THE EFFECT OF SEMANTIC MAPPING STRATEGY ON
VOCABULARY MASTERY AT THE GRADE VII
SMP N 5 PADANGSIDIMPUAN

A THESIS

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

Written by:

EMI FITRIYANI
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ENGLISH EDUCATION DEPARTMENT

TARBIYAH AND TEACHERS TRAINING FACULTY
STATE INSTITUTE FOR ISLAMIC STUDIES
PADANGSIDIMPUAN
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Submitted to the State Institute for Islamic Studies Padangsidimpuanas a Partial Fulfillment of the Requirementfor Proposal Seminar in English Education Department

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2020

LETTER AGREEMENT

Term : Munaqosyah
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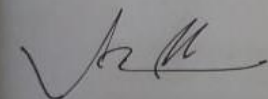Item : 7 (Seven) Exemplars

Padangsidimpuan, November 2020.
To:
Dean Tarbiyah and Teacher Training
Faculty
In-
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Assalamu a'laikum warahmatullah wabarakatuh

After reading, studying and giving advice for necessary revision on thesis belongs to **EMI FITRIYANI** entitled **"The Effect Of Semantic Mapping Strategy On Vocabulary Mastery At The Grade VII SMP N 5 Padangsidimpuan"**. We approved that thesis has been acceptable to complete the assignments and fulfill the requirements for graduate degree of Education (S.Pd) in English Education Department, Tarbiyah and Teacher Training Faculty in IAIN Padangsidimpuan.
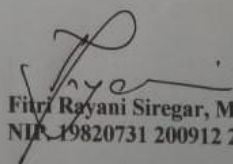
Therefore, we hope that the thesis will soon be examined by the Thesis examiner team of English Educational Departemnt of Tarbiyah and Teacher Training Faculty IAIN Padangsidimpuan. Thank you.

Wassalamu a'laikum warahmatullah wabarakatuh

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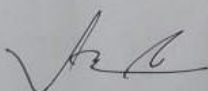Chief,   Secretary,

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The thesis has been accepted as a partial fulfillment of the requirement for degree of graduate of Education (S.Pd) in English.

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DECLARATION OF SELF THESIS COMPLETION

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Tittle of Thesis : The Effect Of Semantic Mapping Strategy On Vocabulary Mastery At The Grade VII SMP N Padangsidimpuan

I hereby declare that I have arranged and written the Thesis by myself, without asking for illegal help from the others, except the guidance from advisors, and without plagiarism as it is required in students' ethic code of IAIN Padangsidimpuan in article 14 verses 2.

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Mastery at Grade VII SMP Negeri 5 Padangsidimpuan

ABSTRACT

This research focuses on The effect of semantic mapping on vocabulary mastery at the grade VII SMP N 5 Padangsidimpuan.The problems of this research are of the students in vocabulary mastery were: 1) Most of the students still poor vocabulary. 2) Most of the students was lazy for bring dictionary. 3) they prefer to wait for the teacher to translate the vocabulary. 4)and they also tend to forget the meaning of the word which have been taught or particed in berief. 5) students vocabulary mastery does not fulfill. The aim of this research is to know the effect of semantic mapping strategy on vocabulary mastery at the grade VII SMP N 5 Padangsidimpuan.

The method that is used in this research is experimental research. Two classes were chosen randomly as the sample. They were VII-3 as experimental class that consisted of 25 students and VII-8 as control class that consisted of 25 students. It was taken after conducting normality and homogeneity test. The data was 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 semantic mapping strategy was higher than control class. Mean score of experimental class before using semantic mapping strategy was 61.19 and mean score after using semantic mapping strategy was 76.1 and it had gain 14.91. The effect of semantic mapping strategy on vocabulary mastery was 2.205 with t_{count} was higher than t_{table} (2.205 > 1.67155). It meant that H_a was accepted and H_0 was rejected. There was effect of semantic mapping strategy on vocabulary mastery at the grade VII SMP Negeri 5 Padangsidimpuan.

Key Words: *Semantic Mapping Strategy, Students Vocabulary Mastery*

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Padangsidimpuan,   November 2020
Researcher

EMI FITRIYANI
Reg. No. 14 203 00033

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CHAPTER I

INTRODUCTION

A. Background of the Research

English is general of language that used as international language. It is a tool of communcation among nations. Without English, someone will be old fashion because they cannot communicate with people arround the the world, they can not use technology media and they will be lack of information in science world because many scientific books are written in English.

The position of English in the curriculum 2013, 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 complusory subject in junior high school up to senior high school level. English is one of 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 skiil, reading skill, and writing skill. Beside that is another aspect in material of English teaching is vocabulary. Vocabulary is an activity to transfer the knowledge from the text to mind. It is impossible to gain information from many sources without proportional amount of vocabulary, anyone will get trouble in listening, speaking, reading and writing a foreign text without knowing the vocabulary inside the text.

Vocabulary is all the words in language list of words in lesson or books, and other activities in English. It is difficult to master other competencies without mastering and understanding vocabulary.

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 the conntens. Vocabulary can explore new things. They are also can not communicate effectively.

There are some efforts that has been done by the goverment to increase student's vocabulary mastery. Firstly, begin from prepare the good facilities and tool for studying in English. Second, manage the classroom be confortable so students can be focus in learning English. Finally, giving task about new words that they have not learned yet, until use the various media in theaching English for fun English class.

Condition of English vocabulary mastery in seventh students of SMP Negeri 5 Padangsidimpun vocabulary mastery still poor. Based on interview with the teacher in SMP Negeri 5 Padangsidimpuan.

The teacher said that students" was lazy for bring the dictionary, they prefer to wait for the teacher to translate the vocabulary, and they also tend to forget the meaning of the word wich have been taught or particed in berief, students vocabulary mastery does nit fullfill the expectation".[1]

The researcher also interviewed some of students in seventh of SMP Negeri 5 Padangsidimpuan.The students said" we have difficulty in remembering new vocabularies because of the differences between what is written and what is spoken so the students were easy to fell bored in learning of vocabulary not interested in learning process. The teacher still used the command way in teaching vocabulary such as giving then a list of vocabulary and asked the students to remember".[2]

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[1]*Private Interview,* MissHapsyah Sri Mei Siregar, Teacher of SMP Negeri 5 Padangsidimpuan, (Padang Matinggi, October 23th 2017).

[2]*Private Interview*, Nazwa Putri FadilaHarahap Students of SMP Negeri 5 Padangsidimpuan, (Palopat, October 25th 2017).

Based on interview at school, it can be concluded that the problem is the students felt boring in learning vocabulary, because their theacher do not use media in teaching vocabulary. So that, teaching not is effective.

There are many factors of vocabulary mastery such as, motivation, classrom interaction, learning style, students interest, psycological, and strategy.[3] Strategy is a teaching and learning tool . it can be used to stimulate thoughts, feelings, concerns and abilities or skills of learners so as facilities the process of learning.

Strategy is simply and interesting which can make teaching, and it can help the teacher and it make students enjoyable. It is a specific method of approaching a problem of a task, model of operation for achieving a particular abd panned designed for controling and manipulating certain information.

Kinds of teaching vocabulary strategy such as scrabble, chrades and semantic mapping strategy. Based on strategies mention above, the researcher interested to semantic mapping strategy. While, semantic mapping is more simply to make students enrich their vocabularies.[4]

Semantic mapping is to promote the students' deeper understanding of words through depicting varying relationship between and among words. So, semantic mapping was helpful for developing students' understanding of almost any concept, it had been used to develop concepts.[5]

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[4]Judi Willis, *Teaching The Braing to Read: Startegies For Improving Fluency, Vocabulary and Comprehension* (London: ASCD Oybkucatub, 2008).
[5]Austin, *Promoting Vocabulary Depelopment: Component of Effective Vocabulary Intrucion* (Texaz: Education Agency Publisher, 2002).

The role of semantic mapping in teaching vocabulary because semantic mapping can make students easier to develop their knowledge about vocabulary that will be learned. So, it can help the students easy for understanding the vocabulary.

Based on the explanation above, the researcherwant to do a research the title **"The Effect of Semantic Mapping Strategy on Vocabulay Mastery At The Grade SMP Negeri 5 Padangsidimpuan"**

B. Identification of the problem

Vocabulary is basic competence that must reach by students in order to get other competencies like reading, listening, speaking, and other activities in English. It is difficult to master other cometencies without mastering and undrestanding vocabulary.

Based on background of the problem above there are some factors influencing the students vocabulary mastery are motivation, classroom interaction, learning style, students interest, psylogycal, and strategy.

C. Limitationof the Problem

As mention above, there are some factors that influence of students' vocabulary mastery are listening ability, speaking ability, students interest, psychological such as (motivation, courage, and culture), and media.

In this research the researcher wants to make a study about how to teach vocabulary for students in junior high school with the sematic mapping. There are many semantic mapping that can be used in teaching vocabulary as mention above, but the researcher does not discuss allof the media. Researcher discused only media.

There some reason why researcher choose the semantic mapping strategy. First semantic maping is a simple media can be used to teach inside or outside the room. Second, it is easy to present learning message in a consis and practical manner. Third, it make students can remember the new vocabulary easily, and the last semantic mapping can to make students activities in the classroom.

D. The Formulation of the Problem

Based on limitation of the problem mentioned above, the reseacher formulation the problem is this research as follow: "is there a significant effect of semantic mapping strategy on vocabulary mastery at the grade VII students of SMPN 5 Padangsidimpuan ?"

E. Aim of the research

Based on formulation above the aim of the research is to know whether there is the significant effect of Semantic Mapping strategy on vocabulary mastery or not at grade VII students of SMPN 5 Padangsidimpuan.

F. Significances of the Research

The result of the research expected to be userful for:

1. For headmaster, as an information especially about teaching vocabulary by using semantic mapping strategy at the grade VII students' of SMP Negeri 5 Padangsidimpuan.

2. For English teachers, as an information to add his technique in teaching English especially in teaching vocabulary by using semantic mapping strategy at the grade VII students' of SMP Negeri 5 Padangsidimpuan.

3. For other researcher, as an information in conducting further research in the same topic.

G. The Systematic of the Thesis

This research is organized into five chapters. Every chapter is subdivided into subtopics to elaborate the given issue. First chapter, it consists of background of the problem, identification of the problem, formulation of the problem, limitation of the problem, aim of research, significances of the research, definition of operational variables, and the systematic of the thesis.

Second chapter, it consists of the theoretical description. It is divided into subchapters which consist of description of ice breaking games and description of vocabulary. Second chapter also consists of related findings, conceptual framework and hypothesis.

Third chapter, it consists of research methodology which is divided into sub chapter; time and place of the research, research methodology, population

and sample, instrument of research, techniques of data collection, techniques of data analysis and outline of the thesis.

Fourth chapter, it consists of data description, hypothesis testing, discussion and the threats of research.

Fifth chapter, it consists of conclusion about the result of this research and suggestions that are given by the researcher.

CHAPTER II

LITERATURE REVIEW

A. Theoretical Description

    1. Vocabulary Mastery

        a) Definition of Vocabulary

Vocabulary is one of component for the language, where is vocabulary help people to speaking and language in communication. It is a part of language that so important to all aspect in life and vocabulary as a major part in English has to be taught effectively, because students should feel glad and interesting in learning vocabulary.[6]

In general of vocabulary is one aspect should be owned by every student's to make them understand and master in English vocabulary. Vocabulary is important part of language. People can not understand something without knowing the meaning first and it can be constructed from knowing word by word.

The core in English is vocabulary.[7] The learners should master it firstly for mastering the four skills in English, speaking, listening, reading, and writing. According to jack C. Richard and Willy a Renandya "Vocabulary is a core component of language proficiency

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[6] Fitri Rayani Siregar, Improving Students' Vocabulary Mastery Through Crossword Puzzle Technique At SD Muhammadiyah 1 Padangsidimpuan, Jurnal Bahasa Inggris IAIN Padangsidimpuan Vol. 04 No. 1 Juni 2018, http://jurnal.iain-padangsidimpuan.ac.id/index.php/TZ/Vol. 04 No. 1 june 2018.accessed on Monday 14th of December 2020. P. 94.

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

and provides much of the basis for how well learners speak, listen, reand, and write". It means vocabulary is very important aspect in language. Someone can speak, listen, read, and write by using a language because they have had , known, and mastered much vocabularies.

According to A.S. Hornoby, vocabulary is a person's knowledge about all the words using.[8] Vocabulary may be defined as the total number of words in language and vocabulary is a list of words with their meanings.

Schmit Broadly says, " we must consider what mean by vocabulary. The first idea that probably springs to mind is words, a formulation yhat is admirably aduquate foe the layperson".[9] It means we should use the vocabulary in the right placement. We must known what we mean by using the vocabulary.

According to Elfrieda H. Hiebert and Michael L. Kamil, "Vocabulary is the knowledge of meaning of words".[10] The some thing is also delivered by Caroline T. Linse that vocabulary is the individual's knowledge about the collection of words.[11] It means that vocabulary is someone's knowledge about words.

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[8] A.S Hornby, *Oxford Advance Learner's Dictionary* (New York: Oxford University Press, 2000).
[9] Norbeth Schmitt, *Vocabulary in Language Teaching* (Cambridge: Cambridge University Press, 2000).
[10] Hiebert, Elfriede H., and Michael L. Kamil, *Teaching and Learning Vocabulary: Brinnging Research to Practice* (New Jersie: Lawrence Erubaum Associates Publishers, 2005).
[11] Caroline T. Linse, *Practical English Language Teaching : Young Learners* (New York: McGraw-Hill Companie, Inc, 2005).

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

In the other hand, based on the curriculum junior high school. Vocabulary is a large numbers of words that students have to know, not only memorizing the form of the word but also understand the meaning. It makes the students are able to identify the meaning of the words, students are able to communicate and understand the meaning. It is widely accepted that vocabulary teaching should be part of the syllabus, and taught in a well-planned and regular basis. It seems that the teachers' task to arrange such kind of lesson pland based on the current syllabus in order to help students master English vocabulary. It must be taught in an English class vocabulry.

Based on explanation above, it can be comcluded that vocabulary is a core component of language propeciency and provides much of the basis how well learners listen, speak, read, and write. Vocabulary is very important in languae acquistion and the first languages as the words. Vocabulary is a large numbers of words that students have to know, not only memorizing the from of the word but also understand the meaning.

b) Purpose of Vocabulary

In general purpose of vocabulary is often views as a critical tool for second language learners because a limited vocabulary in a second language impedes successful communication. Undesrcoring the importance of vocabulary acquestion, schmitt emphasizes that "lexcical knowledge is central to communicative competence and to the acquestion of a second language".[12] It means vocabulary is important to students. It more important than grammar for communication purpose, particular in early stages when students are motivated to learn the basic words they need to get by in language.

In specific purpose of vocabulary based on curriculum 2013 in junior high school is to increase students vocabulary mastery, to identifying a meaning of word in the text, to understand the function, structure, and linguistic elements of the text to state and ask for the name of the day, month, time name in days, time in the form of numbers, dates and years, to develop communication competencies in oral and written forms to achieve functional literacy levels.[13] It means vocabulary is important for students to comprehend four skill such as listening, speaking, reading and writing.

Vocabulary is important for students. There are several purposes of vocabulary:

1) To express their opinion thingking

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[12] Schmitt, *Vocabulary in Language Teaching*.
[13] Siti Wachidah et al., *Buku Bahasa Inggris: When English Rings a Bell* (Jakarta: Balitbang Kemendikbud, 2017).

2) To express idea in their society
3) Particulary in early stages when students are motivated
4) To learn the basic words they need to get by in language
5) To understand nuances of meaning
6) To be come more proficient in their own choice of words and expressions.[14]

According to Michael J. Wallace, the purpose of mastering vocabulary is divided into three purpose of vocabulary, they are :

1) Quantity means number of words to counting a lesson. In minimal number of words for junior high school is around words, while senior high school is about 4000 words.
2) Need to determine the students' vocabulary for business.
3) Presentation to spesific understanding in the meaning of the words being learn since meaning involves many things, this requires the teaching in which the words are presented.[15]

So it can be conclude that the purpose of vocabulary is the way to express our opinion thingking, to express to an idea in our society, make early to learn the basic loord that our need to get by in language, make us more propecient in our own choice of words and expressions.

Meanwhile, the purpose of vocabulary in junior high school institution are: students are able to memories vocabulary around 250 words, students are able to enrich vocabulary in daily activity, and students able to know the meaning of words.[16]

c) **Kinds of Vocabulary**

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[14] Roger Gower, *Teaching Practical Handbook* (Thailand: Macmilian, 1995).
[15] Michael J. Wallace, *Eaching Vocabulary* (ELBS, 1989).
[16] Syllabus at SMP Negeri 5 Padangsidimpuan.

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

1. Receptive Vocabulary or Passive Vocabulary

   Receptive vocabulary can be understood ony 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.

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 gramatical patterns along with the words that usually collocate with.[17]

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

   1) General Vocabulary
   2) Special Vocabulary.[18]

   According Scail says that there are types of vocabulary, they are:

   1) Active Vocabulary
   2) Reserve Vocabulary

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[17] Jeremy Harmer, *The Practical of English Language Teaching* (New York: Longman, 2000).
[18] Azimar Enang, *Kinds of Vocabulary* (Bandung: PT. Pustaka Media, 2001).

3) Passive Vocabulary.[19]

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 pronounce the word, how to write and spell it, how to use it in correct gramatical 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) **Advantages of Vocabulary**

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

Tarigan points out the importances of vocabulary in language is essential for successfull language use, because without an extensive

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[19] Schail, *Seven Days to Faster Reading* (New York: Oxford University Press, 1967).

someone will be unable to use structure and function that has learned for comprehesible communication. Someone uses vocabulary to listen, speak, read, and write effectively.[20] So, the students must have much vocabularies for successful in language use.

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

e) **Material of Vocabulary**

There are some materials in vocabulary teaching. Based on explanation above there are some kinds of vocabulary, such as receptive vocabulary and productive vocabulary. So, the English lerarner can learn or understand vocabulary while listening to a spoken or reading a passage and produce it when do speaking or writing.

The book used SMPN 5 Padangsidimpuan "BahasaInggris When English Rings A Bell". It divide into thirteen chapters, they are; chapter I Good Morning. How are You, chapter II It's Me, chapter III What Time Is It?, chapter IV This is My Word, chapter V It's a Beautiful day!, chapter VI We love what we do, chapter VII I'm Proud of Indonesia, chapter VIII That's what friends are supposed to do.

From those material, the researcher did not talk about all topic. The researcher only focus on chapter IV with sub topic This is My Word. This topic talk about things and transportation. The vocabulary in this

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[20] H. G. Tarigan, *Pengajaran Kosa Kata* (Bandung: Aksara, 1985).

topic also include into speaking not only as a especially vocabulary lesson.

In this research, to know the students' vocabulary mastery, researcher limit the materials of teaching vocabulary they are; name of thing in outside home, name of thing in the home, name of thing in the school and animal we can see in the below.[21]

1) Name of thing in outside home
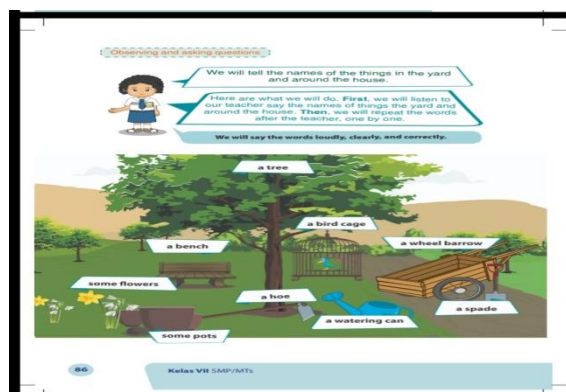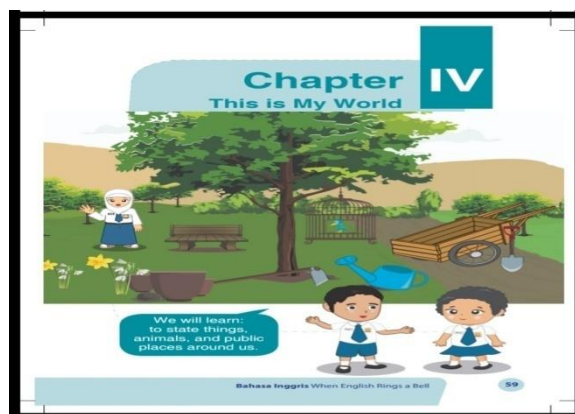
Exercise

[21] *Syllabus Seventh Grade Junior* High School Based On K13.

2) Name of thing in the home

Exercise

3) Name of thing in the school

Exercise

4) Animal

Exercise

2. Semantic Mapping Strategy

a. Defenition of Semantic Mapping

According to Heimlich and Pittelman 1986 Semantic mapping is is a teacherdirected study of a word or concept in relation to other related words and ideas. The teacher begins a Semantic Mapping activity by providing a word or concept about to be studied and students brainstorm characteristics, attributes, related words and ideas, and specific examples of the word. The map is a graphic representation of this thinking and discussion.

Discussion is a significant aspect of a Semantic Mapping activity . In addition, there is a significant line of research that supports the positive impact of Semantic Mapping in terms of students' memory of the targeted word and recognition of that word in a variety of contexts (Johnson, Toms Bronowski, and Pittelman 1982).[22] Semantic mapping is a strategy that can be used in all disciplines to demonstrate the

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[22] Johnson, Toms Bronowski, and Pitelman, *Inside Words: Tools for Teaching Academic Vocabulary Grades 4-12* (Portland: Stenhouse Publishers, 2007).

relationship between ideas. It is an activity that helps bring into consciousness relationship among word in a text and help deepen understanding by creating associative networks for words.[23]

From the definitions above, it can be conclude semantic mapping as a graph or diagram that represents ideas verbally. These ideas consists of the main ideas is a subject that will be discussed and sub-sub ideas that describe the subject. Sub-sub ideas can take the form of words or phrases that are interconnected. Usually, the main idea is placed in the middle while the sub-sub ideas emitted from the main idea with the fingers. These ideas can be placed in a circle, square, or triangle. Semantic mapping can also be shaped tree trunk while the idea is basically as sub-sub ideas that are in the branch.

b. Kinds of Semantic Mapping

Semantic mapping is one of strategy can be use to teach vocabulary. Semantic mapping is stategy which can make teaching strategy more simply and interesting, and it make students' enjoyable because there are four kind of semantic mapping that cannot make students' boring. They are : network tree, star, cycle concept map and spider concept map:

1) Network Tree

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[23] Marianne Celce Murcia, *Teaching English as a Second of Foreign Language Teaching* (USA: Heinle&Heinle Thompson Learning, 2001).

Network tree is one of the kind of the research,the way for making network tree is so easy. Keyword and idea of topic is making in rectangle,and another word is writing in line connection, this line is showing that concept has related one word with other word.[24]

Appropriate with name of graphic, network tree is like as tree.
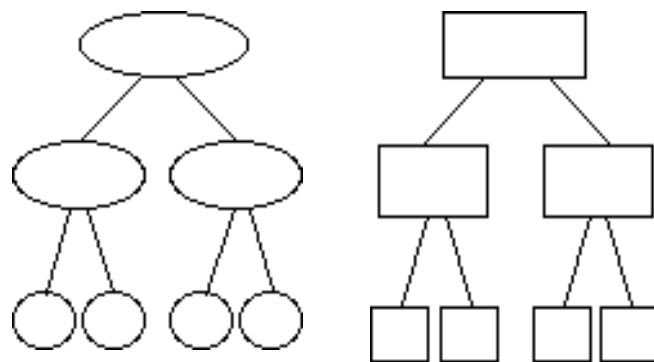
Picture 1.Network Tree
(source: Schoarly research journal)

2) Star map

The second kind of semantic mapping is called star map. This kind also easy for making .star diagrams are useful for basic brainstorming about a topic or simply listing all the major traits related to a theme.[25]

24“...
on Juny 22th

25 “...
on Juny 22th

w.encha   ws/

w.encha   ws/
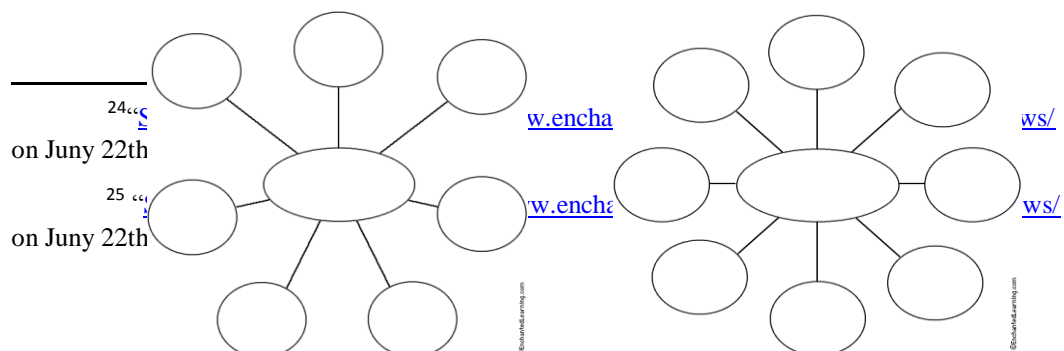
Picture 2.Star Map
(source: Schoarly research journal)

3) Cycle concept

Cycle concept is kind of semantic mapping that can be use in teaching ,especially in teaching vocabulary. Cycle concept is use to relate how oneconnection structure is connecting.[26]for this one , the graphic made like as cycle.
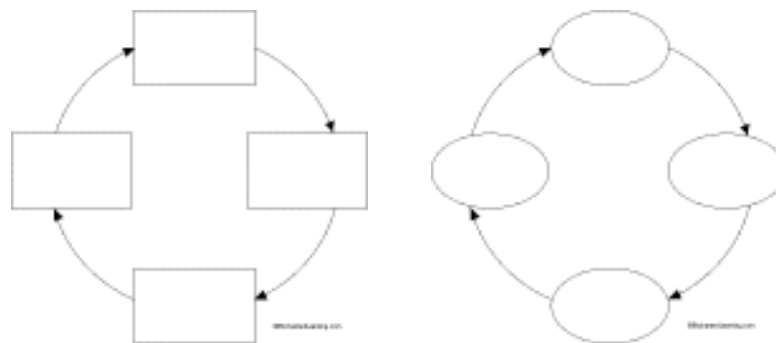
Picture 3.Cycle map
(source: Schoarly research journal)

4) Spider Map

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[26] Tritanto, *OP. Cit.,* p. 161-165.

Spider map is the last kind of semantic mapping strategy. The spider Map always used to effuse opinion. This graphic is made like as spiSder map
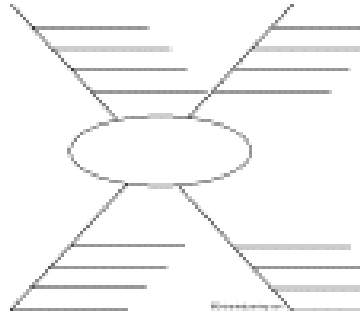
Picture 4.Spider map
(source: Schoarly research journal)
The kind of semantic mapping above can be used to teach vocabulary ; it canbe done appropriate that vocabulary with vocabulary that will be learned.With some kind of semantic mapping above, the teacher can make class more innovative, so that, teaching vocabulary with semantic mapping strategy is not monotonous, and here, researcher choose star map concept to teach students because more easy to understand it.

c. **The purpose of Semantic Mapping**

The major purpose of the semantic map is to allow students to organize their prior knowledge into these formal relations and thus to provide themselves a basis for understanding what they are re about to read and study. Comprehension can be thought of as the elaboration and refinement of prior knowledge. What the semantic map provides is a graphic structure of that knowledge to be used as the basis for organizing

new ideas as they areunderstood.[27] The students will associate new word meaning with prior knowledge through the use of a semantic map.

The framework of semantic mapping strategy, to to concept of word, two categories example and another examples. This is a very interactive process and should be modeled by the teacher first. The step involved in semantic mapping strategy are: write the concept word on the board, explain the steps involved and have students think of as many words as they can for the concept word, write the list on the board or overhead and have students copy it, and finally in group have students put the words into categories.

d. Advantages and Disvantages of Semantic Mapping Strategy

Semantic mapping is strategy that can be used for teaching vocabulary, because semantic mapping can make students easier to develop their knowledge about vocabulary that will be learned. Another ways, semantic mapping strategy cam make abstract to be come concrete. So, it can help the students easy for understanding the vocabulary, below are some advantages of semantic mapping strategy:

1). Advantages of Semantic Mapping Strategy

There are some advantages of semantic mapping strategy like as below:

a) Students easier to comprehend the learning material.

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[27] *http://yoga4rifwijaya.blogspot.co.id/2012/03/semantics-mapping.html*(online) taken 18 july 2016

b) Students can develop the learning after teacher give the learning material to students.

c) Students can relate their leaning in one category.

d) Semantic strategy can grow students' creativity.

e) With semantic mapping students are not feel boring, because if the learning material is excessively. It makes students so hard to relate.

Their learning, but if students just look their learning in semantic mapping They know where the aims of their learning.[28]

Based on all of the advantages of semantic mapping above, it shows that semantic mapping is strategy that can help the students to easy understand their learning, and can develop their learning with their creativity. However, semantic mapping also has some disadvantages like as below:

2) Disadvantages of Semantic Mapping Strategy

Semantic mapping not only has advantages but also has disadvantages. There are three disadvantages of semantic mapping below:

a) Teacher is not preparing enough these concept itself.

b) Object of reading was less.

c) Semantic mapping can make students difficult to think concrete.

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[28] Istarani, *OP. Cit.,* p.247.

So that, semantic mapping makes teacher less in preparing the concept, and makes the students easier to think abstract, and it make students just think abstract only.

e. Teaching Vocabulary by Using Semantic Mapping

Teaching Vocabulary by using Semantic Mapping include three Phases, They are :Pre teaching is the teaching of the language learners need before an activity, then while teaching, is the process of teacher activities when giving lesson to students, and the last, post teaching is teacher activities to make summaries and conclusions about what has been learned to close the learning process.

In the teaching learning process there must be interaction, interaction teaching and learning is engangement reciprocal between teacher and students who have to show the connection that is educate. The function of interaction not only as the exchange of information and the message, but as the individual and the exchange of data, fact and aideas. For more detail see table below :

Table I
Teaching Vocabulary by using Semantic Mapping

	Teacher activities	Procedure of Semantic Mapping	Students activities
1. Pre Teaching	**Opening activity**		
	1.Teacher Give Salam (Greeting)	1.Involved semantic in mapping	1.Students answer Salam
	2.Teacher ask student to Pray	2.write the concept word on the board	2.Students responding to the teacher
	3.Teacher Reading Present list	3.explain the steps involved and have students think of as many words as they can for the concept word	3.Students Pray
	4.Teacher give Motivation		4.Students answer present and not present
	5.Teacher give illustration about topic	4.write the list on the board or overhead and have students	5.Students Listening to Teacher
			6.Students see and Focus to the Teacher
2.While Teaching	**Exploracy**		
	1.Teacher explain about semantic mapping	1. Select a word central to the topic.	1. Students pay attention to the teacher explanation
	2.Teacher give some keyword about topic		2.Students asked the teacher
			3. Students choose one topic
	1.Teacher display the topic (Noun)	2.Display the target Word	1.Students pay attention to the teacher
	Elaboracy 1. Teacher splits the students into several groups	3.invite students to generate as many words as possible that relate to thetarget word	1.Students sit together with their groups
	2. Teacher ask the students to search for as many word as possible with noun		2.Students Brainstorm 3.Students record the word on a chart or on the chalkboard
	1.Teacher ask the students to write the generated words in categories	4. Have the students write the generated words in categories	1.Students discuss How the information could be placed into categories 2. Students exchange

			ideas with each other
	1.Teacher ask students label categories	5. Have the students label categories	1.Students label and add extra information to each category
	1.Teacher ask students to construct a map	6.From this list, construct a map	1. Students construct a map
	1.Teacher give a test to Students 2.Teacher give time to students for doing the test 3.Teacher lead the class in discussion	7.Lead the class in a Discussion	1. Students answer the Test 2. Students discussion with their groups
	Confirmacy 1.Teacher collect the Test 2.Teacher examine students answer 3. Teacher discuss the answer of students together		1. Students give paper test to teacher 2.Students focuses on identifying meaning and uses of word clarifying ideas, highlightingmajor conclusion, identifying key elements and expanding ideas
3. Post Teaching	**Clossing activity**		
	1.Teacher make a learning summary and conclussion 2.Praying at the end of learning		1.Students repeat, write and remember the learning 2.Students Praying to end of learning

Based on table above, there are some procedures of applying to teaching semantic mapping in the classroom. It can be looked from the procedures that semantic map is also to make teacher and student active

and have interaction in teaching learning process in the classroom, especially in learning vocabulary.

3. **Conventional Strategy**

   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.[29] 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 envirorment. The teacher actually is the leader in the class.

   b. **Classification of Conventional Strategy**

   There are many teaching strategies that we can use in teaching and learning process. One of them is conventional or traditional strategy. Conventional strategy can be divided into some strategies, such as: lecture, project, catechize, discuss, problem solving, homework, recitation, demonstration and experiment, role play, and so on.[30] From those strategies, there is a strategy that is often used by the teacher, such as lecture strategy. It is a traditional strategy because it has been used for a long time in teaching and learning process. In this strategy, the teacher usually gives all of the explanation of the materials or it is a teacher centered. This traditional strategy, sometimes, will make the students be easier to feel bored.

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   [29] Hudson, The meaning of Conventional Teaching, accased on *http://www.conventional-strategy/topic/54372-strategy,* retrieved on november, 29-11-2018.
   [30] Syaiful Bahri Djamara, *Strategy Belajar Mengajar* (Jakarta: PT. Asdi Mhasatya, 2006).

Strategy of the teacher at the scholl, any of a wide variety of exercise, activity, or task used in the language classroom for realizing lesson objectives. Teacher's understanding on the learners will determine the strategy to use in their teaching.teachers's understanding of how he learns will determine their philosopy or education, teaching style, approach, methods, and classroom strategy. Therefor, strategy is variety or activities or procedure that used in the language classroom for theaching lesson objectives.

Based on the explanation above, it can be stated the approach is a belief about the language learning, applicability, and pedagogical. In addition, method is teacher and student's role with such features as linguistic and subject matter objectives. Furthermore, strategy is activity used in the language classroom for achieving the lesson goal.

B. Review of Related Findings

There are some related findings related to this research. The first is AhmadinAzhar. He concluded that there is the effect of using media video Dore The Explorer, where the mean score is 93.26 and control class is 83.04, with t_0 is higher than t_t (12.77 > 1.68). So, the implication of media video Dora the Explorer is better than conventional strategy.[31]

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[31] Ahmadin Azhari, "The Effect of Using Media Video Dora The Explorer to Students' Vocabulary Mastery at SD Negeri 200201/4 Padangsidimpuan 2011/2012 Academic Year" (STAIN Padangsidimpuan, 2012).

The second is Ahmad NurulFurqon ".[32]He concluded that there is no the effect of direct method, with t_0 is smaller than t_t(1,882> 87) . So, the null hypothesis is accepted and the alternative hypothesis is rejected, or it can be said that there is no significant influence of using direct method in teaching vocabulary.

The Third is SitiJuhaeriyah . She concluded that there is the effect of direct method, with t_0 is higher than t_t (5.758 > 2.65). So, the implication of direct method in teaching vocabulary is better than conventional strategy.[33]

The Fourth is Putri Ziko Mamura's . She concluded that the different result of students' vocabulary mastery. It is because the students' average scores of the post test after giving treatment increase 1,0517 from the students' average scores of the pre-test before giving the treatment.[34]

The Fifth is from Nidajumaliana . The result of comparison between the students' understanding in reading ability before and after using of Semantic mapping is using pre-tet and post-test, the score are 69.3 and 75.2. So there is significant influence of using of Semantic mapping on the

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[32] Ahmad Nurul Furqon, "Using Direct Method in Teaching Vocabulary at First Grade of Private Junior High School Muhammadiyah 44 Pamulang" (Syarif Hidayatullah State Islamic University, 2007).

[33] SitiJuhaeriyah

[34] Putri Ziko Mamura, "The Use of Semantic Mapping to Improve Vocabulary Mastery of The Fourth Grade Students' of SD Muhammadiyah Ngijon 1 in The Academic Year 2009/2010" (State University of Yogyakarta, 2011), http://eprints.uny.ac.id.

students understanding in reading ability at the eighth grade students of SMPN 1 KadipatenMajalengka.[35]

In summary, from the description above, the researcher concludes that strategy or methods can increase the students' vocabulary mastery. So, the researcher hopes that Semantic Mapping can increase the students' vocabulary mastery and this research was complete and contribute previous findings. Moreover, the researcher wants to research about "The Effect of Semantic Mapping Strategy On Vocabulary Mastery at Grade VII Students' of SMP N 5 Padangsidimpuan.

C. Conceptual Frame Work

Strategy in teaching vocabulary is the important thing that must be considered by the teacher to succeed the learning vocabulary. The teacher must choose the suitable strategy for the students so they are not easy to feel bored when following the vocabulary lesson. For junior high school's students, the teacher can choose the strategy which does not only ask them to learn. In the other word, the teacher creats some of strategy to teach vocabulary. One of them is semantic mapping. Semantic mapping is a strategy for reoresenting word concepts graphically. It helps the students to develop their vocabulary through a deeper understanding conceptual knowledge by displaying words into categories to show how they are related to each other. In additiom, semantic mapping is strategy that can be used in all disciplines to demonstrate the relationship among words in a text and

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[35] Nida Jumaliana, "The Influence of Using of Semantic Mapping OnThe Students Understanding in Reading Ability at The Eight Grade Students of SMP N 1 Kadipaten Majalengka" (Syekh Nurjati State Institute For Isamic Students, n.d.).

help deepen understending by creating associative network of word.The conceptual framework that will be done is as below :

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┌─────────────────────────────────────────┐
│  The students are difficult in remembering new │
│  vocabulary,easy to feel bored, lack of         │
│  motivation in learning and seldom practice the │
│  new vocabulary.                                │
└─────────────────────────────────────────┘
            ┌──────────────────────┐
            │   Semantic Mapping    │
            └──────────────────────┘
            ┌──────────────────────┐
            │       Pre-test        │
            └──────────────────────┘
┌──────────────────────────┐  ┌──────────────────────────┐
│ Experiment class with Semantic │  │ Control class with conventional │
│ Mapping Stratregy               │  │ Strategy                        │
│ (Class VII-3)                   │  │ (Class VII-4)                   │
└──────────────────────────┘  └──────────────────────────┘
            ┌──────────────────────┐
            │       Post-test       │
            └──────────────────────┘
            ┌──────────────────────┐
            │      Hypothesis       │
            └──────────────────────┘
┌──────────────────┐        ┌──────────────────┐
│        H1         │        │        H0         │
└──────────────────┘        └──────────────────┘
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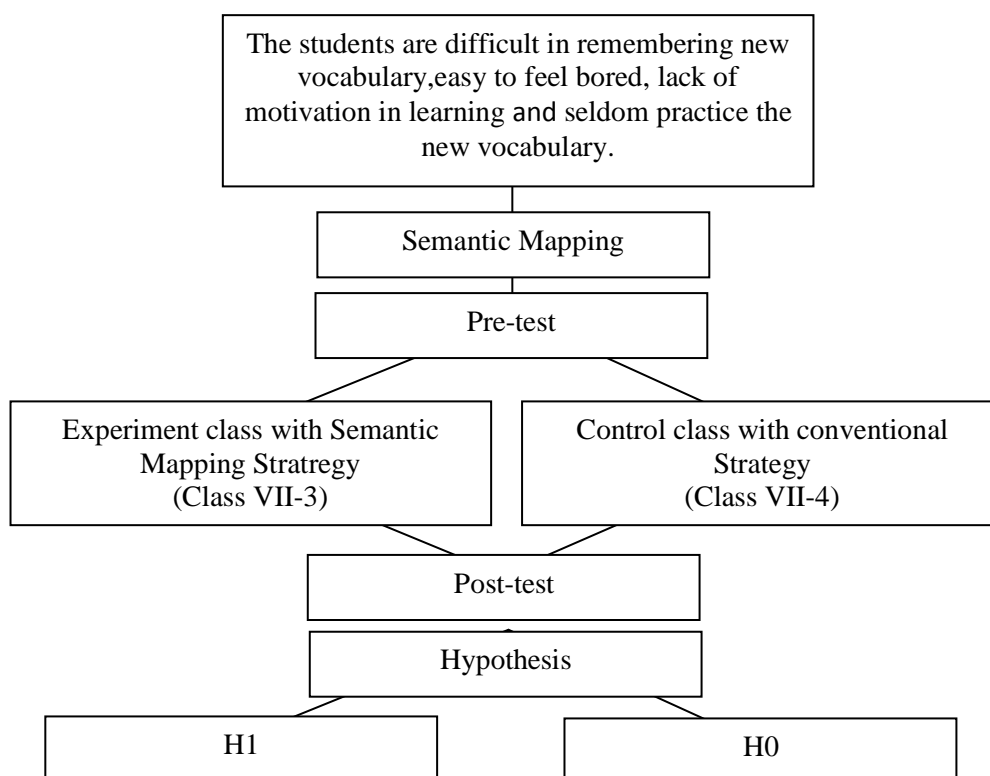
Picture 5. Conceptual Framework.

D.   Hypothesis

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

a. Students' vocabulary mastery by using Semantic Mapping is better than conventional strategy (H1). $\mu_1 > \mu_2$

b. Students' vocabulary mastery by using Semantic Mapping is not better than conventional strategy (H 0). $\mu_1 = \mu_2$

CHAPTER III

RESEARCH METHODOLOGY

A. Place and Schedule of the Research

This research will done at SMP Negeri 5 Padangsidimpuan. It is located at Perintis Kemerdekaan Street, Padangsidimpuan. It is number in Padangmatinggi. It is about 4 kilometers from the central town.

The subject of this research was seventh grade of students in SMP Negeri 5 Padangsidimpuan The schedule of this research was from October 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.[36] 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.[37]

In this research, the researcher have choosen two classes as experiment class and control class. The classes are VII-3 as experimental class and VII-8 as control class. For VII-3 class as experiment class, they will be taught by using semantic mapping strategy and VII-8 class as control class will be taught

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[36] L.R. Gay and Peter Airasian, *Educational Reasearch: Competences for Analysis and Aplication Sixt Edition* (USA: Prentice Hall, Inc., 2000).

[37] Burhan Bungin, *Metode Penelitian Kuantitatif* (Jakarta: Kencana, 2005).

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

Table II
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.[38] Besides, Burhan stated that population is all of the objects that become the target of the research.[39] It means that the population of this research is all of the VII class of SMP Negeri 5 Padangsidimpuan. It consists of 11 classes with 247 students. It can be seen in the following table:

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[38] Gay and Airasian, *Educational Reasearch: Competences for Analysis and Aplication Sixt Edition*.

[39] Bungin, *Metode Penelitian Kuantitatif*.

Table III
The Population of the Grade VII Students of SMPN 5
Padangsidimpuan

No	Class	Total of Students
1	VII-1	24
2	VII-2	26
3	VII-3	25
4	VII-4	24
5	VII-5	24
6	VII-6	27
7	VII-7	22
8	VII-8	25
9	VII-9	26
10	VII-10	26
11	VII-11	22
	TOTAL	247

(Source: data of students SMP Negeri 5 Padangsidimpuan from voice of headmaster)

2.Sample

Arikunto says, "Sample is a part of population which will be research".[40] 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 individu al is defined population have an equal and independent chhance of being selected for the sample.[41]

So, the research reason uses 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 plesmentest.

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[40] Bungin.
[41] Suharsimi Arikunto. *Op.Cit*. p.174.

Then, the research used the 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 classses.[42]

Finally, the research get two classes of grade VII, they are VII-3 as the experimental class and VII-8 as a control class.

Table IV:
Sample of the Research

The First Experimental Class	The Second Control class	Total
VII-3 = 25 Students	VII-8= 25 Students	50 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 VII-3 and control class is VII-8. The researcher chooses VII-3 consists of 25 students and VII-8 consists of 25 students. Therefore, total samples are 50 students. One class as experimental class and another one class as control class.

C. Definition of the Operational Variables

1. Semantic mapping technique is a visual Technique for vocabulary expansion and extension of knowledge by displaying in categories words related to one another. Semantic mapping is an adaptation of concept definition mapping but builds on students prior knowledge or schema.

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[42] Headmaster.*SMP Negeri 5 Padangsidimpuan.*

2. Students' vocabulary mastery is students' knowledge about the meaning of word that use to identify Identify out side home, Identify in home, Identify the school, Identify animal.

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.

The researcher was 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 V:
Indicators of Vocabulary mastery Pre-Test

No	Indicator	Topic	Number of items	Item
1	Identify the name of things	Thing in outside home	7, 8, 9, 12, 22, 19, 26, 30, 31, 37, 38, 49	12
		Thing in the home	1, 2, 5, 10, 15, 17, 27, 32, 39, 40, 46, 50	12
2	Memorize the word	School	4, 11, 13, 16, 18, 23, 24, 29, 33, 41, 42, 47	12
		Animal	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 VI:

Indicator of vocabulary mastery Post-Test

No	Indicator	Topic	Number of items	Item
1	Identify the meaning of word	Thing in outside home	51, 52, 53, 60, 61, 62, 72, 73, 83, 84, 87, 90	12
		Thing in the home	63, 64, 65, 78, 79, 80, 88, 89, 93, 94, 95, 96	12
2	Memorize the word	School	54, 55, 56, 66, 67, 68, 74, 75, 81, 82, 91, 92	12
		Animal	57, 58, 59, 69, 70,71,76, 77, 85, 86, 97, 98, 99,100	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

Anas Sudijono stated that Validity is a characteristic of the good test. To get the validity of an achievement test can be used two ways:[43]

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. In this research, the research used item validity. Before

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[43] Anas Sudijono, *Pengantar Evaluasi Pendidikan* (Jakarta: PT. Raja Grapindo Persada, 1996).

validity, the test consist of questions 100 of multiple choice questions, 50 for pre-test and 50 for post-test. Meanwhile, after validity the test consist of 70 questions, 35 for pre-test and 35 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.[44] 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:
$$R_{11} = \left(\frac{n}{n-1}\right) \left(\frac{S_{t^2} - \Sigma pq}{S_{t^2}}\right)$$

Where:
R$_{11}$: Reliability of the Instrument

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

N   : Total of Question

St^2 : Variants Total

P   : <u>Proporsi Subject who is right Answer(1)</u>

          N

Q   : <u>Proporsi Subject who is Wrong Answer (0).[45]</u>

           N

Reliability is a good character of the test that refers to the consistency

of the measurement. The test is reliable $r_{count} > r_{table}$ by using formulation KR-20

with r_{table} 0.70.

Criteria of test reliability is as follows:

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

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

r_{11} < 0,70   low correlation (un- reliable).[46]

F. Technique of Collecting Data

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

Semantic Mapping group and conventional group before the researcher

give treatment to the experimental group. In this case, the researcher uses

some steps. They are:

1) The researcher prepared the test 50 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.

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[45] Suharsimi Arikunto

[46] Sudijono, *Pengantar Evaluasi Pendidikan*.

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 Semantic Mapping in the experimental class. The researcher has some procedure. There are:

1) The researcher prepared 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:

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

Hypotheses is accepted if $F_{(count)} \leq F_{(table)}$
Hypotheses is rejected if $F_{(count)} \geq F_{(table)}$ [47].

H. Hypothesis test

Based on the hypothesis, the analysis of the data was 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

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[47] Agus Irianto, *Sttistik Konsep Dasar Dan Aplikasinya* (Padang: P2LPTK Departemen, Pendidikan Nasional, 2003).

research. So, the data will be analyzed by using the following *t-test* formula:[48]

H$_a$: $\mu_1 > \mu_2$

H$_o$: $\mu_1 \leq \mu_2$

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 Semantic Mapping at grade VII SMPN 3 Padangsidimpuan was not better than conventional Technique. To test the hypothesis, researcher uses the formula as follow:

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

Where:

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

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

n_1 = Total of experimental class sample

n_2 = Total of control class sample.[49]

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[48]Suharsimi Arikunto

[49] Sugiyono, *Statistika Untuk Penelitian* (Bandung: Alfabeta, 2011).

CHAPTER IV

THE RESULT OF RESEARCH

This chapter presents research result. It would be presented the result of research after giving the instrument to the respondent about vocabulary mastery at the grade VII SMP Negeri 5 Padangsidimpuan. The researcher has calculated the data using pre test and post test. Applying quantitative research, the research used the formulation of T-test. Next, researcher has describe the result based on the data that has been researched as follow:

A. Description of Data

1. Description of Data Before Semantic Mapping Technique Score of Pre-Test Experimental Class I

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

Table 7
The Score of Experimental Class in Pre-test

Total	1835
Highest score	85
Lowest score	35
Mean	61.19
Median	58.8
Modus	56.46
Range	50
Interval	9
Standard deviation	13.29
Variants	171.86

Based on the above table the total score of experimental class in pre-test was 1835, mean was 61.19, standard deviation was 13.29, variants was171.86, median was 58.5, range was 50, modus was 56.46, interval was 9. The researcher got the highest score was 85 and the lowest score was 35. It can be seen on appendix 17. Then, the calculation of the frequency distribution of the students' score of experiment class can be applied into table frequency distribution as follow:

Table 8
Frequency Distribution of Experimental Class (Pre-test)

No	Interval	Mid-Point	Frequency	Percentages
1	35 – 43	39	2	6.67%
2	44 – 52	48	4	20%
3	53 – 61	57	10	33.33%
4	62 – 70	66	5	16.67%
5	71 – 79	75	3	6.67%
6	80 – 88	84	6	16.67%
$i = 9$		-	30	100%

From the table above, the students' score in class interval between 35 – 43 was 2 students (6.67%), class interval between 44 – 52 was 6 students (20%), class interval between 53 – 61 was 10 students (33.33%), class interval between 62 – 70 was 5 students (16.67%), class interval between 71 – 79 was 2 students (6.67%), and the last class interval between 80 – 838 was 5 students (16.67%).

In order to get description of the data clearly and completely, the researcher presents them in histogram on the following figure:
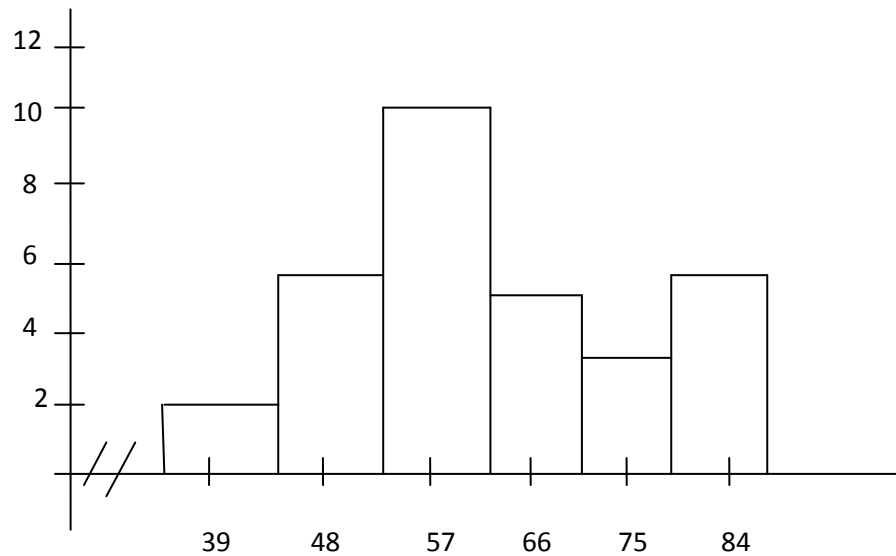
Figure 1: Diagram the Result Score of Students Vocabulary Mastery in Experimental Class (Pre-test)

From the histogram above, the students' score 39 was 2 students, the students' score 48 was 6 students, the students' score 57was 10 students, the students' score 66 was 5 students, the students' score 75 was 2 students,and the last the students' score 84 was 5 students.

a) **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:

Table 9
The Score of Control Classin Pre-test

Total	1705
Highest score	85
Lowest score	30
Mean	59.9
Median	60.9
Modus	64.5
Range	55
Interval	10
Standard deviation	17.08
Variants	292.21

Based on the above table the total score of control class in pre-test was 1705, mean was 59.9, standard deviation was 17.08, variants was292.21, median was 60.9, range was 55, modus was 64.5, interval was 10. The researcher got the highest score was 85 and the lowest score was 30. It can be seen on appendix 7. Then, the calculation of the frequency distribution of the students' score of control class can be applied into table frequency distribution as follow:

Table 10
Frequency Distribution of Students' Score

No	Interval	Mid-Point	Frequency	Percentages
1	30 – 39	35.5	4	13.33%
2	40 – 49	44.5	5	16.67%
3	50 – 59	54.5	5	16.67%
4	60 – 69	64.5	7	23.33%
5	70 – 79	74.5	5	16.67%
6	80 – 89	84.5	4	13.33%
$i = 10$		-	30	100%

From the table above, the students' score in class interval between 30–39 was 4 students (13.33%), class interval between 40 – 49 was 5 students (16.67%), class interval between 50 – 59 was 5 students (16.67%), class interval between 60 – 69 was 7 students (23.33%), class interval between 70 – 79 was 5students (16.67%), and the last class interval between 80 – 89 was4 students (13.33%).

In order to get description of the data clearly and completely, the researcher presents them in histogram on the following figure:
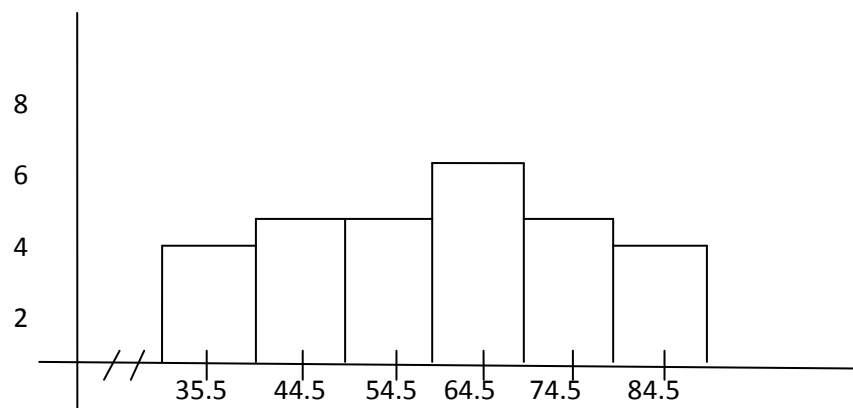
Figure 2: Diagram the Result Score of Students Vocabulary Mastery in Control Class (Pre-test)

From the histogram above, the students' score 34.5 was 4 students, the students' score 44.5 was 5 students, the students' score 54.5was 5 students, the students' score 64.5 was 7 students, the students' score 74.5 was 5 students,and the last the students' score 84.5 was 4 students.

2. **Description of Data After Semantic Mapping Strategy**
   a. **Score of Post-Test 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 Semantic Mapping Strategy can be seen in the following table:

Table 11
The Score of Experimental Class in Post-test

Total	2275
Highest score	90
Lowest score	55
Mean	76.1
Median	78.5
Modus	81.92
Range	35
Interval	6
Standard deviation	9.3
Variants	91.52

Based on the above table the total score of experiment class in post-test was 2275, mean was 76.1 standard deviation was 9.3, variants was 91.52, median was 78.5, range was 35, modus was 81.92, interval was 6. The researcher got the highest score was 90 and the lowest score was 55. It can be seen on appendix 20. Then, the calculation of the frequency distribution of the students' score of experimental class can be applied into table frequency distribution as follow:

Table 12
Frequency Distribution of Students' Score

No	Interval	Mid-Point	Frequency	Percentages
1	55 – 60	57.5	3	10%
2	61 – 66	63.5	2	6.67%
3	67 – 72	69.5	5	16.67%
4	73 – 78	75.5	5	16.67%
5	79 – 84	81.5	9	30%
6	85 – 90	87.5	6	20%
i =6		-	30	100%

From the table above, the students' score in class interval between 55 – 60 was 3 students (10%), class interval between 61 – 66 was 2 students (6.67%), class interval between 67 – 72 was 5 students (16.67%), class interval between 73 – 78was 5 students (16.67%), class interval between 79 – 84 was 9 students (30%), and the last class interval between 85 – 90 was 6 students (20%).

In order to get description of the data clearly and completely, the researcher presents them in histogram on the following figure:
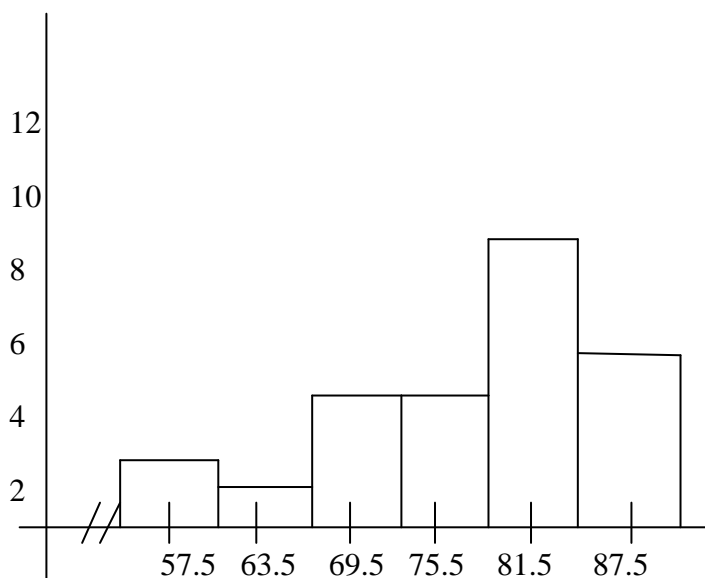
Figure 3: Histogram the Result of Students Vocabulary Mastery in Experimental Class (Post-test)

From the histogram above, the students' score57.5 was 3 students, the students' score 63.5 was 2 students, the students' score69.5 was 5 students, the students' score75.5 was 5 students, the students' score 81.5 was 9 students, and the last the students' score 87.5 was 6 students.

b. **Score of Post-Test Control Class**

As the control class, the researcher took class VII-3. The result that had been gotten by the students in answering the question (test) after the researcher taught the vocabulary mastery by using conventional strategy can be seen in the following table:

Table 13
The Score of Control class in Post-test

Total	2190
Highest score	90
Lowest score	50
Mean	72.81
Median	74.7
Modus	71.48
Range	40
Interval	7
Standard deviation	10.36
Variants	102.75

Based on the above table the total score of control class in post-test was 2190, mean was 72.81 standard deviation was 10.36, variants was102.75, median was 74.7, range was 40, modus was 71.48, interval was 7. The researcher got the highest score was 90 and the lowest score was 50. It can be seen on appendix 20. Then, the calculation of the frequency distribution of the students' score of control class can be applied into table frequency distribution as follow:

Table 14
Frequency Distribution of Students' Score

No	Interval	Mid-Point	Frequency	Percentages
1	50 – 56	53	3	10%
2	57 – 63	60	1	3.33%
3	64 – 70	67	10	33.33%
4	71 – 77	74	5	16.67%
5	78 – 84	81	6	20%
6	85 – 91	88	5	16.67%
$i =7$		-	30	100%

From the table above, the students' score in class interval

between 50 – 56 was 3students (10%), class interval between 57 – 63

was 1 students (3.33%), class interval between 64 – 70 was 10

students (33.33%), class interval between 71 – 77was5 students

(16.67%), class interval between 78 – 84 was 6 students (20%), and

the last class interval between 85 – 91 was 5 students (16.67%).

In order to get description of the data clearly and completely,

the researcher presents them in histogram on the following figure:
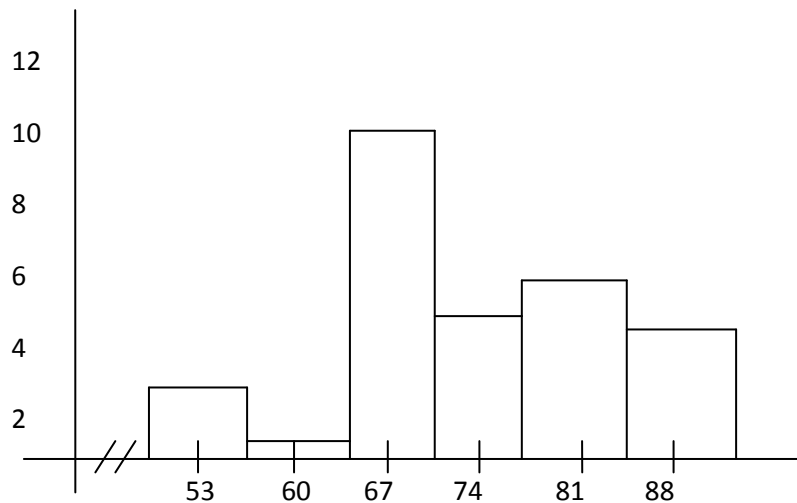
Figure 4: Diagram the Result Score of Students Vocabulary Mastery in Control Class (Post-test)

From the histogram above, the students' score53 was 3students, the

students' score 60 was 1 student, the students' score67was 10

students, the students' score 74 was 5 students, the students' score 81

was 6 students, and the last the students' score 88 was 5 students.

3. Description of Data using Semantic Mapping Strategy

a. The Comparison Data between Pre-Test and Post-Test by Using Semantic Mapping Strategy

The comparison score between pre-test and post-test of

experimental class can bee seen in the following table:

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

Description	Pre-Test	Post-Test
Total	1835	2277
Highest score	85	90
Lowest score	35	55
Mean	61.19	76.1
Median	58.8	78.5
Modus	56.46	81.92
Range	50	35
Interval	9	6
Standard deviation	13.29	9.3
Variants	171.86	91.52

Based on the above table the total score of experimental class in

pre-test was 1835; post-test was 2275,pre-test mean score was 61.19;

post-test was 76.1, pre-test standard deviation was 13.29; post-test

was 9.3, pre-test variants was 171.86; post-test was 91.52, pre-test

median was 58.8; post-test was 78.5, pre-test range was 50; post-test

was 35, pre-test modus was 56.46; post-test was 81.92, pre-test interval was 9; post-test was 6. The researcher got the highest score of pre-test was 85 and the lowest score was 35; mean while the highest score of post-test was 90 and the lowest score was 55.

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:
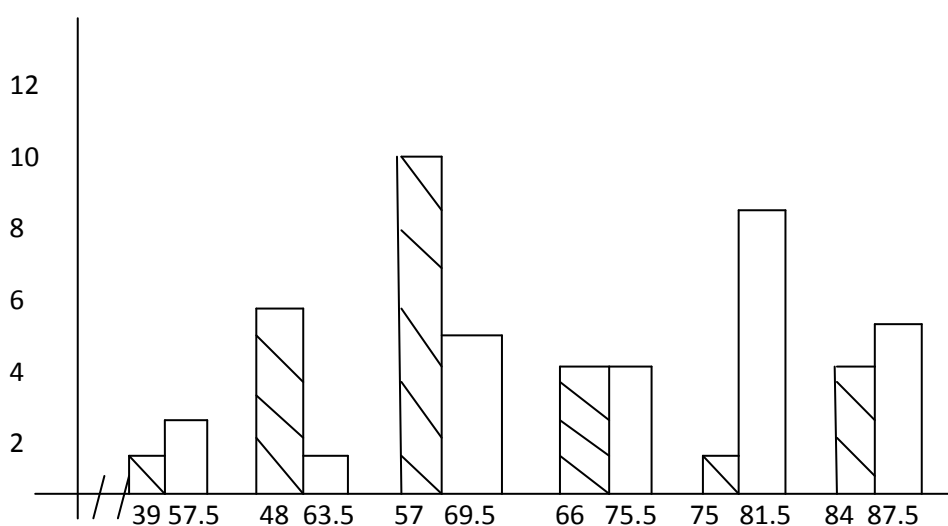
Figure 5: Diagram the Comparison Data of Students Vocabulary Mastery in Pre-test and Post-test (Experimental Class)

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

b. The Comparison Data between Pre-Test and Post-Test by Using Conventional Strategy

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

Table 16
The Comparison Data of Control Class
in Pre-test and Post-test

Description	Pre-test	Post-test
Total	1705	2190
Highest score	85	90
Lowest score	30	50
Mean	59.9	72.81
Median	60.9	74.7
Modus	64.5	71.48
Range	55	40
Interval	10	7
Standard deviation	17.08	10.36
Variants	292.21	102.75

Based on the above table the total score of control class in pre-test was 1705; post-test was 2190,pre-test mean score was 59.9; post-test was 72.81, pre-test standard deviation was 17.08; post-test was 10.36, pre-test variants was 292.21; post-test was 102.75, pre-test median was 60.9; post-test was 74.4, pre-test range was 55; post-test was40, pre-test modus was 64.5; post-test was 71.48, pre-test interval was 10; post-test was 7. The researcher got the highest score of pre-

test was 85and the lowest score was 30; mean while the highest score of post-test was 90 and the lowest score was 50.

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:
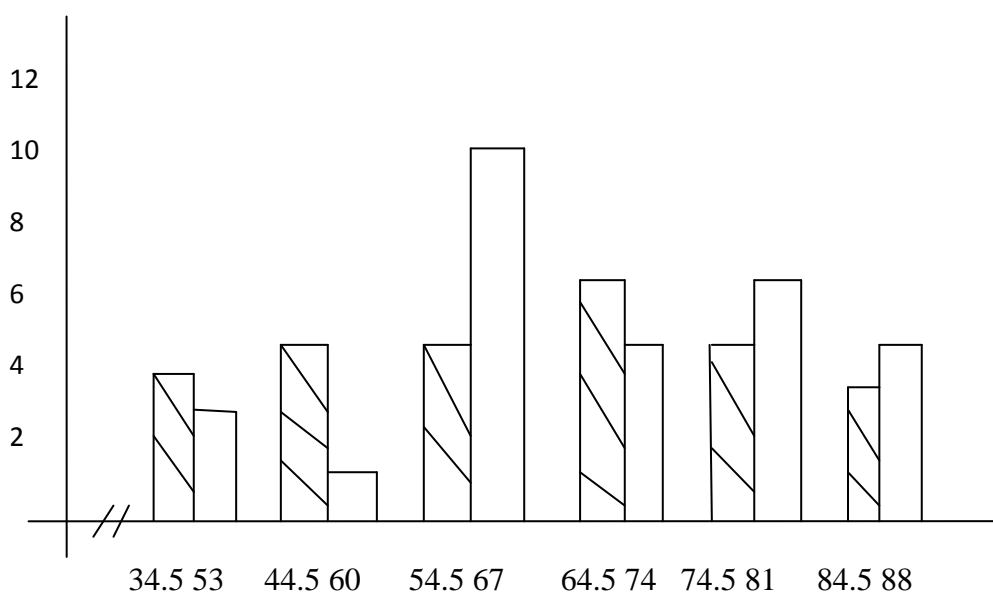
Figure 6: Diagram the Comparison Data of Students Vocabulary Mastery in Pre-test and Post-test (Control Class)

From the histogram above, the students' scores of control classin post-testwas higher than pre test.

c. **The Comparison Data between Using Semantic Mapping Strategy and Conventional Strategy in Pre Test**

Before the researcher gave treatment to the class, researcher gave pre test to both of class (VII-3 as experimental and VII-8 as control class). In pre test, the researcher did not apply treatment to

experimental and control class. The researcher got the comparison

data between pre test score in experimental and control class before

gave a treatment. The comparison data can be seen in the following

histogram:
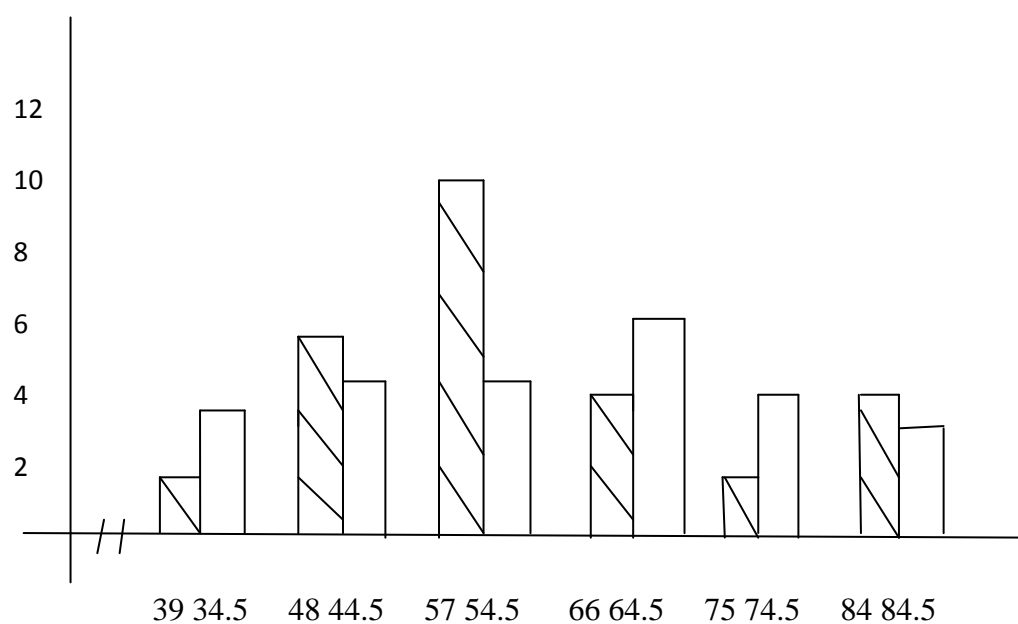
Figure 7: Diagram the Comparison Data of Students Vocabulary Mastery in Experimental and Control Class (Pre-test)

From the description of comparison data above, it can be

concluded that the students' score of experimental class was higher

than the students' score of control class in answering the pre test.

d. **The Comparison Data between Using Semantic Mapping Strategy**

and Conventional Strategy in Post Test

After the researcher gave a treatment to one of class as

experimental class by using Semantic Mapping Strategy and other

class was not gave a treatment as control class. 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:
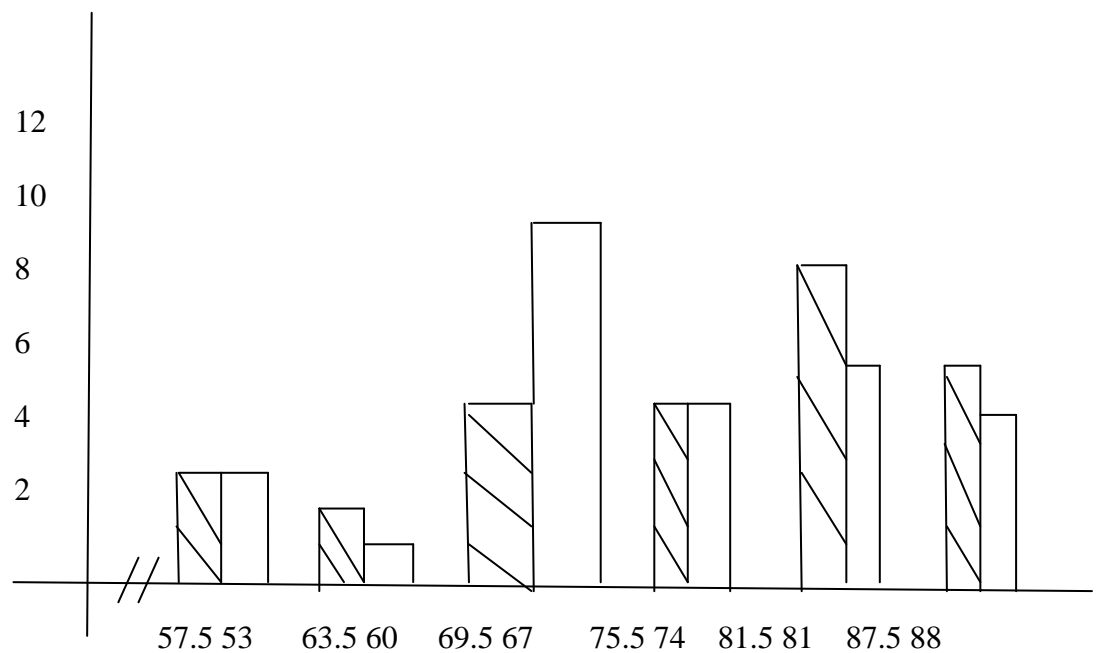
Figure 8: Diagram the Comparison Data of Students Vocabulary Mastery in Experimental and Control Class (Post-test)

From the description of comparison data above, it can be concluded that the students' score of experimental class by using Semantic Mapping Strategy was higher than the students' score of control class by using Conventional technique.

A. The Technique of Data Analysis

1. Requirement Test

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

<div align="center">

Table 17
Normality and Homogeneity in Pre-Test

</div>

Class	Normality Test		Homogeneity Test	
	x_{count}	x_{table}	f_{count}	f_{table}
Experiment Class	-2.71	11.070		
Control Class	-2.63	11.070		1.70<4.18

Based on the above table researcher calculation, the score of experimental class Lo = -2.71 < Lt = 11.070 with n = 30 and control class Lo = -2.63< Lt = 11.070 with n = 30, and real level α 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. It can be seen in appendix17.

The coefficient of F_{count}= 1.70 was compared with F_{table}. Where F_{table} was determined at real α 0.05, and the different numerator dk = n-1 = 30-1 = 29 and denominator dk n-1 = 30–1 = 29. So, by using the list of critical value at F distribution is got $F_{0.05}$ = 4.18. It showed that F_{count} 1.70 <F_{table} 4.18. So, it shows that both of experimental and control class were homogeneous. The calculation can be seen on the appendix18.

b. **Normality and Homogeneity of Experimental and Control Class in Post-Test**

<div align="center">

Table 18
Normality and Homogeneity in Post-Test

</div>

Class	Normality Test		Homogeneity Test	
	x_{count}	x_{table}	f_{count}	f_{table}
Experimental Class	8.92	11.070	1.12 <4.18	
Control Class	6.71	11.070		

Based on the table above researcher calculation, the score

of experiment class Lo = 8.92< Lt = 11.070 with n = 30 and

control class Lo = 6.71 < Lt = 11.070 with n = 30, and real level

α 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. It can be seen in appendix20.

The coefficient of F_{count}= 1.12 was compared with F_{table}.

Where F_{table} was determined at real α 0.05, and the different

numerator dk = n-1 = 30-1 = 29 and denominator dk n-1 = 30-1 =

29. So, by using the list of critical value at F distribution is got $F_{0.05}$

= 4.18. It showed that F_{count} 1.12 <F_{table} 4.18. So, it shows that both

of experimental and control class were homogeneous. The

calculation can be seen on the appendix 21.

2. **Hypothesis Test**

After calculating the data of post-test, researcher found that post-

test result of experimental class 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 "Semantic Mapping Strategy has effect on vocabulary

mastery at the grade VII SMP N 5 Padangsidimpuan". The calculation

can be seen on the appendix 22 and 23. The result of t-test was as follow:

Table 19

Result of T-test from the Both Averages

Pre-test		Post-test	
t_{count}	t_{table}	t_{count}	t_{table}
0.329	1.67155	2.205	1.67155

The test hypothesis have two criteria. First, if $t_{count}<t_{table}$, H_0 is

accepted. Second, $t_{count}>t_{table}$, H_a is accepted. Based on researcher

calculation in pre test, researcher found t_{count}0.329 while t_{table}1.67155 with

opportunity $(1-\alpha) = 1\text{-}5\% = 95\%$ and dk $= _{n1 + n2} - 2 = 30 + 30 - 2 = 58$.

Cause $t_{count}<t_{table}$(0.329 <1.67155), it meant 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_{count}2.205 while t_{table}1.67155 with opportunity $(1-\alpha) = 1\text{-}5\% = 95\%$ and

dk $= _{n1 + n2} - 2 = 30 + 30 - 2 = 58$. Cause $t_{count}>t_{table}$(2.205 >1.67155), it

meant 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 Semantic Mapping Strategy was 76.1 and

mean score of control class was 72.81 that was taught by using

conventional Strategy. Thus, the students' KKM score in their learning is

75 that become their category in achievement. So, there was the effect of

Semantic Mapping Strategy on vocabulary mastery at the grade VII SMP

N 5 Padangsidimpuan.

B. The Discussion

There are some related findings related to this research. The first is

Ahmadin Azhar "The Effect of Using Media Video Dora the Explorer to

Students' Vocabulary Mastery at SD Negeri 200201/4 Padangsidimpuan". He

concluded that there is the effect of using media video Dore The Explorer,

where the mean score is 93.26 and control class is 83.04, with t_0 is higher than

t_t (12.77 > 1.68). So, the implication of media video Dora the Explorer is better

than conventional strategy.[50]

The second is Ahmad Nurul Furqon "Using Direct method in Teaching

Vocabulary at First Grade of Private Junior High School Muhammadiyah 44

Pamulang.[51] He concluded that there is no the effect of direct method, with t_0 is

smaller than t_t (1,882 > 87) . So, the null hypothesis is accepted and the

alternative hypothesis is rejected, or it can be said that there is no significant

influence of using direct method in teaching vocabulary.

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[50] Ahmadin Azhari, "The Effect of Using Media Video Dora The Explorer to Students' Vocabulary Mastery at SD Negeri 200201/4 Padangsidimpuan 2011/2012 Academic Year" (STAIN Padangsidimpuan, 2012).
[51] Ahmad Nurul Furqon, "Using Direct Method in Teaching Vocabulary at First Grade of Private Junior High School Muhammadiyah 44 Pamulang" (Syarif Hidayatullah State Islamic University, 2007).

The Third is Siti Juhaeriyah "The Influence of Using Direct Method in Teaching Vocabulary at the First Grade of SMP YPI Bintaro". She concluded that there is the effect of direct method, with t_0 is higher than t_t (5.758 > 2.65). So, the implication of direct method in teaching vocabulary is better than conventional strategy.[52]

The Fourth is Putri Ziko Mamura's "The Use of Semantic Mapping to Improve Vocabulary Mastery of The Fourth Grade Students of SD Muhammadiyah Ngijon 1 in The Academic Year of 2009/2010". She concluded that the different result of students' vocabulary mastery. It is because the students' average scores of the post test after giving treatment increase 1,0517 from the students' average scores of the pre-test before giving the treatment.[53]

The Fifth is from Nida jumaliana "The influence of using of Semantic Mapping on the students understanding in Reading Ability at the Eight Grade Students of SMP N 1 Kadipaten Majalengka". The result of comparison between the students' understanding in reading ability before and after using of Semantic mapping is using pre-tet and post-test, the score are 69.3 and 75.2. So there is significant influence of using of Semantic mapping on the students

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[52] Siti Juhaeriyah
[53] Putri Ziko Mamura, "The Use of Semantic Mapping to Improve Vocabulary Mastery of The Fourth Grade Students' of SD Muhammadiyah Ngijon 1 in The Academic Year 2009/2010" (State University of Yogyakarta, 2011), http://eprints.uny.ac.id.

understanding in reading ability at the eighth grade students of SMP N 1

Kadipaten Majalengka.[54]

C. The Threats of the Research

The researcher found the threats of this research as follows:

1. The result of learning could not be considered as the result of treatment at all because the variations of students' learning activity outside of school. For example there were some students who followed English course, diligent to study at home, or some of them learnt at school only. So that, there was possibility for bias in the result of research.

2. There were some students that were lack of serious to answer the test in pre-test and post-test. It would be possible threat the research. So that, there was possibility the researcher cannot reach the validity of trustworthiness of data.

3. Students' attitude could be change to be better or worse when the teacher who teaches them changes. So that it would be possible give the influence to the result of the research.

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[54] Nida Jumaliana, "The Influence of Using of Semantic Mapping OnThe Students Understanding in Reading Ability at The Eight Grade Students of SMP N 1 Kadipaten Majalengka" (Syekh Nurjati State Institute For Isamic Students, n.d.).

CHAPTER V

CONCLUSION AND SUGGESTION

A. Conclusions

Based on the result of data analysis, the researcher take some concluded as follow:

1. Before using Semantic Mapping Strategy, on vocabulary mastery was unsatisfied. The mean score of pre-test for the experimental class that used Semantic Mapping Strategy was 61.19.

2. After using Semantic Mapping Strategy, the mean score of experimental class was higher than before using Semantic Mappig Strategy. The mean score of post-test for the experimental class was 76.1.

3. The researcher found the research result of t-test where t_{count} was higher than t_t, t_{count} was 2.205 and t_t was 1.67155 (2.205 > 1.67155). It meant that there was effect of Semantic Mapping Strategy on vocabulary mastery at the grade VII SMP N 5 Padangsidimpuan where H_a was accepted and H_0 was rejected.

B. Suggestions

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

1. For the teacher, especially teachers of SMP Negeri 5 Padangsidimpuan to always used the semantic mapping strategy the teaching process especially in vocabulary mastery.

2. To the headmaster, especially the headmaster of SMP Negeri 5 Padangsidimpuan can be given the espionage to the educator that there are many strategy can be used in teaching and learning process. And the semantic mapping strategy is suitable strategy in vocabulary mastery.

3. The students' mastery of using semantic mapping strategy is necessary to be developed, it was useful toward students' vocabulary mastery.

4. The writer hoped that this research was continued by other writer by taking one of the variables of this research to develop knowledge.

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CURRICULUM VITAE

A. Identify

    Name   : Emi Fitriyani

    Reg. Nim   : 1420300033

    Place/Birth   : Padangsidimpuan/ 28 August 1995

    Sex   : Female

    Religion   : Moeslim

    Address: Tamiang Ampalu, Kec. Koto Balingka Pasaman Barat.

B. Parents

    Father's Name:Syaparuddin

    Mother's Name   : Rostini

C. Education Background

1. Graduated from Elementary School SD Negeri 200211 Padang Matinggi 2007.

2. Graduated from Junior High School SMP N 1 Koto Balingka 2011.

3. Graduated from Senior High School SMA N 1 Koto Balingka 2014.

4. Be University student IAIN Padangsidimpuan 2014.

Experimental class

LEARNING MATERIAL

A. Desenition of Noun

Noun Is a word that function as the name of some specific thing or set of things,such as living creatures,objects,places, actions, qualities, states of existence, or ideas.

B. Concept Map
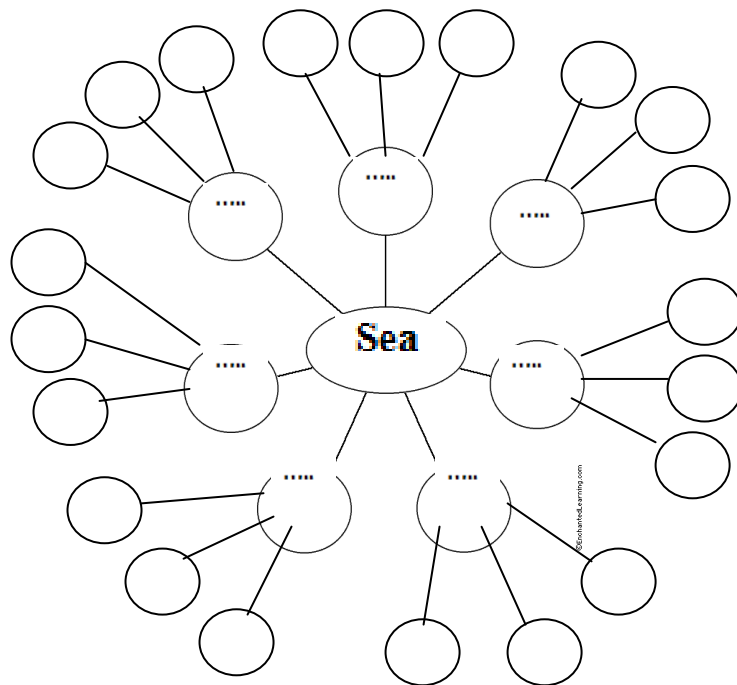
C. Material of Vocabulary

1. Identify vocabulary inside of Outside home
2. Identify Vocabulary inside of Home
3. Identify Vocabulary inside of school
4. Identify Vocabulary inside of Animal

Appendix 1
Experimental Class by Using Semantic Mapping

RENCANA PELAKSANAAN PEMBELAJARAN (RPP)

Nama sekolah	: SMP Negeri 5 Padangsidimpuan
Mata Pelajaran	: Bahasa Inggris
Kelas/Semester	: VII³ / Genap
Tema	: *Noun (Outside home, Home, School, Animal)*
Alokasi Waktu	: 4 x 40 menit

Standar Kompetensi :

- Menemukan new vocabulary / kosakata yg berhubungan dengan keyword atau kata kunci yg telah diberikan guru.

Kompetensi Dasar :

- siswa mampu menemukan new vocabulary yaitu dalam bentuk noun/kata benda baru yg berhubungan dengan keyword/kata kunci yg diberikan oleh guru

Indikator :

a. Mengidentifikasi noun *(Outside home, Home, School, Animal)* yang diberikan oleh guru.

b. Menyebutkan noun *(Outside home, Home, School, Animal)* yang guru tunjuk dengan benar.

c. Menuliskan nama noun *(Outside home, Home, School, Animal,)* tersebut dengan ejaan yang benar.

Tujuan pembelajaran : Siswa mampu menemukan new vocabulary yg ada di dalam rumah, hutan, olahraga dan sekolah, serta mampu mengembangkan, memperbanyak vocabulary siswa dan memperluas wawasan siswa dalam vocabulary

\

Metode/strategi pembelajaran   **:** *Semantic Mapping Technique*

Materi Pembelajaran   **:***Noun (Outside home, Home, School, Animal)*

Kegiatan Pengajaran

	Teacher activities	Procedure of Semantic Mapping	Students activities
1. Pre Teaching	**Opening activity**		
	- Teacher Give Salam (Greeting)		- Students answer Salam - Students responding to the teacher
	- Teacher ask student to Pray		- Students Pray
	- Teacher Reading Present list		- Students answer present and not present
	- Teacher give Motivation		- Students Listening to Teacher
	- Teacher give illustration about topic		- Students see and Focus to the Teacher
2.While Teaching	**Exploracy**		
	- Teacher explain about semantic mapping	- Select a word central to the topic.	- Students pay attention to the teacher explanation
	- Teacher give some keyword about topic		- Students asked the teacher - Students choose one topic
	- Teacher display the topic (Noun)	- Display the target word	- Students pay attention to the teacher
	Elaboracy		
	- Teacher splits the students into several groups	- invite students to generate as many words as possible that relate to thetarget word	- Students sit together with their groups
	- Teacher ask the students to search for as many word as possible with noun		- Students Brainstorm - Students record the word on a chart or on the chalkboard
	- Teacher ask the students to write the generated words in categories	- Have the students write the generated words in categories	- Students discuss How the information could be placed into categories - Students exchange ideas with each other
	- Teacher ask	- Have the students	- Students label and

	students label categories	label categories	add extra information to each category
	- Teacher ask students to construct a map	- From this list, construct a map	- Students construct a map
	- Teacher give a test to Students	- Lead the class in a Discussion	- Students answer the Test
	- Teacher give time to students for doing the test - Teacher lead the class in discussion		- Students discussion with their groups
	Confirmacy		
	- Teacher collect the Test		- Students give paper test to teacher
	- Teacher examine students answer - Teacher discuss the answer of students together		- Students focuses on identifying meaning and uses of word clarifying ideas, highlightingmajor conclusion, identifying key elements and expanding ideas
4. Post Teaching	**Clossing activity**		
	- Teacher make a learning summary and conclussion		- Students repeat, write and remember the learning
	- Praying at the end of learning		- Students Praying to end of learning
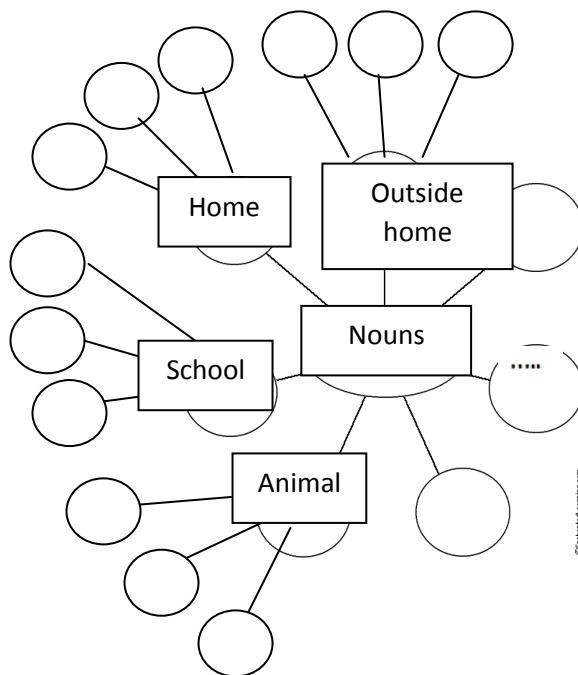
Media dan sumber pembelajaran :

    a. Media Pembelajaran : Tabel *Semantic Mapping*

    b. Sumber pembelajaran : Buku "When English Rings a Bell"

Rubrik Penilaian   **:**Setiap nama *Noun(Outsidehome,Home, School, Animal)* dengan penulisan yangtepat dan benar diberi skor 2.

Indikator pencapaian kompetensi	Teknik penilaian	Bentuk instrument	Instrument soal
1. Mengidentifikasi Outside home 2. Mengidentifikasi the Home 3. Mengidentifikasi the school 4. Mengidentifikasi the Animal	Tes tulisan	Multiple choice	Memilih jawaban yang sesuai dengan petunjuk soal

Jumlah skor maksimal keseluruhan adalah 100.

Setiap jawaban yang benar diberi skor 2.

Jumlah skor keseluruhan 2 x 50 =100.

Padangidimpuan,   2019

Validator   **Researcher**

Marlina Hasibuan, S.Pd   **EMI FITRIYANI**
NIP. 19780921 2000604 2 017   **14 203 000 33**

Control Class By Using Conventional Strategy

RENCANA PELAKSANAAN PEMBELAJARAN
(RPP)

Nama Sekolah	: SMP Negeri 5 Padangsidimpuan
Mata Pelajaran	: Bahasa Inggris
Kelas/Semsester	: VII^8 / Genap
Alokasi Waktu	: 4 x 40 menit

Standar Kompetensi :

- Menemukan new vocabulary / kosakata yg berhubungan dengan keyword atau kata kunci yg telah diberikan guru.

Kompetensi Dasar :

- siswa mampu menemukan new vocabulary yaitu dalam bentuk noun/kata benda baru yg berhubungan dengan keyword/kata kunci yg diberikan oleh guru

Indikator :

d. Mengidentifikasi noun *(Outside home, Home, School, Animal)* yang diberikan oleh guru.

e. Menyebutkan noun *(Outside home, Home, School, Animal)* yang guru tunjuk dengan benar.

f. Menuliskan nama noun *(Outside home, Home, School, Animal)* tersebut dengan ejaan yang benar.

Tujuan pembelajaran : Siswa mampu menemukan new vocabulary yg ada di dalam rumah, hutan, olahraga dan sekolah, serta mampu mengembangkan, memperbanyak vocabulary siswa dan memperluas wawasan siswa dalam vocabulary

Metode/strategi pembelajaran : *GTM (Grammar Translation Method)*

Materi Pembelajaran : *Noun (Outside home, Home, School, Animal)*

Kegiatan Pengajaran

1. **Pendahuluan/pre teaching :**

   a. Greeting (memberi salam dan berdoa)

   b. Mengabsen siswa

   c. Menjelaskan pentingnya materi yang akan dipelajari berikut kompetensi yang harus dikuasai siswa.

2. **Kegiatan inti/During Teaching:** **:**

   1. Guru memberikan teks
   2. Guru menunjukkan Vocabulary yang berhubungan.
   3. Guru menyuruh siswa   mencari arti kosakata yang akan dipelajari di dalam kamus
   4. Guru menyuruh siswa untuk menghapalkan kosakata yang telah dicari
   5. Guru memberikan soal kepada murid dan Kemudian menterjemahkannya

3. **Penutup/post teaching   :**

   a. Guru membuat kesimpulan tentang materi yang sudah dijelaskan.

   b. Guru memberikan test kepada siswa

Media dan sumber pembelajaran :

   a. Media Pembelajaran   : Text Book
   b. Sumber pembelajaran   : " When English Rings a Bell"

Rubrik Penilaian   **:** Setiap nama *noun Noun (Outside home, Home, School Animal)* dengan penulisan yang tepat dan benar diberi skor 2.

Indikator pencapaian kompetensi	Teknik penilaian	Bentuk instrument	Instrument soal
5. Mengidentifikasi Outside home 6. Mengidentifikasi the Home 7. Mengidentifikasi the School 8. Mengidentifikasi the Animal	Tes tulisan	Multiple choice	Memilih jawaban yang sesuai dengan petunjuk soal

Jumlah skor maksimal keseluruhan adalah 100.

Setiap jawaban yang benar diberi skor 2.

Jumlah skor keseluruhan 2 x 50 =100.

Padangidimpuan,   2019

Validator   **Researcher**

Marlina Hasibuan, S.Pd   **EMI FITRIYANI**
NIP. 19780921 2000604 2 017   **14 203 000 33**

Appendix 3
VALIDITY INSTUMENTS
FOR 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. Periksalah jawaban anda dengan teliti sebelum dikumpulkan kepada guru
6. Test ini hanya bertujuan untuk mengetahui data-data siswa tentang pemahaman menghapal kosakata
7. Waktu yang tersedia 45 menit

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

1. Someone use…….. for eat meatball or mie, except.
   a. Forks   c. Spoon
   b. Chop stick   d. Wood

2. My father type the letter by using……
   a. Library   c. Pen
   b. Notebook   d. Blanket

3. The name of animal can fly and have wings, except……
   a. Bird   c.Goose
   b. Tiger   d. Butterfly

4. I'm ….. I study in the school except Sunday and holiday
   a. Regent   c. Police
   b. Student   d. River

5. My grandfather is sitting on the……
   a. Chair   c. River
   b. Bed   d. Table

6. Where is the animals live in the sea…….

a. Crab   c. Bear
b. Wolf   d. Dog

7. Devi is driying clothes on the…….
   a. Clothesline   c. Garden
   b. Car   d. Swimming pool

8. My sister take the fruits and vegetable from…….
   a. Garden   c. House
   b. Cupboard   d. Library

9. The name of place to find many book is…….
   a. Library   c.Train
   b. House   d. Bus

10. Where is the mother cook the rice…….
    a. In rice cooker   c. Bottle
    b. Trademark   d. frying pan

11. I and my friend studying language english in……..
    a. Garden   c. School
    b. Kitchen   d. Mosque

12. My family go to …….. for friying
    a. The kingdom   c. China's great wall
    b. Library   d. The Mosque

13. I'm in the school, If I'm hungry I'II go to the
    a. Home   c. Canteen
    b. Library   d. classroom

14. The name of animal live in the river and land…….
    a. Tiger   c. A frog
    b. Cat   d. Lion

15. Where is the students throw the rubbish…….
    a. Dustbin   c. Plate
    b. Glass   d. Paper

16. I go to school. School means……
    a. Pasar   c. Rumah

b. Sekolah   d. Kantor

17. Someone who know about information ad watch movie from……
    a. Television   c. Radio
    b. Human   d. Newspaper

18. Someone get knowledge from……… in school
    a. Father   c. Uncle
    b. Grandmother   d. Teacher

19. The thing someone put outdoor home is……...
    a. Broom stick   c. Pail
    b. Carpet   d. Curtain

20. The animal always eat the carrot is…….
    a. Rabbit   c. Fish
    b. Chiken   d. Dog

21. The name of animal have wings and two foot is……
    a. A cow   c. A Crab
    b. A han   d. A Rabbit

22. Can yo show, where is things in outside home……
    a. Plate, glass, and cup
    b. Sky, stone, and gravel
    c. Stone, cup, and gravel
    d. Stone, gravel, abd plate

23. What is the meaning of word *eraser* in indonesia
    a. Meja   c. Papan tulis
    b. Kursi   d. Penghapus

24. What is the meaning of word *Library* in indonesia
    a. Mesjid   c. Perpustakaan
    b. Kantin   d. kelas

25. What is the name of animal live in the land
    a. A cow   c. A Crocodile
    b. A fish   d. A Crab

26. Where is the peopole to find the woods for bur…….

a. Campus   c. Library
b. Forest   d. House

27. My mother cook in the mineral water use……
    a. Pan   c. Frying pan
    b. Spoon   d. Fork

28. What is the lord of animal in the forest………
    a. Lion   c. Tiger
    b. Crocodile   d. Mouse

29. My teacher write in blackboard use
    a. Pen   c. Cat
    b. Marker   d. Ruler

30. Grass, animal and fence are some of things that's we can find…….
    a. Outside home   c. In the kitchen
    b. In the bathroom   d. In the car

31. Nita and her father go to…….. to invite her uncle sick
    a. Hospital   c. Police office
    b. Office   d. Bank

32. Adelia take some of foods in the kithcen and she puts some foods on…..
    a. Plate   c. Glass
    b. Fork   d. Snake

33. Nita and her friends bring ……..in school to studying
    a. Books   c. novel
    b. Food   d. Bottle

34. The name of animal who always like to eat the grass is……..
    a. Sheep   c. Turtle
    b. Fish   d. Mouse

35. What is the name of animal always take the coconut from the tree……
    a. Monkey   c. Bear
    b. Ants   d. Cat

36. The meaning of word **_bee_** in indonesia is……
    a. Lebah   c. Kupu- kupu

b. Semut   d. Unta

37. I and my mother go to ………. Buy vegetable
 a. Air port   c. Office
 b. Market   d. Hospital

38. Siska and her friend borrow bokks in…….
 a. Market   c. Bank
 b. Library   d. Office police

39. Pian drink a coffe by using……
 a. Glass   c. Fork
 b. Plate   d. Pan

40. Bowl, glass, plate are some of things that's we can find in……..
 a. The kitchen   c. Bathroom
 b. The library   d. School

41. What is the meaning of word ***chair*** in indonesia……
 a. Kursi   c. Tas
 b. Meja   d. Sepatu

42. What is the meaning of word ***english book*** in indonesia…….
 a. Sendal   c. Papan tulis
 b. Penghapus   d. Buku Bahasa Inggris

43. What is the meaning of word in ***snack*** in indonesia……
 a. Singa   c. kucing
 b. Ular   d. Tikus

44. What is the meaning of word in ***lion*** in indonesia…….
 a. Singa   c. laba-laba
 b. Ular   d. Semut

45. What is the meaning of word in ***elephent*** in indonesia……
 a. Gajah   c. kupu-kupu
 b. Kucing   d. Singa

46. Susi eat a fried rice by using……
 a. Plate   c. Glass
 b. Fork   d. Spoon

47. What is the meaning of word ***pen*** in indonesia……..
    a. Pulpen   c. Pintu
    b. Buku   d. Bangku

48. What is the meaning of word ***Mouse*** in indonesia
    a. Singa   c. Semut
    b. Kucing   d. Tikus

49. My mother take the pillow from
    a. Kitchen   c. In school
    b. Bathroom   d. In garden

50. Someone use……. For coking noodle except
    a. Fork   c. Spoon
    b. Wok   d. Glass

Padangsidimuan,
Validator

Marlina Hasibuan, S.Pd.
NIP. 19780921 200604 2 017

Appendix 4

<div align="center">

VALIDITY INSTUMENTS

FOR POST-TEST

</div>

Nama   :

Class   :

Instruction :

8. Tulis nama, kelas pada lembar jawaban yang tersedia
9. Jawablah pertanyaan-pertanyaan di bawah ini
10. Bacalah pertanyaan dengan benar dan teliti
11. Pilihlah jawaban yang benar dengan memberi tanda silang (X) pada salah satu jawaban
12. Periksalah jawaban anda dengan teliti sebelum dikumpulkan kepada guru
13. Test ini hanya bertujuan untuk mengetahui data-data siswa tentang pemahaman menghapal kosakata
14. Waktu yang tersedia 45 menit

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

51. Devi is driying clothes on the…….
    - c. Clothesline
    - c. Garden
    - d. Car
    - d. Swimming pool

52. Grass, animal and fence are some of things that's we can find…….
    - c. Outside home
    - c. In the kitchen
    - d. In the bathroom
    - d. In the car

53. My sister take the fruits and vegetable from…….
    - c. Garden
    - c. House
    - d. Cupboard
    - d. Library

54. What is the meaning of word ***dictionary*** in indonesia…….
    - c. Kamus
    - c. Papan tulis
    - d. Meja
    - d. Penghapus

55. What is the meaning of word ***ruler*** in indonesia…….
    - a. Kamus
    - c. Penghapus
    - b. Kursi
    - d. Penggaris

56. What is the meaning of word **_paper_** in indonesia…….
   a. Buku   c. Peta
   b. Kertas   d. Buku catatan

57. The meaning of word **_crocodile_** in indonesia…….
   c. Lebah   c. Kupu- kupu
   d. Buaya   d. Unta

58. The meaning of word **_horse_** in indonesia…….
   a. Ayam   c. Kupu- kupu
   b. Ular   d. Kuda

59. The meaning of word **_frog_** in indonesia…….
   a. Katak   c. Rusa
   b. Kucing   d. Singa

60. My family go to …….. for friying
   c. The kingdom   c. China's great wall
   d. Library   d. The Mosque

61. The name of place to find many book is…….
   c. Library   c.Train
   d. House   d. Bus

62. I and my mother go to ………. Buy vegetable
   c. Air port   c. Office
   d. Market   d. Hospital

63. Where is the mother cook the rice……..
   c. In rice cooker   c. Bottle
   d. Trademark   d. frying pan

64. Someone use…….. for eat meatball or mie, except.
   c. Forks   c. Spoon
   d. Chop stick   d. Wood

65. My grandfather is sitting on the……
   c. Chair   c. River
   d. Bed   d. Table

66. What is the meaning of word **_lesson_** in indonesia……….
   c. Mesjid   c. Perpustakaan

d. Pelajaran   d. Pulpen

67. What is the meaning of word **_lesson_** in indonesia………
    a. Mesjid   c. Perpustakaan
    b. Pelajaran   d. Pulpen

68. What is the meaning of word **_pensil sharpener_** in indonesia……..
    a. Pena   c. Rautan pensil
    b. Spidol   d. Kamus

69. What is the meaning of word **_goat_** in indonesia……….
    a. Kambing   c. Ayam
    b. Bebek   d. Singa

70. What is the meanig of word **_bird_** in indonesia………
    a. Cacing   c. Katak
    b. Semut   d. Burung

71. What is the meaning of word **_dolphin_** in indonesia……
    a. Lumba-lumba   c. Ikan
    b. Sapi   d. Rusa

72. Where is the peopole to find the woods for bur…….
    c. Campus   c. Library
    d. Forest   d. House

73. Can yo show, where is things in outside home……
    e. Plate, glass, and cup
    f. Sky, stone, and gravel
    g. Stone, cup, and gravel
    h. Stone, gravel, abd plate

74. What is the meaning of word **_memo pad_** in indonesia……
    a. Kertas   c. Pen
    b. Kertas memo   d. Kamus

75. What is the meaning of **_word eraser_** in indonesia……
    a. Penggaris   c. Pulpen
    b. Penghapus   d. Pensil

76. What is the meaning of word _**lion**_ in indonesia…….
    a. Singa   c. Kuda
    b. Ayam   d. Katak

77. What is the meaning of word _**eagle**_ in indonesia……
    a. Elang   c. Lumba-lumba
    b. Sapi   d. Ayam

78. Someone who know about information ad watch movie from……
    c. Television   c. Radio
    d. Human   d. Newspaper

79. My mother cook in the mineral water use……
    c. Pan   c. Frying pan
    d. Spoon   d. Fork

80. Someone use……. For eat meatball or mie except
    c. Forks   c. Spoon
    d. Chop stick   d. Wood

81. What is the meaning of word _**poster point**_ in indonesia……..
    a. Cat poster   c. Spidol
    b. Cat   d. Peta

82. What is the meaning of word _**protractor**_ in indonesia…….
    a. Lem   c. Busur derajat
    b. Pensil   d. Kamus

83. The thing someone put outdoor home is…….
    a. Broom stick   c.Pail
    b. Carpet   d. Curtain

84. Nita and her father go to…….. to invite her uncle sick
    c. Hospital   c. Police office
    d. Office   d. Bank

85. What is the meaning of word _**gazelle**_ in indonesia………
    a. Katak   c. Rusa
    b. Bebek   d. Kambing

86. What is the meaning of word ***hippopotamus*** in indonesia…….
a. Kuda
c. Singa
b. Sapi
d. Kuda nil

87. My mother take the pillow from
c. Kitchen
c. In school
d. Bathroom
d. In garden

88. Pian drink a coffe by using……
c. Glass
c. Fork
d. Plate
d. Pan

89. Bowl, glass, plate are some of things that's we can find in……..
c. The kitchen
c. Bathroom
d. The library
d. School

90. Siska and her friend borrow bokks in…….
c. Market
c. Bank
d. Library
d. Office police

91. What is the meaning of word ***paste*** in indonesia……
a. Lem
c. Kamus
b. Penggaris
d. Sampul buku

92. What is the meaning of word ***library*** in indonesia……..
a. Kantin
c. Toilet
b. Mesjid
d. Perpustakaan

93. My father type the letter by using……….
a. Library
c. Pen
b. Note book
d. Blanket

94. Adelia take some of foods in the kithcen and she puts some foods on…..
c. Plate
c. Glass
d. Fork
d. Snake

95. Susi eat a fried rice by using……
c. Plate
c. Glass
d. Fork
d. Spoon

96. Someone use……. For coking noodle except
    a. Fork　　　　　c. Spoon
    b. Wok　　　　　d. Glass

97. What is the meaning of word **_camel_** in indonesia…….
    a. Kucing　　　　c. Laba-laba
    b. Gajah　　　　 d. Unta

98. What is the meaning of word **_Ant_** in indonesia…….
    a. Semut　　　　c. Ular
    b. Kupu-kupu　　d. Sapi

99. What is the meaning of word **_cochkroach_** in indonesia……..
    a. Siput　　　　c. Kecoak
    b. Ikan　　　　 d. Ayam

100.　　　What is the meaning of word **_snail_** in indonesia…….
    a. Lumba-lumba　c. Kambing
    b. Siput　　　　 d. Singa

Padangsidimuan,
Validator

Marlina Hasibuan, S.Pd.

NIP. 19780921 200604 2 017

Appendix 5

Keyword Pre-test

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

Keyword post-test

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

11. Validity of pre test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	2
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2	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	0	1	
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4	1	0	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	0	
5	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	
6	1	0	0	1	1	1	1	0	1	1	1	1	0	1	1	1	1	1	0	1	
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25	0	0	0	0	1	1	0	0	0	0	1	1	0	1	1	1	1	1	1	1	
N= 25	19	19	16	17	22	17	16	12	20	17	18	16	18	18	14	22	18	18	22	17	1
P	0,8	0,8	0,6	0,7	0,9	0,7	0,6	0,5	0,8	0,7	0,7	0,6	0,7	0,7	0,6	0,9	0,7	0,7	0,9	0,7	
q	0,2	0,2	0,4	0,3	0,1	0,3	0,4	0,5	0,2	0,3	0,3	0,4	0,3	0,3	0,4	0,1	0,3	0,3	0,1	0,3	0

26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
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20	12	21	17	19	19	16	10	19	15	17	18	0	12	22	19	19	17	21	16	1	18
0,8	0,5	0,8	0,7	0,8	0,8	0,6	0,4	0,8	0,6	0,7	0,8	0,8	0,5	0,9	0,8	0,8	0,7	0,8	0,6	0,8	0,7
0,2	0,5	0,2	0,3	0,2	0,2	0,4	0,6	0,2	0,4	0,3	0,2	0,2	0,5	0,1	0,2	0,2	0,3	0,2	0,4	0,2	0,3

Appendix 7

Validity of Post Test

NO	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
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6	1	1	1	1	1	1	0	1	1	1	0	0	1	1	1	0	1	1	1	0	1
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14	0	1	0	1	0	1	0	1	1	0	1	1	1	1	0	1	0	1	0	1	0
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25	1	1	1	1	1	0	0	0	0	0	0	0	1	1	1	0	1	0	1	1	0
N=25	18	14	22	22	17	16	13	20	17	19	19	17	17	18	16	18	18	13	20	17	20
p	0,7	0,6	0,9	0,9	0,7	0,6	0,5	0,8	0,7	0,8	0,8	0,7	0,7	0,7	0,6	0,7	0,7	0,5	0,8	0,7	0,8
q	0,3	0,4	0,1	0,1	0,3	0,4	0,5	0,2	0,3	0,2	0,2	0,3	0,3	0,3	0,4	0,3	0,3	0,5	0,2	0,3	0,2

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19	16	11	19	21	17	14	18	18	16	20	18	14	21	19	15	17	18	19	12	22	19	19
0,8	0,6	0,4	0,8	0,8	0,7	0,6	0,7	0,7	0,6	0,8	0,7	0,6	0,8	0,8	0,6	0,7	0,7	0,8	0,5	0,9	0,8	0,8
0,2	0,4	0,6	0,2	0,2	0,3	0,4	0,3	0,3	0,4	0,2	0,3	0,4	0,2	0,2	0,4	0,3	0,3	0,2	0,5	0,1	0,2	0,2
0,182	0,230	0,246	0,182	0,134	0,218	0,246	0,202	0,202	0,230	0,160	0,202	0,246	0,134	0,182	0,240	0,218	0,202	0,182	0,250	0,106	0,182	0,182

Appendix 8

B. Calculation of Pre-test

1. Mean score from score total (M_t)

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

$$M_t = \frac{880}{25} = 35.2$$

2. Standard Deviation (SD_t)

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

$$SD_t = \sqrt{\frac{31289}{25} - \left(\frac{880}{25}\right)^2}$$

$$SD_t = \sqrt{1251.56 - 35.2^2}$$

$$SD_t = \sqrt{1251.56 - 1239.04}$$

$$SD_t = \sqrt{12.52} = 3.53$$

3. Mean Score (M_p)

Item 1

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n14}$$

$$M_{pl} = \frac{33+41+40+36+40+38+39+42+36+40+40+40+37+33+39+41+38+28}{18}$$

$$M_{pl} = \frac{681}{18} = 37.83$$

Item 2

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n15}$$

$$M_{pl} = \frac{33+41+36+40+38+37+39+36+25+40+37+38+39+28}{14}$$

$$M_{pl} = \frac{507}{14} = 36.21$$

Item 3

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n16}$$

$$M_{pl} = \frac{33+41+40+36+40+38+22+37+39+42+26+36+40+40+40+37+33+39+41+38+27+28}{22}$$

$$M_{pl} = \frac{803}{22} = 36.5$$

Item 4

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n5}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+36+40+25+40+40+37+33+38+39+41+38+37+28}{22}$$

$$M_{pl} = \frac{818}{22} = 37.18$$

Item 5

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n6}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+40+40+38+39+41+38+37+28}{17}$$

$$M_{pl} = \frac{647}{17} = 38.05$$

Item 6

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n7}$$

$$M_{pl} = \frac{41+36+40+38+39+42+36+25+40+40+37+33+38+39+41+38}{16}$$

$$M_{pl} = \frac{603}{16} = 37.68$$

Item 7

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n8}$$

$$M_{pl} = \frac{33+40+26+36+40+40+40+37+33+14+38+41+38}{13}$$

$$M_{pl} = \frac{456}{13} = 35.07$$

Item 8

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n9}$$

$$M_{pl} = \frac{33+41+40+36+40+38+22+39+26+36+40+25+40+37+33+14+38+39+41+38}{20}$$

$$M_{pl} = \frac{696}{20} = 34.8$$

Item 9

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n10}$$

$$M_{pl} = \frac{33+41+36+38+39+36+40+25+40+40+37+33+38+39+41+38+37}{18}$$

$$M_{pl} = \frac{631}{18} = 37.11$$

Item 10

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n1}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+36+40+40+37+14+38+39+41+38+37}{19}$$

$$M_{pl} = \frac{706}{19} = 37.15$$

Item 11

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n2}$$

$$M_{pl} = \frac{33+40+40+22+39+42+26+36+40+25+40+40+37+33+14+38+39+38+37}{19}$$

$$M_{pl} = \frac{659}{19} = 34.68$$

Item 12

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n3}$$

$$M_{pl} = \frac{33+41+40+36+40+37+39+40+25+40+40+37+33+14+38+39+38}{17}$$

$$M_{pl} = \frac{610}{17} = 35.88$$

Item 13

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n4}$$

$$M_{pl} = \frac{33+41+36+40+38+39+42+36+40+25+40+40+38+39+38+37+28}{17}$$

$$M_{pl} = \frac{630}{17} = 37.05$$

Item 14

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n11}$$

$$M_{pl} = \frac{33+41+40+40+38+37+39+42+26+25+40+40+33+14+39+41+37+28}{18}$$

$$M_{pl} = \frac{633}{18} = 35.16$$

Item 15

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n12}$$

$$M_{pl} = \frac{41+40+36+40+38+39+40+40+40+37+33+38+39+41+37+28}{16}$$

$$M_{pl} = \frac{607}{16} = 37.93$$

Item 16

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n13}$$

$$M_{pl} = \frac{41+40+36+40+22+37+39+42+26+36+40+25+40+40+41+38+37}{18}$$

$$M_{pl} = \frac{658}{18} = 36.55$$

Item 17

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n17}$$

$$M_{pl} = \frac{41+40+36+40+38+22+37+42+26+36+40+40+40+37+38+39+37+28}{18}$$

$$M_{pl} = \frac{41+40+36+40+38+22+37+42+26+36+40+40+40+37+38+39+37+28}{18} =$$

$$M_{pl} = \frac{657}{18} = 36.5$$

Item 18

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n23}$$

$$M_{pl} = \frac{33+40+36+40+38+42+25+40+37+33+38+39+37}{13}$$

$$M_{pl} = \frac{478}{13} = 36.76$$

Item 19

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n24}$$

$$M_{pl} = \frac{33+41+40+36+40+38+22+37+39+42+26+36+40+40+40+37+38+39+38+28}{20}$$

$$M_{pl} = \frac{730}{20} = 36.5$$

Item 20

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n25}$$

$$M_{pl} = \frac{40+36+22+37+39+42+36+40+25+40+40+37+33+41+38+37+28}{17}$$

$$M_{pl} = \frac{611}{17} = 35.94$$

Item 21

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n26}$$

$$M_{pl} = \frac{33+40+36+40+38+37+39+42+26+36+40+40+40+37+14+38+39+41+38+37}{20}$$

$$M_{pl} = \frac{731}{20} = 36.55$$

Item 22

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n27}$$

$$M_{pl} = \frac{41+22+37+39+42+36+40+40+38+41+38+37}{12}$$

$$M_{pl} = \frac{451}{12} = 37.58$$

Item 23

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n28}$$

$$M_{pl} = \frac{33+41+40+40+38+22+37+42+26+36+40+25+40+37+33+14+38+39+41+38+37}{21}$$

$$M_{pl} = \frac{737}{21} = 35.09$$

Item 24

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n29}$$

$$M_{pl} = \frac{41+40+36+22+37+39+42+36+40+25+40+40+37+33+41+37+28}{17}$$

$$M_{pl} = \frac{614}{17} = 36.11$$

Item 25

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n30}$$

$$M_{pl} = \frac{33+40+36+40+38+22+39+42+36+40+40+40+37+33+38+39+41+37+28}{19}$$

$$M_{pl} = \frac{699}{19} = 36.78$$

Item 26

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n31}$$

$$M_{pl} = \frac{33+40+36+40+38+37+39+42+26+36+40+40+40+33+38+39+41+38+28}{19}$$

$$M_{pl} = \frac{704}{19} = 37.05$$

Item 27

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n32}$$

$$M_{pl} = \frac{41+40+38+22+37+39+42+26+36+40+40+40+38+41+38+37}{16}$$

$$M_{pl} = \frac{595}{16} = 37.18$$

Item 28

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n33}$$

$$M_{pl} = \frac{41+40+22+37+39+42+26+36+40+41+37}{11}$$

$$M_{pl} = \frac{401}{11} = 36.45$$

Item 29

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n34}$$

$$M_{pl} = \frac{33+41+40+36+40+38+22+37+39+42+36+40+37+33+39+41+28+37+28}{19}$$

$$M_{pl} = \frac{697}{19} = 36.68$$

Item 30

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n18}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+36+40+25+40+37+33+38+39+41+38+37+28}{21}$$

$$M_{pl} = \frac{778}{21} = 37.04$$

Item 31

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n11}$$

$$M_{pl} = \frac{36+40+22+39+42+26+40+25+40+33+14+38+39+41+38+37+28+34}{18}$$

$$M_{pl} = \frac{612}{18} = 34$$

Item 32

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n20}$$

$$M_{pl} = \frac{33+41+40+40+38+37+42+36+33+14+38+39+38+37}{14}$$

$$M_{pl} = \frac{506}{14} = 36.14$$

Item 33

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n21}$$

$$M_{pl} = \frac{33+40+40+38+22+37+39+26+40+25+40+40+37+38+41+38+37+28}{18}$$

$$M_{pl} = \frac{639}{18} = 35.5$$

Item 34

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n22}$$

$$M_{pl} = \frac{41+40+36+38+37+39+26+36+40+25+40+40+37+33+38+39+41+38}{18}$$

$$M_{pl} = \frac{664}{18} = 36.88$$

Item 35

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n45}$$

$$M_{pl} = \frac{41+40+40+38+22+37+39+42+26+40+40+40+37+33+39+41}{16}$$

$$M_{pl} = \frac{595}{16} = 37.18$$

Item 36

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n46}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+42+26+40+25+40+40+33+38+39+41+38+37+28}{20}$$

$$M_{pl} = \frac{732}{20} = 36.6$$

Item 37

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n47}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+26+36+40+40+37+14+39+41+37}{18}$$

$$M_{pl} = \frac{656}{18} = 36.44$$

Item 38

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n48}$$

$$M_{pl} = \frac{41+40+38+22+37+42+26+36+40+40+40+38+41+37}{14}$$

$$M_{pl} = \frac{518}{14} = 37$$

Item 39

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n49}$$

$$M_{pl} = \frac{39+42+26+40+40+40+37+38+38+39+41+38+28}{13}$$

$$M_{pl} = \frac{481}{13} = 37$$

Item 40

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n50}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+40+40+40+37+33+38+39+41+38+28}{19}$$

$$M_{pl} = \frac{720}{19} = 37.89$$

Item 41

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n35}$$

$$M_{pl} = \frac{33+41+40+39+42+25+40+37+33+38}{15}$$

$$M_{pl} = \frac{551}{15} = 36.73$$

Item 42

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n36}$$

$$M_{pl} = \frac{33+41+40+36+40+38+39+42+26+36+40+37+14+39+41+38+37}{17}$$

$$M_{pl} = \frac{617}{17} = 36.29$$

Item 43

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n37}$$

$$M_{pl} = \frac{41+40+36+40+22+37+39+42+40+25+40+40+37+33+41+38+37+28}{18}$$

$$M_{pl} = \frac{656}{18} = 36.44$$

Item 44

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n38}$$

$$M_{pl} = \frac{33+41+40+40+38+37+42+36+40+25+40+37+33+14+38+39+41+38+37}{19}$$

$$M_{pl} = \frac{689}{19} = 36.26$$

Item 45

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n39}$$

$$M_{pl} = \frac{33+41+40+38+37+42+36+14+38+39+38+37}{12}$$

$$M_{pl} = \frac{433}{12} = 36.08$$

Item 46

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n40}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+26+40+25+40+40+37+33+38+39+41+38+37+28}{22}$$

$$M_{pl} = \frac{808}{22} = 36.72$$

Item 47

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n41}$$

$$M_{pl} = \frac{41+40+36+40+22+37+39+42+36+40+25+40+40+37+33+41+38+37+28}{19}$$

$$M_{pl} = \frac{692}{19} = 36.42$$

Item 48

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n42}$$

$$M_{pl} = \frac{33+41+40+36+38+37+42+26+36+40+40+40+37+33+38+39+41+38+28}{19}$$

$$M_{pl} = \frac{703}{19} = 37$$

Item 49

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n43}$$

$$M_{pl} = \frac{41+36+38+37+39+42+26+36+25+40+40+37+38+39+41+37+28}{17}$$

$$M_{pl} = \frac{620}{17} = 36.47$$

Item 50

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n44}$$

$$M_{pl} = \frac{41+40+36+40+38+22+37+42+26+36+40+40+40+37+33+38+39+41+38+37+28}{21}$$

$$M_{pl} = \frac{769}{21} = 36.61$$

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

Item 1

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

$$r_{pbi} = \frac{37.83 - 35.2}{3.53}\sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{2.63}{3.53}\sqrt{2.33}$$

$r_{pbi} = 0.745 \times 1.52 = 1.132$

Item 2

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

$$r_{pbi} = \frac{36.21 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.01}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.286 x 1.22 = 0.349

Item 3

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

$$r_{pbi} = \frac{36.5 - 35.2}{3.53} \sqrt{\frac{0.9}{0.1}}$$

$$r_{pbi} = \frac{1.3}{3.53} \sqrt{9}$$

r_{pbi}= 0.368 x 3 = 1.105

Item 4

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

$$r_{pbi} = \frac{37.18 - 35.2}{3.53} \sqrt{\frac{0.9}{0.1}}$$

$$r_{pbi} = \frac{1.98}{3.53} \sqrt{9}$$

r_{pbi}= 0.560 x 3 = 1.122

Item 5

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

$$r_{pbi} = \frac{38.05 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{2.85}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.807 x 1.52 = 1.227

Item 6

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

$$r_{pbi} = \frac{37.68 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{2.48}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.702 x 1.22 = 0.857

Item 7

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

$$r_{pbi} = \frac{35.07 - 35.2}{3.53} \sqrt{\frac{0.5}{0.5}}$$

$$r_{pbi} = \frac{-0.13}{3.53} \sqrt{1}$$

r_{pbi} = -0.037 x 1 = -0.037

Item 8

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

$$r_{pbi} = \frac{34.8 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{-0.4}{3.53} \sqrt{4}$$

r_{pbi} = -0.113 x 2 = -0.227

Item 9

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

$$r_{pbi} = \frac{37.11 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.91}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.541 x 1.52 = 0.822

Item 10

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

$$r_{pbi} = \frac{37.15 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.95}{3.53} \sqrt{4}$$

r_{pbi} = 0.552 x 2 = 1.105

Item 11

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

$$r_{pbi} = \frac{34.68 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{-0.52}{3.53} \sqrt{4}$$

r_{pbi} = -0.147 x 2 = -0.295

Item 12

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

$$r_{pbi} = \frac{35.88 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{0.68}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.192 x 1.52 = 0.293

Item 13

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

$$r_{pbi} = \frac{37.05 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.85}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.524 x 1.52 = 0.797

Item 14

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

$$r_{pbi} = \frac{35.16 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{-0.04}{3.53} \sqrt{2.33}$$

r_{pbi} = -0.011 x 1.52 = -0.017

Item 15

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

$$r_{pbi} = \frac{37.93 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{2.73}{3.53} \sqrt{1.50}$$

r_{pbi} = 0.773 x 1.22 = 0.944

Item 16

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

$$r_{pbi} = \frac{36.55 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.35}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.382 x 1.52 = 0.581

Item 17

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

$$r_{pbi} = \frac{36.5-35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.52}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.368 x 1.52 = 0.560

Item 18

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

$$r_{pbi} = \frac{36.76-35.2}{3.53} \sqrt{\frac{0.5}{0.5}}$$

$$r_{pbi} = \frac{1.56}{3.53} \sqrt{1}$$

r_{pbi} = 0.441 x 1 = 0.441

Item 19

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

$$r_{pbi} = \frac{36.5-35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.3}{3.53} \sqrt{4}$$

r_{pbi} = 0.368 x 2 = 0.737

Item 20

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

$$r_{pbi} = \frac{35.94-35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{0.74}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.209 x 1.52 = 0.319

Item 21

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

$$r_{pbi} = \frac{36.55-35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.35}{3.53} \sqrt{4}$$

r_{pbi} = 0.382 x 2 = 0.765

Item 22

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

$$r_{pbi} = \frac{37.58 - 35.2}{3.53} \sqrt{\frac{0.5}{0.5}}$$

$$r_{pbi} = \frac{2.38}{3.53} \sqrt{1}$$

r_{pbi} = 0.674 x 1 = 0.674

Item 23

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

$$r_{pbi} = \frac{35.09 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{-0.11}{3.53} \sqrt{4}$$

r_{pbi} = -0.031 x 2 = -0.062

Item 24

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

$$r_{pbi} = \frac{36.11 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{0.91}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.257 x 1.52 = 0.392

Item 25

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

$$r_{pbi} = \frac{36.78 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.58}{3.53} \sqrt{4}$$

r_{pbi} = 0.447 x 2 = 0.895

Item 26

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

$$r_{pbi} = \frac{37.05 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.85}{3.53} \sqrt{4}$$

r_{pbi} = 0.524 x 2 = 1.048

Item 27

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

$$r_{pbi} = \frac{37.18 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.98}{3.53}\sqrt{1.50}$$

r_{pbi}= 0.560 x 1.22 = 0.684

Item 28

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

$$r_{pbi} = \frac{36.45-35.2}{3.53}\sqrt{\frac{0.4}{0.6}}$$

$$r_{pbi} = \frac{1.25}{3.53}\sqrt{0.67}$$

r_{pbi}= 0.354 x 0.81 = 0.287

Item 29

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

$$r_{pbi} = \frac{36.68-35.2}{3.53}\sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.48}{3.53}\sqrt{4}$$

r_{pbi}= 0.419 x 2 = 0.839

Item 30

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

$$r_{pbi} = \frac{37.04-35.2}{3.53}\sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.84}{3.53}\sqrt{4}$$

r_{pbi}= 0.521 x 2 = 1.042

Item 31

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

$$r_{pbi} = \frac{34-35.2}{3.53}\sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{-1.2}{3.53}\sqrt{2.33}$$

r_{pbi}= -0.339 x 1.52 = -0.517

Item 32

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

$$r_{pbi} = \frac{36.14-35.2}{3.53}\sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{0.94}{3.53}\sqrt{1.50}$$

r_{pbi}= 0.266 x 1.22 = 0.325

Item 33

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

$$r_{pbi} = \frac{35.5 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{0.3}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.084 x 1.52 = 0.129

Item 34

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

$$r_{pbi} = \frac{36.88 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.68}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.475 x 1.52 = 0.723

Item 35

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

$$r_{pbi} = \frac{37.18 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.98}{3.53} \sqrt{1.50}$$

r_{pbi} = 0.560 x 1.22 = 0.684

Item 36

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

$$r_{pbi} = \frac{36.6 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.4}{3.53} \sqrt{4}$$

r_{pbi} = 0.396 x 2 = 0.793

Item 37

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

$$r_{pbi} = \frac{36.44 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.24}{3.53} \sqrt{2.33}$$

r_{pbi} = 0.351 x 1.52 = 0.534

Item 38

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

$$r_{pbi} = \frac{37 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.8}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.509 x 1.22 = 0.622

Item 39

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

$$r_{pbi} = \frac{37 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.8}{3.53} \sqrt{4}$$

r_{pbi}= 0.509 x 2 = 1.020

Item 40

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

$$r_{pbi} = \frac{37.89 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{2.69}{3.53} \sqrt{4}$$

r_{pbi}= 0.762 x 2 = 1.524

Item 41

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

$$r_{pbi} = \frac{36.73 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.53}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.433 x 1.22 = 0.529

Item 42

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

$$r_{pbi} = \frac{36.29 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.09}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.308 x 1.52 = 0.469

Item 43

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

$$r_{pbi} = \frac{36.44-35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.24}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.351 x 1.52 = 0.534

Item 44

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

$$r_{pbi} = \frac{36.26-35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.06}{3.53} \sqrt{4}$$

r_{pbi}= 0.300 x 2 = 0.601

Item 45

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

$$r_{pbi} = \frac{36.08-35.2}{3.53} \sqrt{\frac{0.5}{0.5}}$$

$$r_{pbi} = \frac{0.88}{3.53} \sqrt{1}$$

r_{pbi}= 0.249 x 1 = 0.249

Item 46

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

$$r_{pbi} = \frac{36.72-35.2}{3.53} \sqrt{\frac{0.9}{0.1}}$$

$$r_{pbi} = \frac{1.52}{3.53} \sqrt{9}$$

r_{pbi}= 0.430 x 3 = 1.292

Item 47

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

$$r_{pbi} = \frac{36.42-35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.22}{3.53} \sqrt{4}$$

r_{pbi}= 0.345 x 2 = 0.691

Item 48

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

$$r_{pbi} = \frac{37-35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.8}{3.53}\sqrt{4}$$

r_{pbi}= 0.509 x 2 = 1.020

Item 49

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

$$r_{pbi} = \frac{36.47 - 35.2}{3.53}\sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.27}{3.53}\sqrt{2.33}$$

r_{pbi}= 0.359 x 1.52 = 0.547

Item 50

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

$$r_{pbi} = \frac{36.61 - 35.2}{3.53}\sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.41}{3.53}\sqrt{4}$$

r_{pbi}= 0.399 x 2 = 0.799

Appendix 9
B. Calculation of Post-test
1. Mean score from score total (M_t)

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

$M_t = \dfrac{880}{25} = 35.2$

2.   Standard Deviation (SD_t)

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

$SD_t = \sqrt{\dfrac{31289}{25} - \left(\dfrac{880}{25}\right)2}$

$SD_t = \sqrt{1251.56 - 35.2^2}$

$SD_t = \sqrt{1251.56 - 1239.04}$

$SD_t = \sqrt{12.52} = 3.53$

3.   Mean Score (M_p)

Item 1

$M_{pl} = \dfrac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n14}$

$M_{pl} = \dfrac{33+41+40+36+40+38+39+42+36+40+40+40+37+33+39+41+38+28}{18}$

$M_{pl} = \dfrac{681}{18} = 37.83$

Item 2

$M_{pl} = \dfrac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n15}$

$M_{pl} = \dfrac{33+41+36+40+38+37+39+36+25+40+37+38+39+28}{14}$

$M_{pl} = \dfrac{507}{14} = 36.21$

Item 3

$M_{pl} = \dfrac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n16}$

$M_{pl} = \dfrac{33+41+40+36+40+38+22+37+39+42+26+36+40+40+40+37+33+39+41+38+27+28}{22}$

$M_{pl} = \dfrac{803}{22} = 36.5$

Item 4

$M_{pl} = \dfrac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n5}$

$M_{pl} = \dfrac{33+41+40+36+40+38+37+39+42+36+40+25+40+40+37+33+38+39+41+38+37+28}{22}$

$M_{pl} = \dfrac{818}{22} = 37.18$

Item 5

$M_{pl} = \dfrac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n6}$

$M_{pl} = \dfrac{33+41+40+36+40+38+37+39+42+40+40+38+39+41+38+37+28}{17}$

$$M_{pl} = \frac{647}{17} = 38.05$$

Item 6

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n7}$$

$$M_{pl} = \frac{41+36+40+38+39+42+36+25+40+40+37+33+38+39+41+38}{16}$$

$$M_{pl} = \frac{603}{16} = 37.68$$

Item 7

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n8}$$

$$M_{pl} = \frac{33+40+26+36+40+40+40+37+33+14+38+41+38}{13}$$

$$M_{pl} = \frac{456}{13} = 35.07$$

Item 8

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n9}$$

$$M_{pl} = \frac{33+41+40+36+40+38+22+39+26+36+40+25+40+37+33+14+38+39+41+38}{20}$$

$$M_{pl} = \frac{696}{20} = 34.8$$

Item 9

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n10}$$

$$M_{pl} = \frac{33+41+36+38+39+36+40+25+40+40+37+33+38+39+41+38+37}{18}$$

$$M_{pl} = \frac{631}{18} = 37.11$$

Item 10

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n1}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+36+40+40+37+14+38+39+41+38+37}{19}$$

$$M_{pl} = \frac{706}{19} = 37.15$$

Item 11

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n2}$$

$$M_{pl} = \frac{33+40+40+22+39+42+26+36+40+25+40+40+37+33+14+38+39+38+37}{19}$$

$M_{pl} = \frac{659}{19} = 34.68$

Item 12

$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n3}$

$M_{pl} = \frac{33+41+40+36+40+37+39+40+25+40+40+37+33+14+38+39+38}{17}$

$M_{pl} = \frac{610}{17} = 35.88$

Item 13

$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n4}$

$M_{pl} = \frac{33+41+36+40+38+39+42+36+40+25+40+40+38+39+38+37+28}{17}$

$M_{pl} = \frac{630}{17} = 37.05$

Item 14

$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n11}$

$M_{pl} = \frac{33+41+40+40+38+37+39+42+26+25+40+40+33+14+39+41+37+28}{18}$

$M_{pl} = \frac{633}{18} = 35.16$

Item 15

$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n12}$

$M_{pl} = \frac{41+40+36+40+38+39+40+40+40+37+33+38+39+41+37+28}{16}$

$M_{pl} = \frac{607}{16} = 37.93$

Item 16

$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n13}$

$M_{pl} = \frac{41+40+36+40+22+37+39+42+26+36+40+25+40+40+41+38+37}{18}$

$M_{pl} = \frac{658}{18} = 36.55$

Item 17

$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n17}$

$M_{pl} = \frac{41+40+36+40+38+22+37+42+26+36+40+40+40+37+38+39+37+28}{18}$

$M_{pl} = \frac{41+40+36+40+38+22+37+42+26+36+40+40+40+37+38+39+37+28}{18} =$

$M_{pl} = \frac{657}{18} = 36.5$

Item 18

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n23}$$

$$M_{pl} = \frac{33+40+36+40+38+42+25+40+37+33+38+39+37}{13}$$

$$M_{pl} = \frac{478}{13} = 36.76$$

Item 19

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n24}$$

$$M_{pl} = \frac{33+41+40+36+40+38+22+37+39+42+26+36+40+40+40+37+38+39+38+28}{20}$$

$$M_{pl} = \frac{730}{20} = 36.5$$

Item 20

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n25}$$

$$M_{pl} = \frac{40+36+22+37+39+42+36+40+25+40+40+37+33+41+38+37+28}{17}$$

$$M_{pl} = \frac{611}{17} = 35.94$$

Item 21

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n26}$$

$$M_{pl} = \frac{33+40+36+40+38+37+39+42+26+36+40+40+40+37+14+38+39+41+38+37}{20}$$

$$M_{pl} = \frac{731}{20} = 36.55$$

Item 22

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n27}$$

$$M_{pl} = \frac{41+22+37+39+42+36+40+40+38+41+38+37}{12}$$

$$M_{pl} = \frac{451}{12} = 37.58$$

Item 23

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n28}$$

$$M_{pl} = \frac{33+41+40+40+38+22+37+42+26+36+40+25+40+37+33+14+38+39+41+38+37}{21}$$

$$M_{pl} = \frac{737}{21} = 35.09$$

Item 24

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n29}$$

$$M_{pl} = \frac{41+40+36+22+37+39+42+36+40+25+40+40+37+33+41+37+28}{17}$$

$$M_{pl} = \frac{614}{17} = 36.11$$

Item 25

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n30}$$

$$M_{pl} = \frac{33+40+36+40+38+22+39+42+36+40+40+40+37+33+38+39+41+37+28}{19}$$

$$M_{pl} = \frac{699}{19} = 36.78$$

Item 26

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n31}$$

$$M_{pl} = \frac{33+40+36+40+38+37+39+42+26+36+40+40+40+33+38+39+41+38+28}{19}$$

$$M_{pl} = \frac{704}{19} = 37.05$$

Item 27

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n32}$$

$$M_{pl} = \frac{41+40+38+22+37+39+42+26+36+40+40+40+38+41+38+37}{16}$$

$$M_{pl} = \frac{595}{16} = 37.18$$

Item 28

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n33}$$

$$M_{pl} = \frac{41+40+22+37+39+42+26+36+40+41+37}{11}$$

$$M_{pl} = \frac{401}{11} = 36.45$$

Item 29

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n34}$$

$$M_{pl} = \frac{33+41+40+36+40+38+22+37+39+42+36+40+37+33+39+41+28+37+28}{19}$$

$$M_{pl} = \frac{697}{19} = 36.68$$

Item 30

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n18}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+36+40+25+40+37+33+38+39+41+38+37+28}{21}$$

$$M_{pl} = \frac{778}{21} = 37.04$$

Item 31

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n11}$$

$$M_{pl} = \frac{36+40+22+39+42+26+40+25+40+33+14+38+39+41+38+37+28+34}{18}$$

$$M_{pl} = \frac{612}{18} = 34$$

Item 32

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n20}$$

$$M_{pl} = \frac{33+41+40+40+38+37+42+36+33+14+38+39+38+37}{14}$$

$$M_{pl} = \frac{506}{14} = 36.14$$

Item 33

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n21}$$

$$M_{pl} = \frac{33+40+40+38+22+37+39+26+40+25+40+40+37+38+41+38+37+28}{18}$$

$$M_{pl} = \frac{639}{18} = 35.5$$

Item 34

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n22}$$

$$M_{pl} = \frac{41+40+36+38+37+39+26+36+40+25+40+40+37+33+38+39+41+38}{18}$$

$$M_{pl} = \frac{664}{18} = 36.88$$

Item 35

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n45}$$

$$M_{pl} = \frac{41+40+40+38+22+37+39+42+26+40+40+40+37+33+39+41}{16}$$

$$M_{pl} = \frac{595}{16} = 37.18$$

Item 36

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n46}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+42+26+40+25+40+40+33+38+39+41+38+37+28}{20}$$

$$M_{pl} = \frac{732}{20} = 36.6$$

Item 37

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n47}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+26+36+40+40+37+14+39+41+37}{18}$$

$$M_{pl} = \frac{656}{18} = 36.44$$

Item 38

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n48}$$

$$M_{pl} = \frac{41+40+38+22+37+42+26+36+40+40+40+38+41+37}{14}$$

$$M_{pl} = \frac{518}{14} = 37$$

Item 39

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n49}$$

$$M_{pl} = \frac{39+42+26+40+40+40+37+38+38+39+41+38+28}{13}$$

$$M_{pl} = \frac{481}{13} = 37$$

Item 40

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n50}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+40+40+40+37+33+38+39+41+38+28}{19}$$

$$M_{pl} = \frac{720}{19} = 37.89$$

Item 41

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n35}$$

$$M_{pl} = \frac{33+41+40+39+42+25+40+37+33+38}{15}$$

$$M_{pl} = \frac{551}{15} = 36.73$$

Item 42

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n36}$$

$$M_{pl} = \frac{33+41+40+36+40+38+39+42+26+36+40+37+14+39+41+38+37}{17}$$

$$M_{pl} = \frac{617}{17} = 36.29$$

Item 43

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n37}$$

$$M_{pl} = \frac{41+40+36+40+22+37+39+42+40+25+40+40+37+33+41+38+37+28}{18}$$

$$M_{pl} = \frac{656}{18} = 36.44$$

Item 44

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n38}$$

$$M_{pl} = \frac{33+41+40+40+38+37+42+36+40+25+40+37+33+14+38+39+41+38+37}{19}$$

$$M_{pl} = \frac{689}{19} = 36.26$$

Item 45

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n39}$$

$$M_{pl} = \frac{33+41+40+38+37+42+36+14+38+39+38+37}{12}$$

$$M_{pl} = \frac{433}{12} = 36.08$$

Item 46

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n40}$$

$$M_{pl} = \frac{33+41+40+36+40+38+37+39+42+26+40+25+40+40+37+33+38+39+41+38+37+28}{22}$$

$$M_{pl} = \frac{808}{22} = 36.72$$

Item 47

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n41}$$

$$M_{pl} = \frac{41+40+36+40+22+37+39+42+36+40+25+40+40+37+33+41+38+37+28}{19}$$

$$M_{pl} = \frac{692}{19} = 36.42$$

Item 48

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n42}$$

$$M_{pl} = \frac{33+41+40+36+38+37+42+26+36+40+40+40+37+33+38+39+41+38+28}{19}$$

$$M_{pl} = \frac{703}{19} = 37$$

Item 49

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n43}$$

$$M_{pl} = \frac{41+36+38+37+39+42+26+36+25+40+40+37+38+39+41+37+28}{17}$$

$$M_{pl} = \frac{620}{17} = 36.47$$

Item 50

$$M_{pl} = \frac{total\ score\ of\ students'\ score\ that\ true\ item\ answer}{n44}$$

$$M_{pl} = \frac{41+40+36+40+38+22+37+42+26+36+40+40+40+37+33+38+39+41+38+37+28}{21}$$

$$M_{pl} = \frac{769}{21} = 36.61$$

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

Item 1

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

$$r_{pbi} = \frac{37.83-35.2}{3.53}\sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{2.63}{3.53}\sqrt{2.33}$$

$r_{pbi} = 0.745 \times 1.52 = 1.132$

Item 2

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

$$r_{pbi} = \frac{36.21-35.2}{3.53}\sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.01}{3.53}\sqrt{1.50}$$

$r_{pbi} = 0.286 \times 1.22 = 0.349$

Item 3

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

$$r_{pbi} = \frac{36.5-35.2}{3.53}\sqrt{\frac{0.9}{0.1}}$$

$$r_{pbi} = \frac{1.3}{3.53}\sqrt{9}$$

$r_{pbi} = 0.368 \times 3 = 1.105$

Item 4

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

$$r_{pbi} = \frac{37.18-35.2}{3.53} \sqrt{\frac{0.9}{0.1}}$$

$$r_{pbi} = \frac{1.98}{3.53} \sqrt{9}$$

r_{pbi}= 0.560 x 3 = 1.122

Item 5

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

$$r_{pbi} = \frac{38.05-35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{2.85}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.807 x 1.52 = 1.227

Item 6

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

$$r_{pbi} = \frac{37.68-35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{2.48}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.702 x 1.22 = 0.857

Item 7

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

$$r_{pbi} = \frac{35.07-35.2}{3.53} \sqrt{\frac{0.5}{0.5}}$$

$$r_{pbi} = \frac{-0.13}{3.53} \sqrt{1}$$

r_{pbi}= -0.037 x 1 = -0.037

Item 8

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

$$r_{pbi} = \frac{34.8-35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{-0.4}{3.53} \sqrt{4}$$

r_{pbi}= -0.113 x 2 = -0.227

Item 9

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

$$r_{pbi} = \frac{37.11 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.91}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.541 x 1.52 = 0.822

Item 10

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

$$r_{pbi} = \frac{37.15 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.95}{3.53} \sqrt{4}$$

r_{pbi}= 0.552 x 2 = 1.105

Item 11

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

$$r_{pbi} = \frac{34.68 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{-0.52}{3.53} \sqrt{4}$$

r_{pbi}= -0.147 x 2 = -0.295

Item 12

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

$$r_{pbi} = \frac{35.88 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{0.68}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.192 x 1.52 = 0.293

Item 13

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

$$r_{pbi} = \frac{37.05 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.85}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.524 x 1.52 = 0.797

Item 14

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

$$r_{pbi} = \frac{35.16 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{-0.04}{3.53} \sqrt{2.33}$$

r_{pbi}= -0.011 x 1.52 = -0.017

Item 15

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

$$r_{pbi} = \frac{37.93 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{2.73}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.773 x 1.22 = 0.944

Item 16

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

$$r_{pbi} = \frac{36.55 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.35}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.382 x 1.52 = 0.581

Item 17

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

$$r_{pbi} = \frac{36.5 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.52}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.368 x 1.52 = 0.560

Item 18

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

$$r_{pbi} = \frac{36.76 - 35.2}{3.53} \sqrt{\frac{0.5}{0.5}}$$

$$r_{pbi} = \frac{1.56}{3.53} \sqrt{1}$$

r_{pbi}= 0.441 x 1 = 0.441

Item 19

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

$$r_{pbi} = \frac{36.5 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.3}{3.53} \sqrt{4}$$

r_{pbi}= 0.368 x 2 = 0.737

Item 20

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

$$r_{pbi} = \frac{35.94 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{0.74}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.209 x 1.52 = 0.319

Item 21

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

$$r_{pbi} = \frac{36.55 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.35}{3.53} \sqrt{4}$$

r_{pbi}= 0.382 x 2 = 0.765

Item 22

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

$$r_{pbi} = \frac{37.58 - 35.2}{3.53} \sqrt{\frac{0.5}{0.5}}$$

$$r_{pbi} = \frac{2.38}{3.53} \sqrt{1}$$

r_{pbi}= 0.674 x 1 = 0.674

Item 23

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

$$r_{pbi} = \frac{35.09 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{-0.11}{3.53} \sqrt{4}$$

$r_{pbi} = -0.031 \times 2 = -0.062$

Item 24

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

$$r_{pbi} = \frac{36.11 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{0.91}{3.53} \sqrt{2.33}$$

$r_{pbi} = 0.257 \times 1.52 = 0.392$

Item 25

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

$$r_{pbi} = \frac{36.78 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.58}{3.53} \sqrt{4}$$

$r_{pbi} = 0.447 \times 2 = 0.895$

Item 26

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

$$r_{pbi} = \frac{37.05 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.85}{3.53} \sqrt{4}$$

$r_{pbi} = 0.524 \times 2 = 1.048$

Item 27

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

$$r_{pbi} = \frac{37.18 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.98}{3.53} \sqrt{1.50}$$

$r_{pbi} = 0.560 \times 1.22 = 0.684$

Item 28

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

$$r_{pbi} = \frac{36.45-35.2}{3.53}\sqrt{\frac{0.4}{0.6}}$$

$$r_{pbi} = \frac{1.25}{3.53}\sqrt{0.67}$$

r_{pbi}= 0.354 x 0.81 = 0.287

Item 29

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

$$r_{pbi} = \frac{36.68-35.2}{3.53}\sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.48}{3.53}\sqrt{4}$$

r_{pbi}= 0.419 x 2 = 0.839

Item 30

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

$$r_{pbi} = \frac{37.04-35.2}{3.53}\sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.84}{3.53}\sqrt{4}$$

r_{pbi}= 0.521 x 2 = 1.042

Item 31

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

$$r_{pbi} = \frac{34-35.2}{3.53}\sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{-1.2}{3.53}\sqrt{2.33}$$

r_{pbi}= -0.339 x 1.52 = -0.517

Item 32

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

$$r_{pbi} = \frac{36.14-35.2}{3.53}\sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{0.94}{3.53}\sqrt{1.50}$$

r_{pbi}= 0.266 x 1.22 = 0.325

Item 33

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

$$r_{pbi} = \frac{35.5 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{0.3}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.084 x 1.52 = 0.129

Item 34

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

$$r_{pbi} = \frac{36.88 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.68}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.475 x 1.52 = 0.723

Item 35

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

$$r_{pbi} = \frac{37.18 - 35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.98}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.560 x 1.22 = 0.684

Item 36

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

$$r_{pbi} = \frac{36.6 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.4}{3.53} \sqrt{4}$$

r_{pbi}= 0.396 x 2 = 0.793

Item 37

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

$$r_{pbi} = \frac{36.44 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.24}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.351 x 1.52 = 0.534

Item 38

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

$$r_{pbi} = \frac{37-35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.8}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.509 x 1.22 = 0.622

Item 39

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

$$r_{pbi} = \frac{37-35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.8}{3.53} \sqrt{4}$$

r_{pbi}= 0.509 x 2 = 1.020

Item 40

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

$$r_{pbi} = \frac{37.89-35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{2.69}{3.53} \sqrt{4}$$

r_{pbi}= 0.762 x 2 = 1.524

Item 41

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

$$r_{pbi} = \frac{36.73-35.2}{3.53} \sqrt{\frac{0.6}{0.4}}$$

$$r_{pbi} = \frac{1.53}{3.53} \sqrt{1.50}$$

r_{pbi}= 0.433 x 1.22 = 0.529

Item 42

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

$$r_{pbi} = \frac{36.29-35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.09}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.308 x 1.52 = 0.469

Item 43

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

$$r_{pbi} = \frac{36.44 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.24}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.351 x 1.52 = 0.534

Item 44

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

$$r_{pbi} = \frac{36.26 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.06}{3.53} \sqrt{4}$$

r_{pbi}= 0.300 x 2 = 0.601

Item 45

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

$$r_{pbi} = \frac{36.08 - 35.2}{3.53} \sqrt{\frac{0.5}{0.5}}$$

$$r_{pbi} = \frac{0.88}{3.53} \sqrt{1}$$

r_{pbi}= 0.249 x 1 = 0.249

Item 46

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

$$r_{pbi} = \frac{36.72 - 35.2}{3.53} \sqrt{\frac{0.9}{0.1}}$$

$$r_{pbi} = \frac{1.52}{3.53} \sqrt{9}$$

r_{pbi}= 0.430 x 3 = 1.292

Item 47

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

$$r_{pbi} = \frac{36.42 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.22}{3.53} \sqrt{4}$$

r_{pbi}= 0.345 x 2 = 0.691

Item 48

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

$$r_{pbi} = \frac{37 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.8}{3.53} \sqrt{4}$$

r_{pbi}= 0.509 x 2 = 1.020

Item 49

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

$$r_{pbi} = \frac{36.47 - 35.2}{3.53} \sqrt{\frac{0.7}{0.3}}$$

$$r_{pbi} = \frac{1.27}{3.53} \sqrt{2.33}$$

r_{pbi}= 0.359 x 1.52 = 0.547

Item 50

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

$$r_{pbi} = \frac{36.61 - 35.2}{3.53} \sqrt{\frac{0.8}{0.2}}$$

$$r_{pbi} = \frac{1.41}{3.53} \sqrt{4}$$

r_{pbi}= 0.399 x 2 = 0.799

Appendix 10

Table Validity of test

No	M_p	M_t	SD_t	P	Q	$r_{pbi} = \frac{M_p - M_t}{SD_t}\sqrt{\frac{p}{q}}$	r_t on 5% s
1.	37.15	35.12	4.09	0.8	0.2	0.993	0.3
2.	34.57	35.12	4.09	0.8	0.2	-0.269	0.3
3.	35.62	35.12	4.09	0.6	0.4	0.149	0.3
4.	36.23	35.12	4.09	0.7	0.3	0.413	0.3
5.	37.13	35.12	4.09	0.9	0.1	1.474	0.3
6.	38.05	35.12	4.09	0.7	0.3	1.089	0.3
7.	37.56	35.12	4.09	0.6	0.4	0.728	0.3
8.	34.58	35.12	4.09	0.5	0.5	-0.132	0.3
9.	34.7	35.12	4.09	0.8	0.2	-0.205	0.3
10.	37.05	35.12	4.09	0.7	0.3	0.717	0.3
11.	35.05	35.12	4.09	0.7	0.3	-0.026	0.3
12.	37.87	35.12	4.09	0.6	0.4	0.820	0.3
13.	36.5	35.12	4.09	0.7	0.3	0.513	0.3
14.	37.72	35.12	4.09	0.7	0.3	0.966	0.3
15.	36.14	35.12	4.09	0.6	0.4	0.304	0.3
16.	36.4	35.12	4.09	0.9	0.1	0.939	0.3
17.	36.38	35.12	4.09	0.7	0.3	0.468	0.3
18.	37	35.12	4.09	0.8	0.2	0.919	0.3
19.	33.88	35.12	4.09	0.7	0.3	-0.461	0.3
20.	36.14	35.12	4.09	0.6	0.4	0.304	0.3
21.	35.44	35.12	4.09	0.7	0.3	0.119	0.3
22.	36.72	35.12	4.09	0.7	0.3	0.595	0.3
23.	36.69	35.12	4.09	0.5	0.5	0.384	0.3
24.	36.35	35.12	4.09	0.8	0.2	0.601	0.3
25.	35.94	35.12	4.09	0.7	0.3	0.305	0.3
26.	36.45	35.12	4.09	0.8	0.2	0.650	0.3
27.	37.66	35.12	4.09	0.5	0.5	0.621	0.3
28.	35	35.12	4.09	0.8	0.2	-0.059	0.3
29.	35.11	35.12	4.09	0.7	0.3	-0.004	0.3
30.	36.73	35.12	4.09	0.8	0.2	0.787	0.3
31.	36.89	35.12	4.09	0.8	0.2	0.866	0.3
32.	37.12	35.12	4.09	0.6	0.4	0.597	0.3
33.	37.6	35.12	4.09	0.4	0.6	0.491	0.3
34.	36.63	35.12	4.09	0.8	0.2	0.738	0.3
35.	36.66	35.12	4.09	0.6	0.4	0.459	0.3
36.	34.45	35.12	4.09	0.7	0.3	-0.249	0.3
37.	36.44	35.12	4.09	0.7	0.3	0.491	0.3
38.	36.21	35.12	4.09	0.8	0.2	0.533	0.3
39.	36.08	35.12	4.09	0.5	0.5	0.235	0.3
40.	36.63	35.12	4.09	0.9	0.1	1.108	0.3

41.	36.42	35.12	4.09	0.8	0.2	0.636	0.3
42.	36.84	35.12	4.09	0.8	0.2	0.841	0.3
43.	36.35	35.12	4.09	0.7	0.3	0.457	0.3
44.	36.52	35.12	4.09	0.8	0.2	0.685	0.3
45.	37	35.12	4.09	0.6	0.4	0.561	0.3
46.	36.5	35.12	4.09	0.8	0.2	0.675	0.3
47.	36.38	35.12	4.09	0.7	0.3	0.468	0.3
48.	36.92	35.12	4.09	0.6	0.4	0.537	0.3
49.	36.5	35.12	4.09	0.9	0.1	1.012	0.3
50.	37.8	35.12	4.09	0.8	0.2	1.311	0.3

Appendix 11

Reliability Pre Test

To get reliability of the test, the researcher uses formula KR-20:

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

N= 25

$\sum Xt = 878$

$\sum Xt^2 = 31255$

$\sum pq = 9.830$

$$S_t^2 = \sum Xt^2 - \left(\frac{\sum xt}{N} \right)^2$$

$$= 31255 - \left(\frac{878}{25} \right)^2 = 31255 - 35.12^2 = 31255 - 1233.41 = 1891.59$$

$$S_t^2 = \frac{\sum Xt2}{N} = \frac{1891.59}{25}$$

$$S_t^2 = 75.66$$

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

$$R_{11} = \left(\frac{25}{25-1} \right) \left(\frac{75.66 - 9.830}{75.66} \right) = \left(\frac{25}{24} \right) \left(\frac{65.83}{75.66} \right)$$

$$= (1.04)(0.87)$$
$$= 0.90 \ (r_{11} > 0.70 = \text{reliable})$$

Test is reliable if $r_{count} > r_{tabel}$. Based on calculation above, the test have very high reliable.

Appendix 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= 25

$\sum Xt = 880$

$\sum Xt^2 = 31289$

$\sum pq = 9.853$

$S_t^2 = \sum Xt^2 - \left(\frac{\sum xt}{N}\right)^2$

$= 31289 - \left(\frac{880}{25}\right)^2 = 31289 - 35.2^2 = 31289 - 1239.04 = 30049.96$

$S_t^2 = \frac{\sum Xt2}{N} = \frac{30049.96}{25}$

$S_t^2 = 1201.99$

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

$R_{11} = \left(\frac{25}{25-1}\right)\left(\frac{1201.99 - 9.853}{1202.99}\right) = \left(\frac{25}{24}\right)\left(\frac{1192.13}{1201.99}\right)$

$= (1.04)\,(0.99)$

$= 1.02\ (r_{11} > 0.70 = reliable)$

Test is reliable if rcount > rtabel. Based on calculation above, the test have very high reliable.

Appendix 13

Score of Experimental Class and Control Class on Pre Test

1. **PRE TEST**
   a. **Pre Test Score of Experimental Class**

No	The Name of Students	Score of Pre Test
1	AN	50
2	AP	60
3	AR	40
4	AFH	65
5	AI	65
6	AR	50
7	AK	65
8	AP	60
9	AS	65
10	ALH	60
11	AZP	50
12	BS	60

13	EM	65
14	ERU	40
15	HR	75
16	IP	60
17	MT	50
18	RR	80
19	RS	60
20	RSF	60
21	SH	75
22	WH	80
23	YA	60
24	YY	80
25	ZA	60
Total		**1910**

b. Pre Test Score of Control Class

No	The Name of Students	Score of Pre Test
1	AS	35
2	AS	65
3	AWP	45
4	AF	60
5	CAF	50
6	DA	40
7	DW	65
8	EH	70
9	FI	55
10	HP	35
11	HH	50
12	HA	60
13	GPS	35
14	MH	65
15	ML	75
16	NB	45
17	PE	70
18	RP	55
19	RB	60
20	RJ	40
21	RH	40
22	SP	60
23	ST	80
24	YY	45
25	YN	85
Total		**1675**

Appendix 14

RESULT OF NORMALITY TEST IN PRE TEST

A. RESULT OF THE NORMALITY TEST OF VII-3 IN PRE-TEST

1. The score of VII-3 class in pre test from low score to high score:

40	40	50	50	50	50	60	60	85
60	60	60	60	60	60	65	65	
65	75	75	75	80	80	80	80	

2. High = 85

   Low = 35

   Range = High – Low

   $$= 85 - 35$$
   $$= 50$$

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

   = 1 + 3,3 log (30)

   = 1 + 3,3 (1.47)

   = 1 + 4.85

   = 5.85

   = 6

4. Length of Classes $= \dfrac{range}{total\,of\,class}$ $= \dfrac{50}{6} = 8.33 = 9$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
80 – 88	6	84	+3	18	9	54
71 – 79	3	75	+2	6	4	12
62 – 70	5	66	+1	5	1	5
53 – 61	**10**	**57**	**0**	**0**	**0**	**0**
44 – 52	4	48	-1	-4	1	4
35 – 43	2	39	-2	-4	4	8
i = 9	30	-	-	14	-	83

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

$$= 57 + 9 \left(\frac{14}{30}\right)$$

$$= 57 + 9 \ (0.466)$$

$$= 57 + 4.194$$

$$= 61.19$$

$$SD_t = i \sqrt{\frac{\Sigma fx\prime^2}{n} - \left(\frac{\Sigma fx\prime}{n}\right)^2}$$

$$= 9 \sqrt{\frac{72}{30} - \left(\frac{14}{30}\right)^2}$$

$$= 9 \sqrt{2.4 - (0.466)^2}$$

$$= 9 \sqrt{2.4 - 0.217}$$

$$= 9 \sqrt{2.183}$$

$$= 9 \ x \ 1.477 = 13.29$$

Table of Normality Data Test with Chi Kuadrad Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	f_h	f_0	$\frac{(f_0\text{-}f_h)}{f_h}$
	88.5	2.05	0.4798				
80 – 88		1.38	0.4162	0.06	1.8	6	2,33
	79.5	0.70					
71 – 79		0.02	0.2580	0.16	4.8	3	-0.37
	70.5	-0.65					
62 – 70			0.0080	0.25	7.8	5	-0.35
	61.5	-1.33					
53 – 61		-2.00	0.25765	-0.25	-7.5	10	-5.42
	52.5						
44 – 52			0.09176	0.17	5.1	4	0.21
	43.5						
35 – 43			0.02275	0.07	2.1	2	0.001
	34.5						
						X^2	-2.15

Based on the table above, the reseracher found that x^2_{count} = -2.15 while x^2_{table} = 11.070, cause x^2_{count} < x^2_{table} (-2.15< 11.070) with degree of

freedom (dk) = 6–1 = 5 and significant level α = 5%. So distribution of class

VII-3 (pre-test) is normal.

6. Median

No	Interval	F	Fk
1	35 – 43	2	2
2	44 – 52	4	**6**
3	**53 – 61**	**10**	16
4	62 – 70	5	21
5	71 – 79	3	24
6	80 – 88	6	30

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

Bb = 52.5

F   = 6

fm = 10

i   = 9

n   = 30

1/2n= 15

So :

$$\text{Me} = \text{Bb} + i\left(\frac{n\big/_2 - F}{fm}\right)$$

$$= 52.5 + 9\left(\frac{15-6}{10}\right)$$

$$= 52.5 + 9\,(1.1)$$

$$= 52.5 + 9.9$$

$$= 61.4$$

7. Modus

No	Interval	F	Fk
1	35 – 43	2	2
2	44 – 52	4	6
3	**53 – 61**	**10**	16
4	62 – 70	5	21

5	71 – 79	3	24
6	80 – 88	6	30

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

L   = 52.5

d_1 = 6

d_2 = 5

i   = 9

So,

$M_o = 52.5 + \dfrac{6}{6+5}\ 9$

$= 52.5 + 0.54\ (9)$

$= 52.5 + 4.90$

$= 57.4$

B. RESULT OF THE NORMALITY TEST OF VII-8 IN PRE-TEST

1. The score of VII-8 class in pre test from low score to high score:

35	35	35	35	35	40	40	40	85
45	50	50	55	55	60	60	60	
65	65	65	70	70	75	75	80	

2. High = 85

   Low   = 30

   Range = High – Low

       = 85 - 30
       = 55

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

                       = 1 + 3,3 log (30)

                       = 1 + 3,3 (1.47)

                       = 1 + 4.85

                       = 5.85

                       = 6

4. Length of Classes $=\dfrac{range}{totalofclass}$ $=\dfrac{55}{6}= 9.17 = 10$

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
80 – 89	3	84.5	+2	6	4	12
70 – 79	4	74.5	+1	4	1	4
60 – 69	**8**	**64.5**	**0**	**0**	**0**	**0**
50 – 59	4	54.5	-1	-4	1	4
40 – 49	6	44.5	-2	-12	4	24
30 – 39	5	34.5	-3	-15	9	45
i = 10	**30**	-	-	**-13**	-	**89**

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

     $= 64.5 + 10\,(\frac{-14}{30})$

     $= 64.5 + 10\,(-0.46)$

     $= 64.5 + (-4.6)$

     $= 59.9$

$$SD_t = i\sqrt{\frac{\Sigma fx\prime^2}{n} - \left(\frac{\Sigma fx\prime}{n}\right)^2}$$

$$= 10\sqrt{\frac{82}{30} - \left(\frac{-14}{30}\right)^2}$$

$$= 10\sqrt{2.7 - (-0.466)^2}$$

$$= 10\sqrt{2.7 - (-0.217)}$$

$$= 10\sqrt{2.917}$$

$$= 10 \times 1.708$$

$$= 17.08$$

Table of Normality Data Test with Chi Kuadrad Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	f_h	f_0	$\frac{(f_0\text{-}f_h)}{f_h}$
	89.5	1.73	0.4582				
80 – 89		1.15	0.3749	0.08	2.4	3	0.25
	79.5	0.56					
70 – 70		-0.02	0.2123	0.16	4.8	4	0.166
	69.5	-0.61					
60 – 69		-1.19	0.49202	-0.28	-8.4	8	-1.952
	59.5						
50 – 59			0.27093	0.22	6.6	4	-0.393
	49.5						
40 – 49			0.11702	0.15	4.5	6	0.333
	39.5						
30 – 39				0.08	2.4	5	1.083
	29.5						
						X^2	-0.513

Based on the table above, the reseracher found that $x^2{}_{count}$ = -0.513 while $x^2{}_{table}$ = 11.070, cause $x^2{}_{count} < x^2{}_{table}$ (-0.513< 11.070) with degree of freedom (dk) = 6–1 = 5 and significant level α = 5%. So distribution of VII-8 class (pre-test) is normal.

6. Median

No	Interval	F	Fk
1	30 – 39	5	5

2	40 – 49	6	11
3	50 – 59	4	**13**
4	**60 – 69**	**8**	21
5	70 – 79	4	27
6	80 – 89	3	30

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

Bb = 59.5

F   = 13

fm = 8

i   = 10

n   = 30

1/2n= 15

So :

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

$$= 59.5 + 10\left(\frac{15-13}{8}\right)$$

$$= 59.5 + 10\ (0.25)$$

$$= 59.5 + 2.5$$

$$= 62$$

7. Modus

No	Interval	F	Fk
1	30 – 39	5	5
2	40 – 49	6	11
3	50 – 59	4	15
4	**60 – 69**	**8**	23
5	70 – 79	4	27
6	80 – 89	3	30

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

L   = 59.5

d_1 = 4

d_2 = 4

i = 10

So,

M_o = $59.5 + \dfrac{4}{4+4}$ 10

  = 59.5 + 0.5 (10)

  = 59.5 + 5

  = 64.5

Appendix 15

HOMOGENEITY TEST (PRE-TEST)

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

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

Hypotheses:

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

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

A.   Variant of the VII-3 class is:

NO	Xi	Xi^2
1.	40	1600
2.	40	1600
3.	50	2500
4.	50	2500
5.	50	2500
6.	50	2500
7.	60	3600
8.	60	3600
9.	60	3600
10.	60	3600
11.	60	3600
12.	60	3600
13.	60	3600
14.	60	3600
15.	60	3600
16.	60	3600
17.	65	4225
18.	65	4225
19.	65	4225
20.	65	4225
21.	65	4225
22.	75	5625
23.	75	5625

24.	75	5625
25.	80	6400
Total	1960	125600

n = 30

$\sum xi = 1960$

$\sum_{Xi} 2 = 125600$

So:

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

$$= \frac{30(125600)-(1960)^2}{30(30-1)}$$

$$= \frac{3768000-3841600}{30(29)}$$

$$= \frac{149529}{870}$$

$$= 171.86$$

B.   Variant of the VII-8 class is:

NO	Xi	Xi^2
1.	35	1225
2.	35	1225
3.	35	1225
4.	35	1225
5.	35	1225
6.	40	1600
7.	40	1600
8.	40	1600
9.	45	2025
10.	45	2025
11.	45	2025
12.	50	2500
13.	50	2500
14.	55	3025
15.	55	3025
16.	60	3600
17.	60	3600
18.	60	3600
19.	60	3600
20.	65	4225
21.	65	4225
22.	65	4225

23.	65	4225
24.	70	4900
25.	70	4900
Total	1675	100425

$N = 30$

$\sum xi = 1675$

$\sum_{xi} 2 = 100425$

So:

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

$$= \frac{30\ (105375) - (1705)^2}{30(30-1)}$$

$$= \frac{3161250 - 2907025}{30(29)}$$

$$= \frac{254225}{870}$$

$$= 292.21$$

The Formula was used to test the hypothesis was:

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

1. VII-3 and VII-8 :

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

So:

$$F = \frac{292.21}{171.86}$$

$$= 1.70$$

After doing the calculation, researcher found that $F_{count} = 1.70$. It had been compared to F_{table} with α 5% and dk numerator and deminator were same (n_1 and $n_2 = 30$; dk $= 30-1 = 29$).From the distribution list F, researcher found that $F_{table} = 4.18$, so $F_{count} < F_{table}$ (1.70< 4.18). It could be concluded

that there is no difference variant between the VII-3 class and VII-8 class. It means that the variant is homogenous.

Appendix 16

Score of Experimental Class and Control Class on Post Test

1. **Score of Experimental Class Post Test Using Semantic Mapping Strategy**

No	The Name of Students	Score of Post Test
1	AS	80

2	ASY	80
3	AD	85
4	AH	75
5	AAN	90
6	AS	75
7	AZH	90
8	BW	75
9	EH	95
10	HT	70
11	HS	75
12	IA	55
13	ID	80
14	IZ	75
15	LH	85
16	MK	60
17	MS	80
18	MYL	80
19	PLH	65
20	PW	80
21	RJ	70
22	RWS	80
23	SR	75
24	YY	70
25	UH	70
Total		**2265**

2. Score of Control Class Post Test Using Conventional Strategy

No	The Name of Students	Score of Pre Test
1	AS	55
2	AS	70
3	AWP	70
4	AF	65
5	CAF	75
6	DA	80
7	DW	65
8	EH	80
9	FI	85
10	HP	65
11	HH	80
12	HA	75
13	GPS	65
14	MH	75
15	ML	60
16	NB	65
17	PE	70
18	RP	55
19	RB	75
20	RJ	80
21	RH	85
22	SP	70
23	ST	80
24	YY	85
25	YN	70
26	TN	74
27	ZN	90
28	ZZ	55
29	WPP	80
30	WRP	60
Total		**2160**

Appendix 17

RESULT OF NORMALITY TEST IN POST TEST

A. RESULT OF THE NORMALITY TEST OF VII-3 IN POST-TEST

1. The score of VII-3 class in post test from low score to high score:

55	55	60	65	65	70	70	70	90
75	75	75	75	75	75	80	80	
80	80	80	80	80	85	85	90	

2. High $\quad = 95$

   Low $\quad = 55$

   Range $\quad = $ High – Low

   $\quad = 90 - 55$

   $\quad = 35$

3. Total of Classes $\quad = 1 + 3{,}3 \log (n)$

   $\quad = 1 + 3{,}3 \log (30)$

   $\quad = 1 + 3{,}3 (1.47)$

   $\quad = 1 + 4.85$

   $\quad = 5.85$

   $\quad = 6$

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

5. Mean

Interval Class	F	X	x'	fx'	x'^2	fx'^2
85 – 95	5	87.5	+1	5	1	5
79 – 84	9	81.5	0	0	0	0
73 – 78	6	75.5	-1	-6	1	6
67 – 72	5	69.5	-2	-10	4	20
61 – 66	2	63.5	-3	-6	9	18
55 – 60	3	57.5	-4	-12	16	48
$i = 6$	30	-	-	-29	-	97

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

$\quad = 81.5 + 6\left(\dfrac{-27}{30}\right)$

$\quad = 81.5 + 6 (-0.9)$

$\quad = 81.5 + (-5.4)$

$$= 76.1$$

$$SD_t = i\sqrt{\frac{\sum fx\prime^2}{n} - \left(\frac{\sum fx\prime}{n}\right)^2}$$

$$= 6\sqrt{\frac{97}{30} - \left(\frac{-27}{30}\right)^2}$$

$$= 6\sqrt{3.23 - (-0.9)^2}$$

$$= 6\sqrt{2.52 - 0.81}$$

$$= 6\sqrt{2.42}$$

$$= 6 \times 1.55 = 9.3$$

Table of Normality Data Test with Chi Square Formula

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	f_h	f_0	$\frac{(f_0\text{-}f_h)}{f_h}$
	90.5	1.54	0.4382				
		0.90	0.3159	0.12	3.6	5	0.388
	84.5						
		0.25		0.21	6.3	9	0.428
		-0.38	0.0987				
	78.5						
		-1.03		-0.25	-7.5	6	-1.8
		-1.67	0.35197				
	72.5						
		-2.32		0.20	6	5	0.166
			0.15151				
	66.5						
				0.10	3	2	0.33
			0.04746				
	60.5						
				0.03	0.9	3	2.33
			0.01017				
	54.5						
						X^2	1.84

Based on the table above, the reseracher found that x^2_{count} = 1.84 while x^2_{table} = 11.070, cause $x^2_{count} < x^2_{table}$ (1.84< 11.070) with degree of freedom (dk) = 6–1 = 5 and significant level α = 5%. So distribution of VII-3 class (post-test) is normal.

6. Median

No	Interval	F	Fk
1	55 – 60	3	3
2	61 – 66	2	5
3	67 – 72	5	10
4	73 – 78	6	**16**
5	**79 – 84**	**9**	25
6	85 – 90	5	30

Position of Me in the interval of classes is number 5, that:

Bb = 78.5

F = 16

fm = 9

i = 6

n = 30

1/2n = 15

So :

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

$$= 78.5 + 6 \left(\frac{15 - 16}{9} \right)$$

$$= 78.5 + 6 \ (-0.1)$$

$$= 78.5 + -0.66$$

$$= 77.83$$

7. Modus

No	Interval	F	Fk
1	55 – 60	3	3
2	61 – 66	2	5
3	67 – 72	5	10
4	73 – 78	6	**16**
5	**79 – 84**	**9**	25
6	85 – 90	5	30

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

L   = 78.5

d_1 = 5

d_2 = 4

i   = 6

So,

M_o = 78.5 + $\dfrac{5}{5+4}$ 6

    = 78.5 + 0.55 (6)

    = 78.5 + 3.33

    = 81.83

RESULT OF NORMALITY TEST IN POST TEST

B. RESULT OF THE NORMALITY TEST OF VII-8 IN POST-TEST

1. The score of XI MIA-3 class in pre test from low score to high score:

50	55	55	60	65	65	65	65	90
70	70	70	70	75	75	75	75	
80	80	80	80	80	85	85	85	

2. High = 90

   Low = 50

   Range = High − Low

   = 90 - 50

   = 40

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

   = 1 + 3,3 log (30)

   = 1 + 3,3 (1.47)

   = 1 + 4.85

   = 5.85

   = 6

4. Length of Classes = $\frac{range}{total of class}$ = $\frac{40}{6}$ = 6.66 = 7

5. Mean

Interval Class	F	X	x'	fx'	x'^{2}	fx'^{2}
85 – 91	4	88	+3	12	9	36
78 – 84	6	81	+2	12	4	24
71 – 77	5	74	+1	5	1	5
64 – 70	10	67	0	0	0	0
57 – 63	2	60	-1	-2	1	2
50 – 56	3	53	-2	-6	4	12
$i = 7$	30	-	-	21	-	79

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

$$= 67 + 7 \left(\frac{25}{30}\right)$$

$$= 67 + 7\ (0.83)$$

$$= 67 + 5.81$$

$$= 72.81$$

$$SD_t = i\sqrt{\frac{\sum fx\prime^2}{n} - \left(\frac{\sum fx\prime}{n}\right)^2}$$

$$= 7\sqrt{\frac{87}{30} - \left(\frac{25}{30}\right)^2}$$

$$= 7\sqrt{2.9 - (0.14)^2}$$

$$= 7\sqrt{2.9 - 0.019}$$

$$= 7\sqrt{2.22}$$

$$= 7 \times 1.48 = 10.36$$

<div align="center">Table of Normality Data Test with Chi Kuadrad Formula</div>

Interval of Score	Real Upper Limit	Z – Score	Limit of Large of the Area	Large of area	f_h	f_0	$\frac{(f_0\text{-}f_h)}{f_h}$
	91.5	1.80	0.4641				
		1.12	0.3686	0.09	2.7	4	0.481
	84.5	0.45					
			0.1736	0.19	5.7	6	0.052
	77.5	-0.22					
		-0.89	0.41294	-0.23	-6.9	5	1.724
	70.5	-1.57					
		-2.25	0.18673	0.22	6.6	10	0.515
	63.5						
			0.05821	0.12	3.6	2	0.444
	56.5						
			0.0122	0.04	1.2	3	1.5
	49.5						
						X^2	1.268

Based on the table above, the reseracher found that $x^2_{count} = 1.268$ while $x^2_{table} = 11.070$, cause $x^2_{count} < x^2_{table}$ (1.268 < 11.070) with degree of freedom (dk) = 6–1 = 5 and significant level α = 5%. So distribution of VII-8 class (post-test) is normal.

6. Median

No	Interval	F	Fk
1	50 – 56	3	3
2	57 – 63	2	**5**
3	**64 – 70**	**10**	15
4	71 – 77	5	20
5	78 – 84	6	26
6	85 – 91	4	30

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

Bb = 67

F = 5

fm = 10

i = 7

n = 30

1/2n = 15

So :

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

$$= 67 + 7 \left(\frac{15-5}{10} \right)$$

$$= 67 + 7(1)$$

$$= 67 + 7$$

$$= 74$$

7. Modus

No	Interval	F	Fk
1	50 – 56	3	3
2	57 – 63	2	**5**
3	**64 – 70**	**10**	15
4	71 – 77	5	20
5	78 – 84	6	26
6	85 – 91	4	30

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

$$L \quad = 67$$
$$d_1 \quad = 8$$
$$d_2 \quad = 5$$
$$i \quad = 7$$

So,

$$M_o \quad = 67 + \frac{8}{8+5}7$$
$$= 67 + 0.61 \ (7)$$
$$= 67 + 4.30$$
$$= 71.30$$

Appendix 18

HOMOGENEITY TEST (POST-TEST)

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

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

Hypotheses:

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

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

C. Variant of the VII-3 class is:

NO	Xi	Xi^2
26.	55	3025
27.	55	3025
28.	60	3600
29.	65	4225
30.	65	4225
31.	70	4900
32.	70	4900
33.	70	4900
34.	70	4900
35.	70	4900
36.	75	5625
37.	75	5625
38.	75	5625
39.	75	5625
40.	75	5625
41.	75	5625
42.	80	6400
43.	80	6400
44.	80	6400
45.	80	6400
46.	80	6400
47.	80	6400
48.	80	6400
49.	80	6400
50.	80	6400
Total	2.265	173625

n = 25

$\sum xi = 2.265$

$\sum_{xi} 2 = 173625$

So:

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

$$= \frac{30(173625) - (2.265)^2}{30(30-1)}$$

$$= \frac{5208750 - 5130225}{30(29)}$$

$$= \frac{78,525}{870}$$

$$= 90,25$$

D.   Variant of the VII-8 class is:

NO	Xi	Xi^2
1.	55	3025
2.	55	3025
3.	55	3025
4.	60	3600
5.	60	3600
6.	65	4225
7.	65	4225
8.	65	4225
9.	65	4225
10.	65	4225
11.	70	4900
12.	70	4900
13.	70	4900
14.	70	4900
15.	70	4900
16.	75	5625
17.	75	5625
18.	75	5625
19.	75	5625
20.	75	5625
21.	80	6400
22.	80	6400
23.	80	6400
24.	80	6400
25.	80	6400
Total	2160	158200

n   = 25

$\sum xi$ = 2160

$\sum_{xi} 2$ = 158200

So:

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

$$= \frac{30(158200) - (2160)^2}{30(30-1)}$$

$$= \frac{4746000 - 4665600}{30(29)}$$

$$= \frac{80400}{870}$$

$$= 92.41$$

The Formula was used to test the hypothesis was:

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

2. VII-3 and VII-80 :

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

So:

$$F = \frac{92.41}{90,25}$$

$$= 1.02$$

After doing the calculation, researcher found that $F_{count} = 1.02$. It had been compared to F_{table} with α 5% and dk numerator and deminator were same (n_1 and $n_2 = 30$; dk $= 30$-$1 = 29$). From the distribution list F, researcher found that $F_{table} = 4.18$, so $F_{count} < F_{table}$ ($1.02 < 4.18$). It could be concluded that there is no difference variant between the VII-3 class and VII-8 class. It means that the variant is homogenous.

Appendix 19

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:

$$Tt = \frac{X_1 - X_2}{\sqrt{\left(\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$Tt = \frac{61.19 - 59.9}{\sqrt{\left(\frac{(30 - 1)71.86 + (30 - 1)292.21}{25 + 25 - 2}\right)\left(\frac{1}{25} + \frac{1}{25}\right)}}$$

$$Tt = \frac{1.29}{\sqrt{\left(\frac{29(71.86) + 29(292.21)}{48}\right)\left(\frac{2}{25}\right)}}$$

$$Tt = \frac{1.29}{\sqrt{\left(\frac{4983.94 + 8474.09}{48}\right)(0.07)}}$$

$$Tt = \frac{1.29}{\sqrt{(232.035)(0.07)}}$$

$$Tt = \frac{1.29}{\sqrt{16.24}}$$

$$Tt = \frac{1.29}{4.03}$$

$$Tt = 0.320$$

Based on researcher calculation result of homogeneity test of the both averages, researcher found that t_{count}= 0.320 with opportunity (1-α) = $1 - 5\%$ = 95% and dk = $n_1 + n_2 - 2 = 30 + 30 - 2 = 58$, researcher found that t_{table} = 1.67155, because t_{count}<t_{table}(0.320<1.67155). So, H_a was rejected, it means that there is no difference in average between experimental class and control class in pre test.

Appendix 20

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:

$$Tt = \frac{X_1 - X_2}{\sqrt{\left(\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}}$$

$$Tt = \frac{76.1 - 72.81}{\sqrt{\left(\frac{(30 - 1)91.5 + (30 - 1)102.75}{25 + 25 - 2}\right)\left(\frac{1}{25} + \frac{1}{25}\right)}}$$

$$Tt = \frac{3.29}{\sqrt{\left(\frac{29(90.25) + 29(92.41)}{48}\right)\left(\frac{2}{25}\right)}}$$

$$Tt = \frac{3.29}{\sqrt{\left(\frac{2617.25 + 2679.89}{48}\right)\left(\frac{2}{25}\right)}}$$

$$Tt = \frac{3.29}{\sqrt{\left(\frac{5297.14}{48}\right)(0.07)}}$$

$$Tt = \frac{3.29}{\sqrt{91.33(0.07)}}$$

$$Tt = \frac{3.29}{\sqrt{6.39}}$$

$$Tt = \frac{3.29}{2.52}$$

$Tt = 1.30$

Based on researcher calculation result of homogeneity test of the both averages, researcher found that t_{count}= 2.053 with opportunity (1-α) = 1 − 5% = 95% and dk = $n_1 + n_2 - 2$ = 30 + 30 − 2 = 58, t_{table} = 1.67155, cause t_{count}>t_{table-} (2.205>1.67155). It means that H_a was accepted, it means there was the difference average between experimental class and control class in post test. It can be concluded that there was the significant effect of semantic mapping strategy on vocabulary mastery SMP N 5 Padangsidimpuan

Appendix 21

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 22

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
-	0.09680	0.09510	0.09342	0.09176	0.09012	0.08851	0.08691	0.08534	0.08379	0.08226

1.3										
-1.2	0.11507	0.11314	0.11123	0.10935	0.10749	0.10565	0.10383	0.10204	0.10027	0.09853
-1.1	0.13567	0.13350	0.13136	0.12924	0.12714	0.12507	0.12302	0.12100	0.11900	0.11702
-1.0	0.15866	0.15625	0.15386	0.15151	0.14917	0.14686	0.14457	0.14231	0.14007	0.13786
-0.9	0.18406	0.18141	0.17879	0.17619	0.17361	0.17106	0.16853	0.16602	0.16354	0.16109
-0.8	0.21186	0.20897	0.20611	0.20327	0.20045	0.19766	0.19489	0.19215	0.18943	0.18673
-0.7	0.24196	0.23885	0.23576	0.23270	0.22965	0.22663	0.22363	0.22065	0.21770	0.21476
-0.6	0.27425	0.27093	0.26763	0.26435	0.26109	0.25785	0.25463	0.25143	0.24825	0.24510
-0.5	0.30854	0.30503	0.30153	0.29806	0.29460	0.29116	0.28774	0.28434	0.28096	0.27760
-0.4	0.34458	0.34090	0.33724	0.33360	0.32997	0.32636	0.32276	0.31918	0.31561	0.31207
-0.3	0.38209	0.37828	0.37448	0.37070	0.36693	0.36317	0.35942	0.35569	0.35197	0.34827
-0.2	0.42074	0.41683	0.41294	0.40905	0.40517	0.40129	0.39743	0.39358	0.38974	0.38591
-0.1	0.46017	0.45620	0.45224	0.44828	0.44433	0.44038	0.43644	0.43251	0.42858	0.42465
-0.0	0.50000	0.49601	0.49202	0.48803	0.48405	0.48006	0.47608	0.47210	0.46812	0.46414

Z-Table

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

2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.4987	0.4987	0.4987	0.4988	0.4988	0.4989	0.4989	0.4989	0.4990	0.4990
3,1	0,4990	0,4991	0,4991	0.4991	0,4992	0,4992	0,4992	0,4992	0,4993	0,4993
3,2	0,4993	0,4993	0,4994	0,4994	0,4994	0,4994	0,4994	0,4995	0,4995	0,4995
3,3	0,4995	0,4995	0,4995	0,4996	0,4996	0,4996	0,4996	0,4996	0,4997	0,4997
3,4	0,4997	0,4997	0,4997	0,4997	0,4997	0,4997	0,4997	0,4997	0,4997	0,4998
3,5	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998	0,4998
3,6	0,4998	0,4998	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999
3,7	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999
3,8	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999	0,4999
3,9	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000	0,5000

Appendix 23

Percentage Points of the t Distribution

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

36	0.68137	1.30551	1.68830	2.02809	2.43449	2.71948	3.33262
37	0.68118	1.30485	1.68709	2.02619	2.43145	2.71541	3.32563
38	0.68100	1.30423	1.68595	2.02439	2.42857	2.71156	3.31903
39	0.68083	1.30364	1.68488	2.02269	2.42584	2.70791	3.31279
40	0.68067	1.30308	1.68385	2.02108	2.42326	2.70446	3.30688

Percentage Points of the t Distribution

Pr df	0.25 0.50	0.10 0.20	0.05 0.10	0.025 0.050	0.01 0.02	0.005 0.010	0.001 0.002
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