CHAPTER III

RESEARCH METHODOLOGY

Chapter three presents the methodology in conducting this study. This chapter provides four main parts of the investigation: research design, data collection technique, research procedures, and data analysis technique.

1.1 Research Design

This study chiefly employed quantitative method, particularly in design of quasi-experimental with non-randomized or non-equivalent pre-test and post-test groups. Conforming to Lodico *et al.* (2006), this design was chosen for this study because it was unfeasible for the researcher to randomly assign individuals to certain groups as they had already been in intact groups i.e. their class.

The quasi-experimental design using non–equivalent pre-test and post-test groups design is described as follows:

Group	Pre-test	Treatment	Post-test
Experimental	O_1	X	O_2
Control	O_3	–	O_4

Note:

— X : the exposure of a group to an experimental variable

— O : the process of observation or measurement

(Adapted from Cohen *et al.*, 2007:283)

Typically in researches which investigate relationship between object, it is very important for the researchers to figure out the variable in their study. A variable can be defined as a specific noun that represents the variation in a class of objects (Fraenkel and Wallen, 2006). Dealing with the variable in this study, clustering technique became the independent variable which, as typical of experimental research, was controlled and manipulated intentionally. On the other hand, students' narrative text writing score became the dependent variable that bore the effect of experimental manipulation.

In addition to determining the variable, stating one or more hypothesis is also required in any experimental study. Hypothesis states a prediction of the possible results of the study (Fraenkel and Wallen, 2006) and it generally falls into two types, they are null hypothesis and alternative hypothesis. Null hypothesis states that, for example, there is no relationship between the tested variables or there is no change in participants after the treatment. On the contrary, alternative hypothesis states the opposite; that there is relationship between the tested variables or there is change in participants after the treatment (Cohen *et al.*, 2007). In this study, the two hypotheses were stated as the followings:

- H_0 = There is no significant difference between students' post-test scores in the experimental group and students' post-test scores in the control group.
- H_A = There is a significant difference between students' post-test scores in the experimental group and students' post-test scores in the control group

1.2 Data Collection

1.2.1 Population and Sample

According to Scott and Morrison (2006), population is defined as "the wider group of individuals about which the researcher wants to make statements", while sample is the smaller group of individuals taken from wider population which can represent all characteristics of that population. Due to the purpose and design of this study, the sample was chosen by using purposive sampling that included students in one school building who were judged by the researcher to have particular key characteristics which are related to the purpose of the study (Fraenkel and Wallen, 2006). The basis for choosing the sample was similarity in number of students and their average scores. The difference was determined by using the independent *t*-test.

The population of this study was tenth grade-students of one senior high school in Bandung, and the chosen sample was two classes, they were class X-1 as the experimental group and X-3 as the control group.

1.2.2 Research Instruments

By definition, research instrument is the device which is used by the researcher in order to collect the data (Fraenkel and Wallen, 2006). In this study, two kinds of research instrument were employed, they were test, which consisted of pre-test and post-test, and interview guide.

1.2.2.1 Test (Pre-test and Post-test)

Test as the first instrument was aimed at yielding the sample's scores that will be analyzed and interpreted to find out if clustering technique is effective in teaching writing narrative text. The pre-test was administered to both experimental and control group prior to the treatment and it functioned as a measuring tool for students' initial ability in writing narrative text. On the other hand, the post-test was administered after the treatment in order to obtain students' scores that are used to infer whether there is change in students' ability in writing narrative text.

Technically, both the pre-test and post-test were made similar in the form of composition writing test. It is in accordance with Linse's (2005:153) suggestion that the way of assessing writing skill for teacher is through eliciting and examining the sample of students' writing. Since the focus of this study was writing narrative text, the test contained an instruction for the students to write a simple narrative text that are developed from a predetermined theme.

In this study, the test was administered definitely after it had been proven to possess the validity. As one of the two criteria which is used to judge the quality of

the instrument, validity serves to make sure that what is measured by the instrument is truly what is supposed to be measured (Lodico *et al.*, 2006). Especially for the pre-test and post-test in this study, there were two types of validity which should be embodied in both tests; they are face and content validity. The former, face validity refers to the state of instructions in the test which should be understandable by the test-takers; the latter is achieved when the test is evidently successful in generating the data which should be generated indeed (Brown, 2001). To confirm that the item in the pre-test and post-test had embodied face and content validity, mechanism of pilot-testing the test item was conducted. It was administered to ten students from the same grade and school with those in experimental and control group. At first, they were asked to do the test according to the instruction which was found in it. If the instruction has been understandable to the students, the test is confirmed to possess the face validity. On the other hand, if the students are confused in understanding it, they should be asked about the part of the instruction which confuses them. That part is then revised until it is understood by the student; so they can start doing the test. Next, the students' works in the test were then examined to confirm that the test item had reached content validity. If nearly all the students' works reflect their ability in performing given language skill expected by the test maker – regardless of the quality of the result – then the test is proven to possess content validity; hence the test item is allowed to be conducted in the real pre-test and post-test.

1.2.2.2 Interview

In this study, interview was used to provide supplementary information about how students gave their responses toward clustering technique in writing narrative text. Interview was selected because it is a tool for collecting data which is very flexible; interviewer's control over the order of the interview can be maintained while spontaneity is still given the space, and the interviewers can persuade their interviewees to give response about complex and deep issues beside the complete answer (Cohen *et al*, 2007). The interview guide was employed in interviews which were conducted after the post-test to ten students from experimental group. It comprised four open-ended questions which sought students' explanation of their ideas about their own ability in writing narrative text prior to and after the treatment, and their view about the use of clustering technique in writing narrative text. Later, their answer in the interview became the basis for determining students' response toward clustering technique in writing narrative text.

1.2.3 Research Procedure

1.2.3.1 Organizing Teaching Procedure

The stage of organizing teaching procedure involved two main sub-stages. The first was preparing learning materials that are appropriate for language ability level of the students. In this study, the materials used were about narrative text and they were prepared and organized in conformity to the Competence Standard and Basic Competences (*SKKD*) for tenth graders of Indonesian senior high school. The

second sub-stage was organizing teaching procedure for both experimental and control group. The teaching procedure in experimental group employed clustering technique, but it does not in control group.

1.2.3.2 Organizing the Research Instruments

In this stage, the test item for pre-test and post-test were designed and next the questions for the interview were arranged in the form of open-ended questions.

1.2.3.3 Testing the Validity of the Pre-test and Post-test through the Pilot Test

The pilot test was conducted after all of the research instruments had been well-organized, but in this occasion it only involved the pre-test and post-test. The test was examined in this stage in order to confirm that the test item had possessed face and content validity. Ten students from the same grade and school with the targeted sample were involved in this pilot test by doing the test item. To confirm the face validity, those students were at first asked to read the instruction contained in the test. When they have found it clear and understandable enough, then the test item is confirmed to have face validity. After that, the examination of validity can go on to the area of content by asking the students to do the test. The result was then examined and when they showed students' performance in the expected language skill and area, it could be said that the test had possessed content validity.

1.2.3.4 Administering Pre-test to Experimental and Control Group

After the test item had been proven to pass validity and reliability examination, the pre-test was administered to both experimental and control group. This test was aimed at gaining information about students' initial ability in writing narrative text. Also, it provided the basis for researcher to ascertain that there was no difference in average ability of writing narrative text between students in experimental group and those in control group.

1.2.3.5 Conducting the Treatment

As the heart of the study, this stage deals with implementing the treatment or action which is believed to bring some effects or change to the experimental group. In this study, the treatment in the form of clustering technique was given to the experimental group. Meanwhile, in control group the teaching and learning process of writing narrative text was carried out without using this technique.

Table 3.1
Research Schedule

No.	Date	Material	Date	Material
1.	01/11/2013	Pilot test	—	—
	Experimental Group		**Control Group**	
2.	01/12/2013	Pre-test	01/11/2013	Pre-test
3.	01/14/2012	Narrative text "The	01/14/2013	Narrative text "The

		Hunting for Smiles"		Hunting for Smiles"
4.	01/15/2013	"The Hunting for Smiles" (clustering and writing exercise)	01/15/2013	"The Hunting for Smiles" (writing exercise)
5.	01/21/2013	Narrative text "The Carnivorous Plant and the Butcher"	01/21/2013	Narrative text "The Carnivorous Plant and the Butcher"
6.	01/22/2013	"The Carnivorous Plant and the Butcher" (clustering and writing exercise)	01/22/2013	"The Carnivorous Plant and the Butcher" (writing exercise)
7.	01/28/2013	Post-test and Conducting the Interview	01/28/2013	Post-test

1.2.3.6 Administering Post-test to Experimental and Control Group

After the treatment had been applied to the experimental group, the post-test was administered to both groups. The result of this test was analyzed and interpreted to investigate the effectiveness of clustering technique in teaching writing narrative text.

1.2.3.7 Conducting the Interview

Interview becomes the last stage which was conducted in this study. This was aimed at capturing students' responses to clustering technique in helping them to write narrative text. The interview session was administered exactly after the post-test

and it featured four open-ended questions. It involved ten students from experimental group which were selected on the basis of their achievement in the post-test and performance throughout the learning process.

1.2.4 Data Analysis

1.2.4.1 Scoring Rubric

To generate scores that validly represents students' ability in writing narrative text in both pre-test and post-test, the researcher needs to employ an appropriate scoring rubric. The scoring rubric used in this study was the one which was developed by Education Department of Western Australia. This rubric was based on the analytic scoring method, hence it uses separate scales with each of them represents a variety of aspects in writing (Cohen, 1994) including the purpose of the text, organization of the text, and content and linguistic features of the text (Emilia, 2011). The use of analytic scoring method was selected in this study because it provides two main advantages. First, it can prevent skipping certain aspect or category, and second it is more convenient and feasible for the researcher to assign score to the students' works since it embodies an explicit set of analytic scale (Cohen, 1994). The scoring rubric is attached in Appendix A.

1.2.4.2 Data Analysis on the Validity Tests of the Pre-test and Post-test

Previously in the pilot test, the test item had been proven to possess face validity based on the instruction in the test which could be understood by the test-takers. Next it was also confirmed that the test item had content validity as showed by students' work in pilot test. Regardless of the various levels of English ability which were reflected in their work, the students were overall able to perform the expected language skill and area in the test.

1.2.4.3 Data Analysis on the Pre-test and the Post-Test Scores

Subsequently after the pre-test had been conducted to both control and experimental group, the result of students' works in the test underwent the scoring process. Next, the collective scores were then analyzed and tested to prove that the students' initial ability in both experimental and control group were sufficiently similar. To accomplish this, the independent *t*-test was used since it functions as a tool for determining if the means of two different or independent groups (i.e. experimental and control group) have difference to a statistically significant degree (Kranzler and Moursund, 1999; Fraenkel and Wallen, 2006). It is very important for the researcher to be ascertained that the average score of both groups in the pre-test are similar because it is a requisite for conducting the same independent *t*-test to the post-test score. Besides, it validates the notion that the difference in the post-test scores between both groups is attributed only to the treatment (i.e. implementation of

clustering technique) if such thing happens. When the scores of both groups were proven to be similar and after the post-test had been conducted, the result from post-test underwent the same procedure as that from the pre-test.

Though conducting the independent *t*-test is relatively simple, the data which are tested are required to be distributed in normal manner and homogenous in their variance (Arikunto, 2010). Consequently, the distribution normality test and the homogeneity of variance test should be conducted prior to the independent *t*-test.

1.2.4.3.1 The Test of Distribution Normality

To examine the normality of distribution of the present data, the Kolmogorov-Smirnov test was employed through SPSS 16.0 for Windows. It was conducted in three consecutive steps. The first was stating the hypothesis and setting the α level (level of significance) for the computation. In this test for this study, the hypothesis is stated as the following:

- H_0 = the score of the experimental and the control group are normally distributed
- H_A = the score of the experimental and the control group are not normally distributed

The alpha level was set at 0.05 and it was two-tailed test. The second was computing and analyzing the data by using the formula of the Kolmogorov-Smirnov test, and the last was interpreting the output of the test. If it is lower than the set alpha

level ($p < 0.05$ i.e. not significant), the null hypothesis will not be retained, which means that distribution of the sample is probably not normal. On the contrary, if the output is greater than the fixed alpha level ($p > 0.05$ i.e. significant), the null hypothesis will be accepted, which means that the sample is distributed normally (Setyaningsih, 2010).

1.2.4.3.2 The Test of Variance Homogeneity

The test of variance homogeneity came after the distribution normality test. This test was aimed at determining whether or not the variance of the two groups are homogenous. The Levene test was used through SPSS 16.0 for Windows. Similar to the preceding test, this test was also conducted in three steps including stating the hypothesis and setting the alpha level, computing and analyzing the test, and interpreting the test output. The alpha level was set at 0.05 and the hypothesis was as follows:

- H_0 = the variances of the experimental and the control group are homogenous
- H_A = the variances of the experimental and the control group are not homogenous

After computing and analyzing the data, the output was then interpreted. Again, the null hypothesis will not be retained if the output is equal to or lower than the fixed alpha level ($p \leq 0.05$ i.e. not significant). It can be said that the variance of both experimental and control group are not homogenous. On the contrary, the null

hypothesis will be retained if the output is greater than the set alpha level ($p > 0.05$ i.e. significant), so the variances of both group are homogenous (Setyaningsih, 2010).

1.2.4.3.3 The Independent t-test

The independent group *t*-test analyzes the causative relationship between the independent and dependent variable which is measured on both groups (Coolidge, 2000). Like the two test mentioned earlier, this test was also conducted through SPSS 16.0 for Windows. There were three steps in conducting this test which consisted of (1) stating the hypothesis, setting the alpha level and determining the t_{crit}, (2) computing and analyzing the scores of both groups, and (3) interpreting the output (named *t* value or t_{obt}) by comparing it to the fixed alpha level. The alpha level was set at 0.05 and the hypothesis was stated as the following:

- H_0 = the two samples are from the same population and there is no significant difference between both.
- H_A = the two samples are from the same population but there is a significant difference between both.

In interpreting the output of this test, the same rules as in the previous test also apply. If the t_{obt} is equal to or greater than the t_{crit} ($p \geq 0.05$), the null hypothesis will not be retained as there is significant difference between the experimental and control group. On the other hand, if the t_{obt} is lower than the t_{crit} ($p < 0.05$), the null

hypothesis will be retained and it can be said that the difference between both groups does not exist (Setyaningsih, 2010).

1.2.4.3.4 The Dependent t-test

To gain the evidence of the significant difference between the score of experimental group in both pre-test and post-test, the dependent *t*-test was conducted. In computing this test, SPSS 16.0 for Windows was used once more. Three steps were taken in conducting this test including (1) stating the hypothesis, setting the alpha level and determining the t_{crit}, (2) computing and analyzing the scores of both groups, and (3) interpreting the output (named *t* value or t_{obt}) by comparing it to the fixed alpha level. The alpha level was set at 0.05 and the hypothesis was stated as the following:

- H_0 = there is no significant difference between pre-test and post-test score of students in experimental group
- H_A = there is significant difference between pre-test and post-test score of students in experimental group

To interpret the output of this test, the following rules applied. If the t_{obt} is equal to or greater than the t_{crit} ($p \geq 0.05$), the null hypothesis will not be retained as there is significant difference between pre-test and post-test score of students in experimental group. On the contrary, if the t_{obt} is lower than the t_{crit} ($p < 0.05$), the null hypothesis will be retained and it can be said that there is no significant

difference between pre-test and post-test score of students in experimental group (Setyaningsih, 2010).

1.2.4.3.5 The Calculation of Effect Size

In case there is significant difference between pre-test and post-test score of students in experimental group, the calculation of effect size will be conducted to find out the extent of influence of the independent variable on the dependent one (Coolidge, 2000). The formula for the calculation is presented below:

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

Note:

r = effect size

t = t_{obt} from the independent t-test

df = degree of freedom (*N*1 + *N*2 - 2)

After the *r* value has been found out, it is then compared to the scale of effect size in order to determine if it can be classified into small, medium, or large effect category. The effect size scale is depicted in the following table.

Table 3.2
The Scale of Effect Size (Coolidge, 2000)

Effect Size	*r* value
Small	0.100
Medium	0.243
Large	0.371

1.2.4.4 Data Analysis on the Interview

The interviews which are administered to students from experimental group are all taped. The tape is then transcribed, labeled and coded according to students' answer. Next, the answers are classified into several categories and also analyzed until the trends are recognized. Finally they become the basis for explanation in attempt to answer the second research question. The detailed transcription of the interview is inserted in Appendix B.