CHAPTER III

METHOD OF INVESTIGATION

This chapter provides the method of investigation which consists of setting of the research, subject of the research, research design, method of data collection, data analysis for try-out test, and method of data analysis.

3.1 Setting of the Research

The setting of this research took place at SMK Roudlotul Mubtadiin Balekambang Gemiring Lor Nalumsari Balekambang which located in Balekambang hamlet, Gemiring Lor village RT.02 RW.07, Nalumsari, Jepara. The vocational high school who had six majorities It had 28 classes from the tenth grade up to twelfth grade, the classes are divided into female class and male class.

3.2 Subject of the Research

3.2.1 Population

A population is a group of individuals who have the same characteristic (Creswell, 2012:142). In this research, the researcher chose a population of SMK Roudlotul Mubtadiin Balekambang in the academic year of 2018/2019 who had the same individual characteristic. The population was all of students who were in twelfth grade classes 159 students that consisted of TAV, TKR, TKJ, BB, JB, Animasi

in eight different classes. They were five classes for male

class and three classes for female class.

3.2.2   Sample

The researcher took a sample from the population of

twelfth grade for the experiment group, control group and

also try-out test group. Sample is part of the quality and

characteristics of the population (Mubarok, 2015:39). The

researcher used probability sampling in the form of simple

random sampling.   The researcher took simple random

sampling because every individual had the same opportunity

to be sample. The way to choose sample used lottery in

random class. The researcher wrote the classes in little paper

there were XII TAV, XII TKR, XII TKJ 1, XII TKJ 2, XII TKJ

3, XII ANIMASI, XII BB, XII TB.

XII TKJ 1 class as a sample for try-out test group

consisted of 18 students, XII TKJ 3 was the experiment group

consisted of 26 students and control group was XII TKJ 2

class consisted of 29 students.

3.3 Research Design

Research designs are the specific procedures involved in the

research process: data collection, data analysis, and report writing

(Creswell, 2012:155). The researcher used true-experimental as design of this research, by collecting, analyzing data and report writing. Conducted by Mubarok (2015:101) this design, there are two groups of randomly selected, then given a pretest to determine the initial state is there any difference between the experimental group and control group. It means that control pre-test had a function to determine any difference between two groups there were control and experimental group.

The design of the research used true-experimental with the pretest-postest control group design. True experiments comprise the most rigorous and strong experimental designs because of equating the groups through random assignment. (Creswell, 2009:155) it means that researcher had the subject randomly such as technique sampling above. In this case the researcher was more concerned towards between experimental group who received a treatment with the one of cooperative learning strategies that was Circle the Sage Strategy and control group used conventional learning in teaching grammar. The design of true-experimental in the named pretest-posttest control group design as follows:

			O_2
R	O_1	X	
			O_4
R	O_3		

Where:

R : Random sampling

O_1: Pre-test for experiment class

X : Treatment
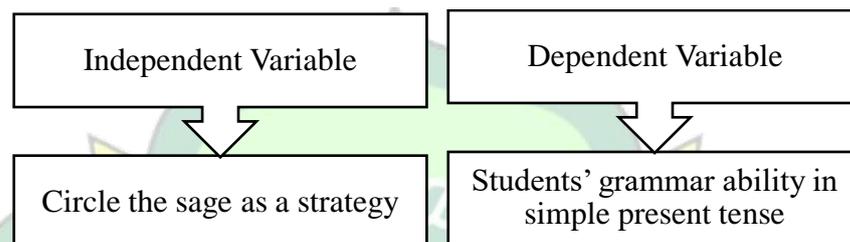
O$_2$: Post-test for experiment class

O3: Pre-test for control class

O$_4$: Post-test for control class

(Mubarok, 2015:101)

Figure 3.1

Variable

The researcher took some steps to conduct this research validation. The first step was pre-test that gave to the sample for control class and experiment class. Especially for the experiment class after giving the pre-test, the class got a treatment. It was a strategy to help students solved their problems. The researcher applied Circle the Sage strategy as a treatment for helping students in learning simple present tense in the classroom. The both of experimental and the control group had different teaching technique in two meetings.

Table 3.1

Learning Process of Experiment Group

Class	Meeting	Treatment
Experiment	Meeting 1	- The Teacher chose students being peer tutor

		- Teacher divided students into group consist of 4-5 students
		- Teacher gave material to the peer tutors
		- There were four students as the peer tutor with different sub material.
		- Students in the group came to the peer tutor and surround them.
		- Every student in each groups went to different peer tutor.
		- Every tutor explained material that had been given by the teacher to the students.
		- After that, students back to their own group and discussed what they got from the tutor.
		- Students in the group explained what they discuss in front of the class one by one.
		- Teacher concluded the material together with students.
	Meeting 2	- The Teacher chose students being peer tutor
		- Teacher divided students into group consist of 4-5 students
		- Teacher gave material to the peer tutors

		- There were four students as the peer tutor with different sub material.
		- Students in the group came to the peer tutor and surround them.
		- Every student in each groups went to different peer tutor.
		- Every tutor explained material that had been given by the teacher to the students.
		- After that, students back to their own group and discussed what they got from the tutor.
		- Students in the group explained what they discuss in front of the class one by one.
		- Teacher concluded the material together with students.

Table 3.2

Learning Process of Control Group

Group	Meeting	Treatment
Control	Meeting 1	- The Teacher wrote the material in the whiteboard - Teacher allowed students to write the material in their book note - After finished wrote all materials teacher explained the material to the students - Before do an exercises, teacher allowed students to asking some question - Teacher concluded the materials with the students - Teacher gave some exercises about the material - students submitted all exercises to the teacher
	Meeting 2	- The Teacher wrote the material in the whiteboard - Teacher allowed students to write the material in their book note - After finished wrote all materials teacher explained the material to the students - Before do an exercises, teacher allowed students to asking some question - Teacher concluded the materials with the students

		- Teacher gave some exercises about the material
		- students submitted all exercises to the teacher

3.4 Method of Data Collection

In this research used a test to collect the data. Test in the form of multiple choice, students went through two tests namely pre-test and post-test. To get the pre-test instrument researcher did try out test for the first and after it calculated the validity. The experimental group gave pre-test, treatment and post-test and control group only pre-test and post-test.

The instrument was given to the students in the form of multiple choice about 40 items which contains about grammar especially simple present tense. The test was given to the students of XII TKJ 1 in SMK Roudlotul Mubtadiin Balekambang. After calculated the validity of try-out instrument, the researcher had given pre-test to get the result of the students' work before they got a treatment and post-test had gave after the students' got a treatment, so that the researcher got the result of the students' work. All of the tests were able to measure the effectiveness of using circle the sage strategy to improve students' grammar ability in the simple present is aimed of implementation test. Pre-test was tested to know the students achievement before got a treatment and post-test was given to the students after got a treatment.

3.5 Data Analysis for Try Out Test

According to Arikunto (2013:161) variable is the object of the research or the attention center of research. In this research it used circle the sage strategy as independent variable and improve grammar ability as dependent variable.

Tests are a series of questions or exercises as well as other tools used to measure the skills, knowledge, intelligence, abilities or talents possessed by individuals or groups. (Arikunto, 2013:193). The researcher used achievement tests to measure student achievement, Arikunto (2013:194) stated that the test is a test used to measure a person's achievement after learning something.

Based on the explained above, after did a try out test to the students researcher had calculated the validity to get pre-test instrument. Validity is a measure that indicates the validity or validity levels of an instrument. Arikunto, (2013: 211). The researcher used a test run on the target to test the empirical validity of the instrument. The data that obtained from the try-out test was in accordance with the level of his validity indicated the instrument was good or valid. The evidence showed that there was the high correlation between test score and trustworthy external criterion when a test could be said empirically valid. The instrument had tested for validity using product moment correlation formula proposed by Pearson.

$$r_{xy} = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}}$$

r_{xy} : Correlation of coefficient that sought.

x   : Value of $X_{ke\text{-}i}$ – mean

y   : Value of $Y_{ke\text{-}i}$ – mean

$\sum xy$: Amount multiplication of x with y

x^2 : Quadrate of *x* (*x* deviation)

y^2 : Quadrate of *y* (*y* deviation)

(Arikunto, 2010: 213)

Reliability refers to an understanding that an instrument is reasonably reliable to use as a data-gathering tool because the instrument is already good (Arikunto, 2013: 221). The instrument was used by the researcher expected to be trusted through internal reliability test. According to Arikunto (2013: 223), internal reliability is obtained by analyzing data from a single test. Techniques was used by researcher to find the reliability as Spearman-Brown formula.

$$\mathbf{r_{11}} = \frac{2x r_{1/21/2}}{(1 + r_{1/21/2})}$$

Note:

r_{11} : instrument reliability

$r_{1/21/2}$: r_{xy} is mentioned as a correlation index between two hemispheres of the instrument

(Arikunto, 2013: 223)

3.6 Method of Data Analysis

3.6.1 Prerequisite Analysis Test

The Prerequisite was an analysis test aim at the truth of hypothesis which suggested in this research. Before hypothesis testing had done, it was a must to do prerequisite analysis data through homogeneity test.

Homogeneity test was used to test the similarity of the sample which took from homogenous population. To calculate the homogeneity test, the researcher used SPSS calculation. The result of homogeneity test was attached in the next chapter.

3.6.2 T-Test of Pre-test

To get result of T-test of pre-test, the researcher used comparative technique. Comparative technique that same as independent sample t-test which used to compare means of two independent samples (experimental and control group) to determine whether there was statistical evidence which had proved that the means were significantly different. The hypothesis that had used as follow:

1. If $t_o < t_{table}$ Ho accepted and Ha rejected. It means there was no significant difference of the students' achievement in grammar ability between students who were taught through circle the sage

strategy and students who were not taught through circle the sage strategy.

2. If $t_o > t_{table}$ Ho rejected and Ha accepted. It means there was significant difference of the students' achievement in grammar ability between students who were taught through circle the sage strategy and students who were not taught through circle the sage strategy

Before calculating the t value of observation, the researcher calculated the means of difference which both of group there were experimental and control group related each other. This step needed to gain mean and deviation from the data of pre-test in experimental and control group. The data analyzed by using statistical calculation through a manual calculation of the t-test formula and SPSS (Statistic Product and Statistic Solution). The formula as follows (Sudijono, 2009:324):

$$t_0 = \frac{M_1 - M_2}{SE_{M_1 - M_2}}$$

Where,

M_1 : Mean of Variable X (Experimental Class)

M_2 : Mean of Variable Y (Control class)

SE : Standard Eror

(Sudijono, 2009:324)

There were several stages had took to get the calculation of t-test, seen as follow:

a. Determining Mean of variable X (Experimental group), with formula:

$$M_x = \frac{\sum X}{N_1}$$

b. Determining Mean of variable Y (Control group), with formula:

$$M_y = \frac{\sum Y}{N_2}$$

c. Determining Standard of Deviation score of variable X, with formula:

$$SD_1 = \sqrt{\frac{\sum X^2}{N_1}}$$

d. Determining Standard of Deviation score of variable Y, with formula:

$$SD_2 = \sqrt{\frac{\sum Y^2}{N_2}}$$

e. Determining Standard Error Mean of variable X, with formula:

$$SE_{M_1} = \frac{SD_1}{\sqrt{N_1 - 1}}$$

f. Determining Standard Error Mean of variable Y, with formula:

$$SE_{M_2} = \frac{SD_2}{\sqrt{N_2 - 1}}$$

g.   Determining Standard Error of different Mean of variable X and

Mean of variable Y, with formula:

$$SE_{M_1 - M_2} = \sqrt{SE_{M_1}{}^2 + SE_{M_2}{}^2}$$

h.   Determining t_o, with formula:

$$t_o = \frac{M_1 - M_2}{SE_{M_1 - M_2}}$$

i.   Determining Degrees of Freedom (df), with formula:

$$df = (N_1 + N_2) - 2$$

3.6.3   T-Test of Post-test

To get the result of T-test of post-test, the researcher used comparative technique same as above. Comparative technique that same as independent sample t-test which use to compared means of two independent samples (experimental and control group) to know the influences of the result after treatment. The hypothesis that used as follow:

Ho = There is no significant difference of the students' achievement in grammar ability between students who are taught through circle the sage strategy and students who are not taught through circle the sage strategy

Ha = There is a significant differences of the students' achievement in grammar ability between students who are taught through

circle the sage strategy and students who are not taught through circle the sage strategy.

Before calculating the t value of observation, the researcher calculated the means of difference which both of group there are experimental and control group related each other. This step needed to gain mean and deviation from the data of pre-test in experimental and control group. The data had analyzed by using statistical calculation through a manual calculation of the t-test formula and SPSS (Statistic Product and Statistic Solution). The formula as follow (Sudijono, 2009:324):

$$t_0 = \frac{M_1 - M_2}{SE_{M_1 - M_2}}$$

Where,

M_1 : Mean of Variable X (Experimental Class)

M_2 : Mean of Variable Y (Control class)

SE : Standard Eror

(Sudijono, 2009:324)

There were several stages had took to get the calculation of t-test, seen as follow:

a. Determining Mean of variable X (Experimental group), with formula:

$$M_x = \frac{\sum X}{N_1}$$

b. Determining Mean of variable Y (Control group), with formula:

$$M_y = \frac{\sum Y}{N_2}$$

c. Determining Standard of Deviation score of variable X, with formula:

$$SD_1 = \sqrt{\frac{\sum X^2}{N_1}}$$

d. Determining Standard of Deviation score of variable Y, with formula:

$$SD_2 = \sqrt{\frac{\sum Y^2}{N_2}}$$

e. Determining Standard Error Mean of variable X, with formula:

$$SE_{M_1} = \frac{SD_1}{\sqrt{N_1 - 1}}$$

f. Determining Standard Error Mean of variable Y, with formula:

$$SE_{M_2} = \frac{SD_2}{\sqrt{N_2 - 2}}$$

g. Determining Standard Error of different Mean of variable X and Mean of variable Y, with formula:

$$SE_{M_1 - M_2} = \sqrt{SE_{M_1}{}^2 + SE_{M_2}{}^2}$$

h. Determining t_o, with formula:

$$t_o = \frac{M_1 - M_2}{SE_{M_1 - M_2}}$$

i. Determining Degrees of Freedom (df), with formula:

$$df = (N_1 + N_2) - 2$$