

### **CHAPTER III**

#### **RESEARCH METHODOLOGY**

This chapter discussed of Research design, Population and Sample, Research instrument of the study, Instruments Try Out, Instrument Validity, Instrument Reliability, Data collection procedures, Technique of processing data and Data analysis procedures.

#### **A. Research Type**

This writer used quantitative approach. Aliaga in Daniel claims that Quantitative research was explaining phenomena by collecting numerical data that were analyzed using mathematically based methods (in particular statistics).<sup>43</sup> The quantitative approach was used when one begins with a theory (or hypothesis) and tests for confirmation or disconfirmation of that hypothesis.<sup>44</sup>

#### **B. Research Design**

The type of this study was pre-experimental study by utilizing One-group Pre-Test/Post-Test Design. The one group pretest-posttest design usually involves three steps: (1) administering a pretest measuring the dependent variable; (2) applying the experimental treatment X to the subjects; and (3) administering a posttest, again measuring the dependent variable.<sup>45</sup>

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<sup>43</sup>Daniel Muijs, *Doing Quantitative Research in Education with SPSS*, London: Sage Publication, 2011, 2<sup>nd</sup> edition, p.1

<sup>44</sup>Isadore Newman, & Carolyn R. Benz, *Qualitative-Quantitative Research Methodology: Exploring the Interactive Continuum*, United States of America: Southern Illinois University, 1998, p.3

<sup>45</sup>Donald Ary, et, al, *Introductory to Research in Education*, Canada: Wadsworth, Cengage Learning 8<sup>th</sup> Edition, p. 304

**Table 3.1**  
**One-Group Pretest-Posttest Design**

| <b>Subject</b> | <b>Pre-Test</b> | <b>Treatment</b> | <b>Post-Test</b> |
|----------------|-----------------|------------------|------------------|
| <b>X-3</b>     | <b>Y1</b>       | <b>X</b>         | <b>Y2</b>        |

The writer will use pre-experimental design because the writer is not the real teacher of the school, so that the writer do not has the authorityto arrange the students into new groups such as the true experiment study.

#### **C. Place And Time Of Research**

This research is carrying out at Senior High School of SMA Muhammadiyah 1 Palangka Raya, which is located on the Jl. RT Amilono Street. The writer found the complete data about two months, it is March-April 2016 and the students at the SMA Muhammadiyah 1 Palangka Raya.

#### **D. Population And Sample**

##### **1. Population**

Population is all cases, situation, or individuals who share one or more characteristics.<sup>46</sup> The population of this research is all the students of the tenth grade student of SMA Muhammadiyah 1 Palangka Raya. The numbers of population are about 120 students. It is classified in four classes.

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<sup>46</sup> David Nunan, Research Methods in Language Learning, p. 231.

**Table 3.2**  
**The Number of the Tenth Grade Students of**  
**SMA Muhammadiyah1 Palangka Raya**

| No. | Classes                 | The Number of Students |
|-----|-------------------------|------------------------|
| 1   | X-1                     | 21                     |
| 2   | X-2                     | 21                     |
| 3   | X-3                     | 21                     |
| 4   | X-4                     | 21                     |
| 5   | X-5                     | 21                     |
|     | <b>The Total Number</b> | 105                    |

## 2. Sample

Sample is a subject of individuals or case from a population.<sup>47</sup> To determine the students as experiment group the writer used cluster sampling. After doing the random class the writer found X-3 as the sample consist of 24 students.

**Table 3.3 the number of sample**

| No           | Classes | Groups           | Number of the students |
|--------------|---------|------------------|------------------------|
| 1            | X-3     | Pre-Experimental | 21                     |
| <b>Total</b> |         |                  | <b>21</b>              |

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<sup>47</sup> David Numan, Research in Language Learning, p.231.

## **E. Research Instrumentation**

### **1. Try Out**

In order to prove the test was suitable to the students who were the sample of this study used try out test. Then, for try-out class was chosen the students in the same school but different class. X-4 was as try out class with 21 students, but the students attend the class just 19 students. The test was students' vocabulary score in gap-fill test form and there were 50 items. The try out test conducted on 15<sup>th</sup> April 2016 at SMA Muhammadiyah Palangka Raya. The result of the try out test was there were 46 items was valid and there were 4 items was invalid.

Writer take the question of test item from some books, namely English vocabulary in use (elementary), Essential Vocabulary, synonyms and antonyms. The result of try out test is calculate for selecting the significant items. In this case, the writer used Alpha Cronbach formula to check instrument reliability, pearson product moment to check instrument validity.

### **2. Test**

Testing provides a form of feedback, both for learners and teachers. Without testing, there was no reliable means of knowing how effective a teaching sequence has been. Testing motivates learners to review vocabulary in preparation for a test. It also provides an excuse for further, post-test, review- when, for example, the teacher goes over the

answers in class. Test of vocabulary knowledge sometimes from a part of placement tests, or as a component of a diagnostic test in advance of planning a course program. Such test usually involves some attempt to measure extent of vocabulary knowledge.<sup>48</sup> There were two kinds of testing, that is objective test and subjective test. In this study, writer used subjective test as research instrument.

Subjective test was one form of the test which used also in the research instrument. This test meant to see the various capabilities of the subject in written form. Essay test items demand the students to organize or present the answer in the form of descriptions. Subjective test divided into four parts, namely: free description form, a form of structured or limited description, forms short answer, completing. Among all of kinds of subjective test, writer will use completing test. Test item "completing" is almost the same with short answer, which is a type of test item that can be answered with words, phrases, numbers, or symbols. The difference between test items "completing" statement is not complete and the students are required to complete the statement.<sup>49</sup>

There were three types of vocabulary test; those were multiple choice test; gap-fill test and cloze test. In this research, writer chooses *gap-fill tests* for testing vocabulary. Gap-fill tests require learners to recall the

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<sup>48</sup>Ibid.,p.83

<sup>49</sup>Hamzah B. Uno., & Satria Koni, *Assesment Pembelajaran*, Jakarta: Bumi Aksara, 2013, p. 116-118

word from memory in order to complete a sentence or text.<sup>50</sup> Thus they test the ability to produce a word rather than simply recognize it. The best-known example of this test type is the *cloze test*. In a cloze test, the gaps are regularly spaced – e.g. every seventh, eight, or ninth word. In this way, knowledge of wide range of word types including grammar words as content words as well as content words is tested. Moreover, the ability to complete the gaps depends on understanding the context.

In this case, the writer choose subjective test especially gap-fill test because according to Thornbury that the test can be steered more towards content words, and hence become a more valid test of vocabulary. Most teachers will be familiar with tests of selective (or open) cloze type, although it is more often used to test grammar than vocabulary.

### **3. Pre-test and posttest**

The writer gave pretest instrument before applying to the real sample in the study. Fot the pre-test conducted on 16<sup>th</sup> April 2016 and for the post-test conducted on 14<sup>th</sup> Mei 2016. Then, writer take the information and result about the instrument quality that consists of instrument reliability, instrument validity, index of difficulty and test normality.

In this study, writer will use *gap-fill* test to check the students' vocabulary mastery. Gap-fill tests require learners to recall the word from memory in order to complete a sentence or text.<sup>51</sup> The writer will use four

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<sup>50</sup>Ibid.,p.120  
<sup>51</sup>ibid

materials that used in pretest and posttest activity; those are greetings, countable and uncountable noun, synonym and antonym, and conjunction.

**Table 3.4 Example of Scoring Guide for Vocabulary Assessment**

| Category | Score |
|----------|-------|
| True     | 1     |
| False    | 0     |

## **F. Research Instruments Validity**

Validity is often defined as the extent to which an instrument measures what it purports to measure. Validity requires that an instrument was reliable, but an instrument can be reliable without being valid.<sup>52</sup>

The validity of an instrument was dependent upon the situation and the specific purpose of use of the instrument. Classification of types of validity to the most famous has done by Joint Commission the American Psychological Association, AERA, and the National Council on Measurement in Education. The Commission distinguishes three types of validity: content validity (validity associated with criteria (criterion-related validity), and the validity of notions (construct validity), these three types of validity include the basic purpose of the test.

### **1. Content validity**

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<sup>52</sup> Carole., L, Kimberlin., &Almut G. Winterstein, *Validity and Reliability of Measurement Instruments Used in Research*, 2008, Vol.65, p.2277

According to Heaton, a good test should possess validity: that was to measure and nothing else.<sup>53</sup> If a test does this, it said to be valid. All of the test must be related to what students learned. The test based on the material in the curriculum applied in SMA Muhammadiyah Palangka Raya. Formula of validity:

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

Where:

$r_{xy}$  : Index Correlation Number “r” Product Moment

N : Number of Cases

$\sum XY$  : Multiplication Result between score X and score Y

$\sum X$ : Total Value of Score X

$\sum Y$ : Total Value of Score Y.<sup>54</sup>

To know the level of validity of instrument, the value will be interpreted based on the qualification of validity as follows:

$t_{\text{test}} > t_{\text{table}} = \text{Valid}$

$t_{\text{test}} < t_{\text{table}} = \text{Not Valid}$

**Table 3.5**  
**Criteria of Validity**

| Validity    | Interpretation     |
|-------------|--------------------|
| 0.800-1.000 | Very High Validity |
| 0.600-0.799 | High Validity      |

<sup>53</sup> *Ibid.*,

<sup>54</sup> Anas Sudijono, *Pengantar Statistik Pendidikan*, Jakarta: PT Raja Grafindo Persada, 1997, p.193



|             |                    |
|-------------|--------------------|
| 0.400-0.599 | Fair Validity      |
| 0.200-0.399 | Poor Validity      |
| 0.000-0.199 | Very Poor Validity |

## 2. Construct Validity

The items test constructed based on the material was given in classroom namely vocabulary. The test was gap-fill test form and there were 45 items for the pre-test and post-test.

## G. Research Instruments Reliability

A reliable test was one whose results were not greatly affected by a change in the conditions under which it was given and marked.<sup>55</sup> Reliability was a necessary of any good test: for to be valid at all, a test must first be reliable as a measuring instrument. The reliability test used formula of Alpha Cronbach to measure the reliability of the whole test:<sup>56</sup>

$$r_{11} = \left( \frac{k}{k-1} \right) \times \left( 1 - \frac{\sum S_i}{St^2} \right)$$

Where:

$r_{11}$  : Reliability of instrument

$k$  : Number of items

$S_i$  : Value variance score of item

$S_t$  : Variance score

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<sup>55</sup> I. S. P. Nation and Jonathan Newton, *Teaching ESL/EFL Listening and Speaking*, New York and London: Routledge, 2008, p. 166.

<sup>56</sup> Riduwan, *Metodedan Teknik Menyusun Thesis*, Bandung: Alfabeta, 2010, p. 120.

The decision is comparing the value of  $r_{11}$  and  $r_t$ :

$r_{11} > r_{table}$  = Reliable

$r_{11} < r_{table}$  = Not Reliable

**Table 3.6 Criteria of Reliability**

| Reliability | Interpretation        |
|-------------|-----------------------|
| 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 Reliability |

## **H. Data Collecting Procedure**

In this research, the writer will use the quantitative research approach, so the technique use to get the data which relate to the teaching vocabulary by the writer is doing some:

- a. The writer observed the school.

The observation purposed to get specific data were:

1. The syllabus and lesson plan of the school.
2. The number of class.
3. The number of students.

- b. The writer used cluster sampling to choose sample from the population.
- c. The writer gave try out test to try out class (X-4).
- d. The writer gave the pre-test to the pre-experiment group.

- e. The writer scored students worksheet.
- f. The writer gave treatment by using CTL in teaching vocabulary.
- g. The writer gave the post-test.
- h. The writer resulted of score to the data.

### **I. Technique of Processing Data**

1. Editing: this activity did in order to check of the data that to anticipate mistakes happens, so the data should be valid and suitable with the need.
2. Coding: after the processing of editing, the second step was exchange codes from the data. Code was a sign made in number or letters that is given to identify in information or data that was to analyze to change the students' name. Each of the answer sheets was replaced by the code, for example: C1 and E1.
3. Scoring: the score was given to the students refers to evaluation standards of English subject: 0-59 categorized as failed and 60-100 categorized as success.

### **J. Data Analysis Procedures**

The data of this study were students' vocabulary score. Therefore, the data were quantitative. The pre-test and post-test raw score converts into percentages. The mean, standard deviation and standard error of students' score computed for the pre-test and post-test scores of the experiment and control groups. For calculation used statistical  $t_{\text{test}}$  to answer the problem of the study. In order to analyze the data, it did some way procedures:

1. Gave tests (pre-test and post-test) to the students at eight grade students of SMA Muhammadiyah 1 Palangka Raya.
2. Collected the score of the students work sheet result.
3. Score the students' answer using the formula:

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

Where:

S = Students' score

n = Number of true answer

N = Number of test items<sup>57</sup>

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 by using the formulas bellow:

- a. Mean of students' score<sup>58</sup>

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

Where:

$\sum fX_i$  : Total of score

N : Total of the students

- b. Standard Deviation<sup>59</sup>

$$S = \sqrt{\frac{\sum Fx'^2}{N}}$$

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<sup>57</sup>Depdikbud, KurikulumpedomanKhususBahasaInggris, Jakarta, DirektoratJendral Agama islam, 2004.

<sup>58</sup>Riduwan, *MetodedanTeknikMenyusun Thesis*, Bandung: Alfabeta, 2010, p. 180.

<sup>59</sup>Triwid Syafarotun Najah, *Statistik Pendidikan*, STAIN Palangka Raya, 2012, p. 62.

c. Standard Error<sup>60</sup>

$$SE_M = \frac{SD}{\sqrt{N-1}}$$

Where:

$SE_M$  : Standard error of the mean

$SD$  : Standard deviation

$N$  : Number of cases

$1$  : Bilangan konstan

## 5. Normality Test

It used to know the normality of the data that was going to be analyzed whether both groups has normal distribution or not. For the normality test was used SPSS 18 program. Then, calculation result of  $X^2_{\text{observed}}$  was compared with  $X^2_{\text{table}}$ .

## 6. Homogeneity Test

It used to know whether experimental group and control group that were decide, come from population that has relatively same variant or not. For the calculation used SPSS 18 program.

7. Calculates the data by using  $t_{\text{test}}$  to test the hypothesis of the study, whether the using of CTL gave effect to the students' vocabulary scores or not. To examined the hypothesis used  $t_{\text{test}}$  formula as follows:

$$T_o = \frac{x - \mu}{SD / \sqrt{n}}$$

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<sup>60</sup> Anas Sudijono, *Pengantar Statistik Pendidikan*, Jakarta: Rajawali Press, 2012, p. 282 .

Which the criteria:

If  $t_{\text{observed}}(\text{the value}) \geq t_{\text{table}}$ , it means  $H_a$  was accepted and  $H_0$  was rejected.

If  $t_{\text{observed}}(\text{the value}) \leq t_{\text{table}}$ , it means  $H_a$  was rejected and  $H_0$  was accepted.

8. Interprets the result of  $t_{\text{test}}$ . previously, it accounted the degrees of freedom (df) with the formula:<sup>61</sup>

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

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  $t_{\text{test}}$  consulted on the  $t_{\text{table}}$  at the level of significance 1% and 5%. In this study, the writer used the level of significance at 5%. If the result or  $t_{\text{test}}$  was higher than  $t_{\text{table}}$ , it meant  $H_a$  was accepted. But if the result of  $t_{\text{test}}$  was lower than  $t_{\text{table}}$ , it means  $H_0$  was accepted.

9. After calculated the data by using manual, then calculated the result  $t_{\text{test}}$  to test the hypothesis of the study by using SPSS 18 program.
10. Then, the interpretation was made to answer the research problem.
11. The last, discussed and concluded the result of data analysis.

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<sup>61</sup>Anas Sudijono, *Pengantar Statistik Pendidikan*, Jakarta: Rajawali Press, 2012, p. 285.

