

CHAPTER III

RESEARCH METHOD

A. Setting of the Study

The writer did research at SDN 03 Tengengwetan Siwalan Pekalongan. She conducted this research from 22th of April 2011 to 21th of May 2011.

B. Procedure and Timeline

In collecting data, the researcher needs four weeks and done some steps as follows:

1. 1st week asks permission and meet to head master and the English teacher of the school.
2. 2rd week, the writer gives pre test to both control and experimental class (class V A and V B).
3. 3th, 4th and 5th week, the writer teaches control and experimental class (class V A and V B).
4. 6th week, the writer gives post test to both control and experimental class (class V A and V B)

Table 1
List of time of the study

Number	Activity	Month/Date					
		April		May			
		22 nd	29 th	6 th	13 th	20 th	21 th
1	Asks permission to head master	-					
2	Pre Test		-				
3	Treatment 1			-			

4	Treatment 2				-		
5	Treatment 3					-	
6	Post Test						-

C. Variable of the Research

Variable refers to the object of research that becomes research focus. The variable of this research refers to the teaching learning method using Word Find Puzzle (independent variable) and the students' achievement on Common Noun (dependent variable). The indicators of teaching and learning technique using Word Find Puzzle are as follows.

a. Class presentation

In this phase, the students' attentions become one important element that should be done by the students while the teacher gives the explanation.

b. Team Game

In this phase, the cooperation ability of the students in team in explaining the given material is needed where they should help to one another for getting understanding to reach the team success.

D. Research Method

In this research, the writer conducted an experimental research. An experimental research involved two groups: experimental group and control group. An experimental group received a new treatment while control group received a usual treatment. According to Nunan, experiment is designed collect data in such as a way that treats to the reliability and validity of research are ministered.¹ 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.

¹ David Nunan, *Research Method in Language Learning* (Cambridge: University Press, 1992) p. 47.

In this study, the approach used by 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.² It will explain the result of pre - test and post – test.

E. Population and Sample

1. Population

Population is “the whole subject of research”.³ In this research, population of this research is fifth grade of SDN 03 Tengengwetan in the academic year 2010/2011. The fifth grade of SDN 03 Tengengwetan is divided into two classes. There are 20 students in each class. The total number of population is 40 students.

2. Sample

Sample is taking of part population using certain procedure. So, that can be expected to represent its population. So, it can be expected to represent its population. In this connection, Arikunto states that sample is “a part of research population”.⁴ The writer took sample in this research because the respondents are more than 100. The respondents are less than 100, it is better to take them all as sample.⁵ Sample in this research are class V A as a control class and class V B as experimental class. So, each class consisted of 20 students.

² M. Burhan Bungin, *Metodologi Penelitian Kuantitatif : Komunikasi, Ekonomi dan Kebijakan Publik Serta Ilmu-Ilmu Social Lainnya* (Jakarta: Kencana, 2006), p. 50.

³ Suharsimi Arikunto, *Op Cit.*, p.130

⁴ Sutrisno Hadi, *Statistik* (Yogyakarta: Adi, 2004) 2nd Vol. 2nd Ed. P. 182

⁵ Suharsimi Arikunto, *Op. Cit.* P. 134

F. Technique of Data Collection

Instrument that are used to collect the data as follows:

1. Documentation

It refers to the archival data that help the researcher to collect the needed data. The researcher function the document related to the object research such as students name list and the English subject schedule.

2. Test

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.⁶ In this research, the test was given to tryout class, control class and experimental class.

The instrument of the test in this research is objective test. Objective test is frequently criticized on the grounds that they are simpler to answer than subjective test. Objective tests are divided into transformation, completion, combination, addition, rearrangement, matching, correct and incorrect (true/false) and multiple choice.⁷ The writer used multiple choice forms. The choice of the test type is based on the consideration that multiple choice test are:

- a. The technique of scoring is easy.
- b. It was easy to compute and determine the reliability of the test.
- c. It was more practical for the students to answer

In this research, the writer used pre test and post test, they are:

a. Pre-test

Before the teacher taught new material by using mind-mapping, the teacher gave grammar test to the students. Pre-test was given to the experimental and control classes in same way. This test was given before the experiment was run.

b. Post-test

⁶ M. Chabib Thoha, *Teknik Evaluasi Pendidikan* (Jakarta: PT Raja Grafindo Persada, 2001), p. 43.

⁷ J.B Heaton, *Writing English Language Tests* (London: Longman, 1975), p. 12-13.

Post-test was given to the experiment class and control class. It was given in order to know the score of students' achievement after they were taught using word find puzzle (experimental class) and without using word find puzzle (control class).

The score of students' achievement can be calculated by using this following formula:⁸

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

G. Technique of Data Analysis

1. Pre-request Test

Before the writer determines the statistical analysis technique used, He 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. The normality test with Chi-square is done to find out the distribution data. 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:

$$P = \frac{\text{range}}{\text{number of class}}$$

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

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

⁸ Suharsimi arikunto, *op. cit.*, p. 235.

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 (X^2), with the formula:

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

13) Determine dk = k-3, where k is the number of class intervals and

$\alpha = 5\%$

14) Determining the value of X^2 table

15) Determining the distribution normality with test criteria:

If $X^2_{count} > X^2_{table}$, the data is not normal distribution and the other way if the $X^2_{count} < X^2_{table}$, the data is normal distribution.⁹

b. Homogeneity Test

⁹ Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 273.

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.¹⁰

The steps as follows:

- 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.¹¹

c. Test of the Average

It is used to examine average whether experiment group and control group have been decided having different average.¹²

T-test is used to analyze the data of this research. A t-test would be the measure you would use to compare the mean scores of the two groups.¹³

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

¹⁰ David Nunan, *Op Cit.* p. 27.

¹¹ Sudjana, *op cit*, p. 250.

¹² Anas Sudijono, *Pengantar Statistik Pendidikan* (Jakarta: PT. Raja Grafindo Persada, 1995) 6th Ed, p. 264.

¹³ Rodgers and Brown, *Doing Secon Language Research*, (Cambridge: Oxford Press 2002 p. 205.

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

With

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

Where:

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

\overline{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:

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

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.¹⁴

¹⁴ Sudjana., *op.cit* p. 239.

2. Analysis Phase End

a. Normality Test

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 follows:

$$H_0 = \mu_1 = \mu_2$$

$$H_a = \mu_1 > \mu_2$$

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:

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

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.¹⁵

¹⁵ Sudjana, *op cit*, p. 243.