CHAPTER III

RESEARCH METHODOLOGY

This chapter elaborates the methodology of research conducted to answer the two research questions previously stated in chapter one. It covers research design, data collection, research procedure, and data analysis.

3.1 Research Design

The research method employed the research was quantitative method with quasi-experimental design. The aims of the research was to find out the effect of through mind mapping technique in teaching narrative text to students' reading comprehension and; the advantages and disadvantages of mind mapping technique in teaching narrative text.

Hatch and Farhady (1982) argue that quasi experimental designs are practical compromises between true experimentation and the nature of human language behavior which the researchers wish to investigate. The researchers have to reach the goal as closely as possible to meet the standards of true experimental design. In relation to the suggestion above, the research would employ the nonrandomized design (Fraenkel and Wallen: 1990). The pretest-posttest design which is the subset of quasi experimental design was conducted. According to McMillan and Sumacher (1989:323) c. f Mulya (2008), this experimental design is described as follow:

Table 3.1

Group	Pretest	Treatment	Posttest
Experimental Group (A)	√	X	√
Control Group (B)	√	-	√

TIME
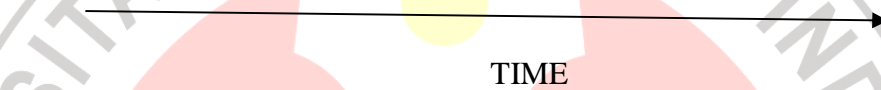
A√   : Pretest/posttest of experimental group

Ax   : Treatment for experimental group

B√   : Pretest/posttest for control group

This research was administered in six treatments, and the formula is as follows:

Table 3.2

Group	Pretest	Treatment 1	Treatment 2	Treatment 3	Treatment 4	Treatment 5	Treatment 6	posttest
Experimental Group (A)	√	x	X	X	x	x	x	√
Control group (B)	√	-	-	-	-	-	-	√

TIME

A√   : Pretest/posttest of experimental group

$Ax_{1,2,3,4,5,6}$: Treatment for experimental group

B√   : Pretest/posttest for control group

Based on the formula above, it can be concluded that both of the classes were given pre-test, but the use of mind mapping as a treatment was in the experimental group only. Meanwhile, the post-test was given to both of the classes and the data were statistically analyzed by using SPSS 17 for window.

Accordingly, there were two variables that would be investigated in the experimental research which are dependent variable and independent variable. An independent variable is the variable which influences dependent variable; meanwhile a dependent variable is the variable that will be affected by an independent variable (as cited in Coolidge, 2000: 15). Based on the explanation above, mind mapping technique would be the independent variable (the major variable to be investigated), as the same time as students' reading comprehension would be the dependent variable (the variable which is observed and measured to determine the effect of the independent variable).

Besides, the hypotheses in the research were in the form of null hypothesis (H_0) and alternative hypothesis (H_A). Null hypothesis argues that there is no difference in adjustment level mean between those who received mind mapping technique and those who did not. By using null hypothesis, every possibility of the research can be shown. If the null hypothesis was accepted, it can be concluded

that the treatment did not work. While, if the alternative hypothesis was accepted, it means that the treatment works well. In other words, alternative hypothesis states that there is a difference between those who received mind mapping technique and those who did not.

The hypotheses can be seen as follows:

$$H_0 = \mu 1 = \mu 2$$

$$H_A = \mu 1 \neq \mu 2$$

3.2 Data Collection

3.2.1 Population and Sample

3.2.1.1 Population

Millan and Schumacher (2000:69) affirm that a population is a group of elements or cases, whether individuals, objects, or events that conform to specific criteria and to which the researcher intend to generalize the results of the research. The population of the research was the eighth grade students in one of junior high school in Bandung.

3.2.1.2 Sample

Sample is a subset of a population (Arikunto, 2006). It should be representing the population. The researcher employed purposive sampling to determine the sample. (Fraenkel and Wallen, 1990: 242; Nunan, 1992: 41) propose that quasi-experimental designs do not include the use of random assignments. In addition, Fraenkel and Wallen (1990) also affirm that in purposive sampling the researcher

chooses the sample based on his personal judgment for a specific purpose. The research chooses the samples since the researcher has an experience in teaching junior high school students and the samples have never received the treatment like this.

With the reason above, two classes were selected as the sample. They were XIII-G class and XIII-F class, where the experimental group was XIII-G class and the control group was XIII-F class. Each class consisted of 30 students. Therefore, the number of the sample was 60 students.

3.2.2 Research Instrument

According to Arikunto (1996:136), instruments are media utilized by the researcher in collecting the data. The instruments were used to collect data in order to answer the research questions. The instruments used in the research were pretest, posttest, and interview. These three instruments were elaborate as follows:

Pre-test was implemented in both experimental and control group. The test instrument was a reading comprehension test. Pre-test was given to the experimental and control group to find out the initial differences between the groups of students who had similar level of reading. Moreover, **Post-test** was implied in the last program of the research. After conducting several treatments, researcher administered the pos-test to both experimental and control group. This post-test was given to find out whether or not there is any difference between those groups as a result of some treatment given. All items of reading test were the same with pre-test. It consisted of twenty multiple choice questions. It was

composed based on standard in Indonesian curriculum of teaching English for the

eighth grade students of Junior High School, as explained in the following table.

Table 3.3

The Competencies and Indicators of Items in Reading Test

Aspect	Standard Competence	Basic Competence	Indicators	Number of Item
Reading	**11**. Understanding the meaning of the simple short essay in the form of recount and narrative relate to the environment	**11.2** Giving respond to the meaning in simple functional text accurately, clearly, and appropriately relate to the environment **11.3** Giving response to the meaning and the rhetorical stage in accurately, clearly, and appropriately relates to the environment in the recount and narrative	• Identifying the generic structures of the text which include theme, place, time, and actor/actress. • Identify type of the text. • Identify contents of the text.	3, 4, 7, 9, 13, 17, 18, 19, 2 1, 5, 6, 8, 10, 11, 12, 14, 15, 20

The non test instrument used in the research was interview. The interview was used to find out the advantages and disadvantages of using mind mapping technique in teaching narrative text to improve students' reading comprehension. According to Fraenkel and Wallen (1990), basically interview and questionnaire were the same; they were consists of questions that should be answered by the sample of the research, but interview was taken orally.

3.3 Research Procedures

3.3.1 Organizing Teaching Procedure

In the research, both classes were taught by the researcher. In preparing the teaching process, the researcher carried out two steps. The first step was preparing the appropriate materials for teaching and learning process during the experiment. Then, as the second step, the researcher organized teaching procedures in control and experimental group.

Moreover, teaching materials and procedures in the experimental group was highly related to the mind mapping technique in teaching narrative text. While in the control group, the conventional method was used in teaching learning process.

3.3.2 Administering Pilot-test

Pilot test was intended to measure the validity, level of difficulty, discrimination, and reliability of the test instrument. The pilot test was administered to different class of the sample on April 15th, 2010. Furthermore, pilot test was given to the students before the research began. The test consisted of 30 multiple choice items.

3.3.3 Conducting the Treatment

In conducting the treatment, the experimental group was taught by using mind mapping in teaching reading narrative text. The treatment was conducted in seven meetings. The experimental group was asked to read a narrative text then made mind mapping to answer the questions relate to the text. Meanwhile, the control group was asked read a narrative text without made mind mapping. The details of the schedule in the classroom can be seen in the following table.

Table 3.4

Schedule of the Research

No.	Experimental Group		Control Group	
	Date	Material	Date	Material
1.	19th April 2010	Pre-test Introduction of narrative text and mind mapping	19th April 2010	Pre-test Introduction of narrative text
2.	20th April 2010	Introduction narrative text, the generic feature, simple past then Making mind mapping from the text The Legend of Penyu Busuk then answer the questions based on the text	20th April 2010	The generic structure in a narrative text
3.	26th April 2010	Making mind mapping from the text Timun Mas then answer the questions based on the text	26th April 2010	Generic structure and kind of narrative
4.	27th April 2010	Making mind mapping from the text Cinderella and	27th April 2010	Read aloud a text about The Prince and

		answer the questions		His Best Friends then answer the questions
5.	3nd May 2010	Making mind mapping from the text The Legend of Tangkuban Perahu and answer the questions	3nd May 2010	Read aloud a text about Cinderella then indentify the generic feature and simple past
6.	4th May 2010	Making mind mapping from the text Kyai Jegod then indentify the generic features, simple past, kinds of narrative	4th May 2010	Answer and discuss the questions based on a text about Kyai Jegot
7.	10th May 2010	Review, Posttest, and administering interview	10th may 2010	Review and Posttest

3.3.4 Administering Pretest and Posttest

Pretest was administered to both the experimental and control group before treatments are conducted to experimental group. After series of treatments are implemented, pos-test was also administered to the both groups. The scores from pretest were used to measure whether or not the implemented technique influences the experimental group.

3.3.5 Administering Interview

Interview was one of the instruments to collect the data. Moreover, interview consists of five questions that should be answered by the students orally. This instrument gave the assessment of the technique used in students' point of view. By having interview, students were expected to share their opinion about the treatment that they had experienced.

The aim of the interview in the research was to get the advantages and disadvantages of using mind mapping technique in teaching narrative text to improve students' reading comprehension perceived by the students.

3.4 Data Analysis

3.4.1 Scoring Technique

The instrument utilized in the research was in the form of multiple-choice questions. After the data were collected, then the data would be analyzed by using scoring technique formula.

In the research, the formula which was used to analyze pre test and post test data was as follows:

S = R

Where,

S: Score

R: Right answer

3.4.2 Data Analysis on the Pilot-test

The data obtained from the pilot test were analyzed to calculate the validity, reliability, level of difficulty, and discrimination level of the instrument.

Validity test

McMillan and Schumacher (2001:181) define that validity is the extent to which inferences and uses made on the basis of scores from an instrument are reasonable and appropriate. Validity is a judgment of the appropriateness of measure for specific inferences, decisions, consequences, or uses that result from the scores

that are generated. Pearson product moment can be used to analyze the validity items. The data were calculated by SPSS 17 for windows. The criteria for the validity test were as follow:

Table 3.5

r Coefficient Correlation (Validity)

Raw Score	Interpretation
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, 2007:147)

Difficulty test

The difficulty test analysis based on assumption that a good item should not be too difficult or too easy (Arikunto, 2008 cited from Purbasari 2009). Then, in the test itself, test instrument can be accepted as a good test if it is not too easy or too difficult for the population for whom the test will be assigned. Item with facility values around 0.5 are considered to be ideal, with acceptable range being from around 0.3 to 0.7 (Henning, 1987:50 cited in Fulcher and Davidson, 2007)

Discrimination

A good item must be able to differentiate the high achiever from the lower achiever students as well (Arikunto, 2008 cited in Sari, 2010). There are some stages in obtaining discrimination index of each item: arrange the obtained scores from the highest to the lowest, divide the subjects into two groups based on their scores, calculate the discrimination index of each item, and interpret the quality of each item based on criteria of discrimination index proposed by Arikunto (2008). The most commonly used method of calculating item of discrimination is the point of biserial correlation. This is a measure of association between responses to any specific items on the whole test (Henning, 1987 cited from Fulcher & Davidson, 2007).

The statistical computation will be as follows:

$$r_{pbi} = \frac{\bar{X}_p - \bar{X}_q}{S_x} \sqrt{pq}$$

Where:

r_{pbi} = point biserial correlation

$\bar{X}_p$ = Mean score on the test for those who get the item correct

$\bar{X}_q$ = Mean score on the test for those who get the item incorrect

S_x = Standard deviation of test score

p = the proportion of test takers who get the item correctly (facility value)

q = the proportion of test takers who get the item incorrect

Items with r_{pbi} of 0.25 or greater are considered as acceptable, while those with lower value was rewritten or excluded from the test (Henning, 1987 cited from Fulcher & Davidson, 2007).

Reliability Test

McMillan and Schumacher (2001:181) propose that reliability test refers to the consistency of measurement, the extent to which the scores are similar over different forms of the same instrument or occasions of data collection.

Reliability always depends on the context to which an instrument was used. Based on the context, an instrument may or may not submit reliable scores. In the research, the reliability of instrument was measured by Cronbach's alpha formula in SPSS 17 for windows. According to Vaus, (2002:21) states from others reliability test Cronbach's alpha is the most widely used and is the most suitable in the research. An alpha of 0.7 is normally considered to indicate a reliable set of item.

3.5 Data Analysis on Pre-test and Post-test

The data obtained from the pretest and posttest was used to investigate initial comprehension in reading and was analyzed by the independent sample t-test statistics. Beforehand, hypothesis was stated with the alpha level at 0.05. Hacth and Farhady (1982: 114) argue that there should be certain assumptions in doing statistical test, they are: only one group is as the subject in the experiment, the scores on independent variable are continuous, and the scores are normally distributed, while variances of score are equal. In other words, *t*-test calculation can be done if the data is normally distributed and the variances are equal. Thus,

test of normal distribution and the homogeneity of variance were done before the t-test calculation.

In analyzing the normal distribution, Kolmogorov-Smirnov test was used in the data analysis. Meanwhile, Levene Test formula in SPSS 17 was used to analyze the homogeneity of variance. Then, in analyzing the pretest data, the researcher used independent sample t-test to see whether or not there is any difference between experimental and control group student's comprehension in reading. Independent sample t-test was also conducted in analyzing the posttest scores of experimental and control group students to compare mean of both groups. Then the calculation of effect size was conducted by using t_{obt} from the independent sample t-test of posttest.

Moreover, matched t-test was also used in the research following the nearly steps as in comparing pretest of both groups. It was conducted to investigate whether or not the difference between pre test and post test means of each group is significant. Clearly, the computation of pretest and posttest scores for the experimental group was conducted to find the students' level of the reading comprehension of the group before and after mind mapping implementation. Furthermore, to check the level of treatment effect, test of effect size was administered after t-test calculation.

Calculation of the effect size is important to be administered to determine the effect of the influence of independent variable upon the dependent variable (Coolidge, 2000 p.151). It is calculated to investigate how important the effect of

the independent variable in practical terms. 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   = $t_{obt \, or}$ t value from the calculation of the independent t-test

df = $N_1 + N_2 - 2$

   After the value of r has been obtained, the scores were matched with the following scale to interpret the effect size.

Table 3.6

Effect Size Value

Effect Size	r value
Small	.100
Medium	.243
Large	.371

(Coolidge, 2000 p.151)

38

3.6 Data Analysis on Interview

Interview was one of the instruments to collect the data. Furthermore, interview consists of some questions that should be answered by the students orally. According to Arikunto (2006, Purbasari, 2010), the interview can be defined as a dialogue between the interview and the sample in order to collect the information related to the research. The administering of the interview was aimed to find out the advantages and disadvantages of mind mapping technique which had been used in reading narrative text to improve students' reading comprehension.

The data analysis was done to collect the required data then the conclusion was made after completing the whole process of the research. According to Sukmadinata (2005) the interview data was analyzed through five steps such as specifically collecting and limiting the research questions; interviewing sample; collecting basic data with intensive analysis; collecting closed data; and compiling the result of data analysis by drawing charts and concluding answers.