CHAPTER III

RESEARCH METHODOLOGY

This chapter reviewed research methodology that consisted of the setting of the research, research design, population and sample, research instrument, validity of test, method of data collection, and method of data analysis.

3.1 Research Design

This research was conducted with a quasi-experimental research design because researcher is attempting to search the effect of a variable to another variable (Sudjana, 2009: 19). The quasi-experimental study consists of three main characteristics, they are: (1) the independent variables are manipulated, (2) the control or control all other variables except the independent variable, and (3) the observation or measurement of the dependent variable as the effect of independent variables (Sudaryanto 2009: 19).

The research design chosen by the researcher is a quasi-experimental research design which is divided into two types of designs; they are time series design and nonequivalent control group. This study uses a nonequivalent control group. Here is a design pattern nonequivalent control group.

Table 2: ***Nonequivalent Control Group Design***

Group	***Pretest***	**Treatment**	***Posttest***
A	O_1	X	O_2
B	O_3	Y	O_4

O1: Pre-test in experimental group

O2: Post-test in experimental group

O3: Pre-test in control group

O4: Post-test in control group

X : Treatment

Y : Treatment

In this research, students in the experimental class were taught by using problem-based learning and the students in the control class were taught using project-based learning. The researcher needed sixth meetings to collect data through pre-test, treatment, and post-test. There are two variables in this research: independent and dependent. The independent variable methods, Problem-Based Learning (PBL) and Project-Based Learning (PjBL). The dependent variable was the writing skill.

3.2 Population and Sample

3.2.1 Population

Population is a big group of the dominant of the group becomes the field of the research (Sukmadinata, 2013: 250), Sanjaya (2013: 231) states that population is all the elements that will be targeted research. According to Ary (2010:148) population are all members of any well-defined class of people, event, or object. It means that population was the all of element of object which the researcher wants to study, such as: human, animal, flora, and attitude. The population in this research was all of the students from tenth-grade students in

SMA Negeri 1 Tahunan Jepara which consist of 389 students. The following population:

Table 3.1 Populations student class X

Class	Total Students
X-BB	35
X MIPA-1	36
X MIPA-2	36
X MIPA-3	35
X MIPA-4	34
X MIPA-5	33
X MIPA-6	38
X IPS-1	36
X IPS-2	36
X IPS-3	36
X IPS-4	36
Total	389

3.2.2. Sample

Sample was a part of all representative of a population had been analyzed. The samples of the reseach were two clases. They were X MIPA 1 and X MIPA 2 in which each class consisted of 36 students with the entire total of students was The X MIPA 1 becomed the experimental group and X MIPA 2 was control group.

Sampling was the way or technique of taking sample from the population. The sample of this research taken by sample random sampling. In the first lottery, the writer chose two clases as the sample from six classes, and

from that technique, the researcher took class X MIPA 1 and X MIPA 2. Then, the researcher did the second lottery to decided which class as the experimental group and which class as the control group. Based on the lottery, the X MIPA 1 was the experimental group and the X MIPA 2 was the control group, which then the X MIPA 1 taught by using Problem-Based Learning (PBL), and the X MIPA 2 taught by using Project-Based Learning (PjBL).

3.3 Research Instrument

The research instrument was a tool used to collect data in research. The instruments used in this study were a pre-test in the first meeting and a post-test in the last meeting. These were used to measure or to know the score of writing ability of students. The test was conducted based on the course outline of the tenth grade in curriculum. The researcher also observed course book that used by the teacher as a reference. In this study, the researcher used several instruments was collecting the data:

1. Test

   Test is used in this research. A test in simple terms was a method of measuring a person's ability knowledge, or performance in a given domain. It was an instrument, a set of techniques, procedures, or items that require performance on the part of the test-taker (Mubarok, 2015:59). The test was divided into two tests, they were pre-tets and post-test in the experiment and control class.

2. Pre-test

Pre-test was a form of test that was carried out at the beginning of the learning process. Pre-test was done before treatment. The researcher gave the same pre-test to experimental and control class. The pre-test was conducted to determine the level of knowledge students had that had to do with the material to be studied. This needed to be done to avoid letting the teacher convey something knowledge or developed competencies that had been mastered by students. Before the learning of the two clases followed the pre-tezt, then followed the learning with to diffrent methods.

3. Treatment

Treatment was done after pre-test. In experimental class used problem-based learning and control classes used project-based learning. The purpose of treatment was to help students improve their writing skill.

4. Post-test

Post-test was one form of test that was carried out after the core learning activities were completed. Post-test was done after treatment. The post test was conducted to determine the success of the learning process, namely to measure how much the students' mastery of the material had been learned or the competencies developed. After the material had been studied for two meetings, the end of the lesson both classes follow the post-test.

3.4 Time and Setting

This research was held in SMA Negeri 1 Tahunan Jepara that was located in Tahunan, Jepara. It was done to tenth grade students on nthe first semester in

the academic year 2020/2021. The research was begun on 03th September until 24th September 2020. The detail of the reseh schedule as followed:

Table 3.2 Time and setting

No	Activity	Date of January 2020							Place
		21th	22th	23th	24th	25th	26th	27th	
	Sending the research permitio n								SMA Negeri 1 Tahunan Jepara
		Date of September 2020							
		1st	2nd	3th	4th	5th	6th	7th	
2	Test of Validatio n								SMA Negeri Tahunan Jepara
3	Pre Test (Experiment Class)								SMA Negeri 1 Tahunan Jepara
4	Pre Test (Control Class)								SMA Negeri 1 Tahunan Jepara

		Date of September							
		7th	**8th**	**9th**	**10th**	**11th**	**12th**	**13th**	
5	Treatment using Problem-Based Learning								SMA Negeri 1 Tahunan Jepara
6	Treatment using Project-Based Learning								SMA Negeri 1 Tahunan Jepara
		14th	**15th**	**16th**	**17th**	**18th**	**19th**	**20th**	
7	Treatment using Problem-Based Learning								
8	Treatment using Project-Based								

	Learning								
		Date of september							SMA Negeri 1 Tahunan Jepara
		21th	**22th**	**23th**	**24th**	**25th**	**27th**	**28th**	
9	Post Test (Experiment Class)								SMA Negeri 1 Tahunan Jepara
10	Post Test (Control Class)								SMA Negeri 1 Tahunan Jepara

3.5 Validity of Test

Validity was very important to measure in the test. Validity was the extent to which the interpretations of the resulted of a test were warranted. Which depended on the paricular used the test was intended to serve. The responsiveness of the measure to change was of interested in many of the applications in health care where improvement in outcomes as a result of treatment is the primary purpose of the research (Kimberlin, 2008). Test could

be called as valid if there was same between data had collected with real data in the object of research.

Valid is the instrument that can collect data (Sugiyono, 2011: 121). Validity test when those test was fact and could collect what collected. In this research, the researcher used content validity to test the validity of the quantitative data. Content validity was determined by expert judgment. There was no formula in which it could be computed and there was no way to express in quantitatively. To validate the research instrument, the researcher made the test which was suitable with indicator on SMA Negeri 1 Tahunan Jepara syllabus, the researcher asking the opinion, suggestion, feedback or comment from expert. Here, the researcher consulted the test to the English teacher who taught the class because the teacher knew the ability of the students.

3.6 Method of Data Collection

Based on the research, the researcher collected data by using quantitative data. The quantitative data derived from the students obtained scores of the pre-test, treatment, and post-test. Experimental and Control classes were given pre-test, treatment, and posr-test to make a paper for every student. In the experimental class in the learning process divided students to make some group into 7 groups and every group consisted of 5 students.

The techniques used in collecting data of this research were as follows:

1. Pre-test

At the first meeting, the researcher gave pre-test to students. The purpose of pre-test is to measured students score in writing without problem-based learning (X MIPA 1) and project-based learning (X MIPA 2) method. The pre-test gave to the students for both experimental and control class in the beginning of attending X MIPA 1 and X MIPA 2 to know how far student‟s comprehension in writing. The researcher gave the experimental research using problem-based learning and project-based learning to the students learning activity.

2. Treatment

Date	Experiment Class	Control Class
September 3th (Experimental Class) and September 4th (Control Class), 2020	Giving the pre-test	Giving the pre-test
September 9th (Experimental Class),10th (Control Class), 16th (Exprimental Class), and 17th (Control Class), 2020	-Researcher explains the materials by using problem-based learning. -Students see, observe, identify, explore, analyze problem solving in learning, evaluate the learning process, and ask a question about the materials	-Researcher explains the materials by using project-based learning. -.Students see, observe, identify, explore, create project, design project, and evaluation and ask a question about the materials.

September 23th (Experimental Class) and September 24th (Control Class), 2020	Giving the post-test	Giving the post-test

3. Post-test

In the last meeting, the researcher gave the post-test to measured the students score in writing after taught using problem-based learning MIPA and project-based learning (X MIPA techniques. The time allocation when did the post test is 50 minutes. The test in post-test and pre-test was different but had same the difficulty. The test was used to measured the student skill in writing, especially in writing after taught using problem-based learning and project-based learning methods. It was done to know the final score of student after taught using problem-based learning and project-based learning techiniques and one of the requirements to compared and commutating the effectiveness score using SPSS Statistics.

3.7 Method of Data Analysis

The last step of this research was data analysis. In analyzing the data taken from both classes (experimental class and controll class), the writer used analytical scoring rubric. The analytical scoring is adapted from Brown (2004:244) used in this research to analyzing the data related to students test of writing ability. The writer uses analytical scoring rubric to analyze the data

related to the students paragraph writing test adapted from Brown (2004:244) is as follow:

Table 3. 3 Writing Asessment

Aspect	Score	Performance Description
Content Topic	30-26	The topic is complete and clear The details are relating to the topic
Details	25-21	The topic is complete and clear The details are almost relating to the Topic
	20-16	The topic is complete and clear The details are not relating to the Topic
	15-11	The topic is not clear The details are not relating to the Topic
Organizing	20-17	Identification and description are Complete and arranges with almost proper Connective
	16-13	Identification and description are almost complete and arranges with proper connective
	12-9	Identification and description are not complete and arranges with few misuse proper connective
	8-5	Identification and description are not complete and arranges with misuse proper connective
Grammar	20-17	Very few grammatical inaccuracies
	16-13	Few grammatical inaccuracies but not effect on meaning
	12-9	Numerous grammatical inaccuracies
	8-5	Frequent grammatical inaccuracies
Vocabulary	15-12	Effective choice of words and word Form
	11-9	Few misuse of vocabularies, word forms, but not change the meaning.

	8-6	Limited range confusing words and word form
	5-2	Very poor knowledge of words, words form, and not understandable
Mechanics ▯ Capitalization ▯ Punctuation	15-12	It uses correct capitalization and Punctuation
	8-6	It has frequent errors of capitalization and punctuation
	5-3	It is dominated by errors of capitalization and punctuation

After the researcher get the data, it was analyzed by using SPSS (25)

1. T-test

   T-test for the analysing data. The T-test was used in the study with the design of one factor of two samples. What is meant by one factor is that there is only one factor found in the research subject (as an object) by the researcher, and two samples means that there are two groups compared. Test symbol "t" (to) (Sa"idah, 2017:171).

   Provisions:

   a. If to ≥ tt then Ho is rejected means there is a significant difference

   b. If to ≤ tt then Ho is accepted means there is no significant differen

   Formula :

$$to = \frac{X_{1-X_2}}{s\sqrt{\frac{1}{n1}+\frac{1}{n2}}}$$

$$s^2 = \frac{s^2 = (n1-1)s2^2 + (n2-1)\,s2^2}{\mathrm{n1}+\mathrm{n2}-2}$$

Image 3. 2 Calculating, the researcher will use SPSS 25.