

CHAPTER III

METHOD OF INVESTIGATION

A. Objective of the Study

In this thesis, the objectives of study are:

1. To find out the students' achievement of Present Continuous Tense who were taught by using Mime Game at seventh grade of SMP Islam Walisongo Penawangan in the academic year of 2009/2010.
2. To find out the students' achievement of Present Continuous Tense who were not taught by using Mime Game at seventh grade of SMP Islam Walisongo Penawangan in the academic year of 2009/2010.
3. To find out the effectiveness of using Mime Game to improve students' understanding on Present Continuous Tense at seventh grade of SMP Islam Walisongo Penawangan Grobogan in the academic year of 2009/2010.

B. Setting of the Study

The writer did research by title "The Use of Mime Game to Improve Students' Understanding on Present Continuous Tense: An Experimental Study at 7th Grade of SMP Islam Walisongo Penawangan Grobogan in the Academic Year of 2009/2010. She conducted this research from 4th of February 2010 to 2nd of March 2010.

Table 1

List of time of the study

Number	Activity	Month/Date				
		February				March
		4 th	9 th	23 th	26 th	2 nd
1.	Try Out	-				
2.	Pre Test		-			
3.	Treatment 1			-		

4.	Treatment 2				-	
5.	Post Test					-

C. Variable of the Research

Variable can be defined as an object of research. In this study there are two variables. They are Independent Variable (x) and Dependent Variable (y).

1. Independent Variable (x)

Independent variable is variable that influences or those to be cause of change the dependent variable.²¹

The independent variable of this study, according to the definition above is the using of Mime Game to improve students' understanding on Present Continuous Tense.

2. Dependent Variable (y)

Dependent variable is variable that was affected or that be the result because of the existence of the independent variable.²²

Referring to the definition above, the dependent variable of this study is the improvement of students' understanding on Present Continuous Tense for the first year students of SMP Islam Walisongo Penawangan kab. Grobogan.

D. Research Method

This research is experimental study. An experiment is defined as a situation in which one observes the relationship between two variables by deliberately producing a change in one and looking to see whether this alteration produces a change in the other.²³ In other words, experiment is the way to find the causal relationship between two factors which are raised by the researcher in purpose by reducing or eliminating any distracting factors. In

²¹Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: Rineka Cipta, 2006), 4th Ed., p. 119

²²*Ibid.*

²³James Dean Brown and Theodore S. Rodgers, *Doing Second Language Research*, (New York: Oxford University Press, 2002), p. 211

this research, the writer will use experiment to teach class (VII A) by using Mime Game to improve students' understanding on Present Continuous Tense and control class (VII B) without using Mime Game.

In this study, the approach used by the writer was quantitative approach. It is quantitative because the data that was gained were numeric and was analyzed by using statistical computation. Quantitative approach stressed the analysis to the numerical data that is processed by statistical method. It will explain the result of pre - test and post – test.

E. Subject of The Research

1. Population

Population is “the whole subject of research”.²⁴ Population is generally areas which consists of object/subject which has certain quality and characteristic which decided by the researcher to study and then collected the summary.²⁵ Population of this research is the first year students of SMP Islam Walisongo Penawangan Grobogan in the academic year of 2009/2010. The total number of first year students of SMP Islam Walisongo Penawangan Grobogan is 92 students.

2. Sample

Sample is taking of a part population using certain procedure. So, that can be expected to represent its population. Sample is a part of population to be researched. Sample is a subset of individuals from a given population.²⁶ Sample must be reflective with the true example in the field. In this research, the writer uses random sampling to choose which one to be sample. In this case, the researcher will take sample from seventh grade students (VII A as an experiment class and B as a control class) of SMP

²⁴Suharsimi Arikunto, *op.cit*, p. 130

²⁵Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R&D*, (Bandung: Alfa Beta, 2008), p. 19

²⁶David Nunan, *Research Methods in Language Learning*, (New York: Cambridge University Press, 1992), p. 27

Islam Walisongo Penawangan Grobogan in the academic year of 2009/2010.

F. Technique of Data Collection

An instrument plays an important role in a research in the sense that reliability of data obtained. Instrument that used to collect the data in this research is test.

Wiersma and Jurs define test as a set of items or questions to be presented to one or more students under specified conditions.²⁷ Test is a question which is used to measure competence, knowledge, intelligence, and ability of talent which is possessed by individual or group to collect data. The writer used one test type only. It was multiple choice completions. This type of test was chosen because of the following advantages:

1. The technique of scoring is easy.
2. It was easy to compute and determine the reliability of the test.
3. It was more practical for the students to answer.

In this research, the researcher will give pre-test and post-test. These tests are given to both control and experiment class.

1. Pre-test

Before the teacher taught the material by using Mime Game, the teacher gave a test to the students. Pre-test was given at the beginning of research, before the experiment was run to both control and experiment class with similar question that related to the topic.

2. Post-test

Post- test was given to the experiment class and the control class. The test was given in order to know the improvement of students' understanding on Present Continuous Tense. The post-test was given to the experiment class and control class after received treatment. The

²⁷William Wiersma and Stephen G. Jurs, *Educational Measurement and Testing*, (Massachusetts: Allyn and Bacon, 1990), 2nd Ed., p. 8

experiment class taught Present Continuous Tense by using Mime Game. And the control class taught without using Mime Game.

The score of students' achievement can be calculated by using this following formula:

$$\text{Score} = \frac{\text{The number of right answer}}{\text{The number of questions}} \times 100$$

G. Technique of Data Analysis

1. Try Out Instrument of Test

Before the test was used an instrument to collect the data, it had been tried out first to the students in another class. It is to analyze validity, reliability, difficulty level and also the discrimination power of each item. The tryout was given to VII C of the students of test SMP Islam Walisongo Penawangan Grobogan. The writer prepared 30 items as the instrument of the test. From 30 test items of tryout, some items were chosen as the instrument of the test while some others were left out.

The choosing of the instrument had been done by considering: validity, reliability, the degree of test difficulty and discriminating power.

a. The Validity

The validity is an important quality of any test. It is a condition in which a test can measure what is supposed to be measured. According to Arikunto, a test is valid if it measures what it purposes to be measured.²⁸

The validity of test is calculated using Product Moment Formula, which is as follows.

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

²⁸Suharsimi Arikunto, *loc. cit.*, p. 65

Where:

r_{xy} : The correlation coefficient between X variable and Y variable

N : The number of students

$\sum X$: The sum of score of X item

$\sum Y$: The sum of score of Y item

Calculation result of r_{xy} is compared with r_{table} of Product

Moment by 5% degree of significance. If r_{xy} is higher than r_{table} , the item of question is valid.

b. Reliability

Reliability is consistency of measurement.²⁹ A reliable test score will be consistent across different characteristics of the testing situation. Besides having high validity, a good test should have high reliability too. Alpha formula is used to know reliability of test is K - R. 20.³⁰

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

Where:

r_{11} : The reliability coefficient of items

n : The number of item in the test

P : The proportion of students who give the right answer

q : The proportion of students who give the wrong answer

S^2 : The standard deviation of the test

Calculation result of r_{11} is compared with r_{table} of product moment by 5% degree of significance. If r_{11} is higher than r_{table} , the item of question is reliable.

²⁹Lyle F. Bachman and Adrian S. Palmer, *Language Testing Practice: Designing and Developing Useful Language Test*, (New York: Oxford University Press, 1996), p. 19

³⁰Sugiyono, *op.cit.*, p. 132

c. Degree of Test Difficulty

After the try out was conducted, each item is classified in the difficulty level by using formula:

$$P = \frac{B}{JS}$$

Which,

P : item difficulty

B : number of students who answered the item correctly

JS : number of students

The level of difficulty of each item was determined by using this following categorization:

$0 < P \leq 0,3$ is difficult

$0,3 < P \leq 0,7$ is medium

$0,7 < P \leq 1$ is easy

d. Discriminating Power

The discriminating power is a measure of the effectiveness of a whole test. The higher and low values of discriminating power are the more effective the test will be.

$$D = \frac{BA}{JA} - \frac{BB}{JB}$$

Where:

D : discrimination index

JA : member of student in upper group

JB : member of student in low group

BA : member of students in upper group who answer the item correctly

BB : member of students in low group who answer the item correctly

The criteria are:

$D < 0,2$ is poor

$0,2 < D \leq 0,4$ is fair

$0,4 < D \leq 0,7$ is good

$0,7 < D \leq 1$ is very good

2. Pre-Request Test

Before the writer determines the statistical analysis technique used, she examined the normality and homogeneity test of the data.

a. Normality Test

It is used to know the normality of the data that is going to be analyzed whether both groups have normal distribution or not. To find out the distribution data is done normality test with the Chi-square. Step by step Chi-square test is as follows:

- 1) Determine the range (R); the largest data reduced the smallest.
- 2) Determine the many class interval (K) with formula:
 $K = 1 + (3,3) \log n$
- 3) Determine the length of the class, using the formula:

$$P = \frac{\text{range}R}{\text{numberofclass}}$$

- 4) Make a frequency distribution table
- 5) Determines the class boundaries (bc) of each class interval
- 6) Calculating the average \bar{X} , with the formula:

$$\bar{X} = \frac{\sum f_i x_i}{\sum f_i}$$

- 7) Calculate variants, with the formula:

$$S = \sqrt{\frac{\sum f_i (x_i - \bar{x})^2}{n - 1}}$$

- 8) Calculate the value of Z, with the formula:

$$Z = \frac{x - \bar{x}}{s}$$

x = Limit Class

\bar{x} = Average

S = Standard deviation

- 9) Define the wide area of each interval
- 10) Calculate the frequency expository (Ei), with formula:
Ei = n x wide area with the n number of sample
- 11) Make a list of the frequency of observation (Oi), with the frequency expository as follows:

class	bc	Z	P	L	Ei	$\frac{O_i - E_i}{E_i}$

- 12) Calculate the chi-square (χ^2), with the formula:

$$\chi^2 = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

- 13) Determine the degree of validity (dk). In the calculation of this data is arranged in list of frequency distribution consisting of k pieces so that the interval to determine the criteria test used formula $dk = k-3$, where k is the number of class intervals and $\alpha = 5\%$
- 14) Determining the value of χ^2 table
- 15) Determining the distribution normality with test criteria:

If $\chi^2_{count} < \chi^2_{table}$ so the data is not normal distribution and the other way if the $\chi^2_{count} > \chi^2_{table}$ so the data is normal distribution.³¹

b. Homogeneity Test

Is used to know whether experiment class and control class, that are taken from population have same variant or not. According to Nunan, a test should be given to both classes of students before the experiment just to make sure that the both classes really are the same.³²

The steps as follow:

³¹ Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 273

³²David Nunan, *op.cit.*, p. 27

- 1) Calculate variants both classes (experimental and control classes), with the formula:

$$S_1^2 = \frac{\sum (x - \bar{x})^2}{n_1 - 1} \text{ And } S_2^2 = \frac{\sum (x - \bar{x})^2}{n_2 - 1}$$

- 2) Determine $F = \frac{Vb}{Vk}$

Where:

Vb : Bigger Varian

Vk : Smaller Varian

Determine dk = $(n_1 - 1) : (n_2 - 1)$

- 3) Determine F_{table} with $\alpha = 5\%$

- 4) Determining the distribution homogeneity with test criteria:

If $F_{count} > F_{table}$, the data is not homogeneous and the other way if the $F_{count} < F_{table}$, the data is homogeneous.³³

c. Test of the Average

It is used to examine average whether experiment group and control group have been decided having different average.³⁴

T-test is used to analyze the data of this research. A t-test used to measure or to compare the mean scores of the two groups.³⁵

If $\sigma_1^2 = \sigma_2^2$ (has same variant), the formula is:

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

With

³³Sudjana, *op.cit.*, p. 250

³⁴Anas Sudijono, *Pengantar Statistik Pendidikan* (Jakarta: PT. Raja Grafindo Persada, 1995) 6th Ed, p. 264

³⁵Rodgers and Brown, *op.cit.*, p. 205

$$S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

Where:

\bar{X}_1 : The mean score of the experimental group

\bar{X}_2 : The mean of the control group

n_1 : The number of experiment group

n_2 : The number of control group

S_1^2 : The standard deviation of experiment group

S_2^2 : The standard deviation of both groups

If $\sigma_1^2 \neq \sigma_2^2$ (has no same variant) the formula is:

$$t^1 = \frac{\bar{X} - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

The hypotheses are:

$H_0 = \mu_1 = \mu_2$

$H_a = \mu_1 \neq \mu_2$

μ_1 : average data of experiment group

μ_2 : average data of control group

Criteria test is: H_0 is accepted if $-t_{(1-\frac{1}{2}\alpha)} < t < t_{(1-\frac{1}{2}\alpha)}$, where

$t_{(1-\frac{1}{2}\alpha)}$ obtained from the distribution list t with $dk = (n_1 + n_2 - 2)$

and opportunities $(1 - \frac{1}{2}\alpha)$. Values for other t H_0 rejected.³⁶

3. Analysis Phase End

a. Normality Test

³⁶Sudjana, *loc.cit* p. 239

Steps normality second step is the same as the normality test on the initial data.

b. Homogeneity Test

Steps homogeneity second step is the same as the homogeneity test on the initial data.

c. Test Average (Right-hand Test)

Proposed hypothesis test in average similarity with the right test is as follow:

$$H_0 = \mu_1 = \mu_2$$

$$H_a = \mu_1 > \mu_2$$

If $\sigma_1^2 = \sigma_2^2$ (has same variant), the formula is:

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

With

$$S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

Where:

\bar{X}_1 : The mean score of the experimental group

\bar{X}_2 : The mean of the control group

n_1 : The number of experiment group

n_2 : The number of control group

S_1^2 : The standard deviation of experiment group

S_2^2 : The standard deviation of both groups

If $\sigma_1^2 \neq \sigma_2^2$ (has no same variant) the formula is:

$$t^1 = \frac{\bar{X} - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_1^2}{n_2}}}$$

Testing criteria that apply H_0 is accepted if $t_{count} > t_{table}$ with determine $dk = (n_1 + n_2 - 2)$ and $\alpha = 5\%$ with opportunities $(1 - \alpha)$. Values for other t H_0 rejected.³⁷

³⁷ *Ibid*, p. 243.