

CHAPTER III

RESEARCH METHOD

This chapter was going to discuss research type, research design, variable of study, population and sample, research instrument, data collection, data analysis.

A. Time and Place of the study

The study conducted at the SMP Mummadiyah Palangka Raya which located on Jl. Rta. Milono Km. 1 Palangka Raya.

B. Research Design And Approach

This study used quantitative design. It was quantitative design because quantitative is the data that from of number using statistic data. According to Donald Ary “Quantitative research a ginnery employing operational definitions to generate numeric data to answer predator mined hypotheses or questions.”¹ Creswell states that a quantitative study, consistent with the quantitative paradigm, is an inquiry into social or human problems based on testing a theory composed of variables, measured with numbers, and analyzed with statistical procedures, in order to determine whether predictive generalization of the theory hold true.²

The writer applied the quasi experiment approach. Two groups were divided to be experiment group and control group. The researcher included two variables, the first variable applied the crossword puzzle and the second variable applied traditional method. According to Morgan, the best alternative for an experimental design is a quasi-experimental format. The *non randomized control group, pretest–posttest design* is one

¹Ary Donal, et...all. *Introduction - Research In Education Ceight*, Canada: Wadsworth Engage Learning, 2010,p. 648.

² John W.Creswell, *qualitative and quantitative approach*, 1994, california: SAGE Publications, inc, 1994, p.2

of the most widely used quasi-experimental designs in educational research. The design was as follow :³

Tabel 3.1

Nonrandomized Control Group, Pretest–Posttest Design

Subject	Pre test	Treatment	Post test
E	Y_1	X	Y_2
C	Y_1	-	Y_2

Where are:

E : Exprimental group will use crossword puzzle

C : Control group will use traditional method

Y_1 : Pre – test

X : Treatment

Y_2 : Post – test

Because both of experiment group and control group took some pre test and post test, and the study did at the same time. The experiment group just learned english and applied the crossword puzzle and the control group was learned by traditional method.

C. Population and sample

1. Population

A population is defined as all members of any well defined class of people, events, or objects.⁴ The population in this study was all students of second grade of Muhammadiyah junior high school Palangka Raya.

³ Donald Ary, et...all, *Introduction to Research in Educations*, Wardsworth: USA, 2010, p.317

2. Sample

Sample is a half of numbers and characteristics in the population.⁵ This case is based on Arikunto that say if the amount of the subject is large, it can be taken from 10-15% or 20-25% or more.⁶

Cluster sampling is used if the population does not consist of individuals, but groups or cluster.⁷ Because the population of this study was the students of the eight grade students of SMP Muhammadiyah Palangka Raya. Which they consist of two classes. The VIII Aktif class was the experiment class was 30 students and VIII Inovatif was the control class was 30 students.

D. Research instrument

The data was very important in the study. The data were needed to support and prove the study itself. The writer could be helped by them in order to find the aims of the study. There were to measure the effectiveness of the crossword puzzle as a media toward vocabulary mastery of the student on The Second Grade of Muhammadiyah Junior High School Palangka Raya.

The writer was collected the data of this study by using test and the result of the test was used to measure the students' vocabulary scores. The test was in multiple choice test form and there are 50 items. The allocated time to do each vocabulary test are 90 minutes.

²⁹David Nunan, *Research Methods in Language Learning*, Cambridge: Cambridge University Press, 1992, p. 232

⁶ Suharsimi Arikunto, *Prosedur Penelitian. Suatu Pendekatan Praktik*, p.107

⁷Nurul Zurich, *Metodologi Penelitian Sosial dan Pendidikan (TeoriAplikasi)*, Jakarta: BumiAksara, 2006, p.

The writer collected the data of this study by using a test and the result of the test will use to measure the students' vocabulary scores about anagram. The test was vocabulary test. According to Heaton, a test of vocabulary measures the students' knowledge of the meaning of certain words and word group.⁸ In this study the writer used multiple choice test for measuring the students' vocabulary.

The writer gave pre-test and post-test to the both experimental and control group. Pre test was a test given before the writer gives treatment. The function of pre test is to know how are the students' vocabulary scores before they taught by using crossword puzzle. Post test was a test given after a lesson or a period of instruction. The function of post test is to know how are the students' vocabulary scores after they taught by using crossword puzzle.

E. Instruments Try Out

The writer tried out the test instrument was define important before the test applied to the sample of the research. The writer added the information about the instrument quality that consist of instrument validity and instrument reliability.

1. Research Instruments Reability

Reability is necessary characteristic of any good test: for it to be valid at all, a test must be reliable as measuring instrument.⁹ According to Susan Stainback, *reliability is often defined as the consistency and stability of the data or finding. From a positive perspective, reliability typical is consider to be synonymous with the consistency of the data produced by observation made by different researchers, by same reseacher by the same researcher at different times, or by splitting a daa set in two parts.*¹⁰

⁸ J.B. Heaton, *Writing English Language Test*, England: Longman, 1975. P. 5.

⁹ J.B. Heaton, *Languauge Test*, p.155

¹⁰ Sugiyono, *memahami Penelitian Kuantitatif*, p.118

To measure the reability test, the writer will use the Kuder Richardson (KR20) and the formula as follows:

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

Where:

r_{11} = Coefficient of test reability

n = Number of item

St^2 = Total Varians

$\sum pq$ = Result of square between p and q.¹¹

According to Suharto, the result of the calculation above is connected to the following criteria:

0,800 – 1,000 = Very High Reliability

0,600 – 0,799 = High Reliability

0,400 – 0,599 = Fair Reliability

0,200 – 0,399 = Poor Reliability

0,000 – 0,199 = Very Poor Reliability¹²

2. Research Instruments Validity

The validity of a test is the extent to which measure, what is suppose to measured and nothing else.¹³ According to Gronlund “content validity is the process of

¹¹Anas Sujono, *Pengantar Evaluasi Pendidikan*, Jakarta: PT. Raja Grafindo Persada, 2013, p. 252-253.

¹²Suharto, *Methodologi Penelitian dalam Pendidikan Bahasa*, Jakarta: Depdikbud Proyek Pengembangan Pendidikan Tenaga Kependidikan, 1988, p. 125

¹³Anas Sujono, *Pengantar evaluasi Pendidikan*, Jakarta: Raja Grafindo Persada, 2005, p. 185.

determining the extent to which a set of test tasks provides relevant and representative sample of the domain of tasks under consideration.”¹⁴ Instrumentation validity discussed about construct and content validities of the test which use in this research.

a. Face validity

This type of validity, in fact is often referred to as face validity : if a test item looks right to other testers, teachers, moderators, and tasters. The test used by the writer is suitable to others and the same level that is Junior High School level. So that is why, the writer makes the type of test items also suitable in the second grade students at the Muhammadiyah junior high school palangka raya. the face validity of the test item as follows :

The kind of the test is vocabulary test which is about part of speech especially about noun, verb, and adjective.

- 1) The forms of the test items fill the puzzle.
- 2) The language of items use English.
- 3) The test items are suitable to the junior high school.

b. Construct validity

Construct validity is type of validity which assumes the existence of certain learning theories or construct underlying the acquisition of abilities and skills. The test is focus to increase the vocabulary mastery that focus on noun, verb and adjective base on the syllabus. In this case, the test is a written test in order to measure the students' vocabulary mastery.

¹⁴Norman E. Gronlund, *Measurement and Evaluations in Teaching*, New York: Macmillan Publishing Company, t.th, p. 83.

Tabel 3.2

The indicator of vocabulary test

The measured aspects	Indicators	Number of question	Total
Mastery of word form	<ul style="list-style-type: none"> The ability to decide the synonym 	22, 25	2
	<ul style="list-style-type: none"> The ability to decide the antonym 	1, 2, 3, 4	4
Mastery of words meaning	<ul style="list-style-type: none"> The ability to give meaning of a word 	5, 6, 7, 8, 9	5
Vocabulary knowledge	<ul style="list-style-type: none"> The ability to decide the the noun. 	10, 16, 18, 34, 39, 45, 48, 49, 50	9
	<ul style="list-style-type: none"> The ability to decide the adjective. 	14, 20, 31, 32, 40, 43, 47	7
	<ul style="list-style-type: none"> The ability to decide the verb. 	11, 12, 13, 15, 17, 19, 21, 23, 24, 26, 27, 28, 30, 33, 35, 36,	21

		37, 38, 41, 42, 46	
Total number of questions			50

c. Content validity

The test item in this research is to measure the students' English vocabulary mastery and base on the English teaching learning curriculum apply in Muhammadiyah junior high school palangkaraya. In making the test, the writer try to match each of item test with the curriculum that is used by Muhammadiyah junior high school palangkaraya.¹⁵

3. Index of Difficulty

The index of difficulty (or the facility value) of an item simply shows how easy or difficult the particular item proved in the test.¹⁶ To know the level of difficult of test, the writer will use the formula as follows:

$$F.V = \frac{R}{N}$$

Where:

F.V = Facility value / level of difficulty

R = Number of the student who get the right answer

N = The total of students.

The result of formula above is connected the F.V value below:

FV = 0.00 – 0.30= Difficult

¹⁵ J.B. Heaton, *Writing Language English Test*, London: Logman 1974, p.153-154

¹⁶ Anas Sujono, *Pengantar Evaluasi Pendidikan*, Jakarta: PT. Raja Grafindo Persada, 2013, p. 172.

0.31 – 0.70 = Fair

0.71 – 1.00 = Easy ¹⁷

F. Data collection.

Before analyzing data, there are some procedures to collect the data. The writer did some procedures consist of steps as bellow:

1. The writer observed the class.
 - a) The number of class’.
 - b) The number of students.
 - c) The class activity.
2. The writer choosed the class will be taught.
3. The writer gave pre-test and post-test.
4. The writer taught and gave the treatment to the class by using crossword puzzle.
5. The writer gave post-test to the class.
6. The writer gave score to the data from the class.
7. The witer started to analyze the data by t-test.
8. The writers interpreted the data analysis result.
9. The writer concluded the activity of the study whether the crossword puzzle gives the important effect to the students’ vocabulary mastery and achievement, base on the result of data.

G. Data analysis procedures

The data of this study was students’ vocabulary ability score. Therefore, the data were quantitative. The pretest and post-test raw score were converted into percentages. In order to analyze the data that was collected. The mean, standard deviation and standard error of students’ score becomputed for the pretest and post-test scores of the experiment

¹⁷Ibid, p. 253.

and control groups. The writer used statistical t_{test} to answer the problem of the study. In Order to analyze the data, the writer did some way procedures:

1. Gave tests to the students of the second grade students of SMP muhammadiyah.
2. Collected the data of the students work sheet test result.
3. Scored the students' answers using the formula:

$$S = \frac{n}{N} \times 100$$

Where:

S= Students' score

n= number of true answers

N= number of test items

4. Tabulated the data into the distribution of frequency of score table, then find out the mean of students' score, standard deviation, and standard error of variable X1 (Experimental group) and X2 (Control group) by using the formulas bellow:

a. Mean of students' score

$$\bar{X} = \frac{\sum FX_i}{n}$$

Where:

$\sum FX_i$ = total of score

n = total of the students

b. Standard deviation¹⁸

$$S = \sqrt{\frac{n \sum F_{xi}^2 + (\sum F_{xi})^2}{n(n-1)}}$$

c. Standard Error¹⁹

$$SE_{md} = \frac{S}{\sqrt{N-1}}$$

¹⁸ Riduwan, *Metode dan teknik Menyusun Thesis*, p. 351

¹⁹ Sudjana, *Metode Statistika*, Bandung: Tarsito, p. 273.

Where:

S= Standard deviation

n_1 = the number of the experimental group

n_2 = the number of the control group

SE_{md} = Standard error

N= Number of Case

5. 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. Chi square is used here²⁰

$$X^2_{\text{observed}} = \sum_{i=1}^k \frac{(f_o - f_e)^2}{f_e}$$

Notice:

X^2_{observed} = Chi square

f_o = frequency from observation

f_e = expected frequency

6. Calculated result of X^2_{observed} is compared with X^2_{table} by 5% degree of significance. If X^2_{observed} is lower than X^2_{table} , so the distribution list is normal.

7. Homogeneity Test

It is used to know whether experimental group and control group, that are decided, come from population that has relatively same variant or not. The formula was:²¹

$$X^2_{\text{observed}} = (\log 10) \times (B - \sum (dk) \log S^2_i)$$

Where: $B = (\log S^2_i) \times \sum (n_i - 1)$

²⁰*Ibid*, p.179.

²¹*Ibid*, p. 177.

Notice:

$X^2_{observed} \leq X^2_{table}$, is homogeneity.

$X^2_{observed} \geq X^2_{table}$, is not homogeneity.

If calculation result of $X^2_{observed}$ is lower than X^2_{table} by 5% degree of significance, it means both groups had same variant.

8. Calculated the data by using t_{test} to test the hypothesis of the study, whether the using of crossword puzzle gives effect to the students' vocabulary scores or not. To examine the hypothesis, the writer used t_{test} formula as follows:²²

$$t_{observed} = \frac{Mn_1 - Mn_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

Where:

Mn_1 = the mean score of experimental group

Mn_2 = the mean score of control group

S_1^2 = variance of experimental group

S_2^2 = variance of control group

n_1 = total of experimental group students

n_2 = total of control group students

To know the hypothesis was accepted or rejected using the criterion: If $t_{observed}$ (the value) $\geq t_{table}$, it means H_a is accepted and H_o is rejected. If $t_{observed}$ (the value) $\leq t_{table}$, it means H_a is rejected and H_o is accepted.

²²Ibid, p. 273

9. Interpreted the result of t_{test} . Previously, the writer accounted the degrees of freedom (df) with the formula:²³

$$df = (N1+N2-2)$$

Where:

Df : degrees of freedom

N1 : Number of subject group 1

N2 : Number of subject group 2

2 : Number of variable

After that, the value of t_{test} was consulted on the t_{table} at the level of significance 1% and 5%. In this research, the writer used the level of significance at 5%. If the result or t_{test} was higher than t_{table} , it means H_a was accepted. But if the result of t_{test} was lower than t_{table} , it means H_o was accepted.

²³Anas Sugiono, *Pengantar Statistik Pendidikan*, Jakarta: Rajawali Press, 1978, p. 284.