CHAPTER III

RESEARCH METHOD

In this chapter, the researcher presents the design and data that need to complete this research. This chapter consists of (a) research design, (b) population, sample, and sampling, (c) research instruments, (d) validity and reliability testing, (e) data analysis method.

A. Research Design

This research is experimental research. Experimental research with the purpose of examining the cause and the effect after the treatment will be done in an experimental group. The research design aims to give the responsibility for setting the next steps to make the result more accurate and objective. The subject of this research is the first-grade students of MTsN 3 Tulungagung, which consist of 1 class. In this study, there are two variables, namely:

1. Independent Variable is "The use of Duolingo application as a media of teaching English vocabulary".

2. Dependent Variable is "The mastery of English vocabulary".

The experiment research used one group pre-test and post-test design because it was done in one group only without another control group. Therefore this experiment is called pre-experimental design

(simple experiment). There are three stages in one group pretest-posttest design.

1. Pretest

The researcher administers a pre-test to find out the student's vocabulary mastery before being taught using Duolingo application. The pre-test is formulated as T1.

Using the test, the researcher gave twenty-five question in the form by multiple choice, specify the nouns and match the picture with the correct vocabulary.

2. Treatment

The researcher applied the experimental treatment to the subjects. The students were taught using Duolingo application. The experimental treatment is formulated as *X*.

The one-group pretest and posttest design usually involves three steps:

1. Administering a pretest measuring the dependent variable.

2. Applying the experimental treatment *X* to the subjects.

3. Administering a posttest (Y_2) which proposed to measure students' mastery in vocabulary after given a treatment.

In this lesson, the teacher use repetition or imitation drilling technique in teaching vocabulary.

- The teacher tells the students what the mean by drilling technique, what the purpose and how to use it.

- Open the noun chapter in the Duolingo application and explain how to do sentences or phrases, even clauses that are still in random words, so students can arrange words to be the right sentence.

- The teacher tells students to write what they have learned in the Duolingo application, and underline vocabulary that shows nouns.

- By using repetition or artificial drilling, the teacher asks students to read the sentence they have written in the book, and also read the noun vocabulary with the meaning.

- The teacher opens the laptop, then opens the Duolingo application, and the students pay attention to the teacher's instruction.

- By using repetition or artificial drilling the teacher tells students to answer the questions in the Duolingo application without writing them and they only answered together.

- The teacher calls the names of students randomly and tells students to answer 1 question in the Duolingo application alternately and others listen.

3. **Post test**

Administering a post-test, again measuring the dependent variable. Differences attributed to the application of the experimental

treatment are then evaluated by comparing the pretest and post-test scores (Ary et al, 2010: 303).

Table 3.1 A Diagram One Group Pretest-Posttest Design

Pre-test	Independent Variable	Post-test
Y_1	X	Y_2

Applying one group pretest-posttest, the researcher wanted to find out whether there is any significant difference in students' mastery before and after being taught using Duolingo application at MTsN 3 Tulungagung.

B.   **Population and Sample**

The population is the large group about the generalization. Gay (1992: 124) stated population is the group of interest to the researcher, the group to which she or he would like the result of the study to be generalizable. On the other hand, the population is defined as all members of any well-defined class of people, events, or objects (Ary, et. Al, 2010: 148). So that why, Population of this research was first grade in MTsN 3 Tulungagung, which consist of five classes from A until F class. And every class contains twenty-five students

Meanwhile, sampling is the process of selecting a number of individuals for a study in such a way that the individuals represent the larger group from which they were selected (Gay, 1992: 123). This sampling has a function to get information about the population. So

that sampling is the technique to take a sample. In this research, random sampling was chosen as a technique of choosing a sample, because random sampling is the best single way to obtain a representative sample. Besides, the researcher also admits that all subjects were homogenous in their skills especially in their vocabulary.

Gay (1992: 126) stated random sampling is the process of selecting a sample in such a way that all individuals in the defined population have an equal and independent chance of being selected for the sample. It means that every individual has the same probability of being selected and the selection of one individual in no way affect the selection of another individual. Therefore, all members of the population have an equal and independent chance of being included in the selection of the sample.

Selection sample is a very important step in conducting a research study. Because, the sample is the small group that is observed (Ary, et, al, 2010: 148). Besides, the sample is one that is representative of the population from which is selected (Gay, 1992: 126). It means that a good sample must be representative of the entire as possible so that the generalization of the sample as true as the population.

According to the analysis above, the researcher used the first-grade students at MTsN 3 Tulungagung as population and A class students who consisted of 25 students as a sample based on the

purposive sampling. Researchers chose these students intentionally to be sample, because of the time energy and background that the students had met the good criteria for research.

C.   Research Instrument

The instrument is a tool model used in the study. Need to get data in research. The main instrument of this research is the test. The test is focused on vocabulary testing.

The purpose of this study was to implement vocabulary learning by applying the Duolingo application and to find out the English language skills of students primarily vocabulary skills. And the purpose of the vocabulary test is to measure students' ability to master vocabulary in English. The researcher tests the vocabulary so that students can get feedback, backwash effects, motivation, recycling.

The researcher used several forms of tests in making vocabulary questions namely multiple choice, specify the nouns and match the picture with the correct vocabulary with twenty-five questions.

The test is the means of measuring the knowledge, skill, feeling, intelligence, or aptitude of an individual or group (Gay, 1992: 154). Further, (Ary, et. al, 2010: 201) stated test is a set of stimuli presented to an individual in order to elicit responses on the basis of which a numerical score can be assigned. Therefore, the test produces numerical scores that can be used to evaluate test takers and it will be a representative sample of the individual behavior.

To obtain the required scores of the student's achievement in vocabulary ability in this research, the researcher used two kinds of tests. They were pretest and posttest.

1. Pretest

   The pretest was done before the treatment process (teaching vocabulary by Duolingo application).

2. Posttest

   The numbers of the test given the 25 questions for each student. The posttest was done after the treatment process (teaching vocabulary by Duolingo application) it was done to know the final score and to know the students' difference before and after they getting treatment. Thus, in measuring the students' comprehension achievement, the test were considered quite representative in the class.

   The instrument in the test were stated clearly that the students had to work on twenty-five question in the form by multiple choice, specify the nouns and match the picture with the correct vocabulary.

   And in the Duolingo application, there are automatic corrections available when students answer questions incorrectly. This makes it easy for students to understand and remember questions that they might not understand in the correct use of words or vocabulary. There were total 25 Using the test, the researcher gave twenty-five question in the form by multiple choice, specify the nouns and match the picture with the correct vocabulary. The time allocated was 60 minutes with 20 minutes to do the task.

The scoring of the test was carried out subjectively by adding up the number of the right answers. Then the total correct answer was timed by two as a result.

Based on the explanation above, a test was administered to a large number of appropriately defined individuals and resulting test scores were analyzed. Then, these scores as indicators of the construct of the interest were in large part a function of the validity and reliability of tests.

D. Validity and Reliability Testing

The quantitative research always depends on measurement. These measurements are validity and reliability through the instrument of research. The instrument of this research was test.

In this research, the vocabulary test used to measure the students' achievement in mastering vocabulary after they have been taught by using Duolingo application. Validity and reliability testing of this test was very important to know scores derived from instruments in research.

a. Validity

Validity is the most important consideration in developing and evaluating measuring instruments. It means that validity is concerned with what a test measures and for whom it is appropriate, because a test that the validity in one situation may not valid in other situation. Test validity presupposes that the writer can be explicit about what is

to be tasted and takes steps to ensure that the test reflects realistic use of particular ability to be measured (Weir, 1993: 19). Based on this research, the researcher would use content validity to know the validity of the test.

In this research the researcher have been testing this instrument to the students, that the results of tests that have been tested on students is valid. And most of the students were able to do the test well.

b. Content Validity

Content validity is the degree to which a test measures an intended content area (Gay, 1992: 156). So, it is a kind of validity which depends on careful analysis of the language being tested and of the particular test subjective. This validity should require item validity where it represented measurement in the intended content area and sampling validity which was used to know how well the test samples the total content area or relevant with the purpose of the test.

A test is said to have content validity when its contents constitute a representative sample of being tasted. So, content validity is prime importance for achievement test, because the test score cannot accurately reflect a student's achievement if it does not measure what the student was supposed to learn.

c. Construct Validity

Construct validity is to measure the instrument. It means the instrument is said to have construct validity if it can measure what to

be measured. In this research, the researcher tested the students'
vocabulary mastery by giving multiple choice and writing a test to
practice the vocabulary.

E. **Reliability**

Reliability is a consistency of the measurement's test. According
to Brown (2003:20), a reliable test is consistent and dependable. A test
is reliable to the extent that scores made by an individual remain
nearly the same in repeated measurements. That is, individuals will
have the same or nearly the same scores. If the test is reliable enough,
the result would be consistent and the scores in the first and second
test will remain equal.

The researcher have tried out the instrument first before
administering pre-test in the experimental class. It consists of 25
questions based on the text. Test questions consist of multiple choice,
specify the nouns and match the picture with the correct vocabulary.

Table 3.2 The Result of Reability Testing

Reliability Statistics

Cronbach's Alpha	N of Items
,811	32

From table 3.3 the results of reliability testing are 0.811. This
means that trying a pre-test instrument is very high reliability. Based

on reliability criteria, the level of reliability of the pre-test instrument is very high reliability. So, it can be used as research.

F.   Hyphothesis Testing

The statistical test was intended for comparing two means, which is the means of before and after treatment. According to Balnaves and Caputi (2001: 40), the way to test whether the null hypothesis can be rejected is by comparing T-value of the obtained statistics is less than 0, 05. The hypothesis testing of this study is as follow:

1.   If the significant level is less than 0, 05 the alternative hypothesis is rejected and the null hypothesis is cannot be rejected. It means that there is no different score on students' vocabulary mastery after and before being taught by using Duolingo application.

2.   If the significant level more than 0, 05 the alternative hypothesis is not rejected and the null hypothesis is rejected. It means that there is a significant different score on students' Vocabulary mastery after and before being taught by using Duolingo application.

G.   Data Analysis

Data analysis is reviewing the data while they are being collected and attempting to synthesize and make sense out of what is observed (Ary et al, 2010:530). In analyzing data, the researcher used

a statistical calculation of t-test. T-test is used to find out the difference in the score of student vocabulary mastery using Duolingo application. Because this research is just administered in experimental class with one group pre-test and post-test. It means the subject is the same, but they get different treatment. The researcher used Paired Sample t-test application SPSS 16.0 to analyze the data. The data obtained from the result of student pre-test and post-test. The data result was processed by comparing with the first data (pre-test) and the second data (post-test) to see whether there will be a significant difference after given by treatment. The data result (post-test) of vocabulary was data of average score of vocabulary test taught by Duolingo application. The first data (pre-test) is data of students score before taught by using Duolingo application. If the post-test on the students' vocabulary test is higher than pre-test, it means that teaching vocabulary by using Duolingo application is effective.