CHAPTER III

RESEARCH METHOD

In this chapter the researcher describes the research method. It consists of research design, population and sample, research variable, research instrument, validity testing.

A. Research Design

Research is an observing activity of something that have to do by the researcher in doing a research. According to Creswell (2012:3) research is a process of stab used to collect and. It means that a study is done carefully and accurately on investigation of analyze information to increase the understanding of a topic or issue.

This study is conducted in pre-experimental design using quantitative approach with one group pretest-posttest design. This study uses pre-experimental because it does not have random assignment of subject to group or other strategy to control extraneous variable. That is why in this study the researcher just takes one group or class and uses pretest and posttest to see the result of the treatment.

According to Ary *et. al.,* (2002:22), quantitative research uses objective measurement and statistical analysis of numeric data to understand and explain phenomena. In quantitative research there are experimental and non-experimental research design. Experimental research involves a study of

the effect of the systematic manipulation of one variable on another variable and non-experimental research; the researcher identifies variables and may look for relationship among them, but does not manipulate the variables (Ary, *et, al,*. 2002:24).

The experimental research design is classified into pre-experimental design, true experimental, and quasi-experimental. Pre-experimental research does not have random assignment of subjects to groups or other strategies to control extraneous variables. True-experimental research uses randomization and provides maximum control of extraneous variables. Whether quasi-experimental research lack randomization but employ other strategies to provide some control over extraneous variables (Ary *et al*, 2002: 302).

This study is classified as pre-experimental design because it is little or no control of extraneous variables. In the one group pretest-posttest design, a single group is measured or observed not only after being exposed to a treatment of some short, but also before. Pre-experimental research involves administering pre-test to the independent variable, applying the experimental treatment to the subjects, and administering the posttest. The result of the treatment is found by comparing the pretest and posttest score.

This experimental design used pre-experimental research design *(one group pretest-posttest design)* that consists of pre-test, treatment and post-test. The pre-test and post-test are given to take the score of the student's achievement before and after being taught using *mind mapping technique*. Then both of the score were computed by using t-test to find out if there is

significant different in vocabulary by using *mind mapping technique*. The design of this research can be seen at the table below:

Table 3.1 The Design of One-Group Pre-test Post-test

Pre-test	Treatment	Post-test
Y1	X	Y2

Explanation:

Y1 = Pre-test

X = Treatment

Y2= Post-test

The procedures of experimental research that use One group pre-test post test design :

1. Administering a pre-test with a purpose of measuring vocabulary mastery of fifth graders at SDN 1 Jeli Karangrejo Tulungagung.

2. Applying the experimental treatment teaching vocabulary by *using mind mapping technique* to the subject fifth graders at SDN 1 Jeli Karangrejo Tungagung

3. Administering a posttest with a purpose of measuring vocabulary mastery at SDN 1 Jeli Karangrejo Tulungagung.

Differences attributed to application of the experimental treatment are determined by comparing the pretest and posttest scores.

In this research, the observation was conducted twice that is after and before the treatment at SDN 1 Jeli Karangrejo Tulungagung. The researcher

held the pre-test to know the vocabulary mastery on the fifth graders at SDN 1 Je li Karangrejo Tulungagung before using mind mapping technique. And then the researcher apply an experimental treatment (X) to the students. And finally the researcher gives post – test to know the students' vocabulary mastery after giving treatments by using mind mapping technique.

This research intended to investigate the effectiveness of using mind mapping technique in vocabulary mastery on the fifth graders at SDN 1 Jeli Karangrejo in academic year 2015/2016. The use of the treatment is aimed in improving vocabulary mastery of student scores possibly got by the researcher. Thus, the effectiveness of that treatment be known the significant score when the students taught using *mind mapping technique*.

B. **Population, Sample and Sampling**

1. Population

Population is a set to which a researcher wishes to generalize. More technically, the population is a sample space of elementary events. Another way to think of the population is a set of units from which the researcher will sample. According to Ary *et. al.,* (2002:148) stated that population is defined as all members of any well-defined class of people, events, or objects.

The population on this research is all student at SDN 1 Jeli Karangrejo Tulungagung which consist of six class. The population are 91 students, but the researcher only put the sample on fifth graders at SDN 1

Jeli Karangrejo Tulungagung. There are 14 of the fifth graders SDN 1 JELI Karangrejo Tulungagung According to Ary *et. al* (2002:163) population is all members of any well defined class of people, events of objects.

2. Sample

Selected of the sample is very important step in conducting a research study. Based on Ary et, al,. (2002:163) a sample is a person of population. It means that a good sample must be representative of the entire as possible, so that the generalization of the sample as true as population. According the explanation above the sample of this research is 14 students, there are 9 male and 5 female at SDN 1 Jeli Karangrejo Tulungagung in academic year 2015/2016.

3. Sampling

Sampling is a way the researcher select number of individuals as a sample which represents the population. Ary (2002: 163) states "The purpose of sampling is to obtain information concerning the population". The researcher used purposive sampling to take sample from population and it represent the entire population. Ary (2002:169) states "Purposive sampling-also referred to as judgment sampling-sample elements judged to be typical, or representative, are chosen from the population."

Whereas, the six class in SDN 1 Jeli Karangrejo. The researcher chosen in fifth grade because in there the student given beginner some kinds of vocabulary and the student have a problem in vocabulary as recommended by the teacher in SDN 1 Jeli Karangrejo. So, the researcher use mind mapping technique in vocabulary mastery that suitable to prove the problem. This technique can make student stimulate in the brain and make the student remember the prior knowledge.

C. Research Variable

In this research, the researcher thinks it is important to know the meaning of variable itself. According to Cresswell, (2012:112) variable is a characteristic or attribute of an individual or an organization that the researcher can measure or observe and various individuals or organizations has been studied. Measurement means that the researcher records the information from individuals by asking them to answer questions. And when variables vary, it means that scores will assume different values depending on type of variable being measured.

According to Ary (2002:39) variable is a construct or a characteristic that can take on different values or scores. The most important classification is on the bass of their use within the research under consideration, when they are classified as independent variables or dependent variables.

1. **Independent variable (X)**

Independent variable is variable which is manipulated by a researcher deliberately. In this research, independent variable is vocabulary mastery by using mind mapping.

Description of mind mapping on vocabulary. Firstly, the researcher gives the pre-test to the students in fifth graders of SDN 1 Jeli Karangrejo. Pre-test here is to measure how far the students' understanding about the course and how far they know about vocabulary. Secondly, the researcher gives treatment to the students in vocabulary using *mind mapping technique* to find formulate the problems. The student can formulate the problems of vocabulary before and after by using *mind mapping* form correctly, and the researcher analyze and present the result their vocabulary. Finally, the researcher gives the post-test to the fifth graders of SDN 1 Jeli Karangrejo Tulungagung

2. Dependent variable (Y)

Dependent variable is a variable that encourage in function relationship influence by independent variable. In this research, dependent variable is students' achievement in vocabulary. According to Cresswell (2012:115) a dependendent variable attribute or characteristics that is dependent or influenced by independent variable. The variable not manipulated by the researcher but it is affected by the independent variable. The dependent variable of this research is the students' vocabulary mastery.

D. Data and Data Source

1. Data

Data are any type of information collected for use in educational research (Lodico, 2006:66). The data are very significant in the research because the research cannot get information without the data. The data of quantitative is in the form of number. In this research, the data is in the form of number that is the students' achievement in the form of students' score of vocabulary test from pre-test and post-test.

2. Data Source

In this research choose person as data source, it is the fifth grade students of SDN 1 Jeli Karangrejo. The researcher get the data from the subject of the research that are fifth grade students of SDN 1 Jeli Karangrejo. The data are taken from the student's answer from the question in pre-test by the topic 'traffic signs' and the question in post-test by the topic "diseases".

E. Research Instrument

Research instrument is the tool of collecting data that should be valid and reliable. research instrument can be valid if the instrument can measure what will be measured. The instrument of this research is test. Ary (2002:127)

states that "test is a series question, exercise or other means which are used to measure the skill, knowledge, intelligent, ability or talent that have by individual or group". Thus a test is a method to gain the data by giving some question to the respondent.

In this research the researcher used achievement test, Isnawati (2011:14) "achievement test is test that is used to measure the process that students making after learn something". This test used to measure the student in vocabulary mastery before and after they taught by using *mind mapping technique* in SDN 1 jeli karangrejo tulungagung. In this study, the researcher applied pre-test and post-test. Pre-test was given before teaching by using *mind mapping technique*, in the pre-test students provides a measure on some attribute or characteristics assess for participant in an experiment before receive a treatment (Cresswell,2008:301). Pre-test in this research is the test form of multiple-choice (20 questions). The topic about "traffic sign" as the first material in the elementary school. This pre-test give to the student before treatment. Post-test a measure on some attribute or characteristics that is assessed for participant in an experiment after treatment (Cresswell,2008:301). Pre-test in this research is the test form of multiple-choice (20 questions). The topic about "diseases" is the second material in the elementary school. This post-test gives to the student after treatment.

F. Validity and Reliability Testing

The data are correct or not are depend on the instrument of collecting method, the instrument that used in this research is the test. According to Brown (2000:384) the test is a method to There are two important requirements that have to fulfill, validity and reliability.

1. Validity

According to Brown, (2004:22) as quoted by Isnawati, (2014:28) validity is the extent to which inferences made from assessment result are appropriate, meaningful and useful in terms of the purpose of the assessment. In experimental research, the researcher had to check validity and reliability of the instrument. Validity is called is the degree to which the test actually measure (Brown 2000:388). There are three types of validation : content validity, face validity, and construct. The researcher analyzed the test from content validity, face validity and construct validity.

a) Content validity test is side to have content validity if its content constitutes a representative sample of the language skills, structures, etc being tested. In order to judge whether or not the test has content validity, we need a specification of the skills or structure being tested. Comparison of test specification and test content is the basis for judgment for content validity. The content validity of the test can be done by comparing the content of test and material that will be learned. The researcher made this test based on the course objectives

on the syllabus of fifth graders at SDN 1 Jeli Karangrejo Tulungagung. Therefore, this test is valid in term of content validity.

Table 3.2 content validity on test specification on pre test

No	Competence indicator	Test item
1	Student knows about "traffic sign" Determine the name of the kinds of traffic sign	1,3,6,2,8,9,10,14
2	Student knows about map of house Determine the map	18,17,5,7
3	Analyze the name of the traffic sign Determine the name of the traffic sign in the form of conversation.	20,19,11,12,13,,15,

Table 3.3 content validity on test specification on post test

No	Competence indicator	Test item
1	Student knows about kinds of "disease" Determine the name of the kinds of disease	1,12,17,18,15,8,2,3
2	Student knows cause the people sick Determine indication the people of sick	4,5,6,13,19,20
3	Analyze the name of the disease Determine the name of the disease in the form of conversation.	16,9,

b) Face validity

   Face validity if it looks as it measures what it is supposed measure. For example, a test which pretended to measure pronunciation ability but which did not require the test-takers to speak might be through to lack face validity Isnawati (2014:30). This is true even if the test is constructing and criterion-related validity can be demonstrated. Face validity is hardly a scientific concept, yet it is very important. A test which does not have face validity may not be acceptable by test-takers, teachers, education authorities, and employers. The researcher used face validity by consulting with the advisor and teacher.

c) Construct validity

   The construct validity of test is test which is capable of measuring certain specific characteristics in accordance with a theory of language behavior and learning. Based on the theory above, in this test the researcher asked the students to answer the multiple choice based on the vocabulary of the topic that day, the multiple choice test of the pre-test is "traffic signs" and the multiple choice test on the post-test is "diseases", the test has a purpose to measure the students' comprehension in vocabulary and this fulfill the construct of vocabulary test and therefore valid in term of construct validity.

Besides, the researcher tried to check the empirical validity by using SPSS 16.0 after trying out the instrument (pre-test and post-test). In this research, the researcher used SPSS 16.0 for windows to know the validity of test instrument. It can used corrected item-total correlation formulation.

In this test, the researcher gave the multiple-choice test to measure students' ability in vocabulary achievement. The researcher made this test based on the course objectives in the syllabus of fifth grade of SDN 1 Jeli Karangrejo. The students should answer the question from the selection answer.

2. Reliability

Reliability (in testing) is a measure of the degree to which a test is consistent. According to Ary *et, al,.* (2002:250) states that reliability is concerned with the effect of such random errors of measurement on the consistency of scores.

According to Brown (2000:386) stated a reliable test is consistent and dependable. A test is called reliable if the result of the test is similar with the test is tested in the same subject but in the different time.

The researcher used KR-20 Formula because the test was held once, one correct answer is given one point, when the incorrect answer was given zero point. It is appropriate to the measurement process of reliability of the multiple choice test. The researcher measured by using

KR-20 Formula in the Microsoft Excel. According to Vansickle (2015:4),

the classification of reliability test :

Table 3.4 Classification Of Reliability Test

Reliability Test Coefficient	Classification
Less than 0.20	Poor
0.20 to0.40	Fair
0.40 to 0.60	Moderate
0.60 to 0.80	Good
0.80 to 1.00	Very good

G. Data Collection Method

It has the purpose to get data and then it can be measured by the researcher. The data collecting method is the method to obtain the data in the research. The aim of the data collecting in conducting scientific research was to get material that needed by the research.

The researcher collects the data from the students' score of pre-test and post-test. The researcher gave students pre-test to know the students' vocabulary achievement. before the researcher give treatment. Researcher gave post-test to the students after the researcher giving treatment. The schedule of the research will be shown as follow :

Table 3.5 The Schedule Of Research

No	Date	Activity
1	May 28th ,2016	Try out

2	May 30th ,2016	Pre –test
3	May 31th,2016	
4.	June 1th,2016	Treatment
5	June 2th,2016	Post-test

The result of pre-test and post-test and then the researcher compare them. The technique of collecting data was clarified as follow:

1. Pre-test

    At the first meeting, the researcher gave a pre-test to the students. It was conducted to know the students score in vocabulary achievement. This test is given in order to know how far the students' ability in vocabulary The pre-test comprised 20 items, in the form of multiple choices items.

2. Treatment

    After conducting a pre-test, the researcher gave the treatment to the students. The researcher applied the technique or treatment using *mind mapping technique*.

3. Post-test

    Post-test is to measure their ability after treatment process, this test was given to know the basic competence for students and to know their earlier knowledge after they get treatment. It is done to know the

final score and to know the students, difference competence before and after they get treatment.

H. Data Analysis

Data analysis is a time – consuming and difficult process. The data obtained from research result is the results of students' test that were analyzed quantitatively. According to Khotari (2004:18) stated after the data has been collected, the researcher turns to the task of analyzing the data.

The researcher used statistical analysis because the result of the data is in the numerical form. The researcher used T-test to analyze the data to know whether there is significant different score of the students before the students being taught by using *mind mapping technique* and after the students being taught by *mind mapping technique* in improving students' vocabulary achievement.

Quantitative analysis was done using statistics which is called statistical analysis or inferential statistics. The quantitative data of this research in analyzed using statistical computation. This technique was used to find the significant difference on the students' vocabulary achievement after being taught by using *mind-mapping technique*.

The researcher used paired T-test according to Ary at al (2006:195) with the following formulation:

$$t = \frac{MD}{\sqrt{\dfrac{\sum D^2 - \dfrac{(\sum D)^2}{N}}{N(N-1)}}}$$

Where:

t   : The value of T_{count}

MD   : Average difference

$\sum D^2$: Different score squared then summed

$(\sum D)^2$: Different score summed then squared

N   : Number of samples

I.   Hypothesis Testing

The hypothesis of this study was as follow:

a. If T-Test score is bigger that T-table, the alternative hypothesis (Ha) is accepted. It means that there is different score before using mind-mapping technique and after using mind-mapping technique. The difference is significant.

b. If T-Test score is smaller than T-table, the null hypothesis (Ho) is rejected. It means that there is no different score before using mind-mapping technique and after using mind mapping technique. The difference is not significant.