CHAPTER III

RESEARCH METHOD

A. Research Design

In this chapter, describe the research design that used to do the research. The research design of this research is Quasi Experimental Design. Experimental design refers to the process of planning and conducting a scientific study or experiment to investigate the relationship between variables and establish causal relationships (Gopalan et al., 2020). It involves carefully selecting and manipulating independent variables, controlling extraneous variables, and measuring the effects on dependent variables.

In this study, one group designated as the experimental class and the other designated as the control class. The researcher used Educaplay as a media in the experimental class, and the conventional teaching technique used in the control class. The research design presented as follows:

Table 3. 1 Research Design

Class	Pre-test	Treatment	Post-test
XI.2	O1	-	O2
XI.8	O1	X	O2

Note:
XI.2 : Control Class
XI.8 : Experiment Class
O1 : Pre-test
O2 : Post-test
X : Educaplay
- : Conventional Technique

Based on the explanation above, the researcher gives a pre-test to the experimental and control groups to determine students' competence in vocabulary knowledge. In the beginning, the researcher takes a pre-test. Then, simultaneously, the researcher gives treatment to the experimental and control groups. Treatment X (using Educaplay) was given to the

experimental group, and treatment Y (using conventional techniques) was given to the control class. After the researcher practiced this treatment in the experimental and control classes, the researcher conduct a post-test to evaluate the vocabulary level of students.

B. Research Variabel

According to Gould (2001), variable is a term used in research projects to describe something that can change or have more than one value. There are two kind of variable in common. That is independent variable and dependent variable. The independent variable is the antecedent while the dependent variable is the consequent. While, Dependent variable is the variable that is affected by the independent variable (Gould, 2001). The independent variable (X) in this research is Educaplay. Meanwhile, the dependent variable (Y) in this research is students' vocabulary mastery.

C. Population and Sample

1. Population

According to Majid, (2018) population refers to the group of individuals that the study intends to study or treat (Majid, 2018). The population of this research is the eleventh grade students of SMK Muhammadiyah 1 Metro. The total number of population are 5 classes, but only 2 classes can be accessed they are TJKT 1 and TJKT 2. There are 20 students in TJKT1 class and 20 students in TJKT2 class. Total the population of this research is 40 students.

2. Sampling Technique

Based on Shorten & Moorley, (2014) Sampling is the process of selecting a subset of individuals or units from a larger population to participate in a research study (Shorten & Moorley, 2014). The goal of sampling is to obtain a representative sample that accurately reflects the characteristics of the population of interest. This study used the technique in choosing the sample, it total sampling and determine which class experimental group and control group. Below the steps done by the researcher to choose the experimental group and control group :

a. Write class TJKT1 and TJKT2 in piece of paper.
b. The paper is rolled and then put into the glass.
c. The glass is shaken until the paper rools out.

d. The experimental class will focus on the roll of paper that comes out first (TJKT1).
e. The control class will focus on the roll of paper that comes out last (TJKT2).

3. Sample

Based on sampling technique that the researcher carried out, the results were found that the researcher used two classes as the sample to get representative data and divide it into two groups, that is experimental class and control class. The researcher used TJKT1 consists of 20 students as experimental class and TJKT2 consists of 20 students as control class. The total numbers of sample are 40 students.

D. Instrument of The Research

Instrument is a tool that a researcher used when conducting research. It might assist the researcher in gathering information regarding research variables. According to Taherdoost, (2018) instrument refers to a tool used to collect data in social science research. Meanwhile, according to Arikunto cited Anggraini et al., (2022) research instrument is a tool or facility used by researchers in collecting data so that work is easier and the result is better, in the sense of being careful, complete and systematic so that it is easier to process.

In this research, the research instrument used is a test instrument. The researcher conducted the pre-test and post-test in giving the test. A pre-test is a preliminary evaluation or measurement conducted before an intervention or treatment is implemented in a research. While the post-test is an evaluation or measurement conducted after an intervention or treatment has been implemented in a research. The test measures the results of students' vocabulary mastery before and after treatment. The researcher uses 40 questions that answered using multiple choice using material being studied to measure the result of students' vocabulary mastery before and after treatment. In conclusion, the research instruments is a tools used to obtain data in achieving research objectives. In establishing a research instrument for the students, researchers administered an multiple choice test to know students' vocabulary mastery.

E. Validity and Reability

1. Validity

According to Heale & Twycross, (2015) Validity is defined as the extent to which a concept is accurately measured in a quantitative study. Meanwhile, (Sugiyono, 2014) explained validity refers to extent to which the test measures what it is intended to measure. It means that the test measures what it claims to measure. To measure whether the test has good validity, the researcher analyzed the test using face validity. Face validity examines whether the test is a good representation of the material that needs to be tested. So, the item on the test should represent the material being discussed. In terms of content validity, the material given is compatible with the material from the expert assessment.

The evaluation of experts is done in order to complete the development of instructional capability components, indicators for each component, descriptions of each indicator, and correlations between each item and indicator and component to support operational definition.

2. Reliability

Reliability is a necessary characteristic of any good test for it to be valid, and a test must be reliable as a measuring instrument. According to Arikunto suharsimi, (2006) states that the reliability test is a deep measuring tool that measures a symptom at different times and always shows the same results (Arikunto suharsimi, 2006). Instrument reliability is needed to obtain data in accordance with the measurement objectives. In this study researcher use Spearman Brown (Split Half) formula. The formula Spearman Brown (Split Half) with SPSS, while the manual calculation used as follows:

$$r_{xy} = \frac{N\,\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{(N\,\Sigma x2 - (\,\Sigma x)^2\,\{N\,\Sigma y2 - (\Sigma y)^2\})}}$$

where:

r_{xy} = item of test reability

N = the number of the sample

Σx = the sum of x score (odd items)

Σy = the sum of x score (even items)

Σxy = sum of the result of X and Y for each student

Σx^2 = sum of score X2

Σy^2 = sum of score Y2

Score Criteria

Table 3. 2 Score Criteria

Interval Coefficient	Correlation
0,00 – 0,199	Very low
0,20 – 0,399	Low
0,40 – 0,599	Medium
0,60 – 0,799	High
0,80 – 1,000	Very high

(Sugiyono, 2014)

From the table above, it can be seen that the reliability calculation is 1,000, which means that the reliability is very high so that the test can be used for data collection.

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 use in collecting data in this research are

1. Pre-test

Pre-test given before the researcher gave the treatment to the experimental group and the control group. The aim of pre-test is to find out the initial condition of students before the researcher gives the treatment. Before teaching the new material by using The Educaplay platform as media or without using it. A test is a means of measuring the knowledge, skill, feeling, or intelligence of an individual or group. Tests produce numerical scores that can be used to identify, classify, or evaluate test takers. There are 40 questions that answered using multiple choice. The correct answer have 1 score and wrong answer gets 0 score. So if the student fill all the question with the correct answer, the students got a score of 40. Then the score made to 100 using a multiplier index number 2.5. if students have the number of correct answers as much as 40 multiplied by 2.5 and get a score of 100.

2. Treatment

After conducting a pre-test, the researcher gave the treatment to the students. The aim of the treatment is to develop students' vocabulary mastery. The media used by the researcher is Educaplay with the material being studied. There are four meetings in treatment. Every meeting will be 45

minutes using Educaplay as media for learning. The treatment carried out in the experimental group , namely class TJKT1. The researcher explain the material being studied and using the media of Educaplay. Meanwhile, in the control class, namely class TJKT2, the researcher only explained the material studied to the students, then the researcher tested it b giving a post-test.

3. Post-test

The post-test used to determine the students' vocabulary mastery after teaching by using Educaplay. How far did the students understand and remember some vocabulary that was given after the treatment process was done. And how much students memorize some vocabulary awarded after the treatment procces. The question used are the same as those used the researchers in the pre-test. Consisting of 40 multiple choice question with a score of 1. The students who can answer all he questions correctly got a score of 100 with the same calculation score technique as the pre-test.

G. Technique of Data Analysis

The technique of data collection was conducted to analyze the validity and then pre-test and post-test the questions. The research is focused on second grade students of TJKT at SMK Muhammadiyah 1 Metro. After the researcher collected the data, the researcher analyzed the results of the data from the pre-test and post-test related to both of them through the formula of validity and reliability. The researcher used the formula, which is the normality test and homogeneity test. The procedures to treat the data as follows :

1) Normality Test

A normality test is employed to assess whether the data collected from a sample originates from a population that follows a normal distribution. In this research, the researchers will use SPSS to test normality. According to (Anwar, 2009) To determine normality, the Sig score can be used which is in the results of the Shapiro-Wilk calculation. The criteria for normality test according to Nurgiyantoro, B., Gunawan, (2015) as follows:

a. If the Significant value (Sig) > 0.05, the data distribution is normal.
b. If the Significant value (Sig) < 0.05, the data distribution is not normal.

2) Homogeneity Test

The homogeneity test was to measure something that can be used to determine data variation. After getting the result of the variance and average

rate of the classes (the experiment class and the control class), When the sample comes from a population with a normal distribution, further analysis is done. The homogeneity test aims to determine whether the variance between the control group and the experimental group is homogeneous or heterogeneous. Homogeneous means that the data for both groups have the same variance (Supena et al., 2021). The homogeneity test at this stage using one way anova. At this stage there are two criteria, namely:

a. If the significance value is >0.05 it means homogeneous.
b. If the significance value is <0.05 it means not homogeneous

H. Hypothesis Test

The test hypothesis was an assumption about a population parameter. This assumption can be true or false. This is a method of making statistical decisions using experimental data. The best way to determine whether a statistical hypothesis is true is to examine the entire population. After collecting the data, the researcher analyzed it in order to find out whether the use of realia could increase the students' achievement in speaking about things in the classroom.

Hypothesis testing is intended to see whether the hypothesis that researcher 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 using SPSS calculation, there are two hypothesis as follows:

1. First Hypothesis

The researcher will test the first hypothesis using the Paired Sample T Test with SPSS. Paired Sample T Test is a way to test the difference in averages of two samples from the same group (Anggara & Anwar, 2017). Paired Sample T Test is used when the data is normally distributed. The are two criteria for Paired Sample T Test using SPSS calculation as follows:

a. If the Significant value (Sig) ≤ 0.05, Ha is accepted
b. If the Significant value (Sig) > 0.05, Ho is accepted

2. Second Hypothesis

The researcher will test the second hypothesis using the Independent Sample T Test with SPSS. Independent Sample T Test is a way to test the difference in averages between two samples from different groups (Anggara & Anwar, 2017). Independent Sample T Test is used when the data is normally distributed and the data is homogeneous. The are two criteria for Paired Sample T Test using SPSS calculation as follows:

a. If the Significant value (Sig) ≤ 0.05, Ha is accepted
b. If the Significant value (Sig) > 0.05, Ho is accepted

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 true when the sample data is not consistent with the statistical hypothesis, so the hypothesis is rejected because the test was used to know whether the hypothesis that is proposed can be accepted or rejected.