CHAPTER III

RESEARCH METHODOLOGY

This chapter presents research design, research setting, subject of the research, method of data collection, trying out of instrument, method of data analysis and statistical hypothesis.

3.1 Research Design

According to Mubarok (2015:2) that research can be defined as a process to find the solution based on the problem which is investigated. In this research, the researcher wants to find out the effectiveness of crossword puzzle in improving the students' vocabulary mastery. So the researcher uses an experimental research in the form quasi experimental design. Quasi experimental was proposed to examine cause-and-effect relationships between crossword puzzle and vocabulary mastery.

The researcher took two selected classes as experimental class and control class. Experimental class was class which the students given the treatment and control class was class which the students did not received the treatment. Pre-test and post-test were given to each class. The determination of class used as experimental class and control class was not randomly selected. Then, the experimental class was treated by using crossword puzzle while controlled class was treated without using crossword puzzle. Furthermore the post-tests were given. The results of pre-test and post-test in both the classes were compared.

The variant of quasi experimental design are nonequivalent control group design. Based on Mubarok (2015: 101), the non-equivalent control group design can be represented as:

$$O_1 \quad x \quad O_2$$
$$O_3 \qquad O_4$$

O_1 = pre-test for the experimental group

O_2 = post-test for the experimental group

O_3 = pre-test for control group

O_4 = post-test for control group

X = exposure of a group to an experimental by giving treatment using crossword puzzle.

3.2 Research Setting

This research was conducted in SMP N 1 Batealit Jepara placed on Jl. Raya Mindahan 280 Batealit Jepara. The research were implemented on July and August 2018.
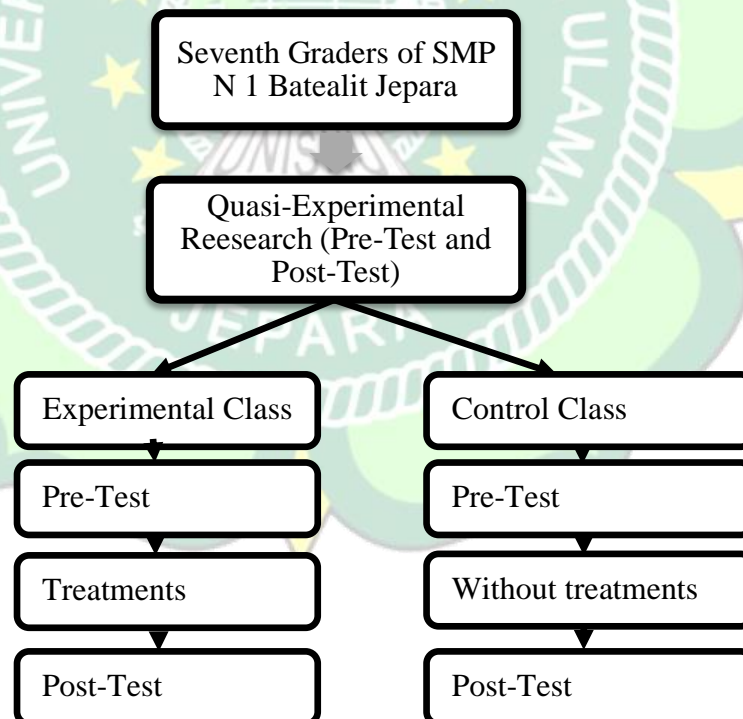
3.3 Subject of the Research

3.3.1 Population

Mubarok (2915:38) stated that population is a unit of the object or subject that has certain qualities and characteristics which are studied by the researchers then be deduced. The population of this research is the seventh grades students of SMP Negeri 1 Batealit Jepara. The students divided into 6 classes. Each class consists of 30 students, so the total population was 180 students.

3.3.2 Sample

Sample is part of the quality and characteristics of the population (Mubarok, 2015:39). In this research, the sample for quasi experimental with non-equivalent control group design is chosen not randomly, but form of purposive sampling which was from students who had the same level English proficiency. So, the researcher chooses two classes. There are VII A as an experiment class and VII C as control class. There are 30 students in each class, so the total sample in this research is 60 students.

3.4 Procedures in Research

For more specific procedures in this research can describe as follows:

Experimental class	Meeting 1 : Pre test Activity : 1. The researcher gave the students pre test. 2. The researcher introduced the material. 3. Students asked and the researcher answered questions about the material.
	Meeting 2 : Treatment Activity : 1. The researcher divided the students into some groups. 2. The researcher gave explanation about the material. 3. The researcher gave crossword puzzles that must be answered by the students, they can discuss with their group. 4. The researcher and the students discuss together about the crossword puzzles.
	Meeting 3 : Treatment Activity : 1. The researcher gave explanation and examples abut the material.

	2. The researcher gave crossword puzzles that must be answered by the students individually.
	3. The researcher gave explanation and examples about the words in the crossword puzzles.
	4. The researcher asked the students to make the other examples about word in the crossword puzzles.
	Meeting 4 : Post-Test
	Activity :
	1. The researcher gave the post-test to the students.
Control Class	**Meeting 1 : Pre test**
	Activity :
	1. The researcher gave the students pre test.
	2. The researcher introduced the material.
	Meeting 2
	Activity :
	1. The researcher gave explanation about the material.
	2. The researcher asked the students to discuss about the material with their partner.
	3. The researcher gave the questions to the students.

	Meeting 3
	Activity :
	1. The researcher gave the explanation and examples about the material.
	2. The researcher gave instruction to student to make examples about the material.
	3. The researcher gave some questions to the students.
	Meeting 4 : Post-Test
	Activity :
	1. The researcher gave the students post-test.

3.5 Method of Data Collection

In this research the researcher used test to collect the data. Ary, et. al (2010:201) stated that a 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. The type of the test is short answer. The test divided into pre-test and post-test. A pre-test is used before the treatment to know the students understanding about the material before the treatment. While a post-test will be used after treatment to know the students understanding the material after gave the treatment.

3.6 Trying Out of the Instrument

    3.6.1 Validity

        Based on Ary et. Al (2010:201) validity is the extent to which a test measures what it claims to measure. While Arikunto (2013:211) stated that validity is a measurement that indicates the levels of validity of an instrument.

        In this research, the writer uses product moment to find out the validity instrument.

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

Notice:

r_{xy} = The validity of item test.

N = The number of the respondent.

X = The number of the students who answer correctly.

Y = The students' total score.

                                        (Arikunto, 2010:213)

    3.6.2 Reliability

        Reliability is a component in making an instrument that can be trusted as a tool for collecting data. Based on Ary, et. Al (2010:236) the reliability of a measuring instrument is the degree of consistency with which it measures whatever it is measuring.

        In this research, the researcher used K-R 21 formula to find out the reliability instrument (Arikunto, 2013:232).

$$r_{11} = \left(\frac{k}{k-1}\right)\left(1 - \frac{M(k-M)}{k\,V_t}\right)$$

Notice :

r_{11}= Reliability instrument.

k = The number of items or questions.

M = Mean of the score.

V_t = Total variants

3.7 Method of Data Analysis

In this research, the researcher used t-test to find out the differences score of students' achievement in teaching vocabulary by using crossword puzzle or without using it which adapted from Sudijono, (2011:314-316). The formula t-test as follows:

$$t = \frac{M_x - M_y}{SE_{Mx-My}}$$

Notice:

M_x = Mean of variable X

M_y = Mean of variable Y

SE = Standard Error

There are several stages taken to get the calculation of t-test, it can be seen as follows:

a. Determining Mean of variable X, with formula:

$$Mx = \frac{\sum x}{N}$$

b. Determining Mean of variable Y, with formula:

$$My = \frac{\sum y}{N}$$

c. Determining Standard Deviation Score of Variable X, with formula:

$$SDx = \sqrt{\frac{\sum x^2}{N}}$$

d. Determining Standard Deviation Score of Variable Y, with formula:

$$SDy = \sqrt{\frac{\sum y^2}{N}}$$

e. Determining standard error mean of variable X, with formula:

$$SE_{Mx} = \frac{SDx}{\sqrt{N-1}}$$

f. Determining standard error mean of variable Y, with formula:

$$SE_{My} = \frac{SDy}{\sqrt{N-1}}$$

g. Determining standard error mean of difference mean of variable X and mean of variable Y, with formula:

$$SE_{Mx-My} = \sqrt{SE_{Mx}^2 + SE_{My}^2}$$

h. Determining t0 with formula:

$$t_0 = \frac{Mx - My}{SE_{Mx-My}}$$

i. Determining t-table in significant level 5% with *df*.

$$df = (N1+N2)-2$$

3.8 Statistical Hypothesis

The Statistical hypotheses of this research can be seen as:

1. $H_0 = \mu1 = \mu2$: Crossword puzzle is not effective on students' vocabulary mastery for the seventh graders of SMP N 01 Batealit Jepara.

2. $H_a = \mu1 \neq \mu2$: Crossword puzzle game is effective on students' vocabulary mastery for the seventh graders of SMP N 01 Batealit Jepara.

Then the criteria used as follows:

1. If –test (t_0) > t-table (t_t) in significant degree or α (alpha) of 0.01 Ho (null hypothesis) was rejected and H_a (alternative hypothesis) was accepted. It means that the rates of mean score of the experimental class are higher than the controlled class. The using of crossword puzzle is effective on students' vocabulary mastery.

2. If –test (t_0) < t-table (t_t) in significant degree or α (alpha) of 0.01 Ho (null hypothesis) was accepted and Ha (alternative hypothesis) was rejected. It means that the rates of mean score of the experimental class are same or lower than the controlled class. The using of crossword puzzle is not effective on students' vocabulary mastery.