CHAPTER III

RESEARCH METHODOLOGY

This chapter explains a set of methodology of the research such as method of research, variables of research, population and sample, technique for collecting the data, instrument validity, instrument reliabilility, technique for analyzing the data and statistical analysis.

A. Method of Research

The research method used in this study is the experimental method. Freankel et al. (2019, p. 265) states that "Experimental research design is a systematic approach used to determine casual relationships between variables by manipulating an independent variable and observing its effect on a dependent variable under controlled conditions". The reason for using this research method is because an experiment was conducted in one class by providing treatment in the form of using Memrise application to look at the effect on the ability of students' vocabulary mastery. According to Freankel et al. (2019, pp. 269-277), there are several forms of design experiments namely, pre-experimental design, true experimental design, quasi-experimental design and factorial design.

In this research, researcher focus on design Pre-experimental. According to Freankel et al. (2019, p. 269), pre-experimental design is a type of experimental design that does not incorporate sufficient controls to address threats to internal validity. Consequently, multiple factors beyond the independent variable could influence the study outcomes. The researcher uses Pre-experimental design with one-group pretest-posttest design to measured or observed a single group not only

after being exposed to a treatment of some sort, but also before. One-group pretest-posttest design can be explained as follows:

Table 1.1
Method of Research

O	x	O
Pre-test	Treatment	Post-test

(***Freankel, 2019)***

B. Variables of Research

According to Freankel (2019, p. 77) the meaning of research variables refer to attributes, characteristics, or factors that can change a study. These variables are categorized into independent variables, which are manipulated to observe their effect, and dependent variables, which represent the outcomes being measured. Based on the relationship between one variable and other variables in this study, it consists of independent variables and dependent variables. The explanation is as follows:

a. Independent variables

According to Freankel (2019, p. 80), independent variables are defined as "variables that affect or cause changes or the emergence of the dependent variable". These variables are deliberately manipulated in an experiment to observe their impact on the dependent variable. In this study, the independent variable is (X). According to the researcher, Memrise application can be defined as the main component that can influence students vocabulary mastery.

b. Dependent Variable

According to Freankel (2019, p. 80) the meaning of the dependent variable is the variable that influenced or changed as a result of the manipulation of the independent variable. It represents the outcome or effect that researchers measure in an experiment to determine the impact of the independent variable. Dependent variable in this study is (Y) students' vocabulary mastery.

C. Population and Sample

a. Population

Creswell (2018) said that the population is the entire group of individuals or elements that share common characteristics which a sample is drawn for research purposes. It represents the broader target group to which the researcher intends to generalize the study findings. The population in this study were all eight grade students at SMP Negeri 02 OKU. The total number of class VIII are 369 can be seen in table 1.2:

Table 1.2
Population

No.	Class	Number of Population
1	VIII.1	34
2	VIII.2	33
3	VIII.3	33
4	VIII.4	33
5	VIII.5	34
6	VIII.6	33

7	VIII.7	34
8	VIII.8	34
9	VIII.9	34
10	VIII.10	34
11	VIII.11	33
	Total	369

Source: SMP N 02 OKU TA 2024/2025

b. Sample

Sample is "part of the number and characteristics possessed by the population itself". According to Creswell (2018) if researchers conduct research on large populations but face limitations, they use **s**ampling techniques to select a representative subjects. The purpose of sampling is to ensure that the selected subjects appropriately represent the larger population. In this study the sampling technique used is simple random sampling technique because all groups have the same qualifications and are evenly distributed. The researcher took one class for the study with randomly chose one class by using spinner and the result is class VIII.4, with 15 male students and 18 female students. So the total sample in this research is 33 students can be seen in the table 1.3 below:

Table 1.3
Sample

No.	Group	Class	Number of Sample
1	Experimental Group	VIII.4	33
	Total of Sample		33

Source: SMP N 02 OKU TA 2024/2025

D. Instrument of Collecting the Data

In this research, researcher used vocabulary test to collect data. According to McMillan (2020, p. 178), describes achievement tests as standardized assessments that determine the extent to which students meet educational objectives. They provide measurable data to guide instructional improvements. In this research, the test will be administered twice pre-test and post-test. The pre-test has been give at the first time to the students to measure their vocabulary mastery before teaching using Memrise application. Then, the post-test used to find out the students vocabulary mastery after treatment. To measure students effectiveness, the researcher will compare the result of pre-test and post-test by using SPSS. The reason for compare the pre-test and post-test is to find out effective or not the use of Memrise application in improving students' vocabulary mastery after the treatment. According to Thornbury (2007), there are four indicators of vocabulary namely pronunciation, spelling, meaning, and word use.

The specification of indicator test item can be explained as follows:

Table 1.4
Specification of Vocabulary Test

No	Indicator	Question Number	Total
1	Pronunciation	16,17,18,19,20	5

2	Spelling	1,2,3,4,5	5
4	Meaning	11,12,13,14,15	5
4	Word Use	6,7,8,9,10	5
Total			20

Source: Thornbury (2007)

E. Instrument Validity

Validity is an important key to effective research. Validity is defined as the extent to which a concept is accurately measured in quantitative study (Heale & Twycross, 2015). It is defined as measuring research concept accurately. A test can be said validity the object to be measure and suitable with the criteria. In this study, the researcher will use content validity test based on syllabus that used in SMP Negeri 2 OKU. Validity is a measure that shows the level of validity an instrument. An instrument is declared if it is able to measure what is expected and can reveal data from the variables studied correctly (Cohen et al., 2018). Additionally, Sugiyono (2016) said that tests that are frequently used to measure learning progress are instruments that must have content validity. To have a content validity, the instruments are representative of some defined universe or domain of content. Content validity is the extent to which a measuring instrument provides adequate coverage of the topic under study. Content validity refers to the instrument must show that fairly refers to syllabus that used in SMP Negeri 2 OKU and comprehensively cover the domain or item that is purpose cover.

The try out test researcher took on 10th April 2025 on class VIII.3 and the result can be seen on the table below:

Table 1.5
Validity of the Test

No	Significant (2-tailed)	Sig < 0.05	Conclusion
1.	0.008	0.05	Valid
2.	0.023	0.05	Valid
3.	0.031	0.05	Valid
4.	0.011	0.05	Valid
5.	0.014	0.05	Valid
6.	0.235	0.05	Invalid
7.	0.020	0.05	Valid
8.	< 0.001	0.05	Valid
9.	< 0.001	0.05	Valid
10.	0.005	0.05	Valid
11.	0.001	0.05	Valid
12.	0.392	0.05	Invalid
13.	0.531	0.05	Invalid
14.	0.020	0.05	Valid
15.	< 0.001	0.05	Valid
16.	0.018	0.05	Valid
17.	< 0.001	0.05	Valid
18.	0.018	0.05	Valid
19.	0.003	0.05	Valid
20.	0.003	0.05	Valid
21.	0.004	0.05	Valid
22.	0.001	0.05	Valid
23.	0.013	0.05	Valid
24.	a	0.05	Non-Constant
25.	0.124	0.05	Invalid

Based on the table above, to know the test item were valid or not the researcher conclude based on two hypotheses as follow:

a. If the significant point is less than significant level 0.05, it means that the item are valid.

b. If the significant point is more than significant level 0.05, it means that the item are invalid.

From the result at the table there are 20 test item are valid (number 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23), and then 4 test item are invalid

(number 6, 12, 13, 25), and also 1 test item are non-constant (number 24). So, the researcher took 20 test item valid for instrument of the test.

F. Instrument Reliability

A reliable instrument was an instrument that, when used several times to measure the same object, would result in the same data. Instrument reliability was a condition for instrument validity testing. As a result, the researcher in this study measured the instrument's reliability using SPSS and the Cronbach's Alpha formula. Retnawati (2017), said that the Cronbach's Alpha formula can be used to measure reliability with polytomous scales like scoring instruments ranging from 1 to 0. To know whether the test items were reliable or not, the writer concludes two hypotheses as follow:

a. If the Cronbach Alpha Point is more than 0.60, it means that the items are reliable.

b. If the Conbrach Alpha Point is less than 0.60, it means that the items are not reliable.

Table 1.6
Reliability Analysis

Cronbach's Alpha	N of Items
.837	20

From the table 1.6 above showed that the Cronbach' Alpha point was 0.837, it was more than 0.60, so it means that the items of instruments was reliable and could be used as the instrument of the test.

G. Techniques for Analyzing the Data

1. To analyze the data from vocabulary test there are three steps, the steps are:

   a. Scoring the students correct answer of test

   $$X = \frac{B \times 100}{T}$$

   Where:

   X = The total of students score

   B = Total of students correct answer

   T = Total of test item

   (*Sugiyono, 2016)*

   b. Classified the score of the students into the following criteria:

Table 1.7
Range of Score

Score	Classification
80-100	Very good
66-79	Good
56-65	Average
46-55	Poor
0-45	Fail

(Sugiyono, 2016)

The researcher used paired sample T-test through the SPSS computer program to find out the significant between pre-test and post-test.