

CHAPTER III

RESEARCH METHODOLOGY

3.1. Research Design

This research was true experimental research. Sukmadinata (2015:94-203) states that experimental research was quantitative research approach that more complicated, in other word the research had to complete all regulation to test causal relationship. In true experimental, research to test independent variable and dependent variable was conducted to experimental group sample and control group sample. According to Creswell (2014:156) the basic of intent of an experimental design is to test the impact of a treatment (or an intervention) on an outcome, controlling for all other factors that might influence that outcome.

Mubarok (2015:100) states that the design is a true experiment because the researchers could control all external variables that affected the experimentation. The research design was following the table.

Group	Pretest	Treatment	Post-test
Experiment (R)	O1	X	O2
Control (R)	O3	-	O4

O1: Observation pretest for experiment group

O3: Observation pretest for control group

O2: Observation posttest for experiment group

O4: Observation posttest for control group

X : The Treatment using collaborative learning technique

In this case, the difference could be displayed in achievement between the experimental and the control group. The Experimental group achievement could be displayed from the posttest experimental group reduced group pretest results of experiments (O2-O1). Achievement of the control group could be seen from the control group pretest and posttest reduced control group (O4-O3).

3.2. Population and Sample

Population is unit of an object that had certain qualities and character which were studied by the researchers then be educated (Mubarok, 2015:38). So, the research population in this study was all students of eleventh grade of SMK N 1 Batealit Jepara.

Sample is part of the quality and characteristic of the population. Sample must be truly representative because the conclusion. Research which uses a sample was more favorable if was compared with studies using population. Research by using a sample is saving time and effort (Mubarok, 2015:39). The technique was used by the writer that was simple random sampling. Simple random sampling was used because it was possible to change the classroom setting of the school. The researcher and teacher discuss about the class that would be implemented by researcher. In this study, the writer takes XI ATPH 2 as the experimental class and XI ATPH 1 as the controlled class. The experimental class used collaborative learning technique and control class used through other

method that was Problem Based Learning. The data of eleventh grade as bellow:

Table 3 1 The data of eleventh grade students.

No	Class	Total	Man	Woman
1	TKRO 1	32	32	0
2	TKRO 2	29	29	0
3	ATPH 1	22	20	2
4	ATPH 2	22	20	2
5	AKL 1	33	13	20
6	AKL 2	30	8	22
7	APHP 1	29	9	20
8	APHP 2	20	7	13
9	JB 1	20	3	17
10	JB 2	22	4	18
11	OTKP 1	35	13	22
12	OTKP 2	32	13	19
13	OTKP 3	34	11	23
Total		360		

3.3.Research Variable

Variable is a term frequently used in research projects. It is pertinent to define and identify the variables while designing quantitative research projects. A variable incites excitement in any research than constants. It

was therefore critical for beginners in research to have clarity about this term and the related concepts (Kaur, 2013:36). In addition, Creswell (2014:52) stated that a variable refers to a characteristic or attribute of an individual or an organization being studied.

Based on Kaur (2013:36) there were two variables in the research. They were Dependent and Independent variable. The independent variable was the antecedent while the dependent variable was the consequent. If the independent variable was an active variable then we manipulate the values of the variable to study its effect on another variable. Dependent variable was the variable that was affected by the independent variable. The independent variable in this research was collaborative learning technique, while dependent variable in this research was reading skill of the student of SMK N 1 Batealit in the Academic Year of 2019/2020.

3.4. Instrument of Collecting Data

In this study, the writer used test to collect data. Different from other more conventional or traditional types of research in that it was much focused on individual assessment. The inquiry in this research was list of question given to respondent to collect data from respondent to the Student of SMK N 1 Batealit. This test used multiple choice questions that the numbers of questions are fifty questions as in the appendix 4. Arifin (2014:226) stated that test was a measurement technique which had many kind of question, expression, or assignment that had to be conducted or answered by respondent.

3.5.Method of Data Collection

The data was collected through one technique. This was test (Pre-Test, Treatment, and Post-test).

Pre-test was given for the students in first meeting to measure the students' reading ability by giving the test to get the score of them to be the first data. The students in both of groups between experiment and control groups were given the same test.

Treatment strategy used to help the students solved the problems in learning activity. In this stage, the researcher used collaborative learning technique as a treatment for the experimental group. Treatment was given for two meetings in the experimental group. The explanation bellow:

1. Experimental Group

Table 3 2 Treatment Experimental Group

Experimental Group	
Treatment 1	<ul style="list-style-type: none"> - Teacher gave stimulation to students to pay attention to picture that show about a topic; there were pictures and text displayed. - Students identified what was shown on paper and ask what questions they did not understand. - The teacher formed group students that consist of four till five students to discuss together about material. - Students discussed what students had done with whole students.

	<ul style="list-style-type: none"> - Students concluded about the learning activity and teacher made a conclusion from students.
Treatment 2	<ul style="list-style-type: none"> - The researcher asked to student about the previous material. - Students reviewed what the texts were about; social functions, text structure, and explained the linguistic elements of text are. - The teacher formed students become some groups that consisted of four till five students by choosing their partners. - All groups analyzed analytical exposition texts about education, global warming, or pollution. - Students discussed what students had done with whole students. - Students concluded about the learning activity and teacher made a conclusion from students.

Post-test was given at the last meeting to get the data of study result.

3.6.Method of Data Analysis

In analyzing the data, researcher used SPSS to get the result of the research (Sa'idah, 2017:173-180). Data analysis was an activity to answer the state of the problem statement of the research. The researcher used score pretest and posttest in analyzing the data of the research. It was used

to find out the difference between experiment group and control group in reading skill.

Significance of different reading skills were between groups experiments using Collaborative learning technique with the control group using the traditional model analyzed using t-test to analyze the significance of the experimental results. Assessment criteria and rejection hypothesis in this research using significance level 5%.

T-test formula

$$t = \frac{\bar{X}_1 - \bar{X}_2}{s \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$S = \frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}$$

Notes:

T = t statistic

\bar{x}_1 = mean of experiment class

\bar{x}_2 = means of control class

S = variants

n_1 = total students of experiment class

n_2 = total students of control class (Arifin, 2014:280)

a. Validity

Validity referred to the conceptual and scientific soundness of a research study or investigation, and the primary purpose of all forms

of research was to produce valid conclusions (Marczyk, DeMatteo, & Festinger, 2010:66). The technique of analyzing data, this research used t-test because this research compare the result of test between pre-test and posttest from experimental group and control group.

The writer used the product moment formula (Widoyoko, 2016: 239):

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

In which

r_{xy} : the item of test Validity

N : the number of respondent

X : total score of each item

Y : individual total score

X^2 : total for square for each item

$(X)^2$: the square of the total score for each item

$(Y)^2$: the total of the individual total score

The validity computation was consulted to the r-table of product moment by determining the significances level 5% and n which is according to the data. The instrument is valid if the $r_{xy} > r_{table}$ for $\alpha = 5\%$.

b. Reliability

Reliability referred to the consistency or dependability of a measurement technique, and it was concerned with the consistency or stability of the score obtained from a measure or assessment over time and across settings or conditions (Marczyk et al., 2010:103). According to Korb (2010:4), The writer used the formula of Split Half KR 20 for finding reliability.

The formula of split half KR 20

$$R_{kr20} = \left(\frac{K}{K-1} \right) \left(1 - \frac{\sum pq}{\alpha^2} \right)$$

RKR20 is the Kuder-Richardson formula 20

K = is the total number of test items

Σ = indicates to sum

P = is the proportion of the test takers who pass an item

Q = is the proportion of test takers who fail an item

σ^2 = is the variation of the entire test.