

## CHAPTER III RESEARCH METHODOLOGY

### A. Research Design

In this chapter describes about research design related to this research. This study uses experimental research, Experimental research methods can be defined as a method of research used to locate a particular influence to one another in conditions completely (Sugiyono, 2015: 107). This experimental method as part of quantitative methods that have characteristics, especially with the presence of the control group. The study uses quantitative methodology in order to find out the answer of the research. This research uses true experimental method.

According to Sugiyono (2015: 112) "True experimental research is to be true experiment because in this design the researcher can control all external variables that affect the course of the experiment. Thus the internal validity can be high. The main characteristic of true experiment research is that the sample used for the experiment and as a control group is taken randomly from a certain population. So, the characteristic is that there is a control group and the sample is chosen randomly. Here two forms of true experimental design are presented, namely: posttest only control design and pretest group design

Therefore, the researcher *uses random* sampling as a technique to get an experimental class and control class. The researcher give a sequence of steps, they are pre-test, treatment, and post-test. Giving the pre-test is to know the students' the student's real competence, then do post-test is to know how the students' progress after being taught by using Direct method. The table of the Research Design as quoted by Sugiyono (2010, p:112) as follows

**Table 3.1 Research Design**

Class	Pre-test	Treatment	Post-test
C	O1	-	O2
E	O1	X	O2

Note:

E : Experiment Class

- C : Control Class
- O1 : Pre-test
- X : Direct Method
- : Conventional Technique
- O2 : Post-test

Based on the explanation above the researcher gives the pre-test will be distributed into experimental class and control class, to know the students' real competence in vocabulary mastery. The researcher conducted pre-test before the treatment X (Direct Method) will be implemented at experimental class and control class, and the researcher gave treatment to measure the students' vocabulary mastery by using treatment X (Direct Method) in experimental class. After the researcher implementing the treatment in experimental class, the researcher gave post-test will be held to measure how is students' vocabularies score.

## **B. Research Variable**

According to Arikunto (2006, p:96) variable is research subject or as to focuses some research. The research has two variables examined in this experimental research, they are dependent variable and independent variable. Dependent variable is a variable that emerge in function relationship influence by the independent variable. Independent variable can appear and exist by itself without other supported. It influences and gives special effect independent variable.

The description as follows:

1. The Independent variable is Direct Method (X).
2. The dependent variable is Vocabulary Mastery (Y).

In conclusion, there are two variables in this research, they are X (Direct Method) as independent variable, and Y (Students' Vocabulary Mastery) as dependent variables.

## **C. Research Population, and Sample**

### **1. Population**

In this study reseacher describes about research design related to research Sugiyono (2013,p.80) states that population is composed of the generalization: object or subject that has quality and certain characteristics set by the researchers to learn and then take a conclusion. Then, the population of this research was the students' on the eight grade MTs Riyadlatul'ulum . There are 3

classes, those are “A” class consists of 25 students, “B” class consists of 22 students and “C” class consists of 24 . Then, total of the students’ A and B class are 71 students..

List of population :

**Table 3.2 Research Population**

No	Class	Number
1	VIII A	25
2	VIII B	22
3	VIII C	24
	Total of students	71

## 2. Research Sample

According to Ary et al (2006, p.167) sampling is the small group that is observed. Sampling is also as a way the researcher select number of individuals as a sample which present the population. It is called sample research when the researcher wants to generalize the sample research result. The process of selection would be discussed in the sampling technique.

Sampling is a way the researcher select number of individuals as a sample which presents the population. In this research the researcher takes two classes as the experimental class and the control class. that were “B” class consists of 22 students and “C” class consist of 24 students from the population of students in the eight grade of MTs Riydlatul'ulum as the sample. The research sample is selected by the random sampling technique. It is the sample selection in which all members of the population are naturally grouped in units (Sugiono 2014, p. 120). The reseacher used random selection to determine which class will be the experimental group and the control group. Below terms of use the simple random technique :

- a. This technique is used when the elements of the population have homogeneous properties, so that whichever element is selected as the sample can represent the population.
- b. If the research analysis has adescriptive tendency and is a general in nature, simple random sampling can be done.

Finally, the researcher will get 22 students as experimental group in “B” class, and there are 24 students as control group in “C” class.

#### **D. Instruments of the Research**

According to Sugiyono (2013) research instrument is a device that used by the researcher while collecting data to make his work become easier and get a better result, complete and systematic in order to make the data easy to be processed. There are three kinds of instrument, such as test, questioner, and interview. But, in this research, the researcher use test and the test consists of pre-test and post-test. The tests to measure the result of students' vocabulary mastery before and after treatment. The researcher uses multiple choice to measure the result of students' vocabulary mastery before and after treatment. The researcher administers try out to all students to know whether the question of vocabulary test valid and reliable or not. After knowing the reliability, the researcher administers pre-test before treatment. And after the treatment the researcher administers the post-test.

#### **E. Validity and Reliability**

##### **1. Validity**

Validity refers to extent to which the test measures what it was intended to measure (Sugiyono, 2014 p: 156), It means that the test measures what was claimed to measure. To measure whether the test has a good validity, the researcher analyzed the test formempirical validity.

Formula of product moment:

$$r_{xy} = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}}$$

Where:

- $r_{xy}$  :Coefficient between variable X and Y
- $\sum xy$  : sum of the result of X and Y for each students
- $\sum x^2$  : sum of each item
- $\sum y^2$  : sum of total score/ total items

##### **2. Reliability**

Reliability is a necessary characteristic of any good test for it to be valid at all and a test must be reliable as measuring instruments. Arikunto (2014, p.221) says that the reliability of the test is an instrument can be believed to be used as

instrument for collecting data because it has been good. It means that reliability is needed to know whether the test has a good quality or not. The reliability test is calculated by the formula as stated by Arikunto (2006: p:148) as follows:

$$r_{11} = \frac{2(r_{xy})}{(1 + r_{xy})}$$

Where:

$r_{11}$  = Coefficient reliability is appropriate

$r_{xy}$  = Coefficient between variable X and Y

The criteria of reliability based on Arikunto criteria as follows:

**Table 3.3. The Criteria of Interval Coefficient**

Interval Coefficient	Criteria
0,00 – 0,19	Very low
0,20 – 0,39	Low
0,40 – 0,59	Medium
0,60 – 0,79	High
0,80 – 1,00	Very High

(Source: Arikunto, 2006: p.216).

## F. Data Collecting Technique

The most important thing in this research is collecting the data that can determine the result of the research. Some technique will be used in collecting data in this research are:

### 1. Pre-Test

The pre-test is given before the researcher gives the treatment to the experimental group and control group. First, the researcher comes to the class. Then she explains to the students what they have to do. Finally, she distributes the instruments and asks them to do the test. The type of this instrument is multiple choices, there are 30 items as pre-test instrument. The students must answer the questions. The students answer all questions correctly, they get 100. This score as a first data to know how far the students' vocabulary mastery before treatment.

## **2. Treatment**

Treatment is something which is given in the activities in the learning process. It is given after pre test and before post test. The aim of treatment is to develop the students' vocabulary mastery. The method which is use by the researcher is direct method. There are three meetings in treatment that Every meeting the student are given 10 vocabulary about objects around of them. When the researcher say and show picture, the students should see and listen carffuly. after it the student should repeat the vocabulary and remmember vocabulary after it the researcher give a question to know how far vocabulary tha has be obtained. The aim of treatment is to help the students easily as well as memorize vocabulary, makethem enthusiastic, enjoyable, interested be happy and spiritffulin learning English vocabulary.

## **3.Post- test**

Post-test is used to know the students vocabulary mastery after teaching by using Direct method, how far the students understand and remember about some vocabulary that given after giving treatment process was done. The students were asked to do the twenty five question of vocabularies that related with the vocab has given. Apparently, the result of the test show that the students' vocabulary mastery improved significantly, whether their scores after giving treatment is higher or not than before. The last, after the class has been exposed to the treatment for some period of time, the administering test of the dependent variable (or otherwise measures it). After reducing, classifying, analyzing the data, and then determining whether there is/are any significant different between before using Direct method and after Direct method as method, it is determined whether the treatment made the different or not.

## **G. Technique of Data Analysis**

### **Quantitative Data Analysis Technique**

In experimental design, the technique analysis data that is experimental group and control group pre testpost test design. It means that it has two variables investigated in this research are Direct method and vocabulary mastery two know there are different before and after being taught by using Direct Method. The collected data is analysis by using quantitative data analysis. Quantitative data analyzing is also called statistical analysis. Usually the data classified into numerical form. In the experimental research by using pre test and

post test one group designs, the data are analyzed by using the following formulation of t-test (Arikunto, 2016, p.86):

$$t : \frac{Md}{\sqrt{\frac{\sum x^2 d}{N(N-1)}}}$$

Notes:

Md = means of differential pre test and post test

Xd = deviation in every subject (d-Md)

$\sum x^2 d$  = Total of quadrate deviation

N = Subject of sample

d.b = Decided by N\_1

The formula above is used to count the effectiveness of treatment.

## 1. Normality Test

The object test for normality to determine the distribution of the data follows a normal distribution or not. One of the test assumption of the statistic computation is that the data must fulfill the qualification of normal distribution. Therefore analyzing the normality of distribution the students' score is crucial. Normality test using the formula Chi-quadrat Arikunto (2006, p:273) as follow:

a. The hypothesis formula

Ho: sample comes from the population that has normal distribution.

H<sub>1</sub>: sample did not come from the population that has not normal distribution.

b. The used statistic formula of the test is:

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

Notes:

$\chi^2$  = Chi-quadrat

O<sub>i</sub> = frequency observes

E<sub>i</sub> = frequency expectation

k = Interval class

The criterion, if  $\chi^2_{count} \leq \chi^2_{table}$  with dk = k - 3, so, the data is normal.

## 2. Homogeneity Test

A homogeneity test was applied to analyze whether or not the scores of one group have homogenous variance compared with the score of other groups. In this study, the researcher used F-test. The formula can be seen as follow:

**The hypothesis formula:**

$H_0 : \sigma_{1^2} = \sigma_{2^2}$  both sample have the quality of variants.

$H_1 : \sigma_{1^2} \neq \sigma_{2^2}$  both sample have different of variants.

**The used statistic formula of the test is:**

$$F = \frac{\text{biggestvariants}}{\text{smallestvariants}}$$

**The test criterion**

Accepted  $H_0$  if  $F_{ratio} \geq F_{\frac{1}{2}\alpha}(V_1 - V_2)$ , with  $V_1 = n_1 - 1$  and  $V_2 = n_2 - 1$

(Setiadi, 2006, p.249)

**3. Hypothesis Test**

A hypothesis is an assumption about a population parameter. This assumption can be true or not. It is a method of making statistical decisions using experimental data, the best way to determine whether a statistical hypothesis is true would examine the entire population. After collecting the data, the researcher analyzed them in order to find out whether the use of realia could increase the students' achievement in speaking related to things in the classroom.

Hypothesis testing is intended to see whether the hypothesis that is proposed in this research is accepted or not, to test the hypothesis, Repeated Measures T-test was conducted and the used formula of the test is t-test which frames at this below formula:

$$t\text{-test} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Notes:

$\bar{X}_1$  = the means of the experiment class

$\bar{X}_2$  = the means of the control class

S = the standard deviation

$N_1$  = the number of students' in the experimental class

$N_2$  = the number of students' in the control class

Before using t-test formula the researcher would determine the average variant ( $S^2$ )

**The variant ( $S^2$ ) is calculated by formula:**



$$S^2 = \frac{(N_1-1)S_1^2 + (N_2-1)S_2^2}{N_2(N_2-1)}$$

Notes:

$N_1$  = Number of students' in experimental class

$N_2$  = Number of students' in control class

$S_1^2$  = Variant of experimental class

$S_2^2$  = Variant of control class

$S^2$  = Variant

**The criteria are:**

$H_0$  :  $H_0$  is accepted if t-ratio < t-table

$H_a$  :  $H_a$  is accepted if t-ratio > t-table

Based on the explanation above, the researcher concluded that the hypothesis is an assumption about a population parameter. This assumption may be true or not be true when sample data are not consistent with the statistical hypothesis, so the hypothesis is rejected because the test is used to know whether the hypothesis that is proposed can be accepted or rejected. The formula which is used in this test is t-test.