

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents the method use to conduct the research design, research method, population and sample, instrument and data collection technique and analysis.

A. Research method

This research used quantitative research method. Quantitative research refers to the systematic empirical investigation of social phenomena via statistical, mathematical or computational technique. Quantitative data is any data that is in numerical form such as statistic, percentage, etc. Moreover Creswell (2013) has given a very concise definition of quantitative research as a type of research that is explaining phenomena by collecting numerical data that are analyzed mathematically based method (in particular statistic).

B. Research Design

This research employs quasi experimental design. Creswell (2013) states that quasi-experiment is experimental situations in which the researcher assigns, but not randomly, participants to groups because the experimenter cannot artificially create groups for the experiment

In this research, one of the most commonly used quasi experiment design in educational research can be represented as:

Group	Pre-test	Treatment	Post-test
Eksperimental	Oe 1	E	Oe 2
Control	Oc 1	C	Oc 2

Notes: E: Experiment class (the students who are taught using jigsaw technique).

C: Control class (the students who are using discovery learning).

Oe 1: Pre-test for the experiment class.

Oc 1: Pre-test for the control class.

Oe 2: Post-test for the experiment class after using jigsaw technique.

Oc 2: Post-test for the control class after using discovery learning.

Based on the table research design above, the researcher determines two classes on this research subjects. They are experimental and control class. The table shows that both classes are given a pre-test and post-test, but the different in giving the treatments. In the control class the researcher used discovery learning in the learning process and for the experimental class the researcher used jigsaw technique.

C. Population and Sample

1. Population

Arikunto (2010) states that population is the whole subject of the research. It means that population is the entire subject in which the researcher can gain the data. The

population of this research is the second grade students of SMPN 2 Padalarang that consist nine classes with 315 students.

2. Sample

A sample is the small group that is observed. It is supported by Best and Kahn (2006;13 in Astuti 2017) states that sample is a small partial of the population selected for observation and analysis. There were selected two classes as the sample of the research. They are class VIIIB as control class and VIIIF as experimental class; both classes consisted of 35 students.

D. Research Instruments

The instruments of this research were test, observation and interview.

1. Test

In this research, the researcher used pre-test and post-test. A pre-test was conducted to find out the data which is needed before the research started. The data was to know differences between the experimental and control groups' levels in reading ability before receiving the treatment. And the next step is post-test. The writer does post test to measure the students' reading skill after the treatments were conducted. It used to know the effectiveness of the treatment.

2. Observation

Observations enable the researcher to gather data on the physical setting, human setting, interaction setting, and program setting. By doing observation, the researcher

can see and know the students ability in the class during the teaching and learning process.

3. Interview

Esternberg (in Rakhman 2015) stated that an interview is a meeting of two persons to exchange information and idea through question and responses, resulting in communication and joint construction of meaning about a particular topic. The interview would apply to support data and to know students' perspective about teaching reading.

E. Data Collection

The data were collected from test, observation and interview.

1. Test

There are two types of test namely pre-test and post-test. The test was arranged into 35 items of multiple-choice questions. Pre-test was delivered at the first time before the writer applied the treatment in both experimental and controlled class. The pre-test was held to both groups on 4th February 2019 for Control group and 6th February 2019 for Experimental group during the school hours. And next is the post test, Post-test was held as the final test after the writer applied the treatment. This test was given to both groups (control and experimental groups). This test used to find out the improvements of their reading skill after the experimental group received the treatments. The post-test was held to both groups on 25th February 2019 for Control group and 21th February 2019 for experimental group.

2. Observation

The data from observation were collected during treatments and the schedule of the treatments can be seen in the following table:

Table 3.1	
Treatments Schedule of Control Group	
Meetings	Date
Meeting 1	11 February 2019
Meeting 2	12 February 2019
Meeting 3	18 February 2019
Meeting 4	19 February 2019

Table 3.2	
Treatments Schedule of Experimental Group	
Meetings	Date
Meeting 1	7 February 2019
Meeting 2	13 February 2019
Meeting 3	14 February 2019
Meeting 4	20 February 2019

3. Interview

The data from interview was involved six respondents from each group. For the Control group the interview was conducted on 27th February 2019 and for Experimental group the interview was conducted on 28th February 2019.

F. Data Analysis

Data analysis in the research includes data analysis on instrument try out, pre-test data, post-test data and n-gain, data analysis on observation and data analysis interview.

1. Data Analysis on Instrument try out

Brown (1988 in Juhaendi, 2013) states that before pre-tests and post-tests carried out, it must begin with the try out item to measure its validity and reliability.

a. Validity

Validity test is used to determine whether the test instrument is suitable for use in this study. This research used Anates V.4 to in process of calculation. The criteria of validity were shown in table 3.3.

Table 3.3
r Coefficient Correlation Validity

Raw Score	Interpretation
0,8-1,0	Very High
0,6-0,8	High
0,4-0,6	Moderate
0,2-0,4	Low
0,0-0,2	Very Low

The data gathered from the try out test were analyzed using corrected item total corelation in Anates V.4 for windows. The result is presented in the table 3.4 below.

Table 3.4
The Result of Validity Test

Item Number	Raw Score	Interpretation
	0,8-1,0	Very High
6,9,24	0,6-0,8	High
2,4,5,7,8,12,15,16,18,20,22,31,34,36,37,38,40,43	0,4-0,6	Moderate
3,10,11,14,19,21,29,30,32,35,42,45	0,2-0,4	Low
1,13,17,23,25,26,28,33,39,41,44	0,0-0,2	Very Low

Based on the table above, 28 items were valid and could be used as research instrument. However, 17 items were not valid and could not be used as the research instrument.

b. Reliability

Reliability is the extent which a test is produced in contrast result when administered under similar condition Hatch and Farhadi (1982 in Juhaendi, 2013). To find out the reliability, the researcher used internal consistency method which is facilitated by Cronbach Alpha formula. The criteria were presented in the following table 3.5 below.

Table 3.5
r Coefficient Correlation

Alpha	Reliability Degree
0.00-0.199	Very Low
0.20-0.399	Low
0.40-0.599	Fair
0.60-0.799	High
0.80-1.00	Very High

(Sugiono,2001)

The result of reliability test showed that the reliability of the items is 0,87 with the total items 45. Based on the table above, it can be assumed that reliability of test items were very high and could be used as the research instrument.

2. Data Analysis on Pre-tests

Pre-tests are given at the beginning of the meeting, the pre-test is used to get the initial equality between groups. This study used the t-test to determine the equivalence of the experimental and control groups.

Post-tests were given at the end of the meeting, and the t-test was used to determine whether the research hypothesis was rejected or accepted. If the hypothesis is accepted, it means that there is no difference between the control and experimental groups after applying the two different approaches.

a. Test normal distribution

This study uses the Kolmogorov-Smirnov formula to analyze normal distribution.

Data table output from SPSS 22.00 for windows.

Following are the steps to test a normal distribution:

1) See the hypothesis:

H_0 = Distribution of scores is normally distributed

H_1 = Distribution of scores that are not normally distributed;

2) Analysis of normal distribution uses the Kolmogorov-smirnov formula in SPSS 22.0 for windows;

3) Compare the level of significance to test the hypothesis. If the results of the study are more than the significance level (0.05), then the null hypothesis is accepted and the score is distributed normally.

b. Homogeneity of variance

In analyzing the homogeneity of variance, this study uses the Levene formula in SPSS 22.00. Below are steps taken to test the homogeneity of variance:

1) Declare the hypothesis

H_0 = the variance of the control group and the experiment is homogeneous

H1 = the variance of the control group and the experiment are not homogeneous;

- 2) Analyzing homogeneity variance using SPSS 22.0 for windows;
- 3) Compare the level of significance value to test the hypothesis. If the Levene test is significant at $p < 0.05$, it means the null hypothesis is rejected and the variance is significantly different. However, if Levene is not significant at $p > 0.05$. This means that the variance is approximately the same (Field, 2002).

c. The independent t-test

The primary purpose of t-test is to determine whether the means of the two groups' scores are different from a statistically significant degree as stated by Kranzel and Moursound (1999:89 in Juhaendi, 2013). There are some requirements of the data which must be considered before conducting t-test. First, the data should be measured in form of interval or ratio. Second, the data should be homogeneous or formed in the same type. Third, the data should have a normal distribution (Coolidge, 2000: 143).

The procedures of t-test computation were as follow:

1) Stating the hypothesis

Ho= there is no difference between the pre-test mean for the experimental group and control group.

H1= there is significance difference between the pre-test mean for the experimental group and for the control group;

- 2) Finding the t value with independent sample test computation in SPSS 22.0 for windows;
- 3) Comparing the significance value with the level of significance for testing hypothesis. If the significance value is less than the level of significance (0.05), the null hypothesis is rejected. In contrast, if the significance value is more than the level of significance (0,05), the null hypothesis is accepted.

3. Data Analysis on Post-test

Data analysis on the post-test was conducted to determine the increase in student scores after treatment. The stages in analyzing post-test data are the same as the stages in analyzing pre-test data.

If the significance value is less than the significance level (0.05), the null hypothesis is rejected. This means that there is an increase in student grades after the exercise is done. Conversely, if the significance value is more than the significance level (0.05), the null hypothesis is accepted. This means that there is no increased in student grades after treatment were conducted.

4. Data Analysis about N-Gain

In this study, n-gain analysis was conducted to determine the effectiveness of cooperative learning and discovery learning in teaching reading skills in recount texts. The n-gain score test can be used when there are significant differences between the

experimental post-test group and the control group through an independent sample t-test. The N-gain score can be calculated with the following formula:

$$\text{N-Gain} = (\text{Posttest-pretest}) / (\text{max.score-pretest})$$

5. Data analysis in observation

Data from the observation were collected using checklist tables and each category from the table was described briefly. The table was to record the students activity during the treatments.

Table 3.6
Participant Activity Observation Format

Participant Activity Observation Sheet in Teaching and Learning Activities							
Day, Date		:					
Subject		:					
Group		: Experimental / Control					
No.	Name	Aspect					Σ Score
		1	2	3	4	5	
1.							
2.							
...							
30.							

Table 3.7
Participant Activity Observation Criteria

No.	Aspect	Score	Kriteria Penilaian
1.	Attendance	3	Present on time during the learning process
		2	Late
		1	Not present because of permission/illness
2.	Activeness	3	Frequently asked questions and giving opinions
		2	Ever ask and give opinions
		1	Never ask questions and give opinions
3.	Thinking together with groups	3	Active in group discussions
		2	Less active in group discussions
		1	Not active in group discussions
4.	Honesty	3	Honest when working on the test
		2	Less honest when working on the test
		1	Not honest when working on the test
5.	Ability to communicate	3	Capable and able to communicate verbally in front of the class clearly
		2	Able to communicate verbally in front of the class clearly
		1	Can not communicate verbally in front of the class clearly

6. Data analysis on Interview

Data from the interview were collected using 13 questions. The interview activities were carried out after the post-test was given to the students. Only students who had the highest, the middle and the lowest scores of posttest in the experimental class and control class were interviewed. The interview questions are as follows:

Table 3.8
Questions Draft for Interviews

A. Language in General 1. Do you like English lessons, why? 2. What made you interested in English lessons? 3. What the material do you like in learning English? 4. What about the recount text material? 5. What are your difficulties in learning English? 6. What are your difficulties in learning the recount text?
B. The Implementation of Teaching Model 1. Do you like the learning model used in giving the material? 2. Does the learning like this make you more motivated to take part in classroom learning? 3 What do you think about the learning model used in classroom? 4. In your opinion, what is lacking in implementing this learning model?
C. Students Difficulties 1. Did you find it difficult to understand the reading material provided? 2 Do you feel difficulties in learning process using the jigsaw technique/discovery learning? 3 What the difficulties caused you to have difficulty understanding the material provided?