CHAPTER III
RESEARCH METHODOLOGY

This chapter discusses research methodology. The discussion covers ten main parts: research design, research variables, media and resource books, teacher, time allocation, population and sample, instruments, research procedures, data collection and data analysis.

3.1. The Method of Research

This research applies quasi-experimental non-equivalent pre-test - post-test control design. It provides a reasonable control over most sources of invalidity in which this research concerns not only with the internal validity but also with the external validity that exists in the subject. The reason for choosing this design was that population did not consist of individual but groups of individual or cluster, so that students were not randomly selected and assigned to the groups. Through the design, sample was taken from the available classes (intake); each class was assigned as an experimental group and a control group. Pre-test and post-test were administered to both groups. After the pre-test was administered and there was no difference of mean statistically between two groups ort equivalent based on the calculation by using t-test, the researcher conducted particular treatment in eight meetings to the experimental group while the control group received a conventional model of teaching. However, the writing skills materials given to both groups were same. For clearer description, the following shows the formula of quasi-experimental non-equivalent pre-test - post-test control design. (Mc. Milan and Schumacher, 1989:323)

The design used in this experiment is the pre-test and post test of experimental group and control group design. The formula is as follow:

G1 (Random) T1 X T2
G2 (Random) T1 T2

Notes:

G1 : The experimental group

G2 : The control group

T1 : Pre-test

T2 : Post-test

X : Treatment

Borg and Gall (1979: 547) claim that this research has several characteristics, among others are:

1. Having two subjects, they are the control and experimental groups.
2. Using experimental treatment for the experimental group and using another technique for control group.
3. Measuring and comparing the dependent variable of the experimental and control group in order to determine the effect of the experimental treatment upon the dependent variable.
4. Measuring the test twice for both groups, they are pre-test and post-test.

3.2. Population and Sample

3.2.1. Population

According to Arikunto (1996: 115) that a population is a set (or collection) of all elements possessing one or more attributes of interest. In this research the population is second grade students of SMAN 1 Lembang Bandung,

The population is second grade students based on Ruseffendi (1991:147), that children older than 11-12 years old has formal thinking and second grade students at older than 11-12 years. The children ability on the formal thinking stage, such as: can define, make rule in the context rightly and objectively, can think deductive and inductive, etc. (Ruseffendi, 1991:147).

3.2.2. Sample

Sample is the representative of the population as a whole (Jackson, 1995: 18). This research employed random cluster sampling by using this sampling technique the subject doesn't assign individually but it is done in group (Borg and Gall, 1979:187), and then the sample is in the second grade students of SMAN 1 Lembang Bandung which divided into experimental and control class.

3.3. Technique for Collecting Data

3.3.1. Treatment

The treatment of teaching and learning activity in the control and experimental classes will be done in the same manners. It means that the actual face to face meetings for both of the classes are the same. The difference is each class accepts different treatment.

Below is the schedule of the treatments:

Table 3.3.1

The schedule of the treatment

No.	Month	Class		Time	
		Control	**Experimental**	**Control**	**Experimental**
1.	January 15th	Pre-test	Pre-test	1 X 45’	1 X 45’
2.	January 17th	Conventional teaching writing	Mind mapping Strategy (MMS)	2 X 45’	2 X 45’
3.	January 22nd	Idem	Idem	2 X 45’	2 X 45’
4.	January 24th	Idem	Idem	2 X 45’	2 X 45’
5.	January 29th	Idem	Idem	2 X 45’	2 X 45’
6.	January 31st	Idem	Idem	2 X 45’	2 X 45’
7.	February 5th	Idem	Idem	2 X 45’	2 X 45’
8.	February 12th	Post-test	Post-test	1 X 45’	1 X 45’

The text book used in the teaching and learning process are: Buzan's book, Tracy's book, Yager's book, Sudarwati's book and other related textbooks that are relevant to the objectives.

3.4. Data Collection

Data collection will hold right after the treatment has been completed. Data is gathered by administering a composition test, which was given simultaneously to all subjects. Questionnaires for students and teacher are also used to get the data on the perception of mind mapping strategy and skill in the classroom.

T-test analysis is used to compare the two groups (experiment and control) which are given different treatment (mind mapping strategy and non-mind mapping strategy). The t-test is as follows:

A O X_1 O

A O X_2 O

Annotation:

A **:** sample is selected randomly

O **:** pre-test or post test upon experimental or control class

X_1 : Mind Mapping Strategy (MMS)'s treatment

X_2 : Conventional English teaching

The statistical analysis then are analyzed by using triangulation with the students interview, students questionnaire, students work sheet, and the researcher's observation during the investigation.

Data Analysis

Data were collected from composition test (try out test, pre test and post test) and questionnaire, and then they were calculated and analyzed.

3.5.1. The Validity of the Test

The validity of a test is defined by Arikunto (1992:45) as the extent to which it measures what it is supposed to measure and nothing else. Further, Sugiyono (2003:267) stated that validity of the test is it measures what is intended to be measured. He gave three types of validity: content, criterion and construct validity. We can use Pierson Product Moment for measuring the validity of the test, the formula as follows:

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

Notes:

r: the validity item

x: the score item

y: the total score

N: number tested

Coefficient of correlation had been tested by its significance level, and then conducted interpretation on coefficient of correlation by calculating coefficient of determination. The purpose of interpretation is to know the contribution of *X* variable effect upon *Y* variable. The formula which is used:

Coefficient of determination = $r^2 \times 100\%$

Annotation: *r* = coefficient of correlation

3.5.2 The Reliability of the Test

On www.wikipedia.com/experimental research/reliability stated a test is reliable if a group of students is to take the same test on two occasions, and the result would be roughly the same provided that the students do not receive private tuition or compare notes during the interval, and if the way of scoring is consistent.

Reliability is a necessary characteristic of any good test: for it to be valid at all, a test must first be reliable as a measuring instrument. Reliability is the consistency of a set of measurements or measuring instrument.

In experimental research, reliability is the extent to which the measurements of a test remain consistent over repeated tests of the same subject under identical conditions. An experiment is reliable if it yields consistent results of the same measure. It is unreliable if repeated measurements give different results.