

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents research problem, research method, research subject, research procedure, research instrument, data collection and technique for analyzing the data.

3.1 Research Problem

As previously mentioned in chapter one, this study is aimed to find out whether the use of Mind Mapping techniques effective or not in improving students' narrative text writing ability. The writer measured the students' writing ability through writing test to determine the effectiveness of the treatment. Therefore, there were two types of variables in this study; Independent variable, which is the Mind Mapping techniques, and dependent variable that is students' narrative text writing ability. And to lead the study into structured discussions this research focused on the research questions bellow:

- Is the Mind Mapping technique effective in improving students' narrative text writing ability?
- What are the advantages and disadvantages of Mind Mapping techniques in improving students' narrative text writing ability?

3.2 Research Methods

In this study, the researcher adopted quasi-experimental method using pre-test and post-test design. There are two groups taken for this experiment. There were experimental group, which got treatment, and the control group, which achieved no treatment. The design of the experimental is represented bellow:

G1	T1	X	T2
G2	T1		T2

Notes:G1 : experimental group

G2 : control group

T1 : pre-test

T2 : posttest

X : treatment

(Hatch & Farhady,1982 : 22)

3.2.1 The Variables

The variables in this research are classified into dependent and independent variable.

1. The independent variable is Mind Mapping techniques as a teaching model since this is the major variable that is investigated thus it is selected, manipulates and measured by researcher (Hatch & Farhady, 1982: 15) and
2. The dependent variable is students' writing score as this is the variable which is observed and measured to determine the effect of the independent variable (Hatch & Farhady, 1982: 15)

3.3 Research Subject

3.3.1 Population

According to Sudjana (1983) a population is an entire group of people, objects or events which all have at least one characteristic in common, and must be defined special and

unambiguously. Thus, the population of this research was the second grade students of Lab School Senior High School UPI Bandung.

3.3.2 Sample

The sample of this research was two classes from the second year students of Lab School Senior High School in Bandung. There are XI IPS 1 as the experimental group and XI IPS 2 as the control group. They were taken because it was assumed that they have the basic ability of simple sentence construction.

3.4 Research Procedure

In general, the procedures of the research can be described as follows:

- Preparing the Mind Mapping material for teaching and learning process during the treatment;
- Organizing teaching procedures by using four stages of learning for genre based approach, proposed by Emilia (2007) ;
- Organizing the research instrument ;
- Trying out the research instrument for pretest and post test;
- Analyzing the try out data in order to find out the validity and reliability;
- Administering the pre-test for both groups, that is experimental group and control group. Furthermore, in general the research was conducted by following the research schedule below:

Table 3.1

General Schedule of the Study

No	Experimental Group		Control Group	
	Date	Material	Date	Material
1	31 st Aug 2008	Pretest	31 st Aug 2008	Pretest
2	4 th Aug 2008	Topic: Interesting Experience 1	4 th Aug 2008	Topic: Interesting Experience 1
3	7 th Aug 2008	Topic: Interesting Experience 2	7 th Aug 2008	Topic: Interesting Experience 2
4	11 th Aug 2008	Topic: Interesting Experience 3	11 th May 2008	Topic: Interesting Experience 3
5	14 th Aug 2008	Topic: Holiday Experience 1	14 th Aug 2008	Topic: Holiday Experience 1
6	18 th Aug 2008	Topic: Holiday Experience 2	18 th Aug 2008	Topic: Holiday Experience 2
7	21 st Aug 2008	Review of the whole meetings	21 st Aug 2008	Review of the whole meetings
8	25 th Aug 2008	Posttest	25 th Aug 2008	Posttest

3.5 Research Instruments

Related to Sowell and Casey (cited in Mustika, 2007:27), instrument refers to the decision that researchers make for collecting data. For that reason, there are some instruments used by the researcher. Writing test was carried out as one of the instrument

that was applied for finding the improvement of students' narrative text writing ability. It was conducted at the beginning of the lesson as pre-test and in the end of the lesson as post-test. Besides written test, questionnaire was also used to support the data in order to find out the advantages and disadvantages of Mind mapping techniques in improving narrative text. In detail, the research instrument can be explained as follows:

3.5.1 Writing Test

Students were required to write a narrative text with "Holiday" and "Interesting Moments" as the topic. It was carried out at the beginning of the lesson as pre-test, and conducted at the end of the research as post-test. Furthermore, their writing was analyzed by the scoring sheet.

3.5.2 Questionnaire

The researcher set some questions based on several aspects, such as, students' experiences in learning writing narrative text through Mind Mapping techniques, the difficulties that may appear in their learning process, student's opinion and feeling about the material and the way of the teacher's teaching. The questionnaire consisted of 15 items of open-closed questions and it was given to the experimental group in the end of the program.

3.6 Data Collection

In order to collect the data, there were some taken steps .

3.6.1 Testing Validity and Reliability of the Test

Harris (cited in Mustika, 2007:32) stated that a good test possesses some qualities: validities, reliability and practically. In line with the statement above,

the instrument was tested first in order to find out the validity and its reliability. It was conducted once to another class on the same grade.

3.6.1.1 Validity

One of the important things to consider when researcher prepared or selected an instrument to use is validity. (Fraenkel, 1993: 139). Validity means the appropriateness, meaningfulness and usefulness of the specific assumptions that researcher makes based on the collected data. For that reason, it is necessary to try out the test and compute the result with appropriate formula of validity. In order to measure the criterion-related validity of the test, the Pearson Product Moment was used. The procedures to find out the validity of the instrument are as follow:

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

Note:

r_{xy} = Coefficient correlation coefficient between X and Y variables

\sum = Sum of each variable.

X = The average score of X.

Y = The average score of Y.

N = the number of subjects.

The criteria for the validity test were as follow:

0.800 – 1.00	: Very high
0.600 – 0.800	: High
0.400 – 0.600	: Moderate
0.200 – 0.400	: Low
0.00 – 0.200	: Very low

(Arikunto, 2002:147)

3.6.1.2 Reliability

Reliability is defined as the consistency of the scores obtained. Thus, any instruments should be calculated its reliability. Since the instrument score of this research was not between 1 and 0 or in the form of essay, the instruments were analyzed by using Cornbach Alpha formula or the Kuder-Richardson formula, which are:

$$r_{11} = \left[\frac{k}{k-1} \right] \left[1 - \frac{\sum \sigma_i^2}{\sigma_t^2} \right]$$

(Arikunto, 2002: 110)

Note:

r_{11} = Coefficient instrument reliability

k = Number of subjects

$\sum \sigma_i^2$ = Sum of item variance

σ_t^2 = Total variance

The criteria for the reliability test were as follow:

0.00 – 0.20	: Low
0.21 – 0.40	: Moderate
0.41 – 0.70	: High
Above 0.70	: Very high

3.6.2 Conducting the Pre-test

Pre-test was conducted on August 31, 2008 at class XI IPS I as the experimental group and XI IPS II as the control group. It was conducted to find out the initial equivalent between the two groups.

3.6.3 Giving the Treatment

The treatment was conducted in six meetings due to the limited time. It was given to the experimental group that is XI IPS I. The Mind mapping techniques were given as treatment in the process of improving students' narrative writing. In the end of the treatment, the students have to do post-test with the same question given in the pre-test.

3.6.4 Conducting the Post-test

Post-test was given on August 25, 2008 to both groups, XI IPS I and XI IPS II. The post-test was conducted to measure the influence of the treatment, whether there was significant difference in students' narrative writing scores or not. The written test in the post-test was similar to the written test in the pre-test.

3.6.5 Administering Questionnaire.

Questionnaire was distributed to the experimental group in order to find out the advantages and disadvantages of Mind mapping techniques in learning writing. Furthermore, the questionnaire also used to find out the difficulties that may appear in their learning process.

3.6.6 Counting the Data using t-test

After the data was collected, it was calculated using the t-test formula with the assistance of SPSS 15.0 program.

3.7 Data Analysis

3.7.1 Data Analysis of Pre-test and Post-test

The pre-test and post-test would be analyzed by SPSS.15.0. The written test documents were analyzed by using scoring criteria. The students' writing were analyzed based on several criteria which is adapted from Sapani(1990) cited in Andriana (2007). The adapted scoring sheet consists of five aspects, those are: generic structure, diction, lexicogrammatical features, spelling and content.

After using the scoring criteria, the data were analyzed by using t-test formula and independent sample test to investigate the initial ability and initial equivalence between groups (Hatch and Farhady, 1982: 111). Hatch & Farhady (1982: 114) cited in Permadi (2008) states there are three assumptions underlying the *t*-test. The three assumptions described as follows:

1. The subject is chosen to one group in experiment
2. The variances' scores are equal and normally distributed
3. The scores on the independent variable are continuous

Therefore, the researcher did the normality distribution and variance homogeneity test before calculated the data using *t*-test formula.

3.7.2 Normality Distribution Test

To find the normality distribution of the test, the researcher used Kolmogorov-Smirnov test in SPSS 15.0. The steps of analyzing the normality distribution are as follows:

- Stating the hypothesis and setting the alpha level at 0.05 (two tailed).

H_0 = The score of the experimental and the control group are normally distributed

H_1 = The score of the experimental and the control group are not normally distributed

- Analyzing the normality distribution using Kolmogorov-Smirnov test in SPSS 15.0 windows.
- Comparing the Asymp sig (probability) with the level of significance for testing the hypothesis. If the Asymp sig is more than the level of significance (0.05) the null Hypothesis (H_0) is accepted, the scores are normally distributed.

3.7.3 Variance Homogeneity Test

To examine the homogeneity variance of the scores, Levene's test for equality of variance in SPSS 15 windows was used in this study. The steps of analyzing the homogeneity are as follow:

1. Stating the hypothesis and setting the alpha level at 0.05 (two tailed).

H_0 = the variance of the experimental and control group are homogenous

H_1 = the variance of the experimental and control group are not homogenous

2. Analyzing the homogeneity of variance using Levene's test for equality of variance in SPSS 15.0 windows.
3. Comparing the Asymp sig (probability) with the level of significance for testing the hypothesis. If the Asymp sig is more than the level of significance (0.05) the null Hypothesis (Ho) is accepted, and the variance of the groups are homogenous.

3.7.4 The Calculation of t-test

The steps of computing t-test described below:

3.7.4.1 Stating the Null hypothesis ($H_0: X_1 = X_2$) and the Alternative hypothesis

($H_a: X_1 \neq X_2$)

H_0 = the two samples are from the same population; there is no significant difference between the two sample ($X_e = X_c$)

H_1 = the two samples are from the same population; there is a significant difference between the two sample ($X_e \neq X_c$)

3.7.4.2 Setting the alpha level at 0.05

3.7.4.3 Finding the t value with independent t-test formula.

The formula for a t test between two different groups of scores is as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left[\frac{\sum X_1^2 - \frac{(\sum X_1)^2}{N_1} + \sum X_2^2 - \frac{(\sum X_2)^2}{N_2}}{N_1 + N_2 - 2} \right] \left[\frac{1}{N_1} + \frac{1}{N_2} \right]}}$$

Note:

\overline{X}_1 = The mean of the score of the experimental group

\overline{X}_2 = The mean of the score of the control group

$\sum X_1^2$ = The sum of the squares of the experimental group

$\sum X_2^2$ = The sum of the squares of the control group

$(\sum X_1)^2$ = The square of the sum of the squares of the experimental group

$(\sum X_2)^2$ = The square of the sum of the squares of the control group

N_1 = The total number of scores in the experimental group

N_2 = The total number of scores in the control group

Comparing t-obtained and t-crit. If t_{obt} is lower than t_{crit} , the result is not statistically significant at the 0.05 level, H_0 is accepted; While, If t_{obt} is higher than t_{crit} the result is statistically significant, then H_0 is rejected.

3.7.5 Questionnaire Analysis

The formula of percentage was used to analyze the questionnaire. The data were interpreted based on the frequency of the students' answer. The formula is described as follow:

$$P = \frac{F_o}{N} \times 100\%$$

N

Note: P : Percentage

F : Frequency observed

N : Number of sample