

CHAPTER III

RESEARCH METHOD

A. Research Design

According to Creswell (2008) research design is a process of steps used to collect and analyze information to increase our understanding of a topic or issue. A research method is defined as the way in which the purpose in this research is achieved. There are various kinds of method that can be applied. This research used quantitative research because of the data is in the form of numerical and statistical analysis. It includes on the experimental research. The type of research conducted by the researcher is quasi-experimental design. Sugiyono (2010) states that Quasi-experimental is a design research that has a control group but cannot function entirely to control the variables from outside which influences implementation of experiment. It can be summarized that Quasi-experimental is a research that give the treatment and measures of the treatment but does not use a random sample.

It means that the selection of each respondent for the experimental and control groups is done by sweepstakes. After the two groups were obtained, the two groups were given a pre-test to find out the initial conditions before given the treatment. Second result the pre-test is then compared. Pretest results are said to be good if there is no significant difference between the pre-test results of the two groups. This is to find out equality between the two groups, after given the treatment, post-test is done. The table of the research design is quoted by Sugiyono (2010) as follow:

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 : Stand up Sequence Game
 - : Conventional Technique
 O2 : Post-test
 (Sugiyono, 2010)

Based on the explanation above the researcher will give the pre-test to know the students' the real competence in vocabulary. The researcher conducted the pre-test before the treatment X (Stand up Sequence Game), after implementing the treatment, the researcher will give a post-test to measure how the students' improvement in vocabulary.

B. Research Variable

Variable is something that planed by the researcher to learn. There are two kinds of variable that are Independent variable and dependent variable. Independent variable is a variable that is affected or to influence another variable. Dependent variable is a variable that is affected or has become effect by Independent variable. In this study, there are two variables that is used by the researcher, that are Independent (X) and Dependent (Y) variable.

The researcher conducted "Stand up Sequence Game" as an Independent variable to indicate the students' vocabulary score and in a dependent variable the researcher chose "students' vocabulary mastery".

The description as follows:

Table 3.2
Research Variables

Group	Independent Variable	Dependent Variable
Experimental Group	Stand up Sequence Game	Students' vocabulary mastery
Control Group	Conventional Technique	Students' vocabulary mastery

Based on the table above, the researcher concluded that there are two variable in this study, they are X as a (Stand up Sequence Game) and Y as (Students' vocabulary mastery).

C. Research Population, Sampling Technique and Sample

The researcher determined the population, technique sampling, and sample as follow:

1. Population

A researcher needs to define the population carefully before collecting the sample, including the description of the member to be included. According to Ary (2006:148) population is all members included class of people, events, or objects. Sugiyono (2010) states that population is generalization area consisting of objects / subjects that have quantity and characteristics determined by researcher to learn and make conclusions. In this research, the researcher chooses all female junior high school students in Budi Utomo Orphanage of Metro.

Table 3.3

Research Population

No	Class	Number of Students
1.	A	11
2.	B	11
Total Number of Students		22

(Source: By Budi Utomo Orphanage of Metro)

Based on the table above, the population of this research is there are two classes. The number of students in class A is 11 students and 11 students in class B. Therefore, the total of the population in this research is 22 students.

2. Sampling Technique

Margono (2003:121) states that sampling is technique to choose sample that the number of sample is appropriate to collect the data source, by considering the nature and the distribution of population so that subject gotten the representative sample. Sugiyono (2010) argues that the sampling technique is one of technique to take a sample. Sampling technique is the way for the researcher to take the sample of the population. In conducting the research to get the sample from the population, the researcher used purposive sampling as the technique. It means that to determine of each respondent for the experimental class

and control class is done by sweepstakes and the result is class B become the experimental class and class A become the control class.

3. Sample

Sukardi (2003:54) Sample is part of population that is chosen as the representative. A sample of the research is a part of the population that has all the main characters from the population. Sujarweni (2015:81) the sample is a number of characteristics which are owned by the population used for the research. In this research, the researcher used two classes that B class as the experimental and while class A as the control class.

Based on the explanation above, it can be concluded that the sample is part of the population. After all the class labeled with A and B, it becomes a sample of this research where the researcher conducted this study at those classes. Finally, all female junior high school students in Budi Utomo Orphanage of Metro were divided into two parts to become an experimental class and a control class. There are class A as control class and class B as an experimental class.

D. Research Instrument

Arikunto (2010:262) Research instrument refers to any equipment used to collect the data. As an experimental research, the instrument used in this research was tests, especially vocabulary test. Ary et al (2006:201) test is a set of stimuli presented to individual in order to elicit responses on the basis of which a numerical score can be assigned. There were two kinds of tests in this research, those were pre-test and post-test. Pre-test was intended to measure students' vocabulary mastery before the treatment given, while post-test was to measure students' vocabulary mastery after the treatment given, so that it can make it easy researchers when all data has been obtained.

1. Specification Table of Instrument

a. Specification Table of Vocabulary Mastery

The following table is a vocabulary mastery specification. The questions consist of 20 items. The material is about part of speech. The researcher

limit the material given to the students and the material are noun and verb.

Table 3.4
Specification Table of Vocabulary Test

Research Variable	Material	Indicator	No.of Item	Total
Vocabulary	Noun	The students are able to identify noun.	1,3,5,7,9,11,13,15,17,19	10
	Verb	The students are able to identify verb in a sentence.	2,4,6,8,10,12,14,16,18,20	10
		Total of Question		20

2. Kinds of Research Instruments

In this point, research instrument is equipment that can be used in the research conducted to get the final goal of the research. An instrument is a tool when the researcher administered the research through a certain technique. The researcher gave a test as an instrument in this research. Vocabulary test is used in pre-test and post-test. The pre-test is given to the students to measure their vocabulary before the treatment and the post-test is given to measure their vocabulary after giving the treatment.

E. Validity and Reliability

The validity and reliability of the instrument can explained by the researcher, validity is supposed to measure the instrument of the test that must be valid. Besides, test reliability refers to the degree to which a test is consistent and stable in measuring what is intended measure.

1. Validity

Ary et al (2006:225) defines validity as the extent to which an instrument measured what it claimed to measure. Arikunto (2010) claims that validity is a standard which shows the degree of validity or valid instrument. So, validity is a tool that can be used to see the validity of an instrument used by the researcher.

In this study the researcher use content validity. According to Sekaran (2006) content validity is used to know how well the dimensions and elements of a concept have been be depicted. So, content validity is carried out to ensure whether the contents of the questionnaire are

appropriate and relevant to the research objectives. The instruments got the approval from the experts. The experts are lecturers at Muhammadiyah University of Metro. They are Fenny Thresia, M.Pd. and Amirudin Latif, M.Pd. as the validator of vocabulary instrument.

2. Reliability

Sugiyono (2013: 121) states that the reliable instrument is the instrument which is used in several times to measure the same object can produce the same data. So, the result of instrument is consistent. A can be called reliable when the result score is can be believed and unchanged distinctly. There are several kinds of reliability test such as test-retest reliability, equivalent-forms reliability, split-half reliability, Cronbach alpha reliability, KR reliability, rater reliability, and estimated reliability.

Based on the explanation above, the researcher analyzed the data using split-half reliability in this research. The procedure as follow:

1. The researcher divided the valid instrument in half (odd group instrument and even group instrument).
2. The researcher correlated the sets of scores (total score of odd group and even group), to find coefficient correlation of test the researcher used "Pearson product moment formula" (Sugiyono, 2013, 183), as follow:

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

Note:

r_{xy} = coefficient correlation Pearson product moment

n = the number of students

$\sum$ = sum

X = the students total score from up gap

Y = the students total score from bottom

3. The researcher applied Spearman Brown correction formula to find the reliability test. The formula is follow:

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

Note:

r_{11} = reliability of instrument

r_{xy} = correlation between score each split

4. The researcher evaluated the result. The result of r_{11} consulted to criteria reliability as follow:

Table 3.5

Score Criteria Spearman Brown

Interval Coefficient	Correlation
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: Sugiyono, 2013)

F. Data Collecting Technique

Data collecting technique is an important aspect of any type of the research. The researcher gain the data for this research by using the following steps:

1. Pre-Test

Creswell (2008:301) A pre-test provides a measure on some attribute or characteristic that the researcher assess for participants in an experiment before the students receive a treatment. Pre test are administered in order to know the students' basic ability in vocabulary before Stand up Sequence Game is applied, for the pre-test in the form of multiple choice.

2. Treatment

After conducting a pre-test, the researcher give the treatment to the students. The researcher give Stand up Sequence Game as a treatment and the time for giving this treatment is 4 minutes. The aim of treatments is to develop the students' vocabulary mastery.

3. Post-Test

Creswell (2008:301) A post-test is a measure on some attribute or characteristic that is assessed for participants in an experiment after a

treatment. Post test are administered in order to gain the appropriate data, this aimed to improvement of the students' vocabulary mastery after treatment. The number of the test items is the same as the items of pre test.

G. Data Analysis Technique

After the researcher collected the data, the researcher analyzed the result of data from pre-test and post-test related both of them through the formulas of normality test, homogeneity test, and hypothesis test.

The procedures to treat the data as follow:

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 assumptions of the statistic compilation is that the data must fulfill the qualification of the normal distribution. Therefore analyzing the normality of distribution the students' score is crucial. The detail explanation can be seen as follow:

Normality test using the formula Chi-square as follow:

The hypothesis formula:

H_0 : Sample comes from the population that has a normal distribution.

H_1 : Sample did not come from the population that has not a normal distribution.

Statistic Formula:

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

(Arikunto, 2006)

Notes:

χ^2 = Chi-square

O_i = Frequency observes

E_i = Frequency expectation

K = Interval class

The criterion, if $\chi^2_{\text{count}} \leq \chi^2_{\text{table}}$ 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:

$$F = \frac{\text{biggest variants}}{\text{smallest variants}}$$

The test criterion

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

(Setiadi, 2006)

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 vocabulary 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 is conducted and the used formula of the test is t-test which frames at this below formula:

$$t_{\text{test}} = \frac{X_1 - X_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

Notes :

X_1 = The means of the experiment class

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

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.