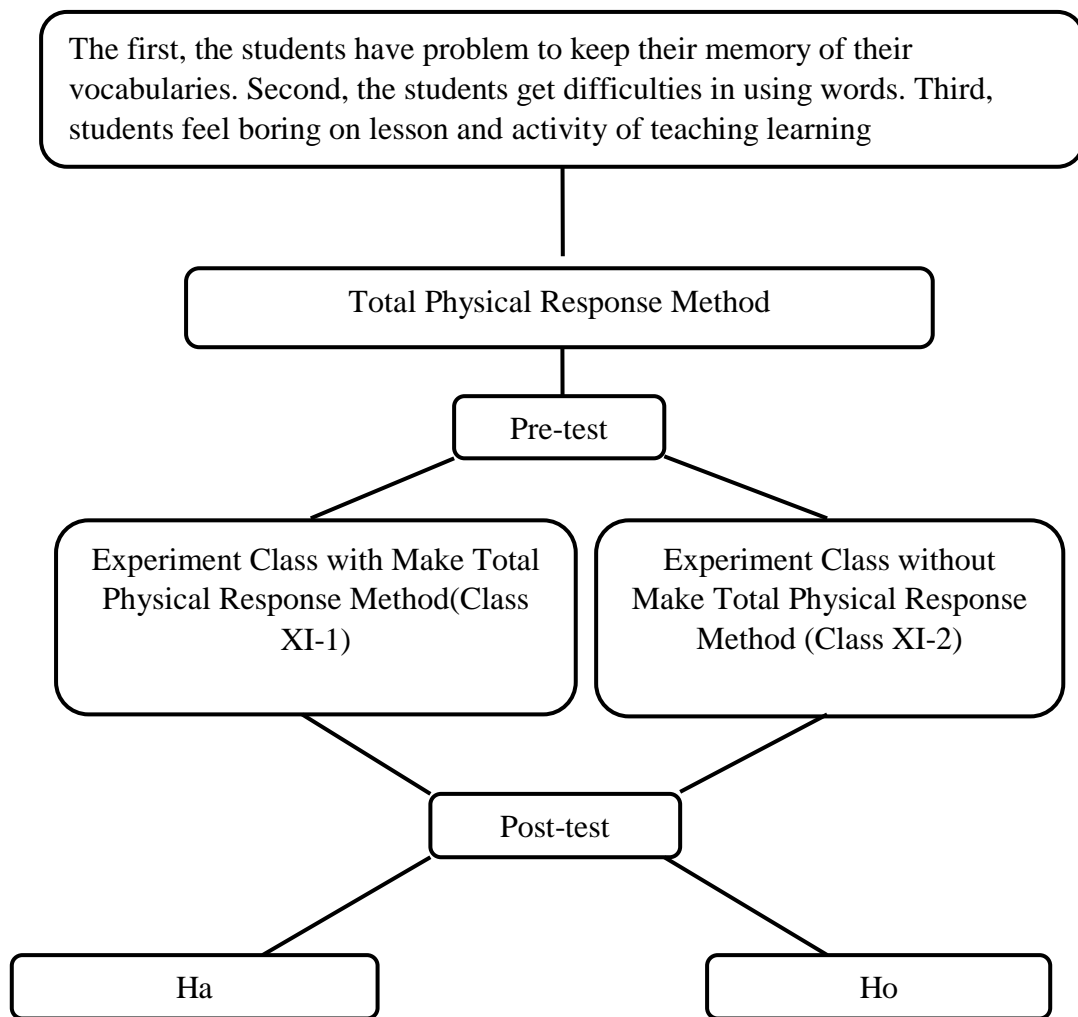
Based on the description above it can be seen clearly that make a Total Physical Response Method can apply for all subjects like reading and writing, this method also can apply for listening. The researcher hoped that make Total physical Response to increase students' vocabulary mastery and could complete the previous research. So, that researcher did a research about "The Effect of Total physical Response Method on Vocabulary Mastery at Grade XISMA N 6 Padangsidempuan.

C. Conceptual Framework

There are many factors that make vocabulary was success. One of them was teachers' way teaching vocabulary to the students. The suitable technique was very important in teaching it, especially in teaching language. In this case, the students would enjoy in learning process without forgetting the purpose of learning. Beside, by having suitable technique, they would be easier in memorizethe words. So many ways for mastering the vocabulary, one of all is make a Total Physical Method.

All activities that take place in a language class are techniques. Technique is a single activity that comes from procedure. Procedures are a collection of method is Total physical response method is a method introduce by James J Asher. In this method, teacher utter commands and then model by responding with appropriate action. This method will make student easy for remembering the vocabulary.

Based on the above, conceptual framework can be seen from the figure below.



D. Hypothesis

Suharsimi Arikunto hypothesis is a provisional answer of result problem in a research.³² So that, it can be said that hypothesis is provisional answer of prediction in a research. the hypothesis of this research were:

- a. H_a : There is significant effect of Total Physical Response Method on Students' English Vocabulary Mastery at Grade XI SMA Negeri 6 Padangsidempuan.
- b. H_0 : There is no significant effect of Total Physical Response Method on Students' English Vocabulary Mastery at Grade XI SMA Negeri 6 Padangsidempuan.

Hypothesis is the provisional result of the research. The hypotheses of this research were:

- a. There was the significant effect of Total Physical Response Method (TPR) on Vocabulary Mastery at grade XI SMA Negeri 6 Padangsidempuan (H_a). $\mu_1 > \mu_2$
- b. There was no significant effect of (H_0). $\mu_1 = \mu_2$

³²SuharsimiArikunto, *ProsedurPenelitianSuatuPendekatanPraktik*,(Jakarta :RinekaCipta, 2006), p. 71.

Total Physical Response Method (TPR) on Vocabulary Mastery at grade XI SMA
Negeri 6 Padangsidempuan

CHAPTER III

RESEARCH METHODOLOGY

A. Place and Schedule of the Research

This research was at SMA Negeri 6 Padangsidempuan. It is located at Sutan Soripada Mulia Street, Padangsidempuan. It is number in Sadabuan. It is about 8.6 kilometers from the central town.

The subject of this research wastwelveth grade of students in SMA Negeri 6 Padangsidempuan. The schedule of this research was from December until finished.

B. Research Design

The kind of this research is experimental research. Experimental research is a research with a purpose to find the effect of one or more variables to the other variable. Gay and Airasian experimental research is the only type of research that can test hypotheses to establish cause and effect relationship.³³ Besides, Burhan stated that experimental research is a research to manipulate and control the variables to find the relationship, effect, or the differences among the variables to the other variable.³⁴

In this research, the researcher have choosen two classes as experiment class and control class. The classes are XI- IPA 2 as experimental class and XI- IPA 3 as control class. For XI-IPA 2 class as experiment class, they will be taught by using total physical response method and XI-IPA 3 class as control

³³L.R. Gay and Peter Airasian, *Educational Research: Competences for Analysis and Application*, Sixth Edition, (USA: Prentice Hall, Inc., 2000), p. 367.

³⁴BurhanBungin, *MetodologiPenelitianKuantitatif*, (Jakarta: Kencana, 2005), p. 49.

class will be taught by using conventional Technique. The research design of this research can be seen in the following table:

Table 1
Pre-test and Post-test Group Design

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

(source: Sugiyono, *Metode Penelitian Kuantitatif, Kualitatif, dan R&D*)

C. Population and Sample

1. Population

Gay and Airasian stated that population is the group of interest to the researcher, the group to which she or he would like the results of the study to be generalizable.³⁵ Besides, Burhan stated that population is all of the objects that become the target of the research.³⁶ It means that the population of this research is all of the XI class of SMA Negeri 6 Padangsidempuan. It consists of 5 classes with 146 students. It can be seen in the following table:

Table 3
The Population of the Grade VII Students of SMA N 6 Padangsidempuan

No	Class	Total of Students
1	XI-1	31
2	XI-2	22
3	XI-3	22
4	XI-4	26
5	XI-5	31
TOTAL		132

(Source: data of students SMANegeri6 Padangsidempuan from voice of headZmaster)

³⁵L.R. Gay and Peter Airasian, *Educational Research*, p. 122.

³⁶Burhan Bungin, *Metodologi Penelitian* ..., p. 99.

2. Sample

A sample is any subset of the population of individuals or things under study . In this research, the research used random sample to take the class research. Random sampling is the process of selecting a sample in such a way that all individual is defined population have an equal and independent chance of being selected for the sample.³⁷

So, thereason use random sampling technique in which all population were randomized based on their class. The researcher used random sampling technique because of all of the population were at the same grade, curriculum, lesson, same age, and don't use placement test in to the role.

Then, it usethe trick to take the sample using a lottery technique of taking random sampling. All the population or all the grade VII class are folded, then, the research shake them. After that, the research took 2 folded classes.³⁸

Finally, the research get two classes of grade XI, they are XI-2as the experimental class and XI-3 as a control class.

³⁷Suharsimi Arikunto..., p.174.

³⁸Headmaster *SMP Negeri 5 Padangsidempuan*.

Table 4
Sample of the Research

The First Experimental Class	The Second Control class	Total
XI- IPA2 = 22 Students	XI-IPA 3= 22 Students	44 Students

Based on explanation above, the population is the eleven classes of the second year students, two classes are selected randomly in order to be an experimental or control class. In this research, the experimental class is XI-IPA 2 and control class is XI- IPA 3. The researcher chooses XI-IPA 2 consists of 44 students and XI- IPA 3 consists of 22 students. Therefore, total samples are 44 students. One class as experimental class and another one class as control class.

C. Definition of the Operational Variables

1. Total physical response method is a language teaching method for vocabulary built around the coordination of speech and action; it attempts to teach language through physical activity.
2. Students' vocabulary mastery is students' knowledge about the meaning of word that use to identify Identify expression to offer, expression to suggestion, responding to offer, responding to suggestion.

D. 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.

It will be collect by giving multiple choice question. In this research, 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. To find out the scores of the students' answer, the researcher gives 2 score for each item. Thus, the maximum score of test is 100.

Table 5
Indicators of Vocabulary mastery Pre-Test

No	Indicator	Topic	Number of items	Item
1	Identify the name of things	Thing of expression about (Offer)	7, 8, 9, 12, 22, 19, 26, 30, 31, 37, 38, 49	12
		Thing of expression about (suggestion)	1, 2, 5, 10, 15, 17, 27, 32, 39, 40, 46, 50	12
2	Memorize the word	Responding to offer	4, 11, 13, 16, 18, 23, 24, 29, 33, 41, 42, 47	12
		Responding to suggestion	3, 6, 16, 20, 21, 25, 28, 34, 35, 36, 43, 44, 45, 48	14
Total				50

The following is formula is score students semantic mapping strategy

$$students\ score = \frac{students\ score\ answer}{total\ items} \times 100\%$$

Table 6
Indicators of vocabulary mastery Post-Test

No	Indicator	Topic	Number of items	Item
1	Identify the name of things	Thing of expression about (Offer)	7, 8, 9, 12, 22, 19, 26, 30, 31, 37, 38, 49	12
		Thing of expression about (suggestion)	1, 2, 5, 10, 15, 17, 27, 32, 39, 40, 46, 50	12
2	Memorize the word	Responding to offer	4, 11, 13, 16, 18, 23, 24, 29, 33, 41, 42, 47	12
		Responding to suggestion	3, 6, 16, 20, 21, 25, 28, 34, 35, 36, 43, 44, 45, 48	14
Total				50

The following is formula is score students semantic mapping strategy

$$students\ score = \frac{students\ score\ answer}{total\ items} \times 100\%$$

E. Validity and Reliability Instrument

1. Validity

AnasSudijono stated that Validity is a characteristic of the good test.

To get the validity of an achievement test can be used two ways:³⁹

- a. Totality of the test validity
- b. Item validity

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 multiple choice test tests that

³⁹Anas Sudijono. *Pengantar Evaluasi Pendidikan* (Jakarta: PT Raja Grafindo Persada, 1996), p. 163.

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.

2. Reliability of The Test

An instrument of the research must be reliable. A reliable test is consistent and dependable.⁴⁰ 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.

The formula:

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

Where:

- R_{11} : Reliability of the Instrument
- N : Total of Question
- St^2 : Variants Total
- P : $\frac{\text{Proporsi Subject who is right Answer}(1)}{N}$
- Q : $\frac{\text{Proporsi Subject who is Wrong Answer (0)}}{N}$ ⁴¹

⁴⁰H. Douglas Brown. *Language Assessment Practical and language Practice*, (San Francisco: Longman, 2003), p. 21.

⁴¹Suharsimi Arikunto, ..., p. 188.

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

Criteria of test reliability is as follows:

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

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

$r_{11} < 0,70$ low correlation (un- reliable).⁴²

F. Technique of Collecting Data

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

Table 7
Table of the Design of Collecting Data

Class	Pre-test	Treatment	Post-test
Experimental Class IPA (XI 2)	O ₁	Teaching vocabulary about expression to offer, expression to suggestion, responding to offer, responding to suggestion by using Total Physical Response Method	O ₂
Control Class IPA (XI 3)	O ₁	Teaching vocabulary about expression to offer, expression to suggestion, responding to offer, responding to suggestion by using Conventional Strategy	O ₂

The process of data collection as follow:

a. Pre test

The pre-test is conducted to find out the homogeneity of the sample. The function of the pre-test is to find the mean scores of the Total Physical Response group and conventional group before the

⁴²Anas Sudijono,..p. 209.

researcher give treatment to the experimental group. In this case, the researcher uses some steps. They are:

- 1) The researcher prepares the test 100 items.
- 2) The researcher distributes the paper of the test to students of experimental class and control class.
- 3) The researcher explains what students to do.
- 4) Giving time.
- 5) The students answer the question.
- 6) Collecting their paper test to researcher.
- 7) The researcher checks the answer of students and fined the mean score of control and experimental class.

b. Post-test

After giving treatment, the researcher conducts a post-test which the different test with the pre-test, and has not been conducted in the previous of the research. This post-test is the final test in the research, especially measuring the treatment, whether is an effect or not. After conducting the post-test, the researcher analyzes the data, and then, the researcher finds out the effect of using Total physical response in the experimental class. The researcher has some procedure. There are:

- 1) The researcher prepares the test 50 item
- 2) The researcher distributes the paper of the test to students of experimental class and control class.
- 3) The researcher explains what students do.

- 4) Giving time.
- 5) The students answer the question.
- 6) Collecting their paper test to researcher.
- 7) The researcher checks the answer of students and finds the mean score of control and experimental class.

G. Technique of Analyzing Data

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

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:

$$F = \frac{\text{Thebiggestvariant}}{\text{Thesmallestvariant}}$$

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

Hypotheses is rejected if $F_{(count)} \geq F_{(table)}$ ⁴³.

H. Hypothesis test

⁴³Agus Iriant...,P. 276.

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:⁴⁴

$$H_a: \mu_1 > \mu_2$$

$$H_0: \mu_1 \leq \mu_2$$

If $H_a: \mu_1 > \mu_2$, it means the result of students' vocabulary mastery by using Semantic Mapping at grade VII SMPN 3 Padangsidimpuan is better than conventional Technique. But, if the $H_0: \mu_1 \leq \mu_2$, it means the result of students' vocabulary mastery by using Total Physical Response Method at grade XI SMA N 6 Padangsidimpuan was not better than conventional Technique. To test the hypothesis, researcher uses the formula as follow:

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

Where:

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

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

n_1 = Total of experimental class sample

n_2 = Total of control class sample.⁴⁵

⁴⁴Suharsimi Arikunto,., p. 311.

⁴⁵Sugiyono. *Statistika untuk Penelitian*. (Bandung: Alfabeta, 2011), p. 138-139.

CHAPTER IV

THE RESULT OF RESEARCH

In this chapter, in order to evaluate the effect of Total Physical Response Method on Student's Vocabulary Mastery at Grade XI of SMA N 6 Padangsidempuan, the researcher has calculated the data using pre-test and post-test. Applying quantitative analysis, the researcher used the formulation of t-test. Then, researcher described the result based on the data as follow.

A. Description of Data

1. Description of Data Before Using Total Physical Response Method

a. Score of Pre Test Experimental Class

Researcher took class XI IPA-2 as the experimental class. Based on students' answer in pre test, the researcher has calculated the students' score. The total score of experiment class in pre-test was 2837 , mean was 109.63 , standard deviation was 61.82, variants was 732.84 , median was 71.3 , range was 64, modus was 63.8 , interval was 11. The researcher got the highest score was and the lowest score was . It can be seen in the following table:

Table 5
The Score of Experimental Class in Pre-Test

Total	2387
Highest score	90
Lowest score	30
Mean	109.63
Median	71.3
Modus	63.8
Range	64
Interval	11
Standard deviation	61.82
Variants	732.84

Then, the calculation of the frequency distribution of the students' score of experiment class in pre-test could be applied into table frequency distribution as follow:

Table 6
Frequency Distribution of Experimental Class (Pre-test)

No	Interval	Mid-Point	Frequency	Percentages
1	30 – 40	35	6	30%
2	41 – 51	46	3	15%
3	52 – 62	57	2	10%
4	63 – 73	68	6	30%
5	74 – 84	79	6	30%
6	85 – 95	90	12	60%
<i>i</i> = 11		-	35	100%

From the table above, the students' score in class interval between 30– 40 was 6 students (30%), class interval between 41– 51 was 3 students (15%), class interval between 52– 62 was 2 students (15%), class interval between 63– 73 was 6 students (30%), class interval between 74–84 was 6 students (30%), and the last class interval between 85– 95 was 12 students (60%).

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

From the histogram of students, score of experimental class in pre-test shown that the lowest interval 52 - 62 was 2students and highest interval 79-85 was two students. Histogram also shows that the highest frequency in interval 85 – 95 was only 12 students.

b. Score of Pre Test Control Class

In pre-test of control class, the researcher calculated the result that had been gotten by the students in answering the question (test). The score of pre-test control class can be seen in the following table:

Table7
The Score of Control Classin Pre-test

Total	1689
Highest score	90
Lowest score	36
Mean	99.61
Median	68.44

Modus	78.44
Range	54
Interval	9
Standard deviation	42.96
Variants	105530

Based on the above table, total score of control of control class in pre-test was 1689, mean was 99.61, median was 68.44, modus was 78.44 range was 54, interval was 9, standard deviation was 42.96, variants was 105530. The researcher got the highest score was 90, and the lowest score was 36. Then, the computed of the frequency distribution of the students' score of control class in pre-test could be applied into table frequency distribution as follow:

Table 8
Frequency Distribution of Students' Score

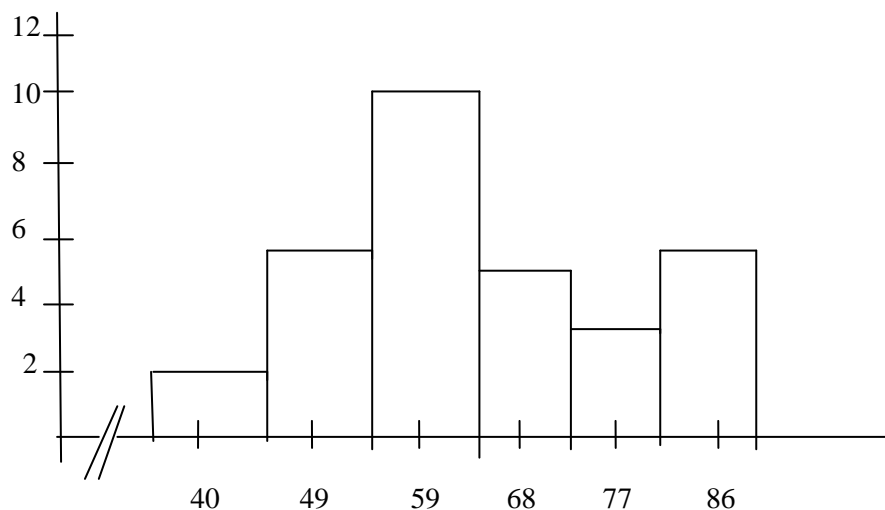
No	Interval	Mid-Point	Frequency	Percentages
1	36 – 44	40	3	15%
2	45 – 53	49	0	0%
3	54 – 63	59	2	10%
4	64 – 72	68	6	30%
5	73 – 81	77	6	30%
6	82 – 90	86	3	15%
$i = 9$		-		

From the table frequency distribution above shown that the students' score is there in class interval between 36- 44 was 3 students

(15%), class interval between 45-53 was 0 students (0%), class interval between 54-63 was 2 students (10%), class interval between 64-72 was 6 students (30%), class interval between 73-81 was 6 student (30%), and the last class interval between 82- 90 was 3 students (15%).

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

Figure 1: Histogram the Result Score of Student's Vocabulary Mastery in Control Class (Pre - Test)



From the histogram of students' score of control class in pre-test shows that the lowest interval 36-44 was 3 students, and highest interval 82-90 was only 3 students. Histogram also shows that the highest frequency in interval 64-72 was 6 students.

2. Description of Data After Using Total Physical Response Method

a. Score Post-Test of Experimental Class

The calculation of the result that had been gotten by the students in answering the question (test) after the researcher did the treatment by using Total Physical Response Method, researcher got total score of experiment class in post-test was 2301, mean was 73.68, median was 56.46, modus was 81, range was 54, interval was 9, standard deviation was 30.24, variants was 148845. The researcher got the highest score was 94 and the lowest score was 40. it can be seen in the following table:

Table 9
The Score of Experimental Class in Post-test

Total	2301
Highest score	94
Lowest score	40
Mean	73.68
Median	56.46
Modus	81
Range	54
Interval	9
Standard deviation	30.24
Variants	148845

Then, the calculation of the frequency distribution of the students' score of experiment class could be applied into table frequency distribution as follow:

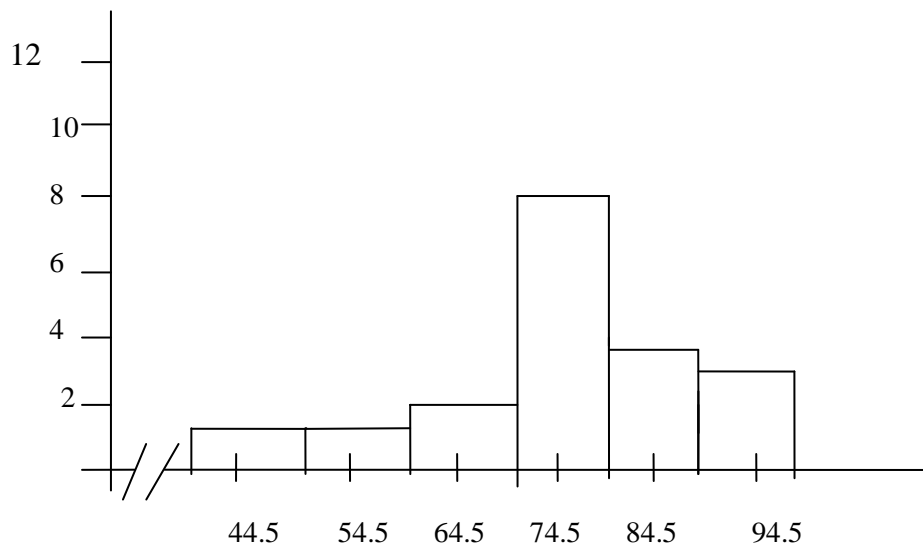
Table 10
Frequency Distribution of Students' Score

No	Interval	Mid-Point	Frequency	Percentages
1	40 – 49	44.5	4	20%
2	50 – 59	54.5	6	30%
3	60 – 69	64.5	12	60%
4	70 – 79	74.5	10	50%
5	80 – 89	84.5	4	20%
6	90– 99	94.5	1	5%
<i>i</i> =6		-	33	100%

From the table frequency distribution above shown that students' score in class interval between 40 – 49 was 4 student (20%), class interval between 50 - 59 was 6 student (30%), class interval between 60 - 69 was 12 students (60%), class interval between 70 - 79 was 10 students (50%), class interval between 80 – 89 was 4 students (20%), and the last class interval between 90 – 99 was 1 students (5%).

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

**Figure 2: Histogram the Result Score of Student's Vocabulary
Mastery in Experimental Class (Post - Test)**



From the histogram of students' score of experimental class in post-test shown that the lowest interval 90 - 99 was 1 student and highest interval 60 - 69 was only 12 students. Histogram also shows that the highest frequency in interval 70 -79 was only 10 students.

b. Score of Control Class in Post Test

The researcher took class XI-3 as the control class. The result that had been gotten by the students in answering the question (test) after the researcher taught the vocabulary mastery by using conventional technique the researcher got the score. The total score of control class in post-test was 1524, mean was 69.31, standard deviation was 9.54, variants was 113.35, median was 69.5, modus was 70.16, range was 40, interval was 7. The researcher got the highest score was 92 and the lowest score was 52. It can be seen in the following table:

Table 11
The Score of Control class in Post-test

Total	1527
Highest score	76
Lowest score	40
Mean	73.2
Median	64.32
Modus	60
Range	36
Interval	6
Standard deviation	19.62
Variants	90157

Then, the calculation of the frequency distribution of the students' score of control class could be applied into table frequency distribution as follow:

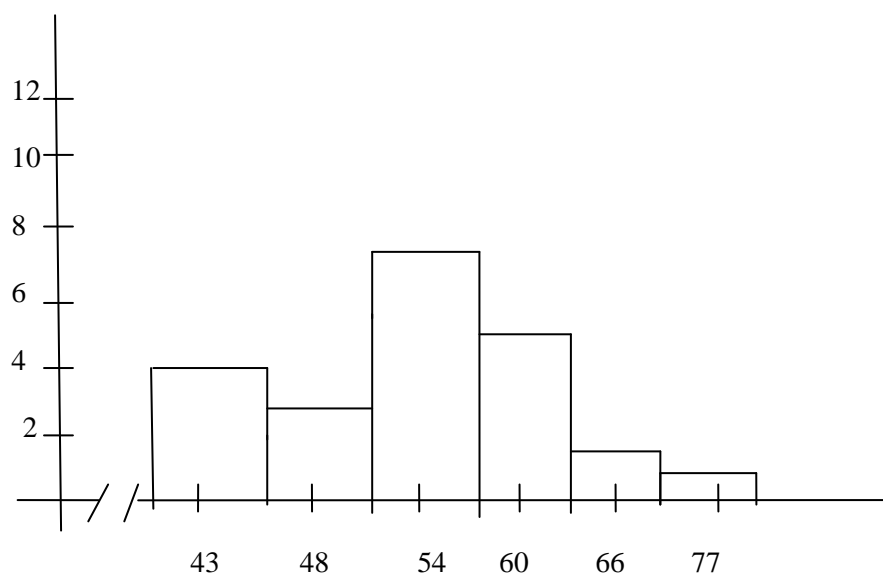
Table 12
Frequency Distribution of Students' Score

No	Interval	Mid-Point	Frequency	Percentages
1	40 – 45	43	1	5%
2	46 – 51	48	2	10%
3	52 – 57	54	2	10%
4	58 – 63	60	5	25%
5	64 – 69	66	2	10%
6	70 – 76	73	9	45%
<i>i</i> =		-	22	100%

From the table above, the students' score in class interval between 40 - 45 was 1 students (5%), class interval between 46 - 51 was 2 students (10%), class interval between 52 - 57 was 2 students (10%), class interval between 58 - 63 was 5 students (25%), class interval between 64 - 69 was 2 students (10%), and the last class interval between 70-76 was 9 students (45%).

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

Figure 3: Histogram the Result Score of Student's Vocabulary Mastery in Control Class (Post - Test)



From the hisogram of students' score of control class in post-test shown that the lowest interval 40 - 45 was 1 students and highest interval 70 - 76 was only 9 student. Histogram also shows that the highest frequency in interval 58 - 63 was 5 students.

3. Description of the Comparison Data between Pre-Test and Post-Test of Experimental and Control Class

a. The Comparison Data between Using Total Physical Response Method and Conventional Technique in Pre Test

Before researcher giving post-test to both of class (control class and experimental class) the researcher did not know students' mastery in vocabulary. After researcher giving pre-test, the researcher got the comparison data between pre-test score an experimental and control class before gave treatment. The comparison data can be seen in the following table:

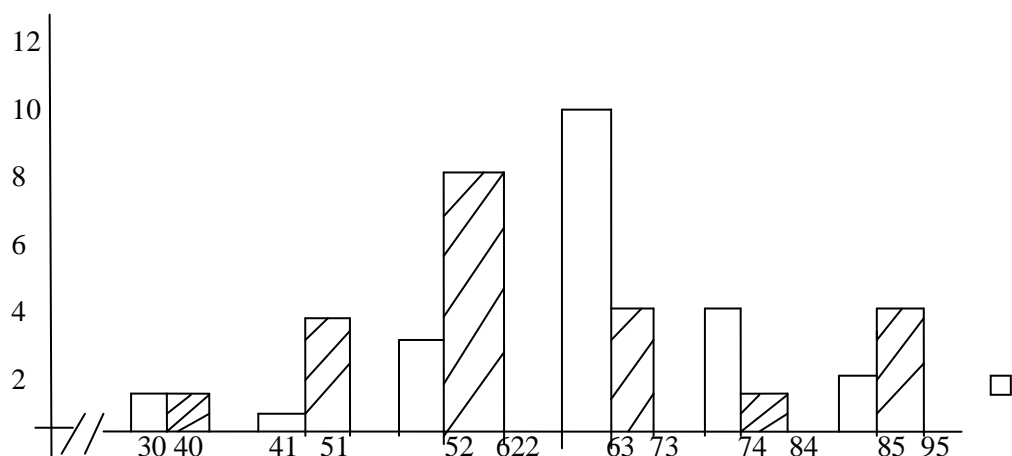
Table 13
The Comparison Data of Experimental Class
And Control Class Pre-test

Description	Experimental Class	Control Class
Total	2387	1689
Highest score	94	90
Lowest score	30	36
Mean	109.63	99.61
Median	71.3	68.44
Modus	63.8	78.44
Range	64	54
Interval	11	9
Standard deviation	61.82	42.96
Variants	18392	105530

Based on the table the total of score of experimental class in pre-test was 2387; control class was 1689, mean score of experimental class was 109.63; control class was 99.61, median of experimental class was 71.3 ; control class was 68.44, modus of experimental class was 63.8; control class was 78.44, standard deviation of experimental class was 61.82; control class was 42.96 , and variants of experimental class was 18392; control class was 105530.

In order to get pre-test data description of the experimental class and control class completely. The researcher presents the histogram on the following figure:

Figure 4: Histogram the Comparison Data of Student's Vocabulary Mastery in Pre- Test and in Experimental Class and Control Class (Pre- Test)



From the description of comparison data above, it can be concluded that the students' score of experimental and control class had the same score in interval 44–50.

b. The Comparison Data between Pre-Test and Post-Test by Using Total Physical Response Method

The comparison score between pre-test and post-test of experimental class can be seen in the following table:

Table 14
The Comparison Data of Experimental Class
in Pre-test and Post-Test

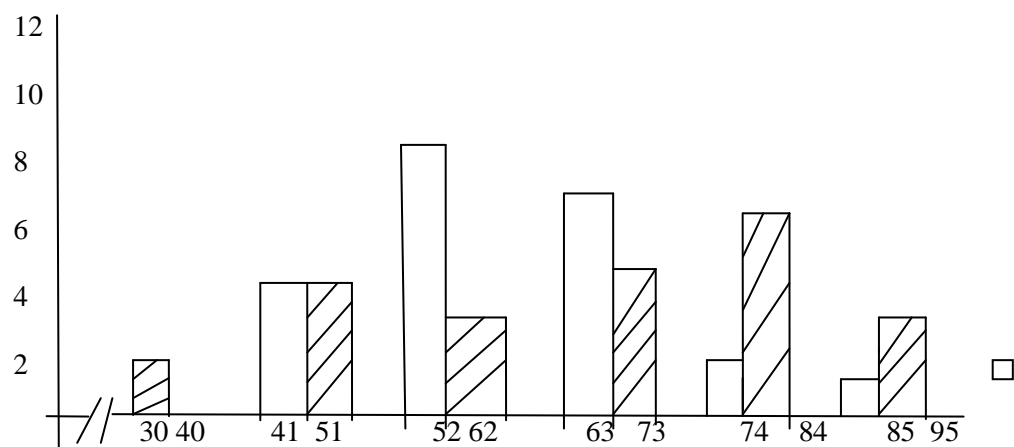
Description	Pre-test	Post-test
Total	2383	2301
Highest score	94	94
Lowest score	30	40
Mean	109.63	73.68
Median	71.3	56.46
Modus	63.8	81
Range	64	54
Interval	11	6
Standard deviation	61.82	30.24
Variants	732.84	148845

Based on the above table the total score of control class in pre-test was 2383; post-test was 2301, pre-test mean score was 109.63; post-test was 73.68, pre-test standard deviation was 61.82; post-test was 30.24, pre-test variants was 732.84; post-test was 148845, pre-test

median was 71.3; post-test was 56.46, pre-test range was 64; post-test was 54, pre-test modus was 63.8; post-test was 81, pre-test wasandpost test interval was 7. The researcher got the highest score of pre-test was 94 and the lowest score was 30; meanwhile the highest score of post-test was 94 and the lowest score was 40.

In order to get the pre-test and post-test data description of control class clearly and completely, the researcher presents the histogram on the following figure:

Figure 5: Histogram the Comparison Data of Student's Vocabulary Mastery in Pre- Test and Post -Test (Control Class)



From the histogram above, the students' scores of experimental

From the histogram above, the students' score of control class in post-test was higher than pre-test.

c. The Comparison Data between Pre-Test and Post-Test by Using Conventional Technique

The comparison score between pre-test and post-test of control class can be seen in the following table:

Table 15
The Comparison Data of Control Class
in Pre-test and Post-test

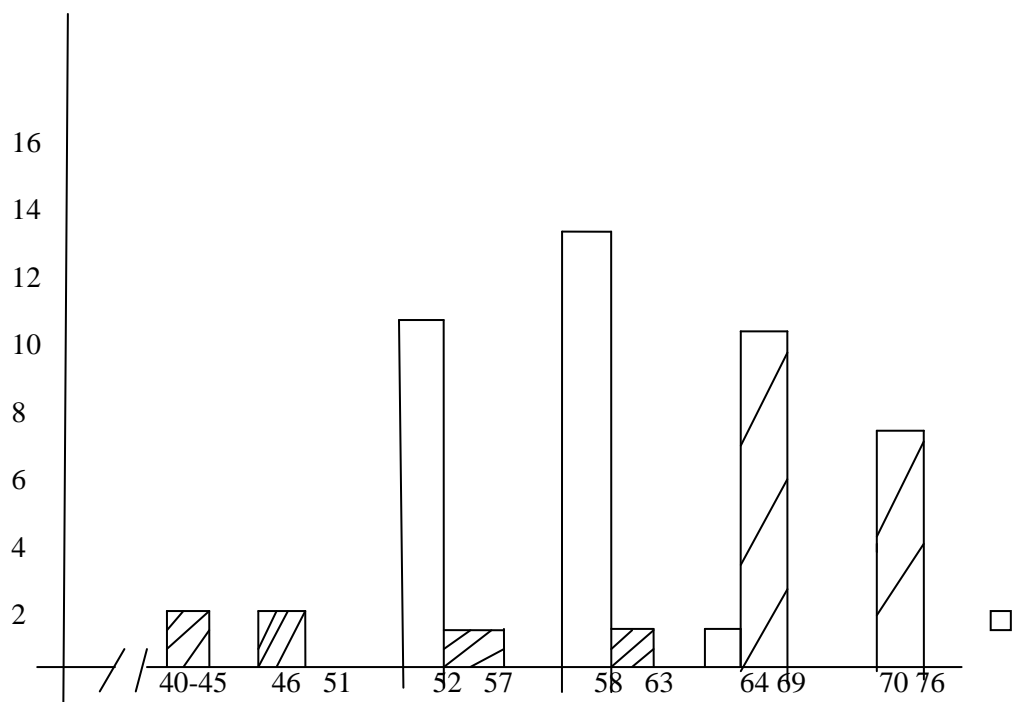
Description	Pre-Test	Post-Test
Total	1600	1527
Highest score	94	76
Lowest score	30	40
Mean	109.63	72.3
Median	71.3	64.32
Modus	63.8	60
Range	64	36
Interval	11	6
Standard deviation	61.82	19.62
Variants	0.46	1.17

Based on the above table the total score of experimental class in pre-test was 1600; post-test was 5278, pre-test mean score was 109.63; post-test was 72.33, pre-test standard deviation was 61.82 post-test was 19.62, pre-test variants was 0.46 ; post-test was 1.27, pre test median was 71.3; post-test was 64.32, pre-test range was 64; post-test was 36, pre-test modus was 63.8; post-test was 60, pre-test interval was 11; post-test was 6. The researcher got the highest score

of pre-test was 90 and the lowest score was 36; meanwhile the highest score was 76 and the lowest score was 40.

In order to get the pre-test and post-test data description of experimental class clearly and completely, the researcher presents the histogram on the following figure:

Figure 6: Histogram the Comparison Data of Student's Vocabulary Mastery in Pre- Test and Post –Test (ExperimentalClass)



From the histogram above, the students' scores of experimental class in post-test was higher than pre test.

d. The Comparison Data between Using Total Physical Response method and Conventional Technique in Post Test

After researcher giving pre test to both of class (XI-2 as experimental as control class) the researcher knew the students' mastery in vocabulary before gave a treatment. In pre-test, the

Researcher did not apply treatment to experimental and control class. Then, the researcher gave a treatment to one of class experimental class and other class was not gave a treatment as control class. The experimental class was using Total Physical Response Method. The researcher got the comparison data between post-test score an experimental and control class after gave a treatment. The comparison data can be seen in the following histogram:

From the description of comparison data above, it can be concluded that the students' score of experiment class by using Total Physical Response Method was higher than the students' score of control class by using Conventional technique.

B. Technique of Data Analysis

1. Requirement Test

a. Normality and Homogeneity of Experimental and Control Class in Pre-Test

After researcher has the score of pre test. The researcher calculated the score. Then, the calculation of normality and homogeneity test is as follow:

Table 16
Normality and Homogeneity in Pre-Test

Class	Normality Test		Homogeneity Test	
	X_{count}	X_{table}	f_{count}	f_{table}
Experiment Class	8.57	1107	1.73 < 1.85	
Control Class	21.74	7815		

Based on the above table researcher calculation, the score of experimental class $Lo = -5.71 < Lt = 11.070$ with $n = 22$ and control class $Lo = -0.83 < 11.070$ with $n = 22$, and real level $\alpha 0.05$. Cause $Lo < Lt$ in the both class. So, H_a was accepted. It means that experimental class and control class were distributed normal.

The coefficient of $F_{count} = 01.24$ was compared with F_{table} . Where F_{table} was determined at real $\alpha 0.05$, and the different numerator $dk = n-1 = 22-1 = 21$ and denominator $dk n-1 = 22-1 = 21$. So, by using the list of critical value at F distribution is got $F_{0.05} = 4.32$. It showed that $F_{count} 1.24 < F_{table} 4.32$. So, it shows that both of

experimental and control class were homogeneous. The calculation can be seen on the appendix 18.

b. Normality and Homogeneity of Experimental and Control

ClassinPost-Test

Researcher got the score of post test from experimental class and control class. The researcher has been calculated the score. Then the normality and homogeneity of experimental and control class can be seen follow:

Table 17
Normality and Homogeneity in Post-Test

Class	Normality Test		Homogeneity Test	
	X_{count}	X_{table}	f_{count}	f_{table}
Experimental Class	96.33	7815	1.17 < 1.85	
Control Class	61.39	7815		

Based on the table above researcher calculation, the score of experiment class $L_o = 0.01 < L_t = 781$ with $n = 36$ and control class $L_o = 8.57 < L_t = 11.070$ with $n = 36$, and real level $\alpha 0.05$. Cause $L_o < L_t$ in the both class. So, H_a was accepted. It means that experimental class and control class were distributed normal. It can be seen in appendix 20.

The coefficient of $F_{count} = 1.85$ was compared with F_{table} . Where F_{table} was determined at real $\alpha 0.05$, and the different numerator $dk = n-1=36 -1 = 35$ and denominator $dk n-1 = 22-1 = 21$. So, by using the

list of critical value at F distribution is got $F_{0.05} = 0.46$ It showed that $F_{\text{count}} = 1.85 < F_{\text{table}} = 0.46$. So, it shows that both of experimental and class were homogeneous. The calculation can be seen on the appendix 21.

2. Hypothesis Test

After calculated the data of post-test, researcher has found that post-test result of experiment and control class is normal and homogenous. Based on the result, researcher used parametric test by using T-test to analyze the hypothesis. Hypothesis alternative (H_a) of the research was “Total Physical Response Method has effect on students’ vocabulary mastery at grade XI SMA N 6Padangsidimpuan.”. The calculation can be seen on the appendix 22 and 23. The result of t-test was a follow.

Table 18
Result of T-test from the Both Averages

Pre-test		Post-test	
t_{count}	t_{table}	t_{count}	t_{table}
7926	1671	1.45	1671

The test hypothesis has two criteria. First, if $t_{\text{count}} < t_{\text{table}}$, H_0 is accepted. Second, if $t_{\text{count}} > t_{\text{table}}$ H_a is accepted. Based on researcher calculation inpre-test, researcher found $t_{\text{count}} 7926$ while $t_{\text{table}} 1.671$ with opportunity $(1 - \alpha) = 1 - 5\% = 95\%$ and $dk = n_1 + n_2 - 2 = 36 + 22 - 2 = 56$. Cause $t_{\text{count}} < t_{\text{table}} (7926 < 1.671)$, it means that hypothesis H_a was rejected and H_0 was accepted. So, in pre test, two classes were same. There is no difference in the both classes. But, in post test, researcher found that $t_{\text{count}} 1.45$ while $t_{\text{table}} 1.671$ with opportunity $(1 - \alpha) = 1 - 5\% = 95\%$ and $dk = n_1 +$

$n_2 - 2 = 36 + 22 - 2 = 56$. Cause $t_{count} > t_{table} (1.45 > 1.681)$, it means that hypothesis H_a was accepted and H_0 was rejected. The calculation can be seen on the appendix 23. In this case, the mean score of experimental class by using Total Physical Response Method was 71.3 and mean score of control class was 99,61 that was taught by using conventional method . Gain score of experimental class and control class is 9.54 . So, there was The Effect of Using Total Physical Response Method on Students' Vocabulary Mastery at Grade XI SMA N 6 Padangsidimpuan.

C. Discussion

The first, research is conducted by entitled "Developing Students Ability In using Imperative Sentences Through Total Physical Response to the first year 1 class of Mts Sawangan in academic years 2011" is conducted by Rosdiana. The result of the pretest shows that the average score of experimental group is 52.21 and the average score of control group is 60.83. Then, The result of the post test. How that the average score for experimental group is higher that the average score of control group. The average score of experimental group is 75. and the average score of control group is 75.21. This indicates that the gain of vocabulary means score of experimental group is significantly higher than the gain of vocabulary means score of control group. So, H_0 was rejected and H_a was accepted.⁴⁶

⁴⁶ Rosdiana " *Developing Students' Ability in using Imperative Sentences through Total Physical Response* (A Thesis Uin Syari fHidayatullah Jakarta, 2011),p.4.

The second, research with title “The Influence of Total Physical Response Toward Listening Skill to the third grade students of Sabilillah Elementary school, Sampang Madura in academic years 2011” is conducted by Mellya Junita Ulfa Salimah. The result of the experimental group got 66.68 in average and 67% in percentage of achievement. Then, the control group got 69.65 in average and 70 % in percentage. It proved that the experimental group got better than the control group. The t-test application to the scores showed that the estimated t value (20.16) was higher than critical t value (1.004). Therefore, there was significant difference between the students who were taught without using make a Total Physical Response method.⁴⁷

The last, research with title “The Effect of Total Physical Response on students vocabulary Mastery at Grade XI SMA N 6 Padangsidimpuan. The This research finding shows the average score of control group’s before treatment (60,23). After treatment was (70.50), the experimental group’s average before treatments is (63.40) and after treatment is (78.60). There are difference score between students taught using total physical response method and taught the total physical response method. So, it is showed the mean of experimental class higher than control class (78.60 > 70.50). On the other hand, the test of hypothesis using t-test formula

⁴⁷ Diana Misyuarni “*The Use of Total Physical Response plus Writing in Improving Students’ Writing Procedural Text Ability*”(A thesis, Universitas Pasundan, 2015),p.15.

shows the value of the t-test is higher than the value of the t-table. The hypothesis is accepted.⁴⁸

D. Threats of the Research

The researcher found the threats of the research as follows:

1. The students were not serious in answering the pre-test and post-test. Some of them still did not do it by themselves.
2. The students were noisy while the learning process. They were not concentrating in following the learning process. Some of them talked to their friends and some of them did something outside teachers' rule. So, it made them can't get the teacher's explanation well and gave the impact to the post-test answer.
3. The students were too enthusiastic in following Total Physical Response Method to the front of the class some of them feel embarrassed.

⁴⁸Mellya Junita Ulfa Salimah "The Influence of Total Physical Response Toward Listening Skill" (A Thesis Universitas Airlangga)

CHAPTER V

CONCLUSION AND SUGGESTION

A. Conclusion

Based on the result of the research and calculation of the data that had described in the previous chapter, the researcher got the conclusions as follows:

1. Students' vocabulary mastery in experiment class before used Total Physical Response method where the mean was 71.3.
2. Students' vocabulary mastery in experimental class after used Total Physical Response method where the mean score was 99.61.

3. There is the significant effect of Total Physical Response method on students' vocabulary mastery at grade XI of SMA N 6 Padangsidimpuan. It can be seen from the calculation of t_0 was while t_t score was the hypothesis alternative (H_a) is accepted. Researcher concluded the hypothesis was accepted because t_0 bigger than t_t ($7.926 > 1.671$). In which the mean score of experiment bigger than control class ($99.61 > 71.3$). So, there is effect of Total Physical Response method on students' vocabulary mastery at grade XI of SMA N 6 Padangsidimpuan where H_a was accepted and H_0 was rejected.

B. Suggestion

After finishing the research, the researcher got much information in information in English teaching and learning process. Therefore, the researcher has some suggestions as follow:

1. From the first conclusion it can be seen that the students' score were satisfied. So, the researcher suggests to the English teacher of SMA Negeri 6 Padangsidimpuan to apply the innovative method such as Make Total Physical Response Method. It also can be supported by choosing right media and good class management.
2. From the second conclusion, it can be seen that the experimental class which was taught by Total Physical Response method got the improvement on mean score from to, meanwhile the control class which was taught by got the improvement of mean score from to . So, the researcher suggests to the English teacher of SMA N 6 Padangsidimpuan to use these method in teaching English, because the students' will be more active and seriously in learning English.
3. From the last conclusion, it can be seen that score of experimental class was higher than control class. The researcher suggests to use Total Physical Response method to another classes or in different grade, even in another schools, because the improvement that has been made by using this method. Beside, the teacher and the other researcher who wants to apply this method are hoped to manage the class well during the

application of Total Physical Response so the students' can be follow the rule Total Physical Response.

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CURRICULUM VITAE

A. Identity

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Religion : Islam
Address : Kayulaut, Mandailing Natal

B. Parents

Father's Name : M.isa
Mother's Name : Dahrani

C. Educational Background

1. Elementary School : SD Negeri 1 No. 142580 Kayulaut (2008)
2. Junior High School : SMP Negeri 1 Kayulaut (2011)
3. Senior High School : MANPanyabungan (2014)
4. Institute : IAIN Padangsidempuan (2014)

APPENDIX I

Experimental Class

Rencana Pelaksanaan Pembelajaran

(RPP)

Nama Sekolah : SMA N 6 Padangsidempuan

Mata Pelajaran : Bahasa Inggris

Kelas/Semester : XI/ II (Genap)

Alokasi Waktu : 2 × 45 Menit

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

Kompetensi Dasar : Mampu mengucapkan kosakata dengan benar
Memahami kosakata yang dipelajari

A. Indikator : Mampu memahami kosakata dibawah ini

B. Tujuan Pembelajaran : Siswa mampu merespon dan mengucapkan makna

kosakata dalam text dengan benar

C. Materi Pelajaran : Expression of Offer and Suggestion, Responding of

Offer and Suggestion

D. Strategi Pembelajaran : Total Physical Response Method

E. Langkah-langkah Kegiatan

1. Pendahuluan

- a. Salam dan tegur sapa
- b. Berdoa sebelum memulai pembelajaran
- c. Mengabsen siswa
- d. Member motivasi siswa terkait pentingnya kompetensi pelajaran yang akan dipelajari dan tehnik yang digunakan

2. Kegiatan Inti

Dalam kegiatan inti:

- 1) Guru menggunakan isyarat tangan, menggerakkan 4 siswa maju ke depan kelas.
- 2) Kemudian guru memberikan isyarat kepada siswa untuk duduk disamping guru menghadap kelas.
- 3) Siswa lain dikelas duduk dalam posisi setengah lingkaran sehingga ada ruang yang agak besar untuk beraksi .
- 4) Kemudian guru mengatakan berdiri dan segera berdiri saat anda menggerakkan siswa yang duduk di kedua sisi anda untuk berdiri .
- 5) Kemudian guru mengatakan duduk dan segera duduk bersama 4 siswa. Jika ada siswa yang mengulangi apa yang guru katakan, beri siswa sinyal dengan menyentuh bibir anda dengan telunjuk.
- 6) Kemudian katakan “berdiri”bersama kelompok termasuk instruktur harus berdiri dan kemudian “duduk” masing masing di ikuti dengan tindakan yang tepat, semua siswa merespon dengan percaya diri dan ragu - ragu.

3. Penutup

Dalam kegiatan penutup:

- 1) Guru menanyakan kesulitan siswa selama kegiatan pembelajaran.
- 2) Guru mengkonfirmasi jawaban/hasil kerja siswa dan memberikan kesimpulan tentang materi yang telah diajarkan.
- 3) Guru memberikan test kepada siswa.

F. Alat/Sumber Belajar :

- Buku teks yang relevan, gambar-gambar atau benda-benda yang berkaitan dengan materi (expression suggest and expression offers)
- Papan tulis, spidol dan penghapus.

G. Penilaian: Multiple Choice

H. Bentuk : Pilihan Ganda

Padangsidempuan, 2018

Mengetahui

Validator

Researcher

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APPENDIX II

Control Class

Rencana Pelaksanaan Pembelajaran

(RPP)

Nama Sekolah : SMA N 6 Padangsidempuan

Mata Pelajaran : Bahasa Inggris

Kelas/Semester : XI/ II (Genap)

Alokasi Waktu : 2 × 45 Menit

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

Kompetensi Dasar : Mampu mengucapkan kosakata dengan benar
Memahami kosakata yang dipelajari

I. Indicator : Mampu memahami kosakata dibawah ini
Bring tea, make a room, make an effort, do laundry, come early, come prepared, go study, want a hand,
eat cake, have a cookie, read 'laskar Pelangi'

J. Tujuan Pembelajaran : Siswa mampu merespon dan mengucapkan makna
Kosakata dalam text dengan benar.

K. Materi Pelajaran : Thing of expression about offer and suggestion ,

Responding to offer and suggestion.

L. Strategi Pembelajaran : Conventional Method

M. Langkah-langkah Kegiatan

4. Pendahuluan

- e. Salam dan tegursapa
- f. Berdoa sebelum memulai pembelajaran
- g. Mengabsensiswa
- h. Member motivasi siswa terkait pentingnya kompetensi pelajaran yang akan dipelajari dan metode yang digunakan

5. Kegiatan Inti

Dalam kegiatan inti:

- 7) Guru memberikan teks
- 8) Guru menunjukkan vocabulary yang berhubungan
- 9) Guru meminta siswa mencari arti kosakata yang akan dipelajari di dalam kamus
- 10) Guru meminta siswa untuk menghafalkan kosakata yang telah dipelajari di dalam kamus
- 11) Guru memberikan soal kepada murid dan kemudian menerjemahkannya

6. Penutup

Dalam kegiatan penutup:

- 4) Guru menanyakan kesulitan siswa selama kegiatan pembelajaran.

- 5) Guru mengkonfirmasi jawaban/hasil kerja siswa dan memberikan kesimpulan tentang materi yang telah diajarkan.
- 6) Guru memberikan test kepada siswa.

N. Alat/Sumber Belajar :

- Bukuteks yang relevan, gambar - gambar atau benda-benda yang berkaitan dengan materi(expression suggest and expression offers)
- Papantulis, spidol dan penghapus.

O. Penilaian: Multiple choice

P. Bentuk: Pilihan Ganda

Padangsidempuan, 2018

Mengetahui

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APPENDIX 3

Learning Material For Pre-Test

Instruction : The teacher teach some new vocabularies related to expression Offer ,Suggestion and , then gives command to the students for doing the instruction based on the offer and Sugestion, for example:

Expression of Suggestion: Teacher say making suggestion and students answer accepting suggestion and declining suggestion with action.

Making suggestion	Accepting suggestion	Declining suggestion
Let's go to movies.	Yes, lets go.	No, thank you. I do not feel like going.
Why don't you do your homework before going out?	Ok, I will	Sorry, I think I will go out first and then do my homework.
How about going to Sam's place first and then to the supermarket?	Yes, let's go. It's a good idea.	No, Let's just go to the supermarket.
I think you should go and meet her.	Ok. If you say so	Sorry, I can't. I have previous engagement

Instruction : The teacher teach some new vocabularies related to Offer , then gives command to the students for doing the instruction based on the offer , for example:

Expression of Offers: Teacher say making offers and students answer accepting offers and declining offers with action

Making offers	Accepting offers	Declining offers
Can I help you? Shall I bring you some tea?	Yes, please. I really appreciate it.	It's okay, I can do it myself.
Shall I bring you some tea?	Thank you, it is very kind of you.	No, thank you.
How about I help you with this?	Yes, please, that would be very kind of you.	No, thanks. I don't want another helping.
Can I take you home?	Thank you, I appreciate your help.	Don't worry, I will do it myself.

APPENDIX 4

Learning Material For Post-Test

Instruction : The teacher teach some new vocabularies related to expression Offer ,Suggestion and , then gives command to the students for doing the instruction based on the offer and Sugestion, for example:

Expression of Suggestion: Teacher say making suggestion and students answer accepting suggestion and declining suggestion with action.

Making suggestion	Accepting suggestion	Declining suggestion
Let's go to movies.	Yes, lets go.	No, thank you. I do not feel like going.
Why don't you do your homework before going out?	Ok, I will	Sorry, I think I will go out first and then do my homework.
How about going to Sam's place first and then to the supermarket?	Yes, let's go. It's a good idea.	No, Let's just go to the supermarket.
I think you should go and meet her.	Ok. If you say so	Sorry, I can't. I have previous Engagement

APPENDIX 5

Instrument pre test

Nama : _____

Class :

Instruction :

1. Tulis nama, kelas pada lembar jawaban yang tersedia
2. Jawablah pertanyaan-pertanyaan di bawah ini
3. Bacalah pertanyaan dengan benar dan teliti
4. Pilihlah jawaban yang benar dengan memberi tanda silang (X) pada salah satu jawaban
5. Periksa jawaban anda dengan teliti sebelum dikumpulkan kepada guru
6. Test ini hanya bertujuan untuk mengetahui data-data siswa tentang pemahaman menghafal kosakata dan melatih berbicara
7. Waktu yang tersedia 45 menit

Choose the correct answer from the option a, b, c, and d by crossing (X) the answer.

1. Hey Siti, _____ go star gazing to night.
a. Are you c. Shall them
b. How about d. would you like to
2. Sam : " would you like to go watch a movie this weekend?"
Charli: " I can't , I am low on cash right now." _____ stay at home
and watch TV instead.
a. How about c. What about
b. Let's d. I think
3. What shall we do today? _____ We go to the library.
a. Shall I c. Why don't
b. Let's d. Whould you
4. _____ Like a cup coffe?
a. Can I c. Would you
b. I'll do d. Should you
5. _____ the washing,if you like.
a. Cam I c. I'll do
b. Would you d. Let's
6. Edo: " i have a lot of work to finish; I don't know how I will manage."
Sam: _____ half of it if you want.
a. Would you c. Why don't
b. I think d. I will have you with
7. Carly: " I submitted my essay to the teacher few days ago, but I haven't
received any _____ received any response from her."
Edo: _____ go and ask her?
a. Shall us c. Why don't you
b. I'll do d. I propose
8. _____ get you a drink?
a. Would you c. Can I
b. Why don't you d. I'll do
9. Aisya: " I am so thirtsty."

Annie: _____ get you something to drink?

- a. How about
- b. What about
- c. Why don't
- d. Can I

10. _____ like me to clean your car?

- a. How about
- b. Let's
- c. Would you
- d. I think

11. A: go to the cinema and watch a good film?

B: That's a good idea.

- a. you must
- b. you have
- c. I think you should
- d. what if we

12. A: I feel drowsy.

B:

- a. you should take a rest.
- b. what if you study harder?
- c. what about calling your friend for help?
- d. you had better call the police

13. This is Saturday night. What will you suggest your friend?

- a. I think we should go to the town square for sight seeing.
- b. what about going to the doctor?
- c. you should speak to your teacher.
- d. what if we take this to be repaired

14. Doctor: smoking if you don't want to get sick.

Patient: Yes sir, I will try.

- a. what if you stop
- b. you should stop
- c. how about
- d. maybe you can stop

15. A: I am so hungry.

B:

- a. I think you should take a rest.
- b. You ought to read it more carefully.
- c. Calm down! You should be more relaxed
- d. What about going to a restaurant?

16. Tom looks very tired. What's your suggestion to him?

- a. you should eat more.
- c. I think you ought to get some rest

b. you should study harder

d. what if you go for a walk?

17. Linda is working on her homework, but she finds some difficult questions. What will you suggest her?

a. I think you should stop studying. yourself?

c. what if you drink to refresh

b. maybe you can sleep now.

d. what about going to your friend's house to study together?

18. Mother: I want to cook an omelette.

You:

a. Let's buy some eggs. ticket first

c. I think you should buy a

b. Let's buy some syrup. barbershop

d. I think you should go to a

19. Your friend needs a book for his homework. But he doesn't have enough money to buy it. What will you suggest him?

a. Maybe you can borrow from our seniors? c. what if we go to the zoo?

b. I think you shouldn't do the homework. d. You ought to get some rest.

20. You and your friends are on a trip to a beach in Banyuwangi. However, none of you knows about the route the that beach. What will be your suggestion?

a. I think we can go home now.

b. What about going to a restaurant?

c. Maybe you can open Google Maps application on your phone.

d. You should read the instruction more carefully.

21. A: What _____ we do this weekend?

B : Let's go to the beach.

a. will

c. shall

b. is

d. should

22. How about _____ surfing?

a. go

c. do

b. going

d. doing

23. X: Let's throw a party this Friday. What do you say?

C: Yes, _____

- a. we can
- b. that would be great
- c. thank you
- d. I do

24. _____ we go to the cafe? It's still too early to go into the cinema now.

- a. why not
- b. shall we do
- c. what shall
- d. why don't

25. _____ order some food? I'm starving now.

- a. Why
- b. let's
- c. shall we
- d. by the way

26. E: How shall we go to the party?

B: Shall we take my car?

E: _____

- a. That'll be great
- b. I think it's nice.
- c. I suppose you're right
- d. I'll have a look at it.

27. R: What about going fishing?

K: Sorry, _____.

- a. I'll be busy
- b. I can't play it.
- b. I'm not really into it.
- d. I think it's not okay.

28. L: What time shall we meet?

P: What _____ two pm?

- a. on
- b. of
- c. is
- d. about

29. Why don't we _____ a ride in the countryside?

- a. go for
- b. go to
- c. go in
- d. go by

30. H: Shall we go camping this weekend?

N: Sorry, man. I don't really fancy it. _____

- a. I'd prefer going skiing
- b. I prefer to go skiing
- c. I'd love to go skiing
- d. I'd rather go skiing

31. A: Would you like a lemonade?

B: _____

The proper form B should be

- a. Yes, please
- b. I don't like lemonade
- c. would you like
- d. lemonade is not favorite

32. Hello, may I you?

- a. let
- b. need
- c. help
- d. get

33. Below are expressions of offering help, except...

- a. Would you like some help?
- b. Can I give you a hand?
- c. Do you need any help?
- d. Could you help me please?

34. Usually a shopkeeper say when they want help customer.

- a. "Are you busy? I need some help"
- b. "Is there anything I can help you with?"
- c. "Excuse me, do you work here?"
- d. "Do you want to buy our product or not?"

35. Informal way to offer something is....

- a. Would you like a piece of cake?
- b. May I offer you a cup of hot tea?
- c. Can I get you some fresh fruits?
- d. Are you up for some chips?

36. How do you say when you want to refuse a help from someone?

- a. Thanks a lot for your help. I'm so grateful.
- b. Yes, sure.
- c. I'm sorry, but I'd rather to do it on my own. Thank you.
- d. Sure I will do you a favor.

37. Anna: Hi Jane, you look so pale. Are you okay?

Jane: Hi Anna, I'm not okay. I have stomach pain. I'm looking for some medicine.

Anna: (7) to get some medicine.

Jane: (8) Thanks a lot Anna.

Anna: You're welcome. (9)? Maybe take you to the emergency?

Jane: No thanks, (10)

The right answer is...

- a. Let me help you
- b. I don't want you
- c. I don't think I can help you
- d. Tell me how

38. The right answer is...

- a. No, I don't need it.
- b. I can do it myself.
- c. Yes, please
- d. Please help me

39. The right answer is...

- a. Would you like a cup of tea?
- b. Is there anything else I can do for you?
- c. No problem
- d. Of course

40. The right answer is...

- a. Yes, please.
- b. I need it so much.
- c. Definitely!
- d. I can manage it myself.

41. Jane: You look pale.

Jim: I've got a serious headache.

Jane:

- a. Let me take you to the restaurant.
- b. What about a glass of avocado juice?
- c. Let me take you to the hospital.
- d. Would you like fried or steamed chicken?

42. Tom: This question is so difficult to answer.

Jerry:

- a. Just don't answer it.
- b. Let's stop studying and go playing.
- c. Would you like a cup of coffee?
- d. Let me help you working on it.

43. Mike: Oh my God, I left my book at home.

Dave:

- a. Shall I take it for you?
- b. Just forget it.
- c. Let me take you to school.
- d. I'll treat you chicken noodles.

44. Nick: Sir, I think I'm lost.

- Jeremy:
- Let me help you carrying your bag.
 - Can I help you? I know this place.
 - May I help you? I have a dog too.
 - Shall I clean your shoes.
45. Steve: I don't understand chemistry at all.
Banner:
- How about having dinner with me?
 - How about going to the beach?
 - How about studying together with me?
 - How about calling the police?
46. Natasha: I want to go shopping but I don't have any vehicle.
Wanda:
- Shall I take you to the hospital with my car?
 - Shall I take you to the school with my car?
 - Shall I take you to the market with my car?
 - Shall I take to the zoo with my car?
47. May: Ah, these books are so heavy.
Ethan:
- Let me help you throwing them away.
 - Let me help you sorting them.
 - Let me help you cleaning them.
 - Let me help you carrying them.
48. Sam: My car won't start.
Anna:
- May I help you? I know about car.
 - May I help you? I know about construction.
 - May I help you? I know about electricity.
 - May I help you? I know about bicycle.
49. Liz: I'm very thirsty.
Mary:
- Should I bring you a bottle of sauce?
 - Should I bring you a bowl of noodles?
 - Should I bring you a glass of orange juice?
 - Should I bring you a can of soup?
50. Upin: I have a lot of things to do. I'm confused which one to do first.
Ipin:
- What can I do for you?
 - Where should we go?
 - When can you do that?
 - How are you?

Padangsidempuan, -03-2020

Validator

Efrida Malik S.Pd

Nip. 19810424 201406 2 004

APPENDIX 6

Instrument post-test

Nama :

Class :

Instruction :

1. Tulis nama, kelas pada lembar jawaban yang tersedia
2. Jawablah pertanyaan-pertanyaan di bawah ini
3. Bacalah pertanyaan dengan benar dan teliti
4. Pilihlah jawaban yang benar dengan memberi tanda silang (X) pada salah satu jawaban
5. Periksa jawaban anda dengan teliti sebelum dikumpulkan kepada guru
6. Test ini hanya bertujuan untuk mengetahui data-data siswa tentang pemahaman menghafal kosakata dan melatih berbicara
7. Waktu yang tersedia 45 menit

Choose the correct answer from the option a, b, c, and d by crossing (X) the answer.

1. Mike: Oh my God, I left my book at home.
Dave:
 - a. Shall I take it for you?
 - b. Just forget it.
 - c. Let me take you to school.
 - d. I'll treat you chicken noodles.
2. Nick: Sir, I think I'm lost.
Jeremy:
 - a. Let me help you carrying your bag.
 - b. Can I help you? I know this place.
 - c. May I help you? I have a dog too.
 - d. Shall I clean your shoes.
3. Steve: I don't understand chemistry at all.
Banner:
 - a. How about having dinner with me?
 - b. How about going to the beach?
 - c. How about studying together with me?
 - d. How about calling the police?
4. Natasha: I want to go shopping but I don't have any vehicle.
Wanda:
 - a. Shall I take you to the hospital with my car?

- b. Shall I take you to the school with my car?
 c. Shall I take you to the market with my car?
 d. Shall I take to the zoo with my car?
5. _____ the washing, if you like.
 a. Can I c. I'll do
 b. Would you d. Let's
6. Edo: "I have a lot of work to finish; I don't know how I will manage."
 Sam: _____ half of it if you want.
 c. Would you c. Why don't
 d. I think d. I will have you with
8. Carly: "I submitted my essay to the teacher few days ago, but I haven't received any _____ received any response from her."
 Edo: _____ go and ask her?
 c. Shall us c. Why don't you
 d. I'll do d. I propose
3. _____ get you a drink?
 a. Would you c. Can I
 b. Why don't you d. I'll do
9. Aisya: "I am so thirsty."
 Annie: _____ get you something to drink?
 c. How about c. Why don't
 d. What about d. Can I
10. _____ like me to clean your car?
 a. How about c. Would you
 b. Let's d. I think
11. A: go to the cinema and watch a good film?
 B: That's a good idea.
 a. you must c. I think you should
 b. you have d. what if we
12. A: I feel drowsy.
 B:
 a. you should take a rest. c. what about calling your friend for help?
 b. what if you study harder? d. you had better call the police
13. This is Saturday night. What will you suggest your friend?
 a. I think we should go to the town square for sight seeing.
 b. what about going to the doctor?
 c. you should speak to your teacher.
 d. what if we take this to be repaired

14. Doctor: smoking if you don't want to get sick.

Patient: Yes sir, I will try.

- a. what if you stop
- b. you should stop
- c. how about
- d. maybe you can stop

15. A: I am so hungry.

B:

- a. I think you should take a rest.
more relaxed
- b. You ought to read it more carefully.
restaurant?
- c. Calm down! You should be
- d. What about going to a

16. Tom looks very tired. What's your suggestion to him?

- a. you should eat more.
some rest
- b. you should study harder
- c. I think you ought to get
- d. what if you go for a walk?

17. Linda is working on her homework, but she finds some difficult questions.
What will you suggest her?

- a. I think you should stop studying.
yourself?
- b. maybe you can sleep now.
- c. what if you drink to refresh
- d. what about going to your
friend's house to study
together?

18. Mother: I want to cook an omelette.

You:

- a. Let's buy some eggs.
ticket first
- b. Let's buy some syrup.
barbershop
- c. I think you should buy a
- d. I think you should go to a

19. Your friend needs a book for his homework. But he doesn't have enough
money to buy it. What will you suggest him?

- a. Maybe you can borrow from our seniors?
- b. I think you shouldn't do the homework.
- c. what if we go to the zoo?
- d. You ought to get some rest.

20. You and your friends are on a trip to a beach in Banyuwangi. However,
none of you knows about the route the that beach. What will be your
suggestion?

- a. I think we can go home now.
- b. What about going to a restaurant?
- c. Maybe you can open Google Maps application on your phone.
- d. You should read the instruction more carefully.

21. A: What _____ we do this weekend?

B : Let's go to the beach.

- c. will
- c. shall
- d. is
- d. should

22. How about _____ surfing?

- a. go
- c. do
- b. going
- d. doing

23. X: Let's throw a party this Friday. What do you say?

C: Yes, _____

- a. we can
- c. thank you .
- b. that would be great
- d. I do

24. _____ we go to the cafe? It's still too early to go into the cinema now.

- a. why not
- c. what shall
- b. shall we do
- d. why don't

25. _____ order some food? I'm starving now.

- a. Why
- c. shall we
- b. let's
- d. by the way

26. E: How shall we go to the party?

B: Shall we take my car?

E: _____

- a. That'll be great
- c. I suppose you're right
- b. I think it's nice.
- d. I'll have a look at it.

27. R: What about going fishing?

K: Sorry, _____.

- a. I'll be busy
- b. I can't play it.
- b. I'm not really into it.
- d. I think it's not okay.

28. L: What time shall we meet?

P: What _____ two pm?

- a. on
- c. is
- b. of
- d. about

29. Why don't we _____ a ride in the countryside?

- a. go for
- c. go in
- b. go to
- d. go by

30. H: Shall we go camping this weekend?

N: Sorry, man. I don't really fancy it. _____

- a. I'd prefer going skiing
- c. I'd love to go skiing
- b. I prefer to go skiing
- d. I'd rather go skiing

31. A: Would you like a lemonade?

B: _____

The proper from B should be

- c. Yes, please
- c. would you like
- d. I don't like lemonade
- d. lemonade is not favorite

32. Hello, may I you?

- a. let
- c. help
- b. need
- d. get

33. Below are expressions of offering help, except...

- a. Would you like some help?
- c. Do you need any help?
- b. Can I give you a hand?
- d. Could you help me please?

34. Usually a shopkeeper say when they want help customer.

- a. "Are you busy? I need some help"
- c. "Excuse me, do you work here?"
- b. "Is there anything I can help you with?"
- d. "Do you want to buy our product or not?"

35. Informal way to offer something is....
a. Would you like a piece of cake?
fruits?
b. May I offer you a cup of hot tea?
chips?
c. Can I get you some fresh
d. Are you up for some

36. How do you say when you want to refuse a help from someone?
a. Thanks a lot for your help. I'm so grateful.
b. Yes, sure.
c. I'm sorry, but I'd rather to do it on my own. Thank you.
d. Sure I will do you a favor.

37. Anna: Hi Jane, you look so pale. Are you okay?
Jane: Hi Anna, I'm not okay. I have stomach pain. I'm looking for some medicine.
Anna: (7) to get some medicine.
Jane: (8) Thanks a lot Anna.
Anna: You're welcome. (9)? Maybe take you to the emergency?

- Jane: No thanks, (10)
The right answer is...
a. Let me help you
b. I don't want you
c. I don't think I can help you
d. Tell me how

38. The right answer is...
a. No, I don't need it.
b. I can do it myself.
c. Yes, please
d. Please help me

39. The right answer is...
a. Would you like a cup of tea?
b. Is there anything else I can do for you?
c. No problem
d. Of course

40. The right answer is...
a. Yes, please.
b. I need it so much.
c. Definitely!
d. I can manage it myself.

41. Jane: You look pale.
Jim: I've got a serious headache.
Jane:
a. Let me take you to the restaurant.
b. What about a glass of avocado juice?
c. Let me take you to the hospital.
d. Would you like fried or steamed chicken?

42. Tom: This question is so difficult to answer.
Jerry:

- a. Just don't answer it.
 - b. Let's stop studying and go playing.
 - c. Would you like a cup of coffee?
 - d. Let me help you working on it.
43. Hey siti, _____ go star gazing to night.
- a. Are you
 - b. How about
 - c. Shall them
 - d. would you like to
44. Sam :” would you like to go watch a movie this weekend?”
Charli:” I can't , I am low on cash right now.” _____ stay at home and watch TV instead.
- a. How about
 - b. Let's
 - c. What about
 - d. I think
45. What shall we do today? _____ We go to the library.
- a. Shall I
 - b. Let's
 - c. Why don't
 - d. Would you
46. _____ Like a cup coffe?
- a. Can I
 - b. I'll do
 - c. Would you
 - d. Should you
47. May: Ah, these books are so heavy.
Ethan:
- a. Let me help you throwing them away.
 - b. Let me help you sorting them.
 - c. Let me help you cleaning them.
 - d. Let me help you carrying them.
48. Sam: My car won't start.
Anna:
- a. May I help you? I know about car.
 - b. May I help you? I know about construction.
 - c. May I help you? I know about electricity.
 - d. May I help you? I know about bicycle.
49. Liz: I'm very thirsty.
Mary:
- a. Should I bring you a bottle of sauce?
 - b. Should I bring you a bowl of noodles?
 - c. Should I bring you a glass of orange juice?
 - d. Should I bring you a can of soup?
50. Upin: I have a lot of things to do. I'm confused which one to do first.
Ipin:
- a. What can I do for you?
 - b. Where should we go?
 - c. When can you do that?
 - d. How are you?

Padangsidimpuan, -03-2020

Validator

Efrida Malik S.Pd

Nip. 19810424 201406 2 004

APPENDIX 7

KEY ANSWER

Pre - Test

1. D	21. C	41. C
2. B	22. B	42. D
3. B	23. B	43. A
4. C	24. D	44. B
5. C	25. C	45. C
6. C	26. A	46. C
7. D	27. B	47. D
8. C	28. D	48. A
9. C	29. A	49. C
10. D	30. D	50. A
11. C	31. A	
12. C	32. C	
13. D	33. D	
14. D	34. B	
15. A	35. D	
16. A	36. C	
17. B	37. A	
18. D	38. B	
19. A	39. B	
20. A	40. D	

KEY ANSWER

Post - Test

1. A	21. C	41. C
2. B	22. B	42. D
3. C	23. B	43. D
4. C	24. D	44. B
5. C	25. C	45. C
6. D	26. A	46. C
7. C	27. B	47. D
8. C	28. D	48. A
9. D	29. A	49. C
10. C	30. D	50. A
11. C	31. A	
12. D	32. C	
13. D	33. C	
14. A	34. B	
15. A	35. D	
16. B	36. C	
17. D	37. A	
18. A	38. B	
19. A	39. B	
20. C	40. D	

A. Calculation of Pre - Test

1. Mean score from score total (M_t)

$$M_t = \frac{\sum X_t}{N}$$
$$M_t = \frac{608}{22} = 27.63$$

2. Standard Deviation (SD_t)

$$SD_t = \sqrt{\frac{\sum X_t^2}{N} - \left(\frac{\sum X_t}{N}\right)^2}$$
$$SD_t = \sqrt{\frac{17686}{22} - \left(\frac{608}{22}\right)^2}$$
$$SD_t = \sqrt{803.9 - 27.63^2}$$
$$SD_t = \sqrt{803.9 - 763.4}$$
$$SD_t = \sqrt{40.5} = 6.36$$

3. Mean Score (M_p)

Item 1

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_1}$$
$$M_{pl} = \frac{25+22+36+25+29+30+22+22+45+37+32+32+28}{13}$$
$$M_{pl} = \frac{365}{13} = 28.07$$

Item 2

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_2}$$
$$M_{pl} = \frac{36+20+29+30+22+22+45+17+32+32}{10}$$
$$M_{pl} = \frac{285}{10} = 28.5$$

Item 3

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_3}$$
$$M_{pl} = \frac{36+20+25+29+37+24+29+23+31+21+22+45+32+28+30}{15}$$
$$M_{pl} = \frac{432}{15} = 28.08$$

Item 4

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_4}$$
$$M_{pl} = \frac{25+36+20+25+29+37+24+29+31+30+21+22++28+32+30+1}{16}$$
$$M_{pl} = \frac{447}{16} = 27.93$$

Item 5

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_5}$$

$$M_{pl} = \frac{25+36+20+25+29+37+24+30+21+22+45+28+32+28+30}{14}$$

$$M_{pl} = \frac{406}{14} = 29$$

Item 6

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_6}$$

$$M_{pl} = \frac{+28+32+22+36+25+37+24+29+23++31+30+21+22+22+45+17+28}{17}$$

$$M_{pl} = \frac{472}{17} = 27.76$$

Item 7

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_7}$$

$$M_{pl} = \frac{25+22+36+24+20+29+37+29+31+22+45+30}{12}$$

$$M_{pl} = \frac{355}{12} = 29.58$$

Item 8

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_8}$$

$$M_{pl} = \frac{25+20+27+37+24+24+29+23+31+22+45+17+28+28++}{13}$$

$$M_{pl} = \frac{358}{13} = 30.72$$

Item 9

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_9}$$

$$M_{pl} = \frac{25+29+37+29+31+30+22+45+32+38+30}{11}$$

$$M_{pl} = \frac{338}{11} = 30.72$$

Item 10

$$M_{pl}$$

$$M_{pl} = \frac{20+19+24+15+20+21+19+20+22+10+14+23+15+17+17}{16}$$

$$M_{pl} = \frac{454}{16} = 28.37$$

Item 11

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{11}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+24+19+20+22+14+23+15+18+17+17}{11}$$

$$M_{pl} = \frac{301}{11} = 27.36$$

Item 12

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{12}}$$

$$M_{pl} = \frac{20+19+19+24+20+21+24+19+19+20+22+14+23+9+14+15+18+21+17+17}{15}$$

$$M_{pl} = \frac{441}{15} = 29.3$$

Item 13

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{13}}$$

$$M_{pl} = \frac{20+19+19+24+21+24+19+20+14+23+15+18+17+17}{13}$$

$$M_{pl} = \frac{360}{13} = 37.72$$

Item 14

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{14}}$$

$$M_{pl} = \frac{20+19+19+24+20+21+24+16+19+22+14+23+9+14+15+18+21+17+17}{16}$$

$$M_{pl} = \frac{467}{16} = 29.18$$

Item 15

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{15}}$$

$$M_{pl} = \frac{20+24+20+21+24+16+19+20+22=14+23+14+18+17+17}{11}$$

$$M_{pl} = \frac{343}{11} = 31.18$$

Item 16

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{16}}$$

$$M_{pl} = \frac{19+24+20+21+24+16+19+20+22+10+14+18+17+17}{11}$$

$$M_{pl} = \frac{303}{11} = 27.54$$

Item 17

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{17}}$$

$$M_{pl} = \frac{19+24+20+21+24+19+20+22+14+23+14+18+21+17+17}{6}$$

$$M_{pl} = \frac{193}{6} = 32.16$$

Item 18

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{18}}$$

$$M_{pl} = \frac{16+10+9+19+15+18+21+22+45+30}{11}$$

$$M_{pl} = \frac{301}{11} = 27.36$$

Item 19

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{11}}$$

$$M_{pl} = \frac{20+19+24+20+24}{5}$$

$$M_{pl} = \frac{151}{5} = 30.20$$

Item 20

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{20}}$$

$$M_{pl} = \frac{20+19+24+20+21+24+16+20+22+10+14+23+18+21}{11}$$

$$M_{pl} = \frac{316}{11} = 28.72$$

Item 21

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{21}}$$

$$M_{pl} = \frac{20+19+19+15+20+21+24+16+22+23+15+18+17}{11}$$

$$M_{pl} = \frac{350}{11} = 31.81$$

Item 22

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{22}}$$

$$M_{pl} = \frac{20+20+21+24+22+23+18+17+19+20+20+22+17}{8}$$

$$M_{pl} = \frac{227}{8} = 28.37$$

Item 23

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{23}}$$

$$M_{pl} = \frac{20+19+15+20+21+24+19+22+10+23+15+18+17}{9}$$

$$M_{pl} = \frac{292}{9} = 32.44$$

Item 24

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{24}}$$

$$M_{pl} = \frac{20+19+24+15+20+21+24+19+22+10+23+15+18+17}{11}$$

$$M_{pl} = \frac{261}{11} = 23.72$$

Item 25

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{25}}$$

$$M_{pl} = \frac{20+19+24+15+20+21+24+16+19+22+10+23+15+17+17}{12}$$

$$M_{pl} = \frac{364}{12} = 30.33$$

Item 26

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{26}}$$

$$M_{pl} = \frac{19+19+25+15+21+24+16+19+20+22+10+23+14+17+17+17}{12}$$

$$M_{pl} = \frac{352}{12} = 29.33$$

Item 27

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{28}}$$

$$M_{pl} = \frac{20+19+19+20+20+21+24+16+19+20+22}{10}$$

$$M_{pl} = \frac{363}{10} = 36.3$$

Item 28

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{28}}$$

$$M_{pl} = \frac{20+19+19+24+24+16+20+22+10+23+19+14+15+18+21+17+17}{16}$$

$$M_{pl} = \frac{431}{16} = 26.9375$$

Item 29

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{29}}$$

$$M_{pl} = \frac{22+19+19+24+15+20+21+20+21+24+19+22+23+14+15+18+217}{10}$$

$$M_{pl} = \frac{310}{10} = 31$$

Item 30

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{30}}$$

$$M_{pl} = \frac{19+19+24+20+20+21+24+16+19+22+14+17+17}{10}$$

$$M_{pl} = \frac{305}{10} = 30.50$$

Item 31

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{31}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+24+19+20+22+14+23+14+17+17}{12}$$

$$M_{pl} = \frac{309}{12} = 25.75$$

Item 32

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{32}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+21+24+19+20+22+14+23+14+17+17}{11}$$

$$M_{pl} = \frac{301}{11} = 27.36$$

Item 33

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{33}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+24+16+19+20+22+14+23+14+17}{12}$$

$$M_{pl} = \frac{343}{12} = 28.58$$

Item 34

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{34}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+24+16+19+20+22+10+14+23}{10}$$

$$M_{pl} = \frac{285}{10} = 28.58$$

Item 35

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{35}}$$

$$M_{pl} = \frac{20+19+24+15+20+21+19+20+22+10+14+23+15+17+17}{14}$$

$$M_{pl} = \frac{375}{14} = 26.78$$

Item 36

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{36}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+24+19+20+22+14+23+15+18+17+17}{11}$$

$$M_{pl} = \frac{282}{11} = 25.63$$

Item 37

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{37}}$$

$$M_{pl} = \frac{20+19+19+24+20+21+24+19+19+20+22+14+23+9+14+15+18+21+17+17}{16}$$

$$M_{pl} = \frac{446}{16} = 27.87$$

Item 38

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{38}}$$

$$M_{pl} = \frac{20+19+19+24+21+24+19+20+14+23+15+18+17+17}{11}$$

$$M_{pl} = \frac{322}{11} = 29.27$$

Item 39

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{39}}$$

$$M_{pl} = \frac{20+19+19+24+20+21+24+16+19+22+14+23+9+14}{9}$$

$$M_{pl} = \frac{206}{9} = 23.22$$

Item 40

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{40}}$$

$$M_{pl} = \frac{20+24+20+21+24+16+19+20+22+14+23+14+18+17+17}{15}$$

$$M_{pl} = \frac{298}{15} = 19.86$$

Item 41

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{41}}$$

$$M_{pl} = \frac{19+24+20+21+24+16+19+20+22+10+14+18=17+17}{13}$$

$$M_{pl} = \frac{390}{13} = 30$$

Item 42

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{42}}$$

$$M_{pl} = \frac{19+24+20+21+24+19+20+22+14+23+14+18+21+17+17}{16}$$

$$M_{pl} = \frac{405}{16} = 25.31$$

Item 43

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{43}}$$

$$M_{pl} = \frac{16+10+9+19+15+18+45+28+32+28+30}{10}$$

$$M_{pl} = \frac{290}{10} = 29$$

Item 44

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{44}}$$

$$M_{pl} = \frac{20+19+24+20+24+16+20+22+14+23+9+14+15+18+17}{12}$$

$$M_{pl} = \frac{350}{12} = 35$$

Item 45

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{45}}$$

$$M_{pl} = \frac{20+19+24+20+21+24+16+20+22+10+14+23+18+21}{11}$$

$$M_{pl} = \frac{311}{11} = 28.27$$

Item 46

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{46}}$$

$$M_{pl} = \frac{20+19+19+15+20+21+24+16+22+23+15+18+17}{19}$$

$$M_{pl} = \frac{281}{9} = 31.22$$

Item 47

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{47}}$$

$$M_{pl} = \frac{20+20+21+24+22+23+18+17+19+20+20+22+17}{13}$$

$$M_{pl} = \frac{357}{13} = 27.46$$

Item 48

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{48}}$$

$$M_{pl} = \frac{20+19+15+20+21+24+19+22+10+23+15+18+17}{13}$$

$$M_{pl} = \frac{360}{13} = 27.69$$

Item 49

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{49}}$$

$$M_{pl} = \frac{20+19+24+15+20+21+24+19+22+10+23+15+18+17}{12}$$

$$M_{pl} = \frac{375}{12} = 29.75$$

Item 50

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{50}}$$

$$M_{pl} = \frac{20+19+24+15+20+21+24+16+19+22+10+23+15+17+17}{12}$$

$$M_{pl} = \frac{389}{12} = 32.41$$

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

Item 1

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

$$r_{pbi} = \frac{28.07 - 27.63}{6.36} \sqrt{\frac{0.6}{0.5}}$$

$$r_{pbi} = \frac{1.32}{17.6} \sqrt{2.58}$$

$$r_{pbi} = 0.075 \times 1.60 = 0.065$$

Item 2

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

$$r_{pbi} = \frac{20.36 - 18.04}{17.6} \sqrt{\frac{0.86}{0.18}}$$

$$r_{pbi} = \frac{2.32}{17.6} \sqrt{4.77}$$

$$r_{pbi} = 0.131 \times 2.18 = 0.136$$

Item 3

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

$$r_{pbi} = \frac{19.64 - 18.04}{17.6} \sqrt{\frac{0.86}{0.31}}$$

$$r_{pbi} = \frac{1.6}{17.6} \sqrt{2.77}$$

$$r_{pbi} = 0.09 \times 1.66 = 0.276$$

Item 4

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

$$r_{pbi} = \frac{19.29 - 18.04}{17.6} \sqrt{\frac{1.09}{0.40}}$$

$$r_{pbi} = \frac{1.25}{17.6} \sqrt{2.725}$$

$$r_{pbi} = 0.071 \times 1.650 = 0.070$$

Item 5

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

$$r_{pbi} = \frac{19.64 - 18.04}{17.6} \sqrt{\frac{0.68}{0.36}}$$

$$r_{pbi} = \frac{1.6}{17.6} \sqrt{1.88}$$

$$r_{pbi} = 0.09 \times 1.37 = 0.365$$

Item 6

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

$$r_{pbi} = \frac{19.25 - 18.04}{17.6} \sqrt{\frac{0.90}{0.72}}$$

$$r_{pbi} = \frac{1.21}{17.6} \sqrt{1.25}$$

$$r_{pbi} = 6.87 \times 1.11 = 0.302$$

Item 7

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

$$r_{pbi} = \frac{20.12 - 18.04}{17.6} \sqrt{\frac{0.95}{0.09}}$$

$$r_{pbi} = \frac{2.08}{17.6} \sqrt{10.55}$$

$$r_{pbi} = 0.118 \times 3.24 = 0.361$$

Item 8

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

$$r_{pbi} = \frac{17.93 - 18.04}{17.6} \sqrt{\frac{1.09}{0.5}}$$

$$r_{pbi} = \frac{0.11}{17.6} \sqrt{2.18}$$

$$r_{pbi} = 0.06 \times 14.76 = 0.125$$

Item 9

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

$$r_{pbi} = \frac{19.26 - 18.04}{17.6} \sqrt{\frac{0.72}{0.68}}$$

$$r_{pbi} = \frac{1.22}{17.6} \sqrt{1.05}$$

$$r_{pbi} = 0.06 \times 1.02 = 0.551$$

Item 10

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

$$r_{pbi} = \frac{18.12 - 18.04}{17.6} \sqrt{\frac{0.86}{0.13}}$$

$$r_{pbi} = \frac{0.8}{17.6} \sqrt{6.16}$$

$$r_{pbi} = 0.04 \times 2.48 = 17.634$$

Item 11

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

$$r_{pbi} = \frac{19.12 - 18.04}{17.6} \sqrt{\frac{0.90}{0.09}}$$

$$r_{pbi} = \frac{1.08}{17.6} \sqrt{10}$$

$$r_{pbi} = 0.061 \times 3.612 = 0.050$$

Item 12

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

$$r_{pbi} = \frac{15.68 - 18.04}{17.6} \sqrt{\frac{1}{0.27}}$$

$$r_{pbi} = \frac{-2.36}{17.6} \sqrt{3.703}$$

$$r_{pbi} = -0.134 \times 1.92 = 0.362$$

Item 13

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

$$r_{pbi} = \frac{20.92 - 18.04}{17.6} \sqrt{\frac{0.45}{0.40}}$$

$$r_{pbi} = \frac{2.88}{17.6} \sqrt{1.125}$$

$$r_{pbi} = 0.163 \times 1.060 = 6.037$$

Item 14

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

$$r_{pbi} = \frac{15.40 - 18.04}{17.6} \sqrt{\frac{0.63}{0.04}}$$

$$r_{pbi} = \frac{-2.64 - 18.04}{17.6} \sqrt{15.75}$$

$$r_{pbi} = -15.4 \times 3.96 = 0.386$$

Item 15

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

$$r_{pbi} = \frac{19.86 - 18.04}{17.6} \sqrt{\frac{1.04}{0.18}}$$

$$r_{pbi} = \frac{1.82}{17.6} \sqrt{5.77}$$

$$r_{pbi} = 0.103 \times 2.40 = 0.709$$

Item 16

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

$$r_{pbi} = \frac{17.46 - 18.04}{17.6} \sqrt{\frac{0.40}{0.22}}$$

$$r_{pbi} = \frac{1.74}{17.6} \sqrt{1.81}$$

$$r_{pbi} = 0.09 \times 1.345 = 0.027$$

Item 17

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

$$r_{pbi} = \frac{19.5 - 18.04}{17.6} \sqrt{\frac{0.63}{0.45}}$$

$$r_{pbi} = \frac{1.46}{17.6} \sqrt{1.183}$$

$$r_{pbi} = 0.082 \times 1.087 = 5.83$$

Item 18

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

$$r_{pbi} = \frac{16.83 - 18.04}{17.6} \sqrt{\frac{0.68}{0.04}}$$

$$r_{pbi} = \frac{-1.21}{17.6} \sqrt{17}$$

$$r_{pbi} = -20.47 \times 3.47 = 3.31$$

Item 19

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

$$r_{pbi} = \frac{18.33 - 18.04}{17.6} \sqrt{\frac{0.63}{0.27}}$$

$$r_{pbi} = \frac{0.29}{17.6} \sqrt{2.3}$$

$$r_{pbi} = 0.016 \times 1.516 = 0.437$$

Item 20

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

$$r_{pbi} = \frac{19.42 - 18.04}{17.6} \sqrt{\frac{0.95}{0.27}}$$

$$r_{pbi} = \frac{1.38}{17.6} \sqrt{3.518}$$

$$r_{pbi} = 0.07 \times 18.73 = 0.205$$

Item 21

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

$$r_{pbi} = \frac{19.15 - 18.04}{17.6} \sqrt{\frac{0.75}{0.22}}$$

$$r_{pbi} = \frac{1.11}{17.6} \sqrt{3.40}$$

$$r_{pbi} = 0.06 \times 1.84 = 0.671$$

Item 22

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

$$r_{pbi} = \frac{20.87 - 18.04}{17.6} \sqrt{\frac{0.77}{0.36}}$$

$$r_{pbi} = \frac{2.83}{17.6} \sqrt{2.13}$$

$$r_{pbi} = 0.16 \times 1.45 = 0.125$$

Item 23

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

$$r_{pbi} = \frac{20.53 - 18.04}{17.6} \sqrt{\frac{0.37}{0.77}}$$

$$r_{pbi} = \frac{2.49}{17.6} \sqrt{0.467}$$

$$r_{pbi} = 0.141 \times 0.68 = 0.505$$

Item 24

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

$$r_{pbi} = \frac{19.07 - 18.04}{17.6} \sqrt{\frac{0.65}{0.5}}$$

$$r_{pbi} = \frac{1.03}{17.6} \sqrt{1.3}$$

$$r_{pbi} = 0.05 \times 1.14 = 0.436$$

Item 25

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

$$r_{pbi} = \frac{18.8 - 18.04}{17.6} \sqrt{\frac{0.68}{0.45}}$$

$$r_{pbi} = \frac{0.76}{17.6} \sqrt{1.51}$$

$$r_{pbi} = 0.04 \times 1.22 = 0.447$$

Item 26

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

$$r_{pbi} = \frac{19.36 - 18.04}{17.8} \sqrt{\frac{0.90}{0.36}}$$

$$r_{pbi} = \frac{1.32}{17.6} \sqrt{2.58}$$

$$r_{pbi} = 0.075 \times 1.60 = 0.715$$

Item 27

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

$$r_{pbi} = \frac{20.36 - 18.04}{17.6} \sqrt{\frac{0.86}{0.18}}$$

$$r_{pbi} = \frac{2.32}{17.6} \sqrt{4.77}$$

$$r_{pbi} = 0.131 \times 2.18 = 1.476$$

Item 28

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

$$r_{pbi} = \frac{19.64 - 18.04}{17.6} \sqrt{\frac{0.86}{0.31}}$$

$$r_{pbi} = \frac{1.6}{17.6} \sqrt{2.77}$$

$$r_{pbi} = 0.09 \times 1.66 = 20.86$$

Item 29

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

$$r_{pbi} = \frac{19.29 - 18.04}{17.6} \sqrt{\frac{1.09}{0.40}}$$

$$r_{pbi} = \frac{1.25}{17.6} \sqrt{2.725}$$

$$r_{pbi} = 0.071 \times 1.650 = 0.647$$

Item 30

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

$$r_{pbi} = \frac{19.64 - 18.04}{17.6} \sqrt{\frac{0.68}{0.36}}$$

$$r_{pbi} = \frac{1.6}{17.6} \sqrt{1.88}$$

$$r_{pbi} = 0.09 \times 1.37 = 0.473$$

Item 31

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

$$r_{pbi} = \frac{19.25 - 18.04}{17.6} \sqrt{\frac{0.90}{0.72}}$$

$$r_{pbi} = \frac{1.21}{17.6} \sqrt{1.25}$$

$$r_{pbi} = 6.87 \times 1.11 = 0.775$$

Item 32

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

$$r_{pbi} = \frac{20.12 - 18.04}{17.6} \sqrt{\frac{0.95}{0.09}}$$

$$r_{pbi} = \frac{2.08}{17.6} \sqrt{10.55}$$

$$r_{pbi} = 0.118 \times 3.24 = 6.63$$

Item 33

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

$$r_{pbi} = \frac{17.93 - 18.04}{17.6} \sqrt{\frac{1.09}{0.5}}$$

$$r_{pbi} = \frac{0.11}{17.6} \sqrt{2.18}$$

$$r_{pbi} = 0.06 \times 14.76 = 0.184$$

Item 34

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

$$r_{pbi} = \frac{19.26 - 18.04}{17.6} \sqrt{\frac{0.72}{0.68}}$$

$$r_{pbi} = \frac{1.22}{17.6} \sqrt{1.05}$$

$$r_{pbi} = 0.06 \times 1.02 = 0.184$$

Item 35

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

$$r_{pbi} = \frac{18.12 - 18.04}{17.6} \sqrt{\frac{0.86}{0.13}}$$

$$r_{pbi} = \frac{0.8}{17.6} \sqrt{6.16}$$

$$r_{pbi} = 0.04 \times 2.48 = 0.108$$

Item 36

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

$$r_{pbi} = \frac{19.12 - 18.04}{17.6} \sqrt{\frac{0.90}{0.09}}$$

$$r_{pbi} = \frac{1.08}{17.6} \sqrt{10}$$

$$r_{pbi} = 0.061 \times 3.612 = 0.325$$

Item 37

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

$$r_{pbi} = \frac{15,68 - 18,04}{17,6} \sqrt{\frac{1}{0,27}}$$

$$r_{pbi} = \frac{-2,36}{17,6} \sqrt{3,703}$$

$$r_{pbi} = -0,134 \times 1,92 = 0,19$$

Item 38

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

$$r_{pbi} = \frac{20,92 - 18,04}{17,6} \sqrt{\frac{0,45}{0,40}}$$

$$r_{pbi} = \frac{2,88}{17,6} \sqrt{1,125}$$

$$r_{pbi} = 0,163 \times 1,060 = 0,18$$

Item 39

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

$$r_{pbi} = \frac{15,40 - 18,04}{17,6} \sqrt{\frac{0,63}{0,04}}$$

$$r_{pbi} = \frac{-2,64 - 18,04}{17,6} \sqrt{15,75}$$

$$r_{pbi} = -15,4 \times 3,96 = -761$$

Item 40

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

$$r_{pbi} = \frac{19,86 - 18,04}{17,6} \sqrt{\frac{1,04}{0,18}}$$

$$r_{pbi} = \frac{1,82}{17,6} \sqrt{5,77}$$

$$r_{pbi} = 0,103 \times 2,40 = 0,159$$

Item 41

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

$$r_{pbi} = \frac{17,46 - 18,04}{17,6} \sqrt{\frac{0,40}{0,22}}$$

$$r_{pbi} = \frac{1,74}{17,6} \sqrt{1,81}$$

$$r_{pbi} = 0,09 \times 1,345 = 0,398$$

Item 42

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

$$r_{pbi} = \frac{19.5 - 18.04}{17.6} \sqrt{\frac{0.63}{0.45}}$$

$$r_{pbi} = \frac{1.46}{17.6} \sqrt{1.183}$$

$$r_{pbi} = 0.082 \times 1.087 = 0.580$$

Item 43

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

$$r_{pbi} = \frac{16.83 - 18.04}{17.6} \sqrt{\frac{0.68}{0.04}}$$

$$r_{pbi} = \frac{-1.21}{17.6} \sqrt{17}$$

$$r_{pbi} = 20.47 \times 3.47 = 0.291$$

Item 44

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

$$r_{pbi} = \frac{18.33 - 18.04}{17.6} \sqrt{\frac{0.63}{0.27}}$$

$$r_{pbi} = \frac{0.29}{17.6} \sqrt{2.3}$$

$$r_{pbi} = 0.016 \times 1.516 = 24.2$$

Item 45

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

$$r_{pbi} = \frac{19.42 - 18.04}{17.6} \sqrt{\frac{0.95}{0.27}}$$

$$r_{pbi} = \frac{1.38}{17.6} \sqrt{3.518}$$

$$r_{pbi} = 0.07 \times 18.73 = 0.137$$

Item 46

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

$$r_{pbi} = \frac{19.15 - 18.04}{17.6} \sqrt{\frac{0.75}{0.22}}$$

$$r_{pbi} = \frac{1.11}{17.6} \sqrt{3.40}$$

$$r_{pbi} = 0.06 \times 1.84 = 0.425$$

Item 47

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

$$r_{pbi} = \frac{20.87 - 18.04}{17.6} \sqrt{\frac{0.77}{0.36}}$$

$$r_{pbi} = \frac{2.83}{17.6} \sqrt{2.13}$$

$$r_{pbi} = 0.16 \times 1.45 = 0.015$$

Item 48

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

$$r_{pbi} = \frac{20.53 - 18.04}{17.6} \sqrt{\frac{0.37}{0.77}}$$

$$r_{pbi} = \frac{2.49}{17.6} \sqrt{0.467}$$

$$r_{pbi} = 0.141 \times 0.68 = 0.037$$

Item 49

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

$$r_{pbi} = \frac{19.07 - 18.04}{17.6} \sqrt{\frac{0.65}{0.5}}$$

$$r_{pbi} = \frac{1.03}{17.6} \sqrt{1.3}$$

$$r_{pbi} = 0.05 \times 1.14 = 0.360$$

Item 50

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

$$r_{pbi} = \frac{18.8 - 18.04}{17.6} \sqrt{\frac{0.68}{0.45}}$$

$$r_{pbi} = \frac{0.76}{17.6} \sqrt{1.51}$$

$$r_{pbi} = 0.04 \times 1.22 = 0.761$$

APPENDIX 9

Table Validity of Pre- Test

No	Mp	Mt	SDt	P	Q	$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$	Rt on 5% significant	Interpretation
1	28.07	27.63	6.36	0.6	0.5	0.665	0.361	Valid
2	28.5	27.63	6.36	0.5	0.3	0.136	0.361	Invalid
3	28.8	27.63	6.36	0.7	0.3	0.276	0.361	Invalid
4	27.93	27.63	6.36	0.7	0.3	0.070	0.361	Invalid
5	29	27.63	6.36	0.7	0.3	0.365	0.361	Valid
6	27.76	27.63	6.36	0.7	0.5	0.302	0.361	Valid
7	29.58	27.63	6.36	0.7	0.4	0.361	0.361	Valid
8	27.53	27.63	6.36	0.5	0.5	0.125	0.361	Invalid
9	30.72	27.63	6.36	0.6	0.2	0.551	0.361	Valid
10	28.37	27.63	6.36	0.5	0.5	17.639	0.361	Valid
11	27.36	27.63	6.36	0.8	0.4	0.050	0.361	Invalid
12	29.3	27.63	6.36	0.5	0.4	0.362	0.361	Valid
13	37.72	27.63	6.36	0.6	0.3	6.037	0.361	Valid
14	29.18	27.63	6.36	0.6	0.5	0.386	0.361	Valid
15	31.18	27.63	6.36	0.7	0.5	0.709	0.361	Valid
16	27.54	27.63	6.36	0.5	0.7	0.027	0.361	Invalid
17	32.16	27.63	6.36	0.5	0.5	5.832	0.361	Valid
18	27.36	27.63	6.36	0.3	0.5	3.31	0.361	Invalid
19	30.2	27.63	6.36	0.5	0.5	0.937	0.361	Valid
20	28.72	27.63	6.36	0.5	0.5	0.205	0.361	Invalid
21	31.81	27.63	6.36	0.5	0.6	0.671	0.361	Valid
22	28.37	27.63	6.36	0.5	0.6	0.125	0.361	Invalid
23	32.44	27.63	6.36	0.4	0.5	0.505	0.361	Valid

24	23.72	27.63	6.36	0.4	0.5	0.436	0.361	Valid
25	30.33	27.63	6.36	0.5	0.5	0.447	0.361	Valid
26	32	27.63	6.36	0.5	0.4	0.715	0.361	Valid
27	36.3	27.63	6.36	0.6	0.5	1.476	0.361	Valid
28	33.8	27.63	6.36	0.5	0.3	20.86	0.361	Valid
29	31	27.63	6.36	0.7	0.5	0.647	0.361	Valid
30	30.5	27.63	6.36	0.5	0.5	0.473	0.361	Valid
31	32.5	27.63	6.36	0.5	0.5	0.775	0.361	Valid
32	27.36	27.63	6.36	0.5	0.5	6.634	0.361	Valid
33	28.58	27.63	6.36	0.5	0.5	0.184	0.361	Invalid
34	28.5	27.63	6.36	0.5	0.5	0.184	0.361	Invalid
35	26.7	27.63	6.36	0.5	0.4	0.108	0.361	Invalid
36	25.63	27.63	6.36	0.5	0.5	0.325	0.361	Invalid
37	27.87	27.63	6.36	0.6	0.2	0.19	0.361	Invalid
38	29.27	27.63	6.36	0.5	0.5	0.181	0.361	Invalid
39	23.22	27.63	6.36	0.8	0.4	-761	0.361	Invalid
40	28.66	27.63	6.36	0.6	0.6	0.159	0.361	Invalid
41	30	27.63	6.36	0.4	0.4	0.398	0.361	Valid
42	25.31	27.63	6.36	0.6	0.3	-580	0.361	Invalid
43	29	27.63	6.36	0.7	0.5	0.291	0.361	Invalid
44	35	27.63	6.36	0.5	0.5	1.15	0.361	Valid
45	28.24	27.63	6.36	0.5	0.5	0.137	0.361	Invalid
46	31.22	27.63	6.36	0.4	0.6	0.425	0.361	Valid
47	27.46	27.63	6.36	0.5	0.5	0.015	0.361	Invalid
48	27.69	27.63	6.36	0.6	0.4	0.073	0.361	Invalid
49	29.75	27.63	6.36	0.5	0.5	0.360	0.361	Invalid
50	32.41	27.63	6.36	0.6	0.5	0.761	0.361	Valid

APPENDIX 10

B. Calculation of Post - Test

1. Mean score from score total (M_t)

$$M_t = \frac{\sum X_t}{N}$$
$$M_t = \frac{742}{22} = 33.72$$

2. Standard Deviation (SD_t)

$$SD_t = \sqrt{\frac{\sum X_t^2}{N} - \left(\frac{\sum X_t}{N}\right)^2}$$
$$SD_t = \sqrt{\frac{25548}{22} - \left(\frac{742}{22}\right)^2}$$
$$SD_t = \sqrt{1161.2 - 33.72^2}$$
$$SD_t = \sqrt{1161.2 - 1137.0}$$
$$SD_t = \sqrt{24.2} = 4.93$$

3. Mean Score (M_p)

Item 1

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_1}$$
$$M_{pl} = \frac{19+19+25+15+21+24+16+19+20+22+10+23+14+17+17+}{20}$$
$$M_{pl} = \frac{671}{20} = 33.55$$

Item 2

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_2}$$
$$M_{pl} = \frac{20+19+19+20+20+21+24+16+19+20+22}{21}$$
$$M_{pl} = \frac{701}{21} = 33.80$$

Item 3

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_3}$$
$$M_{pl} = \frac{20+19+19+24+24+16+20+22+10+23+19+14+15+18+21+17+17}{18}$$
$$M_{pl} = \frac{648}{18} = 36$$

Item 4

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_4}$$
$$M_{pl} = \frac{22+19+19+24+15+20+21+20+21+24+19+22+23+14+15+18+21+17+17}{19}$$
$$M_{pl} = \frac{609}{19} = 32.05$$

Item 5

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_5}$$
$$M_{pl} = \frac{19+19+24+20+20+21+24+16+19+22+14+17+17}{16}$$

$$M_{pl} = \frac{298}{16} = 61.31$$

Item 6

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n6}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+24+19+20+22+14+23+14+17+17}{19}$$

$$M_{pl} = \frac{681}{19} = 35.84$$

Item 7

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n7}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+21+24+19+20+22+14+23+14+17+17}{16}$$

$$M_{pl} = \frac{322}{16} = 20.12$$

Item 8

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n8}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+24+16+19+20+22+14+23+14+17}{17}$$

$$M_{pl} = \frac{503}{17} = 29.58$$

Item 9

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n9}$$

$$M_{pl} = \frac{20+19+19+24+15+20+24+16+19+20+22+10+14+23+14+23+9+15+18+21=17}{17}$$

$$M_{pl} = \frac{582}{17} = 34.23$$

Item 10

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n10}$$

$$M_{pl} = \frac{20+19+24+15+20+21+19+20+22+10+14+23+15+17+17}{19}$$

$$M_{pl} = \frac{624}{19} = 32.84$$

Item 11

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n11}$$

$$M_{pl} = \frac{20+19+19+24+15+20+24+19+20+22+14+23+15+18+17+17}{16}$$

$$M_{pl} = \frac{621}{16} = 38.84$$

Item 12

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n12}$$

$$M_{pl} = \frac{20+19+19+24+20+21+24+19+19+20+22+14+23+9+14+15+18+21+17+17}{19}$$

$$M_{pl} = \frac{575}{19} = 30.26$$

Item 13

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{13}}$$
$$M_{pl} = \frac{20+19+19+24+21+24+19+20+14+23+15+18+17+17}{19}$$
$$M_{pl} = \frac{654}{19} = 34.42$$

Item 14

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{14}}$$
$$M_{pl} = \frac{20+19+19+24+20+21+24+16+19+22+14+23+9+14+15+18+21+17+17}{17}$$
$$M_{pl} = \frac{581}{17} = 34.17$$

Item 15

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{15}}$$
$$M_{pl} = \frac{20+24+20+21+24+16+19+20+22+14+23+14+18+17+17}{15}$$
$$M_{pl} = \frac{549}{15} = 36.6$$

Item 16

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{16}}$$
$$M_{pl} = \frac{19+24+20+21+24+16+19+20+22+10+14+18+17+17}{11}$$
$$M_{pl} = \frac{373}{11} = 33.90$$

Item 17

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{17}}$$
$$M_{pl} = \frac{19+24+20+21+24+19+20+22+14+23+14+18+21+17+17}{14}$$
$$M_{pl} = \frac{458}{14} = 32.71$$

Item 18

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{18}}$$
$$M_{pl} = \frac{16+10+9+19+15+18+32+31+47+38+36}{12}$$
$$M_{pl} = \frac{411}{12} = 34.25$$

Item 19

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{11}}$$

$$M_{pl} = \frac{20+19+24+20+24+16+20+22+14+23+9+14+15+18+17}{14}$$

$$M_{pl} = \frac{500}{14} = 35.71$$

Item 20

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{20}}$$

$$M_{pl} = \frac{20+19+24+20+21+24+16+20+22+10+14+23+18+21}{14}$$

$$M_{pl} = \frac{272}{14} = 19.42$$

Item 21

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{21}}$$

$$M_{pl} = \frac{20+19+19+15+20+21+24+16+22+23+15+18+17}{15}$$

$$M_{pl} = \frac{472}{15} = 31.46$$

Item 22

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{22}}$$

$$M_{pl} = \frac{20+20+21+24+22+23+18+17+19+20+20+22+17}{16}$$

$$M_{pl} = \frac{465}{16} = 33.21$$

Item 23

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{23}}$$

$$M_{pl} = \frac{20+19+15+20+21+24+19+22+10+23+15+18+17}{14}$$

$$M_{pl} = \frac{666}{14} = 47.57$$

Item 24

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{24}}$$

$$M_{pl} = \frac{20+19+24+15+20+21+24+19+22+10+23+15+18+17}{15}$$

$$M_{pl} = \frac{572}{15} = 38.12$$

Item 25

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{25}}$$

$$M_{pl} = \frac{20+19+24+15+20+21+24+16+19+22+10+23+15+17+17}{16}$$

$$M_{pl} = \frac{558}{16} = 34.87$$

Item 26

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{26}}$$

$$M_{pl} = \frac{19+19+25+15+21+24+16+19+20+22+10+23+14+17+17+17}{16}$$

$$M_{pl} = \frac{549}{16} = 34$$

Item 27

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{27}}$$

$$M_{pl} = \frac{20+19+19+20+20+21+24+16+19+20+22}{16}$$

$$M_{pl} = \frac{524}{16} = 32.75$$

Item 28

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{28}}$$

$$M_{pl} = \frac{20+19+19+24+24+16+20+22+10+23+19+14+15+18+21+17+17}{17}$$

$$M_{pl} = \frac{534}{17} = 31.41$$

Item 29

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{29}}$$

$$M_{pl} = \frac{22+19+19+24+15+20+21+20+21+24+19+22+23+14+15+18+21+17+17}{16}$$

$$M_{pl} = \frac{456}{16} = 28.5$$

Item 30

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{30}}$$

$$M_{pl} = \frac{19+19+24+20+20+21+24+16+19+22+14+17+17}{15}$$

$$M_{pl} = \frac{456}{15} = 28.5$$

Item 31

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{31}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+24+19+20+22+14+23+14+17+17}{16}$$

$$M_{pl} = \frac{517}{16} = 32.31$$

Item 32

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{33}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+21+24+19+20+22+14+23+14+17+17}{16}$$

$$M_{pl} = \frac{512}{16} = 32$$

Item 33

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{33}}$$

$$M_{pl} = \frac{20+19+19+24+15+20+21+24+16+19+20+22+14+23+14+17}{18}$$

$$M_{pl} = \frac{608}{18} = 33.77$$

Item 34

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n34}$$

$$M_{pl} = \frac{20+19+19+24+15+20+24+16+19+20}{10}$$

$$M_{pl} = \frac{363}{10} = 36.3$$

Item 35

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n35}$$

$$M_{pl} = \frac{20+19+24+15+20+21+19+20+22+10+14+23+15+17+17}{13}$$

$$M_{pl} = \frac{446}{13} = 34.30$$

Item 36

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n36}$$

$$M_{pl} = \frac{20+19+19+24+15+20+24+19+20+22+14+23+15+18+17+17}{12}$$

$$M_{pl} = \frac{375}{12} = 31.25$$

Item 37

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n37}$$

$$M_{pl} = \frac{20+19+19+24+20+21+24+19+19+20+22+14+23+9+14+15+18+21+17+17}{17}$$

$$M_{pl} = \frac{591}{17} = 34.76$$

Item 38

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n38}$$

$$M_{pl} = \frac{20+19+19+24+21+24+19+20+14+23+15+18+17+17}{11}$$

$$M_{pl} = \frac{384}{11} = 20.92$$

Item 39

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n39}$$

$$M_{pl} = \frac{20+19+19+24+20+21+24+16+19+22+14+23+9+14+15+18+21+17+17}{13}$$

$$M_{pl} = \frac{453}{13} = 34.84$$

Item 40

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n40}$$

$$M_{pl} = \frac{20+24+20+21+24+16+19+20+22}{9}$$

$$M_{pl} = \frac{271}{9} = 30.33$$

Item 41

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{41}}$$

$$M_{pl} = \frac{19+24+20+21+24+16+19+20+22+10+14+18+17+17}{13}$$

$$M_{pl} = \frac{775}{13} = 59.61$$

Item 42

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{42}}$$

$$M_{pl} = \frac{19+24+20+21+24+19+20+22+14+23+14+18+21+17+17}{16}$$

$$M_{pl} = \frac{506}{16} = 31.62$$

Item 43

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{43}}$$

$$M_{pl} = \frac{16+10+9+19+15+18}{10}$$

$$M_{pl} = \frac{363}{10} = 30.3$$

Item 44

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{44}}$$

$$M_{pl} = \frac{20+19+24+20+24+16+20+22+14+23+9+14+15+18+17}{11}$$

$$M_{pl} = \frac{413}{11} = 37.54$$

Item 45

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{45}}$$

$$M_{pl} = \frac{20+19+24+20+21+24+16+20+22+10+14+23+18+21}{11}$$

$$M_{pl} = \frac{330}{11} = 36$$

Item 46

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{46}}$$

$$M_{pl} = \frac{20+19+19+15+20+21+24+16+22+23+15+18+17}{9}$$

$$M_{pl} = \frac{334}{9} = 37.11$$

Item 47

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{47}}$$

$$M_{pl} = \frac{20+20+21+24+22+23+18+17+19+20+20+22+17}{12}$$

$$M_{pl} = \frac{310}{12} = 25.83$$

Item 48

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n_{48}}$$

$$M_{pl} = \frac{20+19+15+20+21+24+19+22+10+23+15+18+17}{13}$$

$$M_{pl} = \frac{450}{13} = 34.61$$

Item 49

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n49}$$

$$M_{pl} = \frac{20+19+24+15+20+21+24+19+22+10+23+15+18+17}{12}$$

$$M_{pl} = \frac{424}{12} = 35.33$$

Item 50

$$M_{pl} = \frac{\text{total score of students' score that true item answer}}{n50}$$

$$M_{pl} = \frac{20+19+24+15+20+21+24+16+19+22+10+23+15+17+17}{13}$$

$$M_{pl} = \frac{467}{13} = 35.92$$

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

Item 1

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

$$r_{pbi} = \frac{19.36 - 18.04}{17.8} \sqrt{\frac{0.90}{0.36}}$$

$$r_{pbi} = \frac{1.32}{17.6} \sqrt{2.58}$$

$$r_{pbi} = 0.075 \times 1.60 = -0.102$$

Item 2

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

$$r_{pbi} = \frac{20.36 - 18.04}{17.6} \sqrt{\frac{0.86}{0.18}}$$

$$r_{pbi} = \frac{2.32}{17.6} \sqrt{4.77}$$

$$r_{pbi} = 0.131 \times 2.18 = 0.016$$

Item 3

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

$$r_{pbi} = \frac{19.64 - 18.04}{17.6} \sqrt{\frac{0.86}{0.31}}$$

$$r_{pbi} = \frac{1.6}{17.6} \sqrt{2.77}$$

$$r_{pbi} = 0.09 \times 1.66 = 0.924$$

Item 4

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

$$r_{pbi} = \frac{19.29 - 18.04}{17.6} \sqrt{\frac{1.09}{0.40}}$$

$$r_{pbi} = \frac{1.25}{17.6} \sqrt{2.725}$$

$$r_{pbi} = 0.071 \times 1.650 = 0.014$$

Item 5

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

$$r_{pbi} = \frac{19.64 - 18.04}{17.6} \sqrt{\frac{0.68}{0.36}}$$

$$r_{pbi} = \frac{1.6}{17.6} \sqrt{1.88}$$

$$r_{pbi} = 0.09 \times 1.37 = 8.487$$

Item 6

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

$$r_{pbi} = \frac{19.25 - 18.04}{17.6} \sqrt{\frac{0.90}{0.72}}$$

$$r_{pbi} = \frac{1.21}{17.6} \sqrt{1.25}$$

$$r_{pbi} = 6.87 \times 1.11 = 1.29$$

Item 7

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

$$r_{pbi} = \frac{20.12 - 18.04}{17.6} \sqrt{\frac{0.95}{0.09}}$$

$$r_{pbi} = \frac{2.08}{17.6} \sqrt{10.55}$$

$$r_{pbi} = 0.118 \times 3.24 = 0.103$$

Item 8

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

$$r_{pbi} = \frac{17.93 - 18.04}{17.6} \sqrt{\frac{1.09}{0.5}}$$

$$r_{pbi} = \frac{0.11}{17.6} \sqrt{2.18}$$

$$r_{pbi} = 0.06 \times 14.76 = -0.1678$$

Item 9

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

$$r_{pbi} = \frac{19.26 - 18.04}{17.6} \sqrt{\frac{0.72}{0.68}}$$

$$r_{pbi} = \frac{1.22}{17.6} \sqrt{1.05}$$

$$r_{pbi} = 0.06 \times 1.02 = 0.206$$

Item 10

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

$$r_{pbi} = \frac{18.12 - 18.04}{17.6} \sqrt{\frac{0.86}{0.13}}$$

$$r_{pbi} = \frac{0.8}{17.6} \sqrt{6.16}$$

$$r_{pbi} = 0.04 \times 2.48 = 0.564$$

Item 11

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

$$r_{pbi} = \frac{19.12 - 18.04}{17.6} \sqrt{\frac{0.90}{0.09}}$$

$$r_{pbi} = \frac{1.08}{17.6} \sqrt{10}$$

$$r_{pbi} = 0.061 \times 3.612 = 1.395$$

Item 12

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

$$r_{pbi} = \frac{15.68 - 18.04}{17.6} \sqrt{\frac{1}{0.27}}$$

$$r_{pbi} = \frac{-2.36}{17.6} \sqrt{3.703}$$

$$r_{pbi} = -0.134 \times 1.92 = 0.888$$

Item 13

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

$$r_{pbi} = \frac{20.92 - 18.04}{17.6} \sqrt{\frac{0.45}{0.40}}$$

$$r_{pbi} = \frac{2.88}{17.6} \sqrt{1.125}$$

$$r_{pbi} = 0.163 \times 1.060 = 0.423$$

Item 14

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

$$r_{pbi} = \frac{15.40 - 18.04}{17.6} \sqrt{\frac{0.63}{0.04}}$$

$$r_{pbi} = \frac{-2.64 - 18.04}{17.6} \sqrt{15.75}$$

$$r_{pbi} = -15.4 \times 3.96 = 0.282$$

Item 15

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

$$r_{pbi} = \frac{19.86 - 18.04}{17.6} \sqrt{\frac{1.04}{0.18}}$$

$$r_{pbi} = \frac{1.82}{17.6} \sqrt{5.77}$$

$$r_{pbi} = 0.103 \times 2.40 = 0.881$$

Item 16

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

$$r_{pbi} = \frac{17.46 - 18.04}{17.6} \sqrt{\frac{0.40}{0.22}}$$

$$r_{pbi} = \frac{1.74}{17.6} \sqrt{1.81}$$

$$r_{pbi} = 0.09 \times 1.345 = 0.036$$

Item 17

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

$$r_{pbi} = \frac{19.5 - 18.04}{17.6} \sqrt{\frac{0.63}{0.45}}$$

$$r_{pbi} = \frac{1.46}{17.6} \sqrt{1.183}$$

$$r_{pbi} = 0.082 \times 1.087 = 0.248$$

Item 18

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

$$r_{pbi} = \frac{16.83 - 18.04}{17.6} \sqrt{\frac{0.68}{0.04}}$$

$$r_{pbi} = \frac{-1.21}{17.6} \sqrt{17}$$

$$r_{pbi} = -20.47 \times 3.47 = 0.136$$

Item 19

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

$$r_{pbi} = \frac{18.33 - 18.04}{17.6} \sqrt{\frac{0.63}{0.27}}$$

$$r_{pbi} = \frac{0.29}{17.6} \sqrt{2.3}$$

$$r_{pbi} = 0.016 \times 1.516 = 0.599$$

Item 20

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

$$r_{pbi} = \frac{19.42 - 18.04}{17.6} \sqrt{\frac{0.95}{0.27}}$$

$$r_{pbi} = \frac{1.38}{17.6} \sqrt{3.518}$$

$$r_{pbi} = 0.07 \times 18.73 = 0.696$$

Item 21

$$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$$
$$r_{pbi} = \frac{19.15 - 18.04}{17.6} \sqrt{\frac{0.75}{0.22}}$$
$$r_{pbi} = \frac{1.11}{17.6} \sqrt{3.40}$$
$$r_{pbi} = 0.06 \times 1.84 = 0.123$$

Item 22

$$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$$
$$r_{pbi} = \frac{20.87 - 18.04}{17.6} \sqrt{\frac{0.77}{0.36}}$$
$$r_{pbi} = \frac{2.83}{17.6} \sqrt{2.13}$$
$$r_{pbi} = 0.16 \times 1.45 = 0.206$$

Item 23

$$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$$
$$r_{pbi} = \frac{20.53 - 18.04}{17.6} \sqrt{\frac{0.37}{0.77}}$$
$$r_{pbi} = \frac{2.49}{17.6} \sqrt{0.467}$$
$$r_{pbi} = 0.141 \times 0.68 = 7.022$$

Item 24

$$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$$
$$r_{pbi} = \frac{19.07 - 18.04}{17.6} \sqrt{\frac{0.65}{0.5}}$$
$$r_{pbi} = \frac{1.03}{17.6} \sqrt{1.3}$$
$$r_{pbi} = 0.05 \times 1.14 = 1.177$$

Item 25

$$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$$
$$r_{pbi} = \frac{18.8 - 18.04}{17.6} \sqrt{\frac{0.68}{0.45}}$$
$$r_{pbi} = \frac{0.76}{17.6} \sqrt{1.51}$$
$$r_{pbi} = 0.04 \times 1.22 = 0.035$$

Item 26

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

$$r_{pbi} = \frac{19.36 - 18.04}{17.8} \sqrt{\frac{0.90}{0.36}}$$

$$r_{pbi} = \frac{1.32}{17.6} \sqrt{2.58}$$

$$r_{pbi} = 0.075 \times 1.60 = 0.186$$

Item 27

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

$$r_{pbi} = \frac{20.36 - 18.04}{17.6} \sqrt{\frac{0.86}{0.18}}$$

$$r_{pbi} = \frac{2.32}{17.6} \sqrt{4.77}$$

$$r_{pbi} = 0.131 \times 2.18 = 0.146$$

Item 28

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

$$r_{pbi} = \frac{19.64 - 18.04}{17.6} \sqrt{\frac{0.86}{0.31}}$$

$$r_{pbi} = \frac{1.6}{17.6} \sqrt{2.77}$$

$$r_{pbi} = 0.09 \times 1.66 = 0.48$$

Item 29

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

$$r_{pbi} = \frac{19.29 - 18.04}{17.6} \sqrt{\frac{1.09}{0.40}}$$

$$r_{pbi} = \frac{1.25}{17.6} \sqrt{2.725}$$

$$r_{pbi} = 0.071 \times 1.650 = 0.421$$

Item 30

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

$$r_{pbi} = \frac{19.64 - 18.04}{17.6} \sqrt{\frac{0.68}{0.36}}$$

$$r_{pbi} = \frac{1.6}{17.6} \sqrt{1.88}$$

$$r_{pbi} = 0.09 \times 1.37 = 2.405$$

Item 31

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

$$r_{pbi} = \frac{19.25 - 18.04}{17.6} \sqrt{\frac{0.90}{0.72}}$$

$$r_{pbi} = \frac{1.21}{17.6} \sqrt{1.25}$$

$$r_{pbi} = 6.87 \times 1.11 = 0.912$$

Item 32

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

$$r_{pbi} = \frac{20.12 - 18.04}{17.6} \sqrt{\frac{0.95}{0.09}}$$

$$r_{pbi} = \frac{2.08}{17.6} \sqrt{10.55}$$

$$r_{pbi} = 0.118 \times 3.24 = 0.56$$

Item 33

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

$$r_{pbi} = \frac{17.93 - 18.04}{17.6} \sqrt{\frac{1.09}{0.5}}$$

$$r_{pbi} = \frac{0.11}{17.6} \sqrt{2.18}$$

$$r_{pbi} = 0.06 \times 14.76 = 0.422$$

Item 34

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

$$r_{pbi} = \frac{19.26 - 18.04}{17.6} \sqrt{\frac{0.72}{0.68}}$$

$$r_{pbi} = \frac{1.22}{17.6} \sqrt{1.05}$$

$$r_{pbi} = 0.06 \times 1.02 = 0.459$$

Item 35

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

$$r_{pbi} = \frac{18.12 - 18.04}{17.6} \sqrt{\frac{0.86}{0.13}}$$

$$r_{pbi} = \frac{0.8}{17.6} \sqrt{6.16}$$

$$r_{pbi} = 0.04 \times 2.48 = 0.25$$

Item 36

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

$$r_{pbi} = \frac{19.12 - 18.04}{17.6} \sqrt{\frac{0.90}{0.09}}$$

$$r_{pbi} = \frac{1.08}{17.6} \sqrt{10}$$

$$r_{pbi} = 0.061 \times 3.612 = 0.865$$

Item 37

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

$$r_{pbi} = \frac{15,68 - 18,04}{17,6} \sqrt{\frac{1}{0,27}}$$

$$r_{pbi} = \frac{-2,36}{17,6} \sqrt{3,703}$$

$$r_{pbi} = -0,134 \times 1,92 = 0,127$$

Item 38

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

$$r_{pbi} = \frac{20,92 - 18,04}{17,6} \sqrt{\frac{0,45}{0,40}}$$

$$r_{pbi} = \frac{2,88}{17,6} \sqrt{1,125}$$

$$r_{pbi} = 0,163 \times 1,060 = 0,556$$

Item 39

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

$$r_{pbi} = \frac{15,40 - 18,04}{17,6} \sqrt{\frac{0,63}{0,04}}$$

$$r_{pbi} = \frac{-2,64 - 18,04}{17,6} \sqrt{15,75}$$

$$r_{pbi} = -15,4 \times 3,96 = 0,374$$

Item 40

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

$$r_{pbi} = \frac{19,86 - 18,04}{17,6} \sqrt{\frac{1,04}{0,18}}$$

$$r_{pbi} = \frac{1,82}{17,6} \sqrt{5,77}$$

$$r_{pbi} = 0,103 \times 2,40 = 0,683$$

Item 41

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

$$r_{pbi} = \frac{17,46 - 18,04}{17,6} \sqrt{\frac{0,40}{0,22}}$$

$$r_{pbi} = \frac{1,74}{17,6} \sqrt{1,81}$$

$$r_{pbi} = 0,09 \times 1,345 = 5,251$$

Item 42

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

$$r_{pbi} = \frac{19.5 - 18.04}{17.6} \sqrt{\frac{0.63}{0.45}}$$

$$r_{pbi} = \frac{1.46}{17.6} \sqrt{1.183}$$

$$r_{pbi} = 0.082 \times 1.087 = 0.088$$

Item 43

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

$$r_{pbi} = \frac{16.83 - 18.04}{17.6} \sqrt{\frac{0.68}{0.04}}$$

$$r_{pbi} = \frac{-1.21}{17.6} \sqrt{17}$$

$$r_{pbi} = -0.068 \times 4.123 = -0.28$$

Item 44

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

$$r_{pbi} = \frac{18.33 - 18.04}{17.6} \sqrt{\frac{0.63}{0.27}}$$

$$r_{pbi} = \frac{0.29}{17.6} \sqrt{2.3}$$

$$r_{pbi} = 0.016 \times 1.516 = 0.024$$

Item 45

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

$$r_{pbi} = \frac{19.42 - 18.04}{17.6} \sqrt{\frac{0.95}{0.27}}$$

$$r_{pbi} = \frac{1.38}{17.6} \sqrt{3.518}$$

$$r_{pbi} = 0.078 \times 1.873 = 0.146$$

Item 46

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

$$r_{pbi} = \frac{19.15 - 18.04}{17.6} \sqrt{\frac{0.75}{0.22}}$$

$$r_{pbi} = \frac{1.11}{17.6} \sqrt{3.40}$$

$$r_{pbi} = 0.063 \times 1.84 = 0.116$$

Item 47

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

$$r_{pbi} = \frac{20.87 - 18.04}{17.6} \sqrt{\frac{0.77}{0.36}}$$

$$r_{pbi} = \frac{2.83}{17.6} \sqrt{2.13}$$

$$r_{pbi} = 0.16 \times 1.45 = 0.894$$

Item 48

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

$$r_{pbi} = \frac{20.53 - 18.04}{17.6} \sqrt{\frac{0.37}{0.77}}$$

$$r_{pbi} = \frac{2.49}{17.6} \sqrt{0.467}$$

$$r_{pbi} = 0.141 \times 0.68 = 0.180$$

Item 49

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

$$r_{pbi} = \frac{19.07 - 18.04}{17.6} \sqrt{\frac{0.65}{0.5}}$$

$$r_{pbi} = \frac{1.03}{17.6} \sqrt{1.3}$$

$$r_{pbi} = 0.05 \times 1.14 = 1.150$$

Item 50

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

$$r_{pbi} = \frac{18.8 - 18.04}{17.6} \sqrt{\frac{0.68}{0.45}}$$

$$r_{pbi} = \frac{35.92 - 33.72}{4.93} \sqrt{1.5}$$

$$r_{pbi} = 0.446 \times 1.5 = 0.554$$

APPENDIX 11

Table Validity of Post Test

No	Mp	Mt	SDt	P	Q	$r_{pbi} = \frac{M_p - M_t}{SD_t} \sqrt{\frac{p}{q}}$	Rt on 5% significant	Interpretation
1	33.55	33.72	4.93	0.9	0.1	-102	0.361	Invalid
2	33.80	33.72	4.93	0.0	0.0	0.016	0.361	Invalid
3	36	33.72	4.93	0.8	0.2	0.924	0.361	Valid
4	32.05	33.72	4.93	0.9	0.1	-1.014	0.361	Invalid
5	61.31	33.72	4.93	0.7	0.3	8.487	0.361	Valid
6	35.84	33.72	4.93	0.9	0.1	1.29	0.361	Invalid
7	39.06	33.72	4.93	0.7	0.3	0.103	0.361	Invalid
8	29.58	33.72	4.93	0.8	0.2	-0.1678	0.361	Invalid
9	34.23	33.72	4.93	0.8	0.2	0.206	0.361	Invalid
10	32.84	33.72	4.93	0.9	0.7	0.564	0.361	Valid
11	38.25	33.72	4.93	0.7	0.3	1.395	0.361	Valid
12	30.26	33.72	4.93	0.9	0.1	0.888	0.361	Valid
13	34.42	33.72	4.93	0.9	0.1	0.423	0.361	Valid
14	34.17	33.72	4.93	0.8	0.2	0.282	0.361	Invalid
15	36.6	33.72	4.93	0.7	0.3	0.881	0.361	Valid
16	33.90	33.72	4.93	0.5	0.5	0.036	0.361	Invalid
17	32.71	33.72	4.93	0.6	0.4	0.248	0.361	Invalid
18	34.25	33.72	4.93	0.5	0.3	0.136	0.361	Invalid
19	35.71	33.72	4.93	0.6	0.4	0.599	0.361	Valid
20	31.46	33.72	4.93	0.7	0.3	0.696	0.361	Valid
21	34.12	33.72	4.93	0.7	0.3	0.123	0.361	Invalid
22	33.21	33.72	4.93	0.6	0.4	0.286	0.361	Invalid
23	47.57	33.72	4.93	0.6	0.4	7.022	0.361	Valid
24	38.13	33.72	4.93	0.7	0.3	1.177	0.361	Valid

25	34.87	33.72	4.93	0.7	0.3	0.035	0.361	Invalid
26	34.31	33.72	4.93	0.7	0.3	0.186	0.361	Invalid
27	32.75	33.72	4.93	0.7	0.3	0.146	0.361	Invalid
28	31.41	33.72	4.93	0.8	0.2	0.485	0.361	Valid
29	28.5	33.72	4.93	0.6	0.4	0.421	0.361	Valid
30	28.5	33.72	4.93	0.7	0.3	2.405	0.361	Valid
31	32.31	33.72	4.93	0.7	0.3	0.912	0.361	Valid
32	32	33.72	4.93	0.7	0.3	0.56	0.361	Invalid
33	33.77	33.72	4.93	0.8	0.2	0.422	0.361	Valid
34	36.3	33.72	4.93	0.5	0.5	0.459	0.361	Valid
35	34.30	33.72	4.93	0.6	0.4	0.256	0.361	Invalid
36	3.25	33.72	4.93	0.3	0.5	0.865	0.361	Valid
37	34.76	33.72	4.93	0.8	0.2	0.127	0.361	Invalid
38	34.90	33.72	4.93	0.5	0.5	0.556	0.361	Valid
39	34.84	33.72	4.93	0.6	0.4	0.379	0.361	Valid
40	30.33	33.72	4.93	0.4	0.6	0.683	0.361	Valid
41	59.61	33.72	4.93	0.6	0.4	5.251	0.361	Valid
42	31.62	33.72	4.93	0.7	0.3	6.048	0.361	Valid
43	30.5	33.72	4.93	0.5	0.5	0.835	0.361	Valid
44	37.54	33.72	4.93	0.5	0.5	0.774	0.361	Valid
45	30	33.72	4.93	0.5	0.5	0.483	0.361	Valid
46	31.11	33.72	4.93	0.4	0.6	0.687	0.361	Valid
47	25.83	33.72	4.93	0.5	0.5	-0.894	0.361	Invalid
48	34.81	33.72	4.93	0.6	0.4	0.180	0.361	Invalid
49	35.33	33.72	4.93	0.5	0.5	1.150	0.361	Valid
50	35.92	33.72	4.93	0.6	0.9	0.544	0.361	Valid

APPENDIX 12

Reliability Post Test

To get reliability of the test, the researcher uses formula KR-20:

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

$$N = 22$$

$$\sum Xt = 608$$

$$\sum Xt^2 = 17686$$

$$\sum pq = 10.8$$

$$\begin{aligned} S_t^2 &= \sum Xt^2 - \left(\frac{\sum Xt}{N} \right)^2 \\ &= 17686 - \left(\frac{608}{22} \right)^2 = 17686 - 27.63^2 = 17686 - 763.41 = 16.921 \end{aligned}$$

$$S_t^2 = \frac{\sum Xt^2}{N} = \frac{16.921}{22}$$

$$S_t^2 = 0.769$$

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

$$\begin{aligned} R_{11} &= \left(\frac{22}{22-1} \right) \left(\frac{0.769-10.8}{0.769} \right) = \left(\frac{22}{21} \right) \left(\frac{10.031}{0.769} \right) \\ &= (1.04)(13.04) \\ &= 13.56 (r_{11} > 0.70 = \text{reliable}) \end{aligned}$$

Test is reliable if $r_{\text{count}} > r_{\text{tabel}}$. Based on calculation above, the test have high reliability.

APPENDIX 13

Reliability Post Test

To get reliability of the test, the researcher uses formula KR-20:

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

$$N = 22$$

$$\sum X_t = 742$$

$$\sum X_t^2 = 25548$$

$$\sum pq = 8.4$$

$$\begin{aligned} S_t^2 &= \sum X_t^2 - \left(\frac{\sum X_t}{N} \right)^2 \\ &= 25548 - \left(\frac{742}{22} \right)^2 = 25548 - 33.72^2 = 25548 - 1.137.0 = 25.546 \end{aligned}$$

$$S_t^2 = \frac{\sum X_t^2}{N} = \frac{25.546}{22}$$

$$S_t^2 = 1.161$$

$$\begin{aligned} R_{11} &= \left(\frac{n}{n-1} \right) \left(\frac{S_t^2 - \sum pq}{S_t^2} \right) \\ R_{11} &= \left(\frac{22}{22-1} \right) \left(\frac{1.161 - 8.4}{1.161} \right) = \left(\frac{22}{21} \right) \left(\frac{1152.6}{1.161} \right) \\ &= (1.04) (0.99) \\ &= 0.93 (r_{11} > 0.70 = \text{reliable}) \end{aligned}$$

Test is reliable if $r_{\text{count}} > r_{\text{tabel}}$. Based on calculation above, the test have high reliability.

APPENDIX 14

Score of Experimental Class and Control Class on Pre Test

1. Score of Experimental Class Pre Test before using Total Physical Response Method

No	The Initial Name of Students (n)	Pre-Test
1.	EYH	50
2.	PR	44
3.	RISH	72
4.	RA	40
5.	DF	50
6.	NA	58
7.	FD	74
8.	PA	48
9.	US	58
10.	NH	48
11.	DKS	62
12.	PHH	60
13.	RMS	42
14.	SA	44
15.	RAPS	44
16.	WA	90
17.	RH	39
18.	RA	58
19.	AAH	64
20.	FAH	64
21.	MTH	56
22.	ARL	60
TOTAL		1225

2.Score of Control Class Pre Test

No	The Initial Name of Students (n)	Pre-Test
1.	EYH	50
2.	PR	44
3.	RISH	72
4.	RA	40
5.	DF	50
6.	NA	58
7.	FD	74
8.	PA	48
9.	US	58
10.	NH	48
11.	DKS	62
12.	PHH	60
13.	RMS	42
14.	SA	44
15.	RAPS	44
16.	WA	90
17.	RH	39
18.	RA	58
19.	AAH	64
20.	FAH	64
21.	MTH	56
22.	ARL	60
TOTAL		1225

RESULT OF NORMALITY TEST IN PRE TEST

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

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

39	40	42	44	44	44	48	48	50	50
56	58	58	58	60	60	62	64	64	72
74	90								

2. High = 90
 Low = 39
 Range = High – Low
 = 90-39
= 51

3. Total of Classes = $1 + 3,3 \log (n)$
 = $1 + 3,3 \log (22)$
 = $1 + 3,3 (1.34)$
 = $1 + 4.62$
 = 5.62
 = 6

4. Length of Classes = $\frac{\text{range}}{\text{totalofclass}} = \frac{51}{6} = 8.5 = 8$

5. Mean

Interval Class	F	X	x'	fx'	x' ²	fx' ²
39 – 46	6	42	3	18	9	324
47 – 54	4	50	2	8	4	64
55 – 62	9	58	1	9	1	81
63 – 70	0	66	0	0	0	0
71 – 78	2	74	-1	-1	1	1
79– 86	0	82	-2	-2	-4	-4
87–94	1	90	-3	-3	-9	-9
<i>i</i> = 8	22			41	28	483

$$\begin{aligned}
M_x &= M^1 + i \frac{\sum fx^1}{N} \\
&= 70 + 8 \left(\frac{41}{22} \right) \\
&= 70 + 8 (1.86) \\
&= 70 + 14.88 \\
&= 84.88
\end{aligned}$$

$$\begin{aligned}
SD_t &= i \sqrt{\frac{\sum fx^2}{n} - \left(\frac{\sum fx^1}{n} \right)^2} \\
&= 8 \sqrt{\frac{483}{22} - \left(\frac{41}{22} \right)^2} \\
&= 8 \sqrt{21.91 - (1.86)^2} \\
&= 8 \sqrt{21.91 - 3.45} \\
&= 8 \sqrt{18.46} \\
&= 8 \times 4.29 \\
&= 7.07
\end{aligned}$$

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z - Score	Limit of Large of the Area	Large of area	f _h	f ₀	$\frac{(f_0 - f_h)}{f_h}$
87-94	94.5	-0.39	0.34827	0.003	1.08	6	4.55
79- 86	86.5	-0.40	0.34458	0.06	0.06	3	49
71 - 78	78.5	-0.58	0.28096	0.05	2.16	2	-0.07
63 - 70	70.5	-0.76	0.22363	0.05	2.16	6	1.77
55 - 62	62.5	-0.94	0.17361	0.04	1.44	6	3.16
47 - 54		-1.11	0.13350	0.02	0.72	12	15.6
39 - 46	29.5	-1.26	0.10383				
						X ²	8.57

Based on the table above, the reseracher found that $x^2_{\text{count}} = 8.57$ while $x^2_{\text{table}} = 11.070$ cause $x^2_{\text{count}} < x^2_{\text{table}}$ ($8.57 < 11.070$) with degree of freedom (dk) = $6-1 = 5$ and significant level $\alpha = 5\%$. So distribution of XI-2 class (pre-test) is normal.

6. Median

No	Interval	F	Fk
1	30 – 40	6	9
2	41 – 51	3	12
3	52 – 62	2	14
4	63 – 73	6	20
5	74 – 84	5	24
6	85 – 95	12	36

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

$$Bb = 62.5$$

$$F = 14$$

$$fm = 5$$

$$i = 11$$

$$n = 36$$

$$1/2n = 18$$

So :

$$\begin{aligned} \text{Me} &= 62.5 + 11 \left(\frac{\frac{n}{2} - F}{fm} \right) \\ &= 62.5 + 11 \left(\frac{18 - 14}{5} \right) \\ &= 62.5 + 11 (0.8) \\ &= 62.5 + 8.8 \\ &= 71.3 \end{aligned}$$

7. Modus

2. High = 90
 Low = 36
 Range = High – Low
 = 90 – 36 = 54
3. Total of Classes = $1 + 3,3 \log (22)$
 = $1 + 3,3 \log (22)$
 = $1 + 3,3 (22)$
 = $1 + 4.42$
 = 5.42
 = 6
4. Length of Classes = $\frac{\text{range}}{\text{totalofclass}} = \frac{54}{6} = 9$

5. Mean

Interval Class	F	X	x'	fx'	x' ²	fx' ²
36 – 44	3	40	3	120	9	14400
45 – 53	0	49	2	49	4	2401
54 – 63	2	59	1	118	1	13924
64 – 72	6	68	0	408	0	166464
73 – 81	8	77	-1	616	1	379456
82 – 90	3	86	-2	258	4	66564
i = 9	22			409.16	9	643209

$$\begin{aligned}
 M_x &= M^1 + i \frac{\sum fx^1}{N} \\
 &= 72 + 9 \left(\frac{409.16}{22} \right) \\
 &= 72 + 9(18.61) \\
 &= 72 + 27.61 \\
 &= 99.61
 \end{aligned}$$

$$SD_t = i \sqrt{\frac{\sum fx^2}{n} - \left(\frac{\sum fx^1}{n} \right)^2}$$

$$\begin{aligned}
&= 9\sqrt{\frac{643209}{22} - \left(\frac{409.16}{22}\right)^2} \\
&= 9\sqrt{29236 - (18.59)^2} \\
&= 9\sqrt{29236 - 345.58} \\
&= 9\sqrt{28.89} \\
&= 8(5.37) \\
&= 42.96
\end{aligned}$$

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z - Score	Limit of Large of the Area	Large of area	f_h	f_0	$\frac{(f_0-f_h)}{f_h}$
82 - 90	90.5	-0.21	0.41683	0.079	1.73	3	0.73
73 - 81	81.5	-0.42	0.33724	0.072	1.58	8	4.06
64 - 72	72.5	-0.63	0.26435	0.06	1.32	6	3.54
54 - 63	63.5	-0.84	0.20045	0.05	1.1	2	0.81
45 - 53	53.5	-1.07	0.14231	0.04	0.88	0	0
36 - 44	44.5	-1.28	0.10027	0.01	0.22	3	12.6
	35.5	-1.49	0.08226				
X^2							21.74

Based on the table above, the reseracher found that $x^2_{count} = 21.74$ while $x^2_{table} = 7.815$ cause $x^2_{count} < x^2_{table}$ ($21.74 < 7,815$) with degree of freedom (dk) = 6-3 = 3 and significant level $\alpha = 5\%$. So distribution of XI-3 class (pre-test) is normal.

6. Median

No	Interval	F	Fk
1	36 - 44	3	3
2	45 - 53	0	0
3	54 - 63	2	2

4	64 – 72	6	8
5	73 – 81	8	19
6	82 – 90	3	22

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

$$Bb = 44.5$$

$$F = 3$$

$$fm = 3$$

$$i = 9$$

$$n = 22$$

$$1/2n = 11$$

So :

$$\begin{aligned}
 Me &= Bb + i \left(\frac{n/2 - F}{fm} \right) \\
 &= 44.5 + 9 \left(\frac{11-3}{3} \right) \\
 &= 44.5 + 9 (2.66) \\
 &= 44.5 + 23.94 \\
 &= 68.44
 \end{aligned}$$

7. Modus

No	Interval	F	Fk
1	36 – 44	3	3
2	45 – 53	0	0
3	54 – 63	2	2
4	64 – 72	6	8
5	73 – 81	8	19
6	82 – 90	3	22

$$M_0 = L + \frac{d_1}{d_1 + d_2} i$$

$$L = 72.5$$

$$d_1 = 4$$

$$d_2 = -2$$

$$i = 9$$

So,

$$\begin{aligned} M_0 &= 72.5 + \frac{4}{4 + -2} \\ &= 72.5 + (0.66) 9 \\ &= 72.5 + 5.94 \\ &= 78.44 \end{aligned}$$

RESULT OF NORMALITY TEST IN PRE TEST

RESULT OF THE NORMALITY TEST OF XI-4 IN PRE-TEST

1. The score of XI-4 class in pre test from low score to high score:

35	35	40	45	45	45	45	50	50	50
50	50	55	55	55	55	55	55	55	55
55	60	60	60	60	60	60	70	70	70
70	70								

2. High = 70

$$\text{Low} = 35$$

$$\text{Range} = \text{High} - \text{Low}$$

$$= 70 - 35$$

$$= 35$$

3. Total of Classes = $1 + 3,3 \log (n)$
 $= 1 + 3,3 \log (32)$
 $= 1 + 3,3 (32)$
 $= 1 + 4.95$
 $= 5.95$
 $= 6$

4. Length of Classes = $\frac{\text{range}}{\text{total of class}} = \frac{32}{6} = 5.33 = 6$

5. Mean

Interval Class	F	X	x'	fx'	x' ²	fx' ²
35 – 40	3	40.5	3	9	9	81
41 – 46	4	46.5	2	8	4	16
47 – 52	4	52.5	1	4	1	1
53 – 58	9	58,5	0	9	0	0
59 – 64	6	64.5	-1	6	1	1
65 – 70	5	70.5	-2	10	4	16
<i>i</i> = 6	31			46		115

$$\begin{aligned}
 M_x &= M^1 + i \frac{\sum fx^1}{N} \\
 &= 57.5 + 6 \left(\frac{46}{22} \right) \\
 &= 57.5 + 6 (2.09) \\
 &= 57.5 + 12.54 \\
 &= 70.04
 \end{aligned}$$

$$\begin{aligned}
 SD_t &= i \sqrt{\frac{\sum fx^2}{n} - \left(\frac{\sum fx^1}{n} \right)^2} \\
 &= 6 \sqrt{\frac{115}{22} - \left(\frac{46}{22} \right)^2} \\
 &= 6 \sqrt{5.22 - (2.09)^2} \\
 &= 6 \sqrt{5.22 - 4.36} \\
 &= 6 \sqrt{0.86} \\
 &= 6 \times 0.92 \\
 &= 5.52
 \end{aligned}$$

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	f_h	f_0	$\frac{(f_0 - f_h)}{f_h}$
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65 - 70	70.5	-0.08	0.46812	0.30	0.009	5	554.4
59 - 64	64.5	-1.00	0.15866	0.14	0.004	6	1.49
53 - 58	58.5	-2.09	0.01831	0.01	0.0003	9	29.9
47 - 52	52.5	-3.17	0.00076	-0.40	0.012	4	331.6
41 - 46	46.5	-0.23	0.40905	0.01	0.0003	4	13.30
35 - 40	40.5	-0.18	0.42858	0.01	0.0003	3	9.96
	34.5	-0.21	0.41683				
						X^2	940.65

Based on the table above, the reseracher found that $x^2_{count} = 940.65$ while $x^2_{table} = 11.070$ cause $x^2_{count} < x^2_{table}$ ($940.65 < 11.070$) with degree of freedom (dk) = 6 - 1 = 5 and significant level $\alpha = 5\%$. So distribution of XI-4 class (pre-test) is normal.

6. Median

No	Interval	F	Fk
1	35 - 40	3	4
2	41 - 46	4	8
3	47 - 52	4	12
4	53 - 58	9	21
5	59 - 64	6	27
6	65 - 70	5	32

Position of Me in the interval of classes is number 5, that:

$$Bb = 40.5$$

$$F = 9$$

$$fm = 4$$

$$i = 6$$

$$n = 32$$

$$1/2n = 16$$

So :

$$\begin{aligned} Me &= Bb + i \left(\frac{n/2 - F}{fm} \right) \\ &= 40.5 + 6 \left(\frac{16-9}{4} \right) \\ &= 40.5 + 6 (2.5) \\ &= 40.5 + 15 \\ &= 55.5 \end{aligned}$$

7. Modus

No	Interval	F	Fk
1	35 – 40	3	4
2	41 – 46	4	8
3	47 – 52	4	12
4	53 – 58	9	21
5	59 – 64	6	27
6	65 – 70	5	32

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

$$L = 53$$

$$d_1 = 5$$

$$d_2 = 3$$

$$i = 6$$

So,

$$\begin{aligned} M_o &= 53 + \frac{5}{5+3} i \\ &= 53 + (0.62) 6 \end{aligned}$$

$$= 53 + 3.72$$

$$= 56.72$$

APPENDIX 16

HOMOGENEITY TEST (PRE-TEST)

Calculation of parameter to get variant of the first class as experimental class sample by using Total Physical Response method and variant of the second class as control class sample by using conventional method are used homogeneity test by using formula:

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

Hypotheses:

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

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

A. Variant of the XI-2 class is:

NO	Xi	Xi ²
1.	85	7225
2.	94	8836
3.	36	1296
4.	36	1296
5.	72	5184
6.	30	900
7.	50	2500
8.	35	1225
9.	85	7225
10.	80	6400
11.	50	2500
12.	30	900
13.	45	2025
14.	55	3025
15.	80	6400
16.	85	7225
17.	90	8100
18.	35	1225
19.	55	3025
20.	75	5625
21.	75	5625

22.	80	6400
23.	85	7225
24.	40	1600
25.	85	7225
26.	85	7225
27.	72	5184
28.	72	5184
29.	68	4624
30.	71	5041
31.	52	2704
32.	63	3969
33.	94	8839
34.	72	5184
35.	85	7225
36.	85	7225
	2387	183982

$$n = 36$$

$$\sum xi = 2387$$

$$\sum xi^2 = 183982$$

So:

$$\begin{aligned}
 S^2 &= \frac{n\sum xi^2 - (\sum xi)^2}{n(n-1)} \\
 &= \frac{36(183982) - (2387)^2}{36(36-1)} \\
 &= \frac{6623352 - 5697769}{36(35)} \\
 &= \frac{925583}{1260} \\
 &= 732.84
 \end{aligned}$$

B. Variant of the XI-3 class is:

NO	Xi	Xi²
1.	70	4900
2.	80	6400
3.	36	1296
4.	55	3025
5.	65	4225
6.	90	8100
7.	70	4900
8.	60	3600
9.	40	1600
10.	85	7225
11.	78	6084
12.	75	5625
13.	40	1600
14.	70	4900
15.	80	6400
16.	65	4225
17.	80	6400
18.	80	6400
19.	75	5625
20.	75	5625
21.	70	4900
22.	90	8100
	1689	105530

$$N = 22$$

$$\sum xi = 1689$$

$$\sum_{xi} 2 = 105530$$

So:

$$\begin{aligned} S^2 &= \frac{n\sum xi^2 - (\sum xi)^2}{n(n-1)} \\ &= \frac{22(105530) - (1689)^2}{22(22-1)} \\ &= \frac{22321660 - 2852721}{22(21)} \\ &= \frac{19468939}{462} \\ &= 42.140 \end{aligned}$$

C. Variant of the XI-4 class is:

NO	Xi	Xi ²
1	35	1225
2	35	1225
3	40	1600
4	45	2025
5	45	2025
6	45	2025
7	45	2025
8	50	2500
9	50	2500
10	50	2500
11	50	2500
12	50	2500
13	55	3025
14	55	3025
15	55	3025
16	55	3025
17	55	3025
18	55	3025

19	55	3025
20	55	3025
21	55	3025
22	60	3600
23	60	3600
24	60	3600
25	60	3600
26	60	3600
27	70	4900
28	70	4900
29	70	4900
30	70	4900
31	60	3600
32	70	4900
	1745	97975

$$N = 32$$

$$\sum xi = 1745$$

$$\sum xi^2 = 97975$$

So:

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

$$= \frac{32(97975) - (1745)^2}{32(32-1)}$$

$$= \frac{3135200 - 3045025}{32(31)}$$

$$= \frac{90175}{992}$$

$$= 90.90$$

The Formula was used to test hypothesis was:

1. XI-2 and XI-3 :

$$F = \frac{\text{TheBiggestVariant}}{\text{TheSmallestVariant}}$$

So:

$$F = \frac{732.84}{42.140}$$
$$= 1.73$$

After doing the calculation, researcher found that $F_{\text{count}} = 1.73$ with $\alpha 5\%$ and $dk = 36$ and 22 from the distribution list F, researcher found that $F_{\text{table}} = 1.85$, cause $F_{\text{count}} < F_{\text{table}}$ ($1.73 < 1.85$). So, there is no difference the variant between the VIII-2 class and VIII-3 class. It means that the variant is homogenous.

2. XI-2 and XI-4 :

$$F = \frac{\text{TheBiggestVariant}}{\text{TheSmallestVariant}} \text{So:}$$
$$F = \frac{732.84}{90.90} = 0.9$$

After doing the calculation, researcher found that $F_{\text{count}} = 0.9$ with $\alpha 5\%$ and $dk = 36$ and 22 from the distribution list F, researcher found that $F_{\text{table}} = 1.85$, cause $F_{\text{count}} < F_{\text{table}}$ ($0.9 < 1.85$). So, there is no difference the variant between the XI-2 class and XI-4 class. It means that the variant is homogenous.

3. XI-3 and XI-4 :

$$F = \frac{\text{TheBiggestVariant}}{\text{TheSmallestVariant}}$$

So:

$$F = \frac{42.140}{90.90}$$
$$= 0.46$$

After doing the calculation, researcher found that $F_{\text{count}} = 0.46$ with $\alpha 5\%$ and $dk = 22$ and 32 from the distribution list F, researcher found that $F_{\text{table}} = 1.85$, cause $F_{\text{count}} < F_{\text{table}}$ ($0.46 < 1.85$). So, there is no difference the variant between the XI-3 class and XI-4 class. It means that the variant is homogenous.

APPENDIX 17

Score of Experimental Class and Control Class on Post Test

1. Score of Experimental Class Post Test after Using Total Physical Response Method (TPR)

No	The Initial Name of Students (n)	Post-Test
1.	NA	74
2.	KF	76
3.	MK	78
4.	AMR	78

5.	ARH	72
6.	NWS	74
7.	DSR	80
8.	YAH	78
9.	ISH	80
10.	ADMS	78
11.	MF	80
12.	HH	82
13.	IHH	72
14.	MRL	74
15.	NHN	74
16.	RW	76
17.	AH	86
18.	KN	84
19.	NH	82
20.	DSN	90
21.	NH	78
22.	IH	82
TOTAL		1812

2. Score of Control Class Post Test

No	The Initial Name of Students (n)	Post-Test
1.	NA	74
2.	KF	76
3.	MK	78
4.	AMR	78
5.	ARH	72
6.	NWS	74
7.	DSR	80
8.	YAH	78
9.	ISH	80
10.	ADMS	78

11.	MF	80
12.	HH	82
13.	IHH	72
14.	MRL	74
15.	NHN	74
16.	RW	76
17.	AH	86
18.	KN	84
19.	NH	82
20.	DSN	90
21.	NH	78
22.	IH	82
TOTAL		1812

APPENDIX 18

GAIN SCORE OF EXPERIMENTAL CLASS AND CONTROL CLASS

Class	Pre- test score	Post- test score	Enhancement	Gain Score
Experimental	109.63	73.68	35.95	9.54

Control	99.61	73.2	26.41	
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APPENDIX 19

RESULT OF NORMALITY TEST IN POST TEST

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

8. The score of XI-2 class in post test from low score to high score:

40	40	40	45	50	50	52	53	55	55
60	60	60	60	60	62	63	64	65	66

68	68	70	70	70	71	71	72	72	73
75	77	80	85	85	94				

9. High = 94
 Low = 40
 Range = High – Low
 = 94- 40
 = 54

10. Total of Classes = $1 + 3,3 \log (n)$
 = $1 + 3,3 \log (36)$
 = $1 + 3,3 (1.55)$
 = $1 + 5.11$
 = 6.11
 = 6

11.Length of Classes = $\frac{\text{range}}{\text{totalofclass}} = \frac{54}{6} = 9$

12.Mean

Interval Class	F	X	x'	fx'	x' ²	fx' ²
90 – 99	1	91.5	3	3	9	9
80 – 89	4	81.5	2	8	4	64
70 – 79	10	71.5	1	10	1	100
60 – 69	12	61.5	0	12	0	144
50 – 59	6	51.5	-1	-6	-1	36
40 – 49	4	41.5	-2	-8	-4	64
<i>i</i> =9	37		-3	19		417

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

$$= 69 + 9 \left(\frac{19}{36} \right)$$

$$= 69 + 9(0.52)$$

$$= 69 + 4.68$$

$$= 73.68$$

$$\begin{aligned} SD_t &= i \sqrt{\frac{\sum fx^2}{n} - \left(\frac{\sum fx}{n}\right)^2} \\ &= 9 \sqrt{\frac{417}{36} - \left(\frac{19}{36}\right)^2} \\ &= 9 \sqrt{11.58 - (0.52)^2} \\ &= 9 \sqrt{11.58 - 0.270} \\ &= 9 \sqrt{11.31} \\ &= 9 \times 3.36 \\ &= 30.24 \end{aligned}$$

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z - Score	Limit of Large of the Area	Large of area	f_h	f_0	$\frac{(f_0 - f_h)}{f_h}$
-------------------	------------------	-----------	----------------------------	---------------	-------	-------	---------------------------

90 – 99	99.5	0.85	0.3051	0.113	4068	1	-0.99	
80 – 89	89.5	0.50	0.1915	0.116	5976	4	-0.99	
70 – 79	79.5	0.19	0.0753	-0.372	-13.39	10	0.25	
60 - 69	69.5	-0.13	0.44828	0.125	4.5	12	1.66	
50 – 59	59.5	-0.46	0.32276	-0.048	1728	6	-0.99	
40 – 49	49.5	1.13	0.3708	0.327	11.77	4	91.45	
	39.5	0.01	0.0438					
							X^2	96.33

Based on the table above, the reseracher found that $x^2_{\text{count}} = 96.33$ while $x^2_{\text{table}} = 7.815$ cause $x^2_{\text{count}} > x^2_{\text{table}}$ ($96.33 > 7.815$) with degree of freedom (dk) = $6 - 3 = 3$ and significant level $\alpha = 5\%$. So distribution of XI-2 class (post-test) is normal.

13. Median

No	Interval	F	Fk
1	40 – 49	4	4
2	50 – 59	6	10
3	60 – 69	12	21
4	70 – 79	10	31
5	80 – 89	4	35
6	90 – 99	1	36

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

$$Bb = 49.5$$

$$F = 4$$

$$fm = 12$$

$$i = 6$$

$$n = 36$$

$$1/2n = 18$$

So :

$$\begin{aligned} \text{Me} &= \text{Bb} + i \left(\frac{n/2 - F}{fm} \right) \\ &= 49.5 + 6 \left(\frac{18-4}{12} \right) \\ &= 49.5 + 6 (1.16) \\ &= 49.5 + 6.96 \\ &= 56.46 \end{aligned}$$

14.Modus

No	Interval	F	Fk
1	40 – 49	4	4
2	50 – 59	6	10
3	60 – 69	12	21
4	70 – 79	10	31
5	80 – 89	4	35
6	90 – 99	1	36

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

$$L = 79.5$$

$$d_1 = -2$$

$$d_2 = 6$$

$$i = 6$$

So,

$$\begin{aligned} M_o &= 79.5 + \frac{-2}{-2+6} i \\ &= 79.5 + (-0.25)6 \\ &= 79.5 + -1.5 \\ &= 8 \end{aligned}$$

RESULT OF NORMALITY TEST IN POST TEST

RESULT OF THE NORMALITY TEST OF XI-3 IN POST-TEST

1. The score of XI-3 class in post test from low score to high score:

40	46	50	55	55	58	58	58	60	60
60	65	67	70	70	73	74	74	74	74
74	76								

2. High = 76

Low = 40

Range = High – Low

= 76 – 40

= 36

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

= $1 + 3,3 \log (22)$

= $1 + 3,3 (1.34)$

= $1 + 4.42$

= 5.42

= 6

4. Length of Classes = $\frac{range}{totalofclass} = \frac{36}{6} = 6$

5. Mean

Interval Class	F	X	x'	fx'	x' ²	fx' ²
40 – 45	1	41.5	3	3	9	9
46 – 51	2	47.5	2	4	4	16
52 – 57	2	53.5	1	2	1	4
58 – 63	5	59.5	0	0	0	0
64 – 69	2	65.5	-1	-2	-1	-4
70 – 76	9	71.5	-2	-18	-4	-324
<i>i</i> = 6			-3	39		299

$$\begin{aligned}
M_x &= M^1 + i \frac{\sum fx^1}{N} \\
&= 63 + 6 \left(\frac{39}{22} \right) \\
&= 63 + 6(1.7) \\
&= 63 + 10.2 \\
&= 73.2
\end{aligned}$$

$$\begin{aligned}
SD_t &= i \sqrt{\frac{\sum fx^2}{n} - \left(\frac{\sum fx^1}{n} \right)^2} \\
&= 6 \sqrt{\frac{299}{22} - \left(\frac{39}{22} \right)^2} \\
&= 6 \sqrt{13.59 - (1.7)^2} \\
&= 6 \sqrt{13.59 - 2.89} \\
&= 6 \sqrt{10.7} \\
&= 6 \times 3.27
\end{aligned}$$

=19.62

Table of Normality Data Test with Chi Kuadrat Formula

Interval of Score	Real Upper Limit	Z - Score	Limit of Large of the Area	Large of area	f_h	f_0	$\frac{(f_0 - f_h)}{f_h}$
70 - 76	76.5	0.16	0.0636	-0.007	-0.154	9	-57.40
64 - 69	69.5	-0.18	0.0714	-0.24	-5.28	2	-0.62
58 - 63	63.5	-0.49	0.31207	-0.10	-2.2	5	-1.27
52 - 57	57.5	-0.80	0.21186	0.07	1.54	2	0.29
46 - 51	51.5	-1.10	0.13567	0.05	1.1	2	0.81
40 - 45	45.5	-1.41	0.07927	-0.06	1.32	1	1
	39.5	-1.71	0.04363	0.03	0.66		
						X^2	61.39

Based on the table above, the researcher found that $x^2_{\text{count}} = 61.39$ while $x^2_{\text{table}} = 7.815$ cause $x^2_{\text{count}} > x^2_{\text{table}}$ ($61.39 > 7.815$) with degree of freedom (dk) = $6 - 3 = 3$ and significant level $\alpha = 5\%$. So distribution of XI-3 class (post-test) is normal.

6. Median

No	Interval	F	Fk
1	40 – 45	1	2
2	46 – 51	2	4
3	52 – 57	2	6
4	58 – 63	5	11
5	64 – 69	2	13
6	70 - 76	9	22
	i= 6		

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

$$Bb = 63$$

$$F = 6$$

$$fm = 2$$

$$i = 6$$

$$n = 22$$

$$1/2n = 11$$

So :

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

$$= 63 + 6 \left(\frac{11 - 6}{22} \right)$$

$$= 63 + 6 (0.22)$$

$$= 63 + 1.32$$

$$= 64.32$$

7. Modus

No	Interval	F	Fk
1	40 – 45	1	2
2	46 – 51	2	4
3	52 – 57	2	6
4	58 – 63	5	11
5	64 – 69	2	13
	i= 6	9	22

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

$$L = 57$$

$$d_1 = 3$$

$$d_2 = 3$$

$$i = 6$$

So,

$$\begin{aligned} M_o &= 57 + \frac{3}{3+3} 6 \\ &= 57 + 6 (0.5) \\ &= 57 + 3 \\ &= 60 \end{aligned}$$

APPENDIX 20

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:

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

Hypotheses:

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

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

D. Variant of the XI-2 class is:

NO	Xi	Xi ²
1	40	1600
2	40	1600
3	60	3600
4	50	2500
5	60	1600
6	70	4900
7	75	5625
8	77	5929
9	60	1600
10	60	3600
11	65	4225
12	55	3025
13	55	3025
14	50	2500
15	53	2809

16	45	2025
17	62	3844
18	60	3600
19	66	4356
20	71	5041
21	73	5329
22	64	4096
23	68	4624
24	70	4900
25	40	1600
26	85	7225
27	85	7225
28	72	5184
29	72	5184
30	68	4624
31	71	5041
32	52	2704
33	63	3969
34	94	8836
35	70	4900
36	80	6400
	2191	148845

$$n = 36$$

$$\sum xi = 2191$$

$$\sum_{xi}^2 = 148845$$

So:

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

$$\begin{aligned}
&= \frac{36(148845) - (2191)^2}{36(36-1)} \\
&= \frac{5358420 - 4800481}{36(35)} \\
&= \frac{55793}{1260} \\
&= 44.28
\end{aligned}$$

E. Variant of the XI-3 class is:

NO.	X_i	X_i^2
1.	60	3600
2.	50	2500
3.	55	3025
4.	60	3600
5.	40	1600
6.	46	2116
7.	58	3364
8.	55	3025
9.	58	3364
10.	70	4900
11.	74	5476
12.	74	5476
13.	70	4900
14.	74	5476
15.	74	5476
16.	60	3600
17.	65	4225
18.	67	4489
19.	73	5329
20.	76	5776
21.	74	5476
22.	58	3364

	1572	90157
--	------	-------

$$N = 22$$

$$\sum xi = 1572$$

$$\sum_{xi} 2 = 90157$$

So:

$$\begin{aligned}
 S^2 &= \frac{n\sum xi^2 - (\sum xi)^2}{n(n-1)} \\
 &= \frac{22(90157) - (1572)^2}{22(22-1)} \\
 &= \frac{1983454 - 247118}{22(21)} \\
 &= \frac{1736336}{462} \\
 &= 3.758
 \end{aligned}$$

The Formula was used to test hypothesis was:

4. XI-2 and XI-3:

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

So:

$$\begin{aligned}
 F &= \frac{4428}{3758} \\
 &= 1.17
 \end{aligned}$$

After doing the calculation, researcher found that $F_{\text{count}} = 1.17$ with $\alpha 5\%$ and $dk = 36$ and 22 from the distribution list F , researcher found that $F_{\text{table}} = 1.85$, cause $F_{\text{count}} < F_{\text{table}}$ ($1.17 < 1.85$). So, there is no difference the variant between the XI-2 class and XI-3 class. It means that the variant is homogenous.

APPENDIX 21

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:

$$Tt = \frac{M_1 - M_2}{\sqrt{\left(\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$Tt = \frac{109.63 - 99.61}{\sqrt{\left(\frac{(36 - 1)732.84 + 42.140(22 - 1)}{36 + 22 - 2}\right)\left(\frac{1}{36} + \frac{1}{22}\right)}}$$

$$Tt = \frac{10.02}{\sqrt{\left(\frac{35(732.24) + 21(42.140)}{56}\right)(0.027 + 0.045)}}$$

$$Tt = \frac{10.02}{\sqrt{\left(\frac{25.628.4 + 884.94}{56}\right)(0.027 + 0.045)}}$$

$$Tt = \frac{10.02}{\sqrt{\left(\frac{910.5684}{56}\right)(0.072)}}$$

$$Tt = \frac{10.02}{\sqrt{16.26(0.072)}}$$

$$Tt = \frac{15.06}{\sqrt{1.17}}$$

$$Tt = \frac{10.02}{1.08}$$

$$Tt = 9.277$$

Based on researcher calculation result of homogeneity test of the both averages, researcher found that $t_{\text{count}} = 7.926$ with opportunity $(1 - \alpha) = 1 - 5\% = 95\%$ and $dk = n_1 + n_2 - 2 = 36 + 22 - 2 = 56$, $t_{\text{table}} = 1.671$. So, $t_{\text{count}} > t_{\text{table}} (7.926 > 1.671)$ and H_a is accepted, it

means there was the differenceaverage between the first class as experimental class and the second class as control class in this research.

APPENDIX 22

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:

$$Tt = \frac{M_1 - M_2}{\sqrt{\left(\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$Tt = \frac{73.68 - 73.2}{\sqrt{\left(\frac{(36 - 1)44.28 + (22 - 1)3.75}{36 + 22 - 2}\right)\left(\frac{1}{36} + \frac{1}{22}\right)}}$$

$$Tt = \frac{0.48}{\sqrt{\left(\frac{35(224.62) + 21(3.75)}{56}\right)(0.027 + 0.045)}}$$

$$Tt = \frac{0.48}{\sqrt{\left(\frac{7.8617 + 78.75}{56}\right)(0.027 + 0.045)}}$$

$$Tt = \frac{0.48}{\sqrt{\left(\frac{86.6117}{56}\right)(0.072)}}$$

$$Tt = \frac{0.48}{\sqrt{1.5466 (0.072)}}$$

$$Tt = \frac{0.48}{\sqrt{0.1113}}$$

$$Tt = \frac{0.48}{0.33}$$

$$Tt = 1.45$$

Based on researcher calculation result of homogeneity test of the both averages, researcher found that $t_{\text{count}} = 1.45$ with opportunity $(1 - \alpha) = 1 - 5\% = 95\%$ and $dk = n_1 + n_2 - 2 = 36 + 22 - 2 = 56$, $t_{\text{table}} = 1.671$. So, $t_{\text{count}} < t_{\text{table}}$ ($1.45 < 1.671$) and H_0 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 23

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 24

Percentage Points of the t Distribution

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

Percentage Points of the t Distribution

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

80	0.67757	1.29222	1.66412	1.99006	2.37387	2.63869	3.19526
∞							

APPENDIX 25

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

APPENDIX 26

PHOTO RESEARCH





