

## **CHAPTER III**

### **RESEARCH METHOD**

This chapter is dedicated to discuss research design, population, sampling technique, sample, variable of the study, research instrument, data collection, data analysis covering normality and homogeneity, and hypothesis testing.

#### **A. Research Design**

Research design refers how the researcher collects the data and how she analyzes the data. This study used quantitative approach with the experimental research design. The writer chose experimental research to know the effect of independent variable to another variable or to know cause and effect relationship between/among variables. Particularly in this study, the researcher intended to know the effect of using cake application in teaching students' vocabulary mastery.

According to Ary, et al. (2010) experimental research design is a study of the effect of the systematic manipulation of one variable on another. Also, it could be explained that experimental research is the research method to test the hypothesis, starting with a question about the relationship between two variables or more.

In this study, the researcher used one type of experimental study, namely pre-experimental, that is using one group pre-test and post-test. The experiment was conducted by giving a treatment to a single group,

preceded by pre-test and followed up by a post-test after the treatment. Pre-test provided a measure on some attribute or characteristic that was assessed in an experiment before the group got a treatment, while in the post-test measured on some attribute or characteristic that assessed for participants in an experiment after the treatment. This design was put forward by Creswell (2014), with a pre-experimental research design the researcher studied one group and does not have a controlled group to compare with the experimental group.

In addition, the reason why using a pre-experimental study was that the school only allowed the researcher to take one of the available classes and the school had fixed learning activities in the classroom for a long time. Thus, it is quite impossible for the researcher to set a randomized members as to put them into an experimental group.

**Table 3.1 The Illustration of pre-experimental research design**

<b>Pre-test</b>	<b>Treatment</b>	<b>Post-test</b>
Y <sub>1</sub>	X	Y <sub>2</sub>

Explanation:

Y<sub>1</sub> : Students' vocabulary achievement measured by a pre-test before treatment

X : Giving treatment by cake application

Y<sub>2</sub> : Students' vocabulary achievement measured by a post-test after treatment

According to table 3.1, the procedures of using one group in pre-experimental study design were:

1. Administering pre-test to measure students' vocabulary achievement measured by a pre-test before treatment
2. Applying the treatment by cake application during teaching learning process.
3. Administering post-test to measure the students' vocabulary mastery after the group received the treatment.

## **B. Population, Sampling, Sample**

### **1. Population**

A population is defined as all members of any well-defined class of people, event, or object (Ary, et al. 2010: 148). It means that population is all subjects of the research. The population of this research was the seventh grade students of MTsS in Tulungagung.

### **2. Sampling**

Sampling is the technique how to select the sample representatively. It means that sampling is the way to collect samples from the population of the same characteristics since it is not feasible to cover the entire research object (population). Thus it only uses the part of population. Then, in deciding the sample, this study uses non-probability sampling in which the individual did not have the same chance to be selected as the sample. Next, the kind of non-probability sampling that is used in this study is convenience sampling. Convenience sampling is the technique of taking samples based on the

availability of a group or a class of entities and the available facility to get them.

### **3. Sample**

Sample is part of population of the object research (Arikunto, 2013: 174). The samples in this study were taken by convenience sampling technique that is class VII of MTsS PSM Rejotangan Tulungagung that consists of 22 students in the class.

### **C. Variables of the Study**

Ary et al (2010:37) says that variable is the constructs or the characteristics that would be studied. It means that variable is the focus of the study used in quantitative approach. In experimental study, actually the variables are classified into independent and dependent variables.

Independent variable can be manipulated by experimenter. It means that independent variable could be intentionally created in order to give an effect to dependent variable. The independent variable in this current study was the use of cake application.

Different from the independent variable, dependent variable cannot be manipulated by the experimenter (Ary et al, 2010:266). This variable is affected by independent variable. In short, dependent variable could be called as the outcome from the effect of independent variable. The dependent variable in the study was students' vocabulary mastery.

#### **D. Treatment**

Treatments are the step that must be conducted well and specific in experimental study. The purpose of treatment in this study is to help the students easier to write especially about understanding the materials. Here, the students were guided to watch the videos in Cake Application. Then, the treatments in this study were conducted on 22<sup>nd</sup> April 2021. First, treatment was given on Saturday, March 07<sup>th</sup> 2020.

Before beginning to apply the Cake Application, the researcher introduced the application especially for teach vocabulary by watching videos. Then, she asked the students' to prepare their own smartphone by download the application and should login by their own account. After the application ready to use, the teacher asked students' to search the first story. After that, the researcher explained about parts of speech in English, and students' continued to read in second times. Then, teacher gave the exercise to the students' after three times of watching the selected videos. The students' had to list the new vocabulary gotten from the story and classified them according to their types of part of speech. For complete description of treatment, please see the lesson plan in the appendices 2.

#### **E. Research Instrument**

In quantitative research, instrument is a measuring tool used by a researcher while collecting data. Arikunto (2010:262) states that research instrument refers to equipment used to collect the data. In an experimental research, the researcher used a test in collecting required data. According to

Ary, et al. (2010:201) 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.

The instrument used by the researcher was multiple-choice test. There were two kinds of tests for this study; those were pre- test and post-test. Pre-test was intended to measure students' vocabulary mastery given before the treatment, while post-test was to measure students' vocabulary mastery after the treatment was given. Both of tests were used to collect the data in this study. The technique of collecting the data was clarified as follows:

### **1. Pre-test**

Pre-test was conducted to measure the students' vocabulary mastery by giving a set of questions and assessing how far the students understand the subject being taught. In this research, pre-test here was given in the first meeting before they received the treatment during the process answer the questions of the material. The form of pre-test was multiple choices with time allocation was 60 minutes.

### **2. Post-test**

After conducting treatment, the post-test was given to the students. The form and the level difficulty of test in the post-test were almost equal to the pre-test, but the wording and topic were different. Basically, this test was conducted to measure the students' vocabulary mastery after receiving the treatment. It was given to know the gain scores of the students and if they had a different achievement before and after they

get the treatment. The time allocation to do this post-test was also 60 minutes.

## **F. Validity and Reliability of the Instrument**

In quantitative research, it was important to get and show the validity and reliability of the instruments used to measure the dependent variable, which is later in the form of numeric data. The validity and the reliability of this study were elaborated as follows:

### **1. Validity**

Ary, et al. (2010:225) defines that validity as the extent to which as an instrument measured what it claimed. While, Fraenkel and Wallen (2006:150) state that validity is the most important idea to consider when preparing or selecting an instrument for use. Hence, it could be concluded that validity is the instrument that measures what is supposed to be measured. To measure whether the test used in this research had a good validity or not, the researcher analyzed the test in terms of its face validity, content validity, and construct validity.

#### **a. Face Validity**

Face validity refers to the degree to which a test looks right, and appears to measure the knowledge or abilities it claims to measure, based on subjective judgement or the examinees who take it, the administrative personnel who decides on its use, and other psychometrically unsophisticated observers (Brown, 2004). The

test in this research was designed to measure students' vocabulary mastery using writing vocab that contain in video.

There are some aspects that were considered from this test to make a good test based on the validity. They are (1) The students asked to find all of vocabulary that contain in video; (2) The video that played is from Cake application and students should write the answer in piece of paper; (3) The researcher gave time about 60 minutes for each student. Please see the physical test formats in the appendix 3 and 4.

#### **b. Content Validity**

Content validity means that the instruments of the research should match with the curriculum. Moreover, content validity is a kind of validity which depends on careful analysis of the language being tested and of the particular test. In the context of this study, the content validity refers to the 2013 National Curriculum of Indonesia. The researcher conducted consultation with the expert as the way to validate the test that has been set up. In this research the content of items in testing used multiple choice questions. It was suitable for the 7<sup>th</sup> grade of MTsS PSM Rejotangan because the tests were based on the basic competence in English syllabus of Junior High School. Therefore, the tests were valid in terms of content validity.



**Table 3.2 Matrix of Content Validity**

<b>Syllabus Basic Competence</b>	<b>Indicator</b>	<b>Learning Material</b>	<b>Technique</b>	<b>Test Item</b>
4.1. Compose oral and written interpersonal interaction texts, approach and simplify which involves greeting, goodbye, introduce myself and others, ask for information, say thank you, and apologize, participate in responding by paying attention to social function, structure text, and and linguistic elements which correct and appropriate.	Student can identify the the materials “Good Morning. How are you” from the text.	Good Morning, How Are You	Written Test Students answer multiple-choice question based on the text	Pre-Test
	Student can identify the cake applications to answer the questions.	Text 2. -	Written Test Students answer Multiple-Choice question based on the text.	Post-Test

In this study, the researcher made some indicators of multiple choice questions in the pre-test and post-test activity. Those indicators related to the components of multiple choices question included social function, generic structure, mechanic, and language features.

### **c. Construct Validity**

Johnson (2001: 303) stated that construct validity deals with the relationship between a test and a particular view of language and language learning. It could be interpreted that the test should be appropriate with the theory of skills and language components that being measured. For measuring students’ vocabulary mastery

by using writing vocab on video, first student should watch the video, then they asked to find all of vocabulary that contain in video, after they found it, the should write down into piece of paper.

## 2. Reliability

Reliability is a measure that states the degree of consistency of a test question. Creswell (2012:627) says that reliability means that individual scores from an instrument should be nearly the same or stable on repeated administrations of the instrument and that they should be free from sources of measurement error and consistent. It means that reliability is the test can be used to know that test is consistent and dependable.

This current study the test's reliability was identified by tryout and the resulted scores were analyzed to see its reliability coefficient. The researcher firstly did a try-out test in different class of the same grade as the experimental group. In finding out the reliability of the test, the researcher used *Cronbach's Alpha*. And the result can be seen below.

**Table 3.3 The result of reliability testing**

**Case Processing Summary**

		N	%
Cases	Valid	20	100.0
	Excluded <sup>a</sup>	0	.0
	Total	20	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha <sup>a</sup>	N of Items
.841	10

According to Sujianto (2009:97), the criteria of reliability degree were as follows:

**Table 3.4 The criteria of reliability**

<b>Cronbach's Alpha</b>	<b>Interpretation</b>
0,00 - 0,20	Less reliable
0,21 – 0,40	Rather reliable
0,41 – 0,60	Quite reliable
0,61 – 0,80	Reliable
0,81 - 1,00	Very reliable

(Sujianto 2009: 97)

Since the reliability coefficient was 0.841, it means it was positively correlated and its strength was very reliable.

**G. Data Analysis**

To identify the effectiveness of Cake to improve students' vocabulary mastery, this research using paired sample t-test by computing data from pre-test and post test. Descriptive statistic also used to indentify the mean score and the frequency of students' score

However before applying the t-test, some prerequisite statistical analyses were carried out. The use of t-test was preceded by Normality and Homogeneity Testing in order to see if the data obtained were normally distributed or not, in order to satisfy the statistical assumptions of using t-test.

## 1. Normality Testing

Normality test is used to test whether a variable is normal or not. Normal here means if the data have normal distribution. The main reason of conducting normality testing in a research that it is necessary for the researcher to know that the population or data involved in the research in normal distribution.

In this research to measure the normality testing, the researcher used SPSS 16.0 One Sample Kolmogorov – Smirnov method by the value of significance ( $\alpha$ ) = 0.05. Basic decisions in making normality testing were as follows:

- a. If the significance value  $> 0.05$ , the data had normal distribution.
- b. If the significance value  $< 0.05$ , the data did not have normal distribution.

## 2. Homogeneity Testing

Homogeneity testing is used to know the similarity of the two conditions or population. Homogeneity testing is conducted to know whether the gotten data has a homogeneous variance or not. To identify the homogeneity of variance, this research used a Levene's Test. This test aimed to verify the equal variances between two data.

The value of significance ( $\alpha$ ) was 0.05. Basic decisions making in homogeneity testing were as follows:

- a. If the significance value  $> 0.05$ , the data distribution was have equal variances (homogeneous).

- b. If the significance value  $< 0.05$ , the data distribution was not equal variances (not homogeneous).

## **H. Hypothesis Testing**

After conducting paired sample t-test by using SPSS 16.0 for windows program and determining that the significance level ( $\alpha$ ) is 0,05 or 5% (it has been programmed on the application) the final step of data analysis is testing the hypothesis, either rejecting or accepting the null hypothesis. The base of rejecting or not rejecting the null hypothesis is: If P-value (denoted by Sig)  $\leq \alpha$  (5 %),  $H_0$  is rejected and thus  $H_a$  is accepted. But, if P-value  $> \alpha$  (5 %),  $H_0$  is not rejected, or accepted and thus  $H_a$  is rejected.