

CHAPTER III

RESEARCH METHODOLOGY

This chapter discusses the research methodology, which is applied in this study. The discussion of this chapter involves the research design, data collection procedures, and data analysis of the research.

3.1 Research Design

3.1.1 Quasi Experimental Design

This research, which is entitled *The Use of Jigsaw in Teaching Reading for Junior High School Students*, was conducted by using a quasi-experimental design. Some limitations of the research such as the complication of human behaviors, language learning, language behavior, and wasting time and energy (Hatch and Farhady, 1982: p.23) make true experimental become impossible to construct. According to Campbell and Stanley (1963) cited in Mason and Bramble (1978, p. 98):

“Quasi-experimental design provides an alternative to experimental design in that quasi-experimental can often be carried out in field settings and does not require that the experimenter has absolute control over the experimental variables”.

Since quasi-experimental designs are used when randomization is impossible and/or impractical, they are typically easier to set up than true experimental designs. It takes less effort to study and compare subjects or groups of subjects that are already naturally organized than to conduct random assignment of subjects (Mason and Bramble: 1978, p. 98). Additionally, utilizing quasi-experimental design minimizes threats to external validity. This research

also used quasi-experimental designs because the number of students in both groups is very similar.

Campbell and Stanley cited in Mason and Bramble (1978, p. 99) categorize the quasi-experimental design into four groups namely the nonequivalent-control-group design, the counterbalanced design, the equivalent-time-samples design, and the time series design. This research focused on non-equivalent control group design because the internal validity can be fairly high in internal validity relative to other quasi experimental designs (Campbell and Stanley, 1978, p. 102). The notation design is as follow:

Table 3. 1
Non-equivalent control group design

O_1	X	O_2
O_3		O_4

Notes:

- O_1 = student reading achievement of experimental group in pre-test
- O_2 = student reading achievement of experimental group in post-test
- O_3 = student reading achievement of control group in pre-test
- O_4 = student reading achievement of control group in post-test
- X = treatment by using jigsaw teaching

The aim of the research is to figure out the use of jigsaw technique in improving students reading ability. The technique was applied to find out the differences between students who learned reading by using jigsaw and those who did not. In the beginning of the research, there was a pre-test for finding out the reading ability of both groups. Then, the jigsaw technique or treatment was given

to the experimental group while the control group used no special treatment. This way was constructed to find out whether the experimental group who got a treatment would get a higher score than the control group, which only used traditional method.

3.1.2 Variable

There are two variables in this research. They are independent and dependent variable. The dependent variable of the research is the improvement of students' reading ability. While the independent variable is the method of teaching reading which in case traditional method (for control group) and jigsaw technique (for experimental group) at junior high school students especially seventh grade students.

3.2 Data Collection Procedures

3.2.1 Population and Sample

The population of the research is the seventh grade students of SMP 2 Majalengka, which consists of eight classes. Two classes were chosen as the sample of the research, they were VII b class as the control group and VII d as the experimental group. Each class has 36 students.

Since quasi experiment enables to use non-random sample to achieve a certain purpose, so this research chose purposive sampling. The limited of time and the similarity of total students in those two groups could be considered as some reasons in choosing this kind sample.

3.2.2 Time Allocation

Six times of treatment were given to the experimental group in a month while the control group did not have any special treatment. This following table presents the time schedule of the study:

Table 3. 2
The schedule of teaching

No.	Experimental Group		Control Group	
	Date	Material	Date	Material
1.	Nov, 8 th	pre-test	Nov, 8 th	pre-test
2.	Nov, 12 th	activities	Nov, 12 th	activities
3.	Nov, 15 th	family	Nov, 15 th	family
4.	Nov, 18 th	letters	Nov, 18 th	letters
5.	Nov, 22 nd	sport	Nov, 22 nd	sport
6.	Nov, 26 th	place	Nov, 26 th	place
7.	Nov, 29 th	communication	Nov, 29 th	communication
8.	Dec, 3 rd	post-test	Dec, 3 rd	post-test

3.2.3 Instrument

The research used test and questionnaire as the instrument. The data of questionnaire and test were obtained from group VII d as an experimental group and VII b as a control group of SMPN 2 Majalengka (except questionnaire, which was only given to the experimental group). Each group has about 36 students.

The instrument is aimed to see the students reading achievement before and after given the treatment. Therefore, the test was developed to check whether there were a significant result before and after the treatment, and the difference results between two groups that were compared. The multiple choices were chosen as an appropriate test to assess students reading comprehension. The test consisted of several questions about some texts. The score of their reading

comprehension test showed whether the improvement of students reading ability of this research before and after treatment is significance or not.

For the additional instrument, the writer used questionnaire for completing the data of the research. The questionnaire was used to find the experimental students group responses about the application (especially the advantages) of jigsaw reading. The questionnaire consists of ten questions about the use of jigsaw in teaching reading so this questionnaire was used only for experimental group.

Since the research use try out test, the writer needs to search the reliability and validity of the test. Then, there should be a try out test to examine the validity and reliability of the test before delivering the pre-test to both of groups. The try out test was conducted in the VII c class. The following table describes the guideline of try out test.

Table 3. 3
Standard Competence of Reading of First Grade Junior High School

No	Competence Based	Base Competence	Indicator	Number of Items
5.2	Memahami makna dalam teks tulis fungsional pendek sangat sederhana yang berkaitan dengan lingkungan terdekat	Merespon makna yang terdapat dalam teks tulis fungsional pendek sangat sederhana secara akurat, lancar dan berterima yang berkaitan dengan lingkungan terdekat	1. Mengidentifikasi berbagai informasi dalam teks fungsional pendek	5,6,8,9, 14,15,16,17,18,
			2. Mengidentifikasi ciri kebahasaan teks yang dibaca	1,2,3,4,7,10,11,12, 13, 19,20,21,22, 23,24,25

3.2.3.1 Validity

For calculating the validity of the try out test, the writer calculated its validity by using Pearson Product Moment Formula that is available in SPSS and MS. Excel. Then, after the Corrected Item-Total Correlation (on SPSS output) was displayed, the next step is comparing the result with r_{table} . The item is valid when the Corrected Item-Total Correlation score is higher than r_{table} .

After getting the validity of the test, the writer is going to find the index of difficulty (or facility value or FV) of an item. This way was done to confirm the difficulties of each particular item test (Heaton, 1995:178). The FV (facility value) is the percentage of students who answered the item correctly. It was calculated by using the formula below:

$$FV = \frac{R}{N}$$

R = the number of the correct answer

N = the number of students taking the test.

This is the index difficulty (FV) criteria:

Table 3. 4
The Index Difficulty Criteria

Score	Criteria
0.00 – 0.30	difficult
0.30 – 0.70	moderate
0.70 – 1.00	easy

Afterwards, the writer completed the last step by calculating the index of discrimination (D). This step showed “those students who performed well on the whole test tended to do well or badly on each items of the test (Heaton,

1995:179)". There are some following procedures suggested by Heaton (1995:130) in this step, they are (1) displaying the data in rank based on the total score and dividing its into two groups of equal size (top half and the bottom half); (2) counting the students correct answer in both groups (upper and lower group); (3) subtracting the correct answer in the lower group from the number correct answer in the upper group and finding the difference in the proportion passing in the upper group and the proportion passing in the lower group; (4) dividing the difference by the total number of students in one group:

$$D = \frac{\text{Correct U} - \text{Correct L}}{n}$$

D = discrimination index

N = number of students in one group

U = upper half

L = lower half

(5) continuing this manner in each item; and (6) matching it with the criteria of the index of discrimination (D):

Table 3. 5
The Criteria of the Index of Discrimination

Score	Criteria
0.00 – 0.20	poor
0.20 – 0.40	moderate
0.40 – 0.70	good
0.70 – 1.00	excellent

3.2.3.2 Reliability

To check the reliability, the writer used the computation of SPSS 15.0 for windows with Pearson's Product Moment Formula reliability analysis first. Then

for comparing the score of reliability analysis score from SPSS 15.0, the writer used the Spearman-Brown split half method and the formula is as follow:

$$r_{11} = \frac{2 r^{1/2 \ 1/2}}{(1 + r^{1/2 \ 1/2})}$$

3.2.4 Test

The experimental research used two kinds of test. They were pre-test and post-test. Before conducting the pre-test in the experimental and control groups, there should be a try out to measure the validity and reliability of the instrument. There were 36 students of VII c who did this tests on November 1st 2008, some students were absents at that time.

Pre-test or first reading comprehension was conducted at the beginning of the experiment (November 8th 2008,) before the group was given any treatment. This pre-test was given for both groups; experimental and control groups. This test was the initial check of students reading comprehension.

After doing a pre-test, the treatment was given during the teaching and learning process to the experimental group (VII d). There were six sessions of treatment for the experimental group. Students learned reading by using jigsaw technique. They were formed into seven groups; each group consisted of six (max seven) students. Then, in the 'jigsaw group' (first group) each student got different text. Next, they had to find and join with students who got the same text, and made an 'expert group'. They discussed the text and after several times, students should come back to the jigsaw group and present their own understanding about the text. Each member should understand all texts because

they had to answer some questions based on the text. The schedule of the treatment can be seen in Time Allocation part.

The last test is post-test, which was distributed to find out whether there are any differences between experimental and control groups students' score after treatments. Post-test or second reading comprehension test was gathered at the end of the research. In making pre-test and post-test questions, the writer used standard competence of reading particularly for seventh grade of junior high school as a reference. The following table describes the standard competence of reading of first grade junior high school.

Table 3. 6
Standard Competence of Reading of First Grade Junior High School

No	Competence Based	Base Competence	Indicator	Number of Items
5.2	Memahami makna dalam teks tulis fungsional pendek sangat sederhana yang berkaitan dengan lingkungan terdekat	Merespon makna yang terdapat dalam teks tulis fungsional pendek sangat sederhana secara akurat, lancar dan berterima yang berkaitan dengan lingkungan terdekat	1. Mengidentifikasi berbagai informasi dalam teks fungsional pendek	5,6,8,9,12,13,14,15
			2. Mengidentifikasi ciri kebahasaan teks yang dibaca	1,2,3,4,10,11,16,17,18,19,20

3.3 Data Analysis

For completing the steps of the research, the writer had to calculate and interpret the data. First, the data from pre-test and post-test were categorized based on the characteristics of the data. Then, the pre-test and post-test's scores were calculated by using t-test to find out the significance of the means of two groups. This t-test was also used to compare the students' reading achievement in both of groups, and see the effectiveness of jigsaw technique in teaching reading.

The normal distribution and homogeneity variance test are some fulfilled requirements of conducting independent t-test. The calculation of normal distribution and homogeneity variance were intended to see the differences of mean in experimental group and control group.

3.3.1 Testing Homogeneity of Variance

Kolmogorov smirnov test was used to examine the homogeneity of variance in this research. The test is valid when the probability (Asymp. Sig- 2 tailed) of the experimental group and the control group are higher than the level of the significance (0.05). H_0 is rejected when the significant of value (sig.) < 0.05 , meanwhile, if the significant value (sig.) > 0.05 , H_0 is accepted. The test of homogeneity variances tries to prove the hypothesis:

H_0 = the sample is a normal distribution from its population

H_a = the sample is not a normal distribution from its population.

3.3.2 Testing Normality of Variance

The test of normality of variance was used for proving these hypotheses:

H_0 = the variance of pre-test of experimental and control groups are homogenous.

H_a = the variance of pre-test of experimental and control groups are not homogenous.

The calculation of normality variance of this research used Levene Test at 5% level of the significant (α). Moreover, the criteria of the homogeneity test is H_0 is rejected if the significant of value (sig.) < 0.05 , meanwhile, if the significant value is (sig.) > 0.05 , H_0 is accepted.

3.3.3 Independent t-test

The analysis of the data in the research used an independent t-test in SPSS 15.0 for windows. This computation was used for comparing the mean from two groups (experimental and control groups). There are some requirements of the data that must be considered before conducting independent t-test. The data should: (1) be in formed of interval or ratio; (2) be homogenous or formed in the same type; and (3) have a normal distribution (Coolidge: 2000, p. 143). If the data did not suitable with the requirement then the non-parametric formula was used for comparing the means of two groups.

There were two steps in calculating the t-test: (1) stating the hypothesis at 0.05 (two tailed); H_0 if there is no significant difference between two samples and H_a if there is a significant difference between two samples; and (2) comparing the level significance of two groups (from the calculation of independent t-test) for testing

the hypothesis: if the probability is less than the level of significance, so the null hypothesis of no difference is rejected.

3.3.4 The Calculation of Effect Size

The calculation of effect size is used to determine the effect of the influence of independent variable upon the dependent variable (Coolidge: 2000, p. 151). If the treatment works well then there will be a large effect size. The formula of effect size is:

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$

where: r = effect size

t = t values from the calculation of independent t test

df = $N_1 + N_2 - 2$

After getting the score of r values, then match the score with the following scale to interpret the effect size

Effect size	r value
Small	.100
Medium	.234
Large	.371

3.3.5 Paired Sample t-test

The computation of paired samples is used to analyze the difference between two groups' means (Coolidge: 2000, p. 156). In this research, the paired samples test was used to compare the significance difference in one group before and after going the treatment. Therefore, both group experimental and control

group had to calculate the score of pre-test and post-test. This computation also used SPSS 15.0. Then, after getting the score of two groups, the next step is to see the level significance (from the calculation of paired t-test) for testing the hypothesis: If the probability is less than the level of significance, so the null hypothesis of no difference is rejected.

3.3.4 Testing Questionnaire

Questionnaire was delivered on the end of the meeting to the experimental group. This questionnaire was used to discover students' responses about the use of jigsaw technique in teaching reading, which illustrates the advantages of this technique. The questionnaire consists of ten statements. Each statement had been answered by circling or crossing the choice YES or b choice NO. Yes or No questionnaire was used to make students find it easier to understand. Then, the open questionnaire was also delivered to students where they had to give the responses to the questions. All statements in this questionnaire were written Indonesian.

The result of the questionnaire was calculated using this formula below

$$P = \frac{F \times 100}{N}$$

Note: P = percentage

F = frequency

N = responses

100 = constants