CHAPTER III

RESEARCH METHODOLOGY

3.1. Research design

The research entitled "A study on cooperative learning type jigsaw towards writing narrative text at the eighth grade of SMP Muhammadiyah 7 Cerme" was considered as an experimental research. It is because the data was taken from experiment and observe the classroom condition which occured naturally and the purpose is to quantify data and results from sample to the population into number such as the present of students' ability in writing narrative. It means this research is belonging to quantitative.

Aliga and Gunderson (2002) stated that quantitative research is collecting numerical data using mathematically based methods (in particular statistics) to explain the phenomena. It means that the quantitative is collecting the numerical representation data to explain a particular phenomenon and manipulation of observation in the form of naturally quantitative data.

Therefore, these studies use experimental research to collect the data. Montagomary (2005:1) defined that experimental is a process to identify the observation or phenomenon by test or series of test. In this study, researcher should pay attention to the experimental and control variables and the result of the experimental. This research consists of two groups. There are experimental group and control group. The experimental group is the group in scientific experiment where the experimental is performed. The experimental group was exposed to the independent variable being tested and gives the changes observed and recorded

but the control group was not. Both the groups were given a pre-test. The

treatment is given to the experimental group but the control group is without

given a treatment just beingtaught as usual. However both of the experimental

groups and control groups were given the same material, pre-test and post-test at

the same time. The design of pre-test and post-test in the experimental group is:

Group	Pre-test	Treatment	Post-test
E	X1	T	X2
C	X1	—	X2

Table.3.1 Quasi Experiment Design

Remarks:

E : The experimental group (which given treatment)

C : The control group (which not given a treatment)

X1 : The pre-test (before the experimental treatment)

T : The treatment

X2 : The post test (after giving a treatment)

In this case, researcher uses the eighth grades of SMP Muhammadiyah 7

Cerme. Researcher decided VIII-A and VIII-B in her observation.

3.2. Research variable

Variable is something that can be changed, such as characteristic or value.

In this study the variable are jigsaw strategies, cooperative learning, teacher,

students and scores or value. Based on the function and the correlation, variable

divided into two types there are dependent variable and independent variable.

Dependent variable is the variable that is measured by the experimenter. It is

impact or the result of the study. Dependent variable can be influenced by another

variable. In contrast, independent variable is the variable that is controlled and

manipulated by the experimenter. It is the cause of the study. Independent variable

can not influenced by another variable. Therefore, the purpose of variable is to measure the qualities and to describe how to classify the subject into groups or categories.

In this study, the independent variable is jigsaw strategy while the dependent variable is the scores of the students' writing narrative text of eighth grade at Junior High School.

3.3. Population and sample

Population is the subject where the research data is collected. According to Bartz (1976:152) population is a group of elements that are alike in one or more characteristics. Then sample is a part of the population. It is smaller in number than the size of the population. In this research the researcher uses cluster sampling because is the choosen unit in and not an individual, but it is a group of individuals who are naturally together. Population of this study is the eighth graders of Junior High School in SMP Muhammadiyah 7 Cerme. It consists of five classes. Two classes were taken as the sample of this study there are VIII-A is the experimental group and VIII-B is the control group.

3.4. Data collection technique

Data collection is the process of gathering and measuring information. There are stages to collect:

3.4.1. Instrument of the study

Instrument is a tool used to collect the data. It is the most important components of research design because the researcher gathers or collects

valid data or information from research instrument. Without research instrument, it is impossiblethat the researcher can collects the valid data. A good instrument will reflect the good result. It is because the instrument takes theimportant role in collecting valid data. Data is gathered to answer research question, it refers to the information.

3.4.1.1. Test

Appropriated instrument which will be used to collect data with this study is test. Test is a set techniques, procedures, and items that constitute an instrument of some sort that requires performance or activity on the part of the test taker. A test is standard question of cognitive knowledge or skill (Mc Millan, 1992: 114). There were two tests that was given to the both experimental and control groups, they are pre-test and post-test.

3.4.1.1.1. Pre test

Before using the technique as a treatment, the researcher organized pre-test to the subjects. Pre-test was arranged in both experimental and control group. Pre-test was used to know the basic ability of students in writing narrative text. The researcher gives the students 60 minutes for finishing their pre-test. Pre-test was utilized to know the ability before giving treatment for the students.

3.4.1.1.2. Post test

Post test was used to know the improvement the students' ability after getting a treatment. The time allocation was 60

minutes. The research subjects were topic, narrative text then they had to find the ideas until produce a writing narrative text. The post-test has same procedure with the pre-test.

3.4.2. Procedure of data collection

The data of this study was in form of number. Then the data were collected through a test. The test is used to know and investigested the students' ability. The researcher used pre-test and post-test to test in this study. The data of this research consisted of primary and supporting data. The primary data were taken from the writing ability test. The researcher chooses the subjects and defines group who will be taught by jigsaw as experimental group and group who is taught without using jigsaw as a control group. The researcher collects the result of pre-test.

The last stage in collecting the data is using post-test. Post-test was arranging in both experimental and control group. Post-test used in order to know whether or not there was a significant difference between students' ability in writing narrative text before and after treatments such as in terms of content and vocabulary. The students in control class did the post-test after they were taught without getting a treatment. Whereas in experimental class the students do the post-test after getting a treatment. The time to do the post-test was appropiate with the schedule. They worked individually in doing post test. The last is analyzing the data from pre-test and post-test by using SPSS 16.0 program.

3.4.3. Validity and reliability

A test is valid when it is appropriated, meaningful, and useful in term of purpose of the test (Brown, 2004: 22). There are three kinds of validity: content validity, criterion-related validity, and construct validity. In this study the test was analyzed by using content validity and construct validity. To determine the content validity, the researcher asked the english teacher to check the instrument validity. The content validity was measured by relating the content of the instrument in Indonesian curriculum. Whereas to define the construct validity, the researcher used the assistance of SPSS version 16.0 to calculate the descriptive statisticsof the instrument validity which was examined by analyzing item well. The formula to testing the instrument is:

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

Where:

r_{xy} : The correlation coefficient between X variable and Y variable

N : The number of students

X : The sum of X scores

Y : The sum of Y scores

$\sum Y$: The sum of total score for each student

$\sum X$: The sum of total score in each item

$\sum XY$: The sum of multiple score from each student with the total score in each item

$\sum X^2$: The sum of the square score in each item

$\sum Y^2$: The sum of the total score from each student each item square is determined by using these following categorizations

(Arikunto, 2003:72)

The test should determine whether the items of the test represent the objective. Reading and listening included to the objective item whereas speaking and writing included to the subjective. This study included in subjective test, the content validity was measured by relating the content of the instrument withcontent standard in Indonesian curriculum. The instrument of this study is in the form of writing test which measured the ability in writing narrative text. It was matched with the Competence Standard and Basic Competence of content standart in Indonesian curriculum. Narrative text stated in Content Standard, it is one of the genres that should be understood and mastered by eight grades students in Junior High School.

The reliable test when the test is consistent and trusty in measurement (Brown:2001,386). The reliability is used to know whether the test reliable or not. To measure the reliability of a subjective test, such as writing test, the intereters were used to measure the consistency of the test. The procedure of determining the reliability is administering test once, then having two different people score the test. It will get two data of scores. Then, the last is computing correlation between those three sets of scores. To compare the reliability of the test, the formula of Pearson r is conducted. The formula is:

$$r = \frac{\frac{\sum XY}{N} XY}{S_\chi S_\gamma}$$

Where:

N : The number of pairs of scores

$\sum XY$: The sum of the products of each pair of scores

X : The mean of the X distribution

Y   : The mean of the Y distribution

S_χ : The standard deviation of the X distribution

S_γ : The standard deviation of the Y distribution

3.5. Scoring guide

According to Heaton (1975:36) the scoring guide used the method of analytical. It was chosen because it was ideally suited to the classroom situation, its certain features have been graded separately so that students was able to see how his particular grade had been obtained. This study used scoring guide based on the standard criteria of writing compositions. This guidance assesses students' composition in five areas of writing component namely content, organization, vocabulary, language use, and writing mechanic.

To administered the writing test, the writer used as analytic score in order to be more reliable in scoring students' writing. The following rating scale desived by Jacob, et al.'s (1981):

No.	Scoring Element	Scale	Quality	Description
1.	Content	30-27	Excellent to Very Good	Knowledge – substantive – through – development of thesis – relevant to assgned topic.
		26-22	Good to Average	Some knowledge of subject – adequate range – limited development of thesis – mostly relevan to topic, but lack detail.
		21-17	Fair to Poor	Limited knowledge of subject – substance – inadequate development of topic.
		16-13	Very Poor	Does not show knowledge subjct – non substantive – not prtinent – or not enough to evaluate.
2.	Organization	20-18	Excellent to Very Good	Fluent expression - ideas clearly stated/ supported – succinct – well organized – logical sequencing – cohesive.

		17-14	Good to Average	Somewhat choppy - loosely organized but main ideas stand out – limited support – logical but incomplete sequencing.
		13-10	Fair to Poor	Non fluent - ideas confused or disconnected – lacks logical sequencing and development.
		9-7	Very Poor	Does not communicates - no organization – or not enough to evaluate.
3.	Vocabulary	20-18	Excellent to Very Good	Sophisticated range - effective word/idiom choice and usage – word form mastery – appropriate register.
		17-14	Good to Average	Adequate range - occasional errors of word/ idiom form, choice, usage – meaning confused or obscured.
		13-10	Fair to Poor	Limited range - frequent errors of word/ idiom form, choice, usage – meaning confused or obscured.
		9-7	Very Poor	Essentially translation - little knowledge of english vocabulary, idioms, word form – or not enough to evaluate.
4.	Language Use	25-22	Excellent to Very Good	Effective complex constructions – few errors of agreement, tense, number, word order/ function, articles, pronouns, prepositions.
		21-18	Good to Average	Effective but simple constructions – minor problems in complex constructions - several errors of agreement, tense, number, word order/ function, articles, pronouns, prepositions but meaning seldom obscured.
		17-11	Fair to Poor	Major problems in simple/ complex constructions – frequent errors og negation, agreement, tense, number, word order/ function, articles, pronouns, prepositions and/ or fragments, run – ons, deletions – meaning confused or obscured.

		10-5	Very Poor	Virtually no mastery of sentence construction rules – dominated by errors – does not communicate – or not enough to evaluate.
5.	Mechanic	5	Excellent to Very Good	Demonstrate mastery of conventions – few errors of spelling, punctuation, capitalization, paragraphing.
		4	Good to Average	Occasional errors of spelling, punctuation, capitalization, paragraphing but meaning not obscured.
		3	Fair to Poor	Frequent errors of spelling, punctuation, capitalization , paragraphing – poor handwriting – meaning confused or obscured.
		2	Very Poor	No mastery of conventions - dominated by errors of spelling, punctuation, capitalization, paragraphing – handwriting illegible – or not enough to evaluate.

SCORE:

Content:__ + Organization:__ + Vocabulary:__ + Language Use:__ +

Mechanics:__ = (TOTAL SCORE)

Categorization	Score
EXCELLENT	90 – 100
GOOD	70 – 89
FAIR	50 – 69
POOR	< 50

3.6. Data analysis technique

In analyzing the data, the writer used t_{test} formula. The two classes are compared to the independent variable, the experiment class is X variable and the control class is Y variable. The formula of t_{test} is expressed as follows:

$$t_0 = \frac{M_1 - M_2}{SE_{M1-M2}}$$

Where:

Mx = Mean of Variable X

My = Mean of Variable Y

SE = Standard Error

Afterwards, the calculation goes to several processes as follows:

1. Determining Mean of Variable X

$$M_1 = \frac{\sum fX}{N_1}$$

2. Determining Mean of Variable Y

$$M_2 = \frac{\sum fY}{N_2}$$

3. Determining Standard of Deviation Score of Variable X

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

4. Determining Standard of Deviation Score of Variable Y

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

5. Determining Standard Error of Mean of Variable X

$$SE_{M1} = \frac{SD_X}{\sqrt{N_1 - 1}}$$

6. Determining Standard Error of Mean of Variable Y

$$SE_{M2} = \frac{SD_Y}{\sqrt{N_2 - 1}}$$

7. Determining coefficient correlation "r_{xy}" Product Moment

$$r_{12} = \frac{\frac{\sum x'y'}{N}(C_{x'})(C_{y'})}{(SD_{x'})(SD_{y'})}$$

8. Determining Standard Error of Difference of Mean of Variable X dan Y

$$SE_{M1-M2} = \sqrt{SE_{M1}{}^2 + SE_{M2}{}^2 - (2.r_{xy})(SE_{M1})(SE_{M2})}$$

9. Determining t_0

$$t_0 = \frac{M_1 - M_2}{SE_{M1-M2}}$$

10. Determining t_{table} in significance level 5% with df (degrees of freedom)

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

(Anas Sudijono, 2008:325-326)

3.6.1. Normality distribution test

To analyze the normal distribution, this study utilized Kolmogorov Sminov Sample Test in SPSS version 16.0. It aimed to find whether or not the distribution of pre-test score in the two groups are normally distributed. In this case, the result of the normality of distribution is also used to find out whether or not the hypothesis that had been determined is accepted. First step in calculating the normality distribution test stated that the hypothesis: H0: the score of the experimental and the control group are normally distributed.

The second step in calculating the normality distribution test tried to compare the Asymp. If the Asymp is more than the level of significance (0.05) the null hypothesis is accepted; the score are normally distributed. On the other hand if the Asymp is less than the level of significance (0.05) the null hypothesis is rejected. The procedure of analysis is pressing "Menu".Then choose Nonparametric test after that you can choose 1 – sample K-S.

3.6.2. Homogeneity test of variance

The analysis of varience, assumed that variances are equal across groups or samples. For homogeneity test, the reseracher uses Levene's test of homogeneity in SPSS 16.0 version. The test of Levine's test, or P, defines as follow:

$$P = \frac{(N-k)}{(k-1)} \frac{\sum_{i=1}^{k} N_i (Z_i - Z_{..})^2}{\sum_{i=1}^{k} \sum_{j=1}^{N_i} (Z_{ij} - Z_{i.})^2}$$

Where:

P is the result of the test,

K is the number of different groups to which the samples belong,

N is the total number of samples,

N_i is the number of samples in the ith group,

Y_{ij} is the value of the jth from the ith group,

$$Z_{ij} = \begin{cases} |_{ij} - \bar{Y}_i |, \bar{Y}_i \text{ is a mean of } i^{th} \text{ group} \\ | Y_{ij} - \bar{Y}_i |, \bar{Y}_i \text{ is median of } i^{th} \text{ group} \end{cases}$$

The significance of P is tested against $F(\alpha, k-1, N-k)$ where F is a quintile of the F-test distribution, with $k-1$ and $N-k$ its degrees of freedom, and α is the chosen level of significance (0.05). To analyze the homogeneity, the researcher used SPSS (Statistical Product and Service Solution) version 16.0. The homogeneity assumption was checked in SPSS

by Levene's test with the following procedure. The first procedure was inserting the pre test data of both experimental and control group using the data view. The second phase were going to the Analyze Menu, selecting Descriptive Statistics - Explore. And then input score into Dependent List and input group into Factor List. Then choose Plots – Untransformed – Continue. The last procedure was interpreting the homogeneity test output. In interpreting homogeneity test output, the researcher needed to see Levene's test column to know whether the equality of variance in the two groups of scores were homogen or not.

3.6.3. Hypothesis testing

The statistical hypothesis of this study can be seen as:

Ho : There is no significant progress in using Cooperative Learning Type Jigsaw towards students' writing skill in narrative text.

Ha : There is a significant progress in using Cooperative Learning Type Jigsaw towards students' writing skill in narrative text.

Ho : $\mu1 = \mu2$

Ha : $\mu1 \neq \mu2$

And then, the criteria used as follows:

1. If t-test (t_o) > t-table (t_t) in significant degree of 0.05, Ho (null hypothesis) is rejected. It means that the rates of mean score of the experimental group are higher than the controlled group. The using of Cooperative Learning Type Jigsaw is effective towads students' writing skill in narrative text.

2. If t-test (t_o) < t-table (t_t) in significant degree of 0.05, Ho (the null hypothesis) is accepted. It means that the rates of the means score of the experimental group are same as or lower than the controlled group. The using of Cooperative Learning Type Jigsaw is not effective towards students' writing skill in narrative text.

T-test was calculated to find out the comparison of two means between experimental and control group pre and post test. In analyzing the data, the researcher used independent t-test formula. The formula used in calculating t-test is:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{S_{\bar{x}_1 - \bar{x}_2}}$$

Where:

$$S_{\bar{x}_1 - \bar{x}_2} = \sqrt{\frac{S^2 pooled}{n_1} + \frac{S^2 pooled}{n_2}}$$

Pooled varience: the average of the two sample variences, allowing the larger sample to weight more heavily.

Formula:

Estimated Standard Error of the Difference

$$S_{\bar{x}_1 - \bar{x}_2} = \sqrt{\left(\frac{SS_1 + SS_2}{n_1 + n_2 - 2}\right)\left(\frac{1}{n_1} + \frac{1}{n_2}\right)}$$

Clearly, the results of the tests were subjected for the following statistical procedures. To calculate t-test, the tesearcher used SPSS (Statistical Product and Service Solution) version 16.0. The post test score experimental and control groups were analyzed by using SPSS version 16.0 with the following procedures. The first procedure was inserting the post test data of both experimental and control group using the data view. The second procedures were going to the Analyze Menu, selecting Comapare Means, and then choosing Independent samples t-test. The last procedure was interpreting t-test output. From interpreting

t-test output, automatically it could answer to the resarch question about the

comparison between two groups. The final result was collected by means of pre

test and post test score. It is aimed to find out the significance on the effect of

Jigsaw in Writing Narrative text.