CHAPTER III

RESEARCH METHODOLOGY

In the previous chapter, the related theories supporting the study have been briefly explained. For this chapter, the research methodology related to the study will be explained. This chapter covers the research method, research hypothesis, data collection, research procedure, scoring rubric and data analysis which covers students' writing task analysis, data analysis on the pretest (t-test), and data analysis in the posttest (t-test).

3.1 Research Method

In order to get empirical data, quasi experimental design used in this study was aimed at investigating the use of series of pictures in teaching procedure text. The quasi experimental design was also used in the study because it enabled to undertake the study with groups that were intact class. Since the research design was a quasi experimental design, there were two groups taken as the investigated groups in the study. The first group was the experimental group, which was treated by using series of pictures, while the second group was the control group,

which received a single picture. Then, the study used quasi experimental design which the pretest and posttest nonequivalent-groups design was conducted. The design below is adapted from Hatch and Farhady (1982:21):

Table 3.1

Experimental Design

Groups	Pretest	Treatment	Posttest
Experimental	T_1E	X	T_2E
Control	T_1C	-	T_2C

Where

T_1E : students' writing scores of the experimental group on pretest

T_1C : students' writing scores of the control group on the pretest

X : the treatments using series of pictures

T_2E : students' writing scores of the experimental group on posttest

T_2C : students' writing scores of the experimental group on posttest

The table above shows that both groups were given pretest and posttest, but they received different treatments. Series of pictures as treatment was only administered in the experimental group while a single picture was administered in the control group. The purpose of the study was to find out whether the students who were given treatment by series of pictures could achieve a higher score than those students who were given a single picture.

3.1.1 Variables

There were two variables which were investigated in this quasi experimental research namely an independent variable and a dependent variable. An independent variable is the variable which influences dependent variable; meanwhile a dependent variable is the variable that will be affected by independent variable (Coolidge, 2000: 15). Based on the explanation above, series of pictures will be the independent variable which is the major variable to be investigated. Since it is the major variable, it is selected, manipulated, and measured by the researcher. On the other hand, students' procedure text writing ability will be dependent variable (the variable which is observed and measured to determine the effect of the independent variable).

3.2 Research Hypothesis

In conducting study, hypothesis is one of important aspects because hypothesis is defined as prediction or temporary answer of the research problems. According to Hatch and Farhady (1982:85-86), hypothesis can be considered as the tentative statement about the outcome of the research. Then, this study takes null hypotheses and alternative hypothesis. The null hypothesis states that there is no significant difference between the posttest mean of control and experimental groups after the treatments. Then, the alternative hypothesis states that there is significant difference between the posttest mean of control and experimental groups after the treatments. The formula are stated below:

$$H_0 : \mu \text{ control} = \mu \text{ experiment}$$

$H_{a:} \mu \text{ control} \neq \mu \text{ experiment}$

3.3 Data Collection

The term "data" refers to the types of information researcher obtains on the subjects of his/her research (Fraenkel and Wallen, 2007:112). The primary data in this study were obtained from students in the first grade of junior high school. Then, data collection in this study included population, sample, and research instrument.

3.3.1 Population

Population is all members of a group about which you want to draw a conclusion (Levine and Stephen, 2005: 5). Based on the definition, the population of this study was the first grade students of SMP in Bandung. The first grader of one of SMPN in Bandung consisted of ten classes in which the total population was about 400.

The choice of population was based on the consideration that procedure text is taught in first grade in junior high school, especially in the second semester. Besides, the study was conducted in one of the SMP in Bandung. The place was chosen because this SMP was the place where the researcher did PLP

program. PLP program is a program for students in Indonesia University of Education to practice teaching in school.

3.3.2 Sample

The number of population was so large that it could not be accessed. In this case, the study was conducted to a part of the whole population. This part must have the characteristics that represent the whole population. According to Coolidge (2000: 24), sample is a smaller group of scores selected from the population of scores. In selecting sample, two classes were used in this study. The first class consisted of students of VII.10 which acted as experimental group who received experimental treatments, and the other class, consisted of students of VII.7 in control group which did not receive any experimental treatments. The reasons why these two classes were chosen because some considerations including the groups were chosen by teacher which PLP is done, procedure text is taught in seventh graders of junior high school, the two groups have the same number of students (40 students), the groups were chosen by teacher's judgment which explain that both groups are homogenous, and the sample has not given any treatment of series of pictures in writing procedure text. To anticipate the absence of some students during the study, the researcher only took 35 students from each class as the sample. Thus, the fix number of the sample was 70 students.

3.3.3 Research Instrument

To obtain the data, an instrument was needed to be involved. According to Fraenkel and Wallen (2007), instrumentation is as the whole process of collecting data in a research. Then, this study employed an instrument to gain data to be analyzed which was writing tests. Writing tests consisted of pretest and posttest which were given in the form of written test. Pretest was administered in both groups to describe the similarity in terms of writing ability of experimental and control groups before conducting the treatments. Then, in the posttest, the test was carried out to examine whether there was significant difference of students' writing in the two groups' skill after one of the groups was given the treatments. The posttest was administered to find out whether the use of series of pictures in teaching writing procedure text was effective or not.

Moreover, the score of students' writing tests was used to know the use and the extent of series of pictures in improving students' writing procedure text. They were collected through writing tests, pretest and posttest which were conducted to both experimental and control groups. To assess the students' writing, the researcher analyzed by using the scoring sheet by Rose (2007, as cited in Emilia, 2011) which is presented in appendix.

3.4 Research Procedure

The research was conducted from May 3rd 2011 to June 2nd 2011. The researcher arranged some procedures to make the study well organized. The steps

of conducting research were as follow. First was a plan for doing pretest, posttest, and lesson plan. Second, trying out the instrument to test its validity and reliability. Third, giving pretest to both experimental and control group. Fourth, giving the sample treatment, teaching them writing procedure text through series of pictures for experimental and single picture for control group. The last, giving posttest to both groups whether both groups got different result or not.

3.4.1 Planning

Planning is one of important works in a study because it can be a standard to do study. In order for study to run well, there were some procedures which were applied in planning. First was preparing the instrument for the pretest and posttest. The written test as instrument was used in the pretest and posttest. There were three topics in this instrument which are “how to make a cup of sweet tea”, “how to serve an instant noodle”, and “how to print document”. The reason of choosing three topics because it avoided noisy class after students finished their work.

Second, before conducting pretest and posttest, the instrument was tried to the students excluding the sample of the study. After trying out the instrument, the validity and reliability of instrument were calculated. Then, the result of calculation would be a standard topic to make lesson plan. In order to make a well-established experiment, Lesson plan was made. The activities in the lesson plan were based on the Genre-Based Approach which includes building

knowledge of field, modeling of text, joint construction of text, and independent construction of text. For detailed explanation about Genre-Based Approach, it can be seen in chapter 2. The example of lesson plan would be shown below and this is a simple lesson plan which is adapted from Brown (2000). The following is an example of lesson plan in experimental and control groups.

Table 3.2

Lesson plan of experimental and control groups

Description	Lesson Plan of experimental Group	Lesson plan of control group
Objectives	• Students are able to identify rhetoric stages in procedure text by using series of pictures. • Students are able to understand what procedure text is. • Students are able to arrange a jumble paragraph based on series of pictures given.	• Students are able to identify rhetoric stages in procedure text by using series of pictures. • Students are able to understand what procedure text is. • Students are able to arrange a jumble paragraph based on series of pictures given.
Materials and equipments:	• Some samples of procedure text. • Series of pictures, white board, textbook, board marker, and handout.	• Some samples of procedure text. • Single picture, white board, textbook, board marker, and handout.
Procedure		
Pre activity	• Greetings and praying. • Check attendance list • Brainstorming and apperception.	• Greetings and praying. • Check attendance list. • Brainstorming and apperception.

Main activity **BKOF**	• Teacher shows series of pictures about how to make a drink. Then, students are asked to identify the pictures. For example: look at this picture! Can you guess what is it?. • After that, Teacher give explanation about what happen in the series of pictures and teachers also write a procedure text which is related to series of pictures by discussing with the students. • Students are asked to answer some questions from the teacher.	• Teacher gives a single picture about a drink and asks students what do they know about the single picture. Then, teacher asks some questions. For example, Have you ever gone to the canteen?, What did you buy? • After that, Teacher give explanation about what happen in the single picture and teachers also write a procedure text which is related to single picture by discussing with the students. • Students are asked to answer some questions from the teacher.
MOT	• Teacher gives a procedure text that has been read by teacher and students are asked to read again. • Teacher explains about the generic structures and imperative sentences of procedure text by using series of pictures.	• Teacher gives a procedure text that has been read by teacher and students are asked to read again. • Teacher explains about the generic structures and imperative sentences of procedure text.
JCT	• Teacher asked students to make a group consist of 6 or 7 people and then teacher give different series of pictures to each group. Students are asked to discuss and do the assignment with their group. • After they finished their work, teacher asks a representation of group to write what they have done. • Teacher and students discuss what a representation has written.	• Teacher asked students to make a group consist of 6 or 7 people and students are asked to discuss and do the assignment with their group. • After they finished their work, teacher asks a representation of group to write what they have done. • Teacher and students discuss what a representation has written.
Post-activity	• Teacher and students conclude what they have learnt today. • Students are given opportunities to ask some questions • Teacher gives homework to students. • Closing and praying	• Teacher and students conclude what they have learnt today. • Students are given opportunities to ask some questions • Teacher gives homework to students. • Closing and praying
Evaluation	Written test	Written test

3.4.2 Administering Pilot Test

Pilot test is selecting a good item to measure validity and reliability of the instrument before it was used in the study. Before administrating pilot test to students, the instrument was consulted to the supervisors and teachers of one of junior high schools where the study was conducted to know the appropriateness of the instrument with students' background knowledge. There were two kinds of validity and reliability which were used in this study, they were face and content validity. To test two kinds of validity and reliability, pilot test was administered to 30 students excluding the experimental and control groups. It was also conducted on Thursday, 21st April 2011.

3.4.3 Administrating pretest

After calculating the result of pilot test and finding validity and reliability of the instrument, the pretest was conducted on May 2nd 2011. It was administrated to the experimental and control groups which each groups consists of 35 students. The aim of pretest was to measure students' prior writing skills.

3.4.4 Conducting Treatment

After researcher got the results of pretest and found out that there was no significant different score mean between both experimental and control groups, the researcher gave the treatments to sample of study. The treatments were conducted five meetings for each group in which meeting lasted for 2x40 minutes.

The first meeting was carried out on May 5rd 2011 for both groups. The first topic given was how to make a cup of sweet tea. The main activity focused on discussing what procedure text was. The teacher explained procedure text as a text type and its characteristics. The other activities were giving examples of procedure texts and discussing them with the students. Some students raised several questions dealing with procedure text and its differences between procedure text and descriptive.

The second meeting was conducted on May 12th 2011 for both groups. There were four students (two students of experimental group and two students of control group) were absent on the second meeting. The activity of the second meeting focused on discussing present tense formation and imperative sentences. Many students made mistakes in using verb in the sentences. For instance, “I very hungry” instead of “I am very hungry”.

The third meeting was carried out on May 17th 2011 for both groups. The topic discussed was how to print a document. The main activity in this meeting focused on the way to organize sentences into a good procedure text paragraph. The teacher also explained temporal connectives and the plural noun as the main discussion of the third meeting. There were many students who did not know the

temporal connectives such as first, second, third, next, and finally which are often used in procedure text.

The fourth meeting was conducted on May 19th 2011 for both groups. The theme discussed was how to make instant porridge. The main activity in this meeting was discussing simple present tense and imperative sentences, discussing incorrect sentence that students made, and correcting students' mistakes in making sentences.

The fifth meeting was carried out on May 24th 2011 for both groups. This was the last meeting before the posttest was given in which the teacher reviewed the whole four meetings before. The activity on this meeting was dominated by the teacher to ask the students everything they had not clear yet about procedure text, present tense, imperative sentences, temporal connectives, and the difficulties that the students faced after they were treated four meetings. The teacher also gave more procedure text as examples to be discussed again to lead them to reach a conclusion the procedure text.

Moreover, all cycle of writing process by Harmer (2005) including preparation, drafting, and editing appear in each meeting of the teaching and learning process. Limitation of time and approval of study is the reasons why all cycle of writing is integrated in each meeting. For example, the teacher prepared students to make a draft by giving vocabulary and making sentences. After that, the students make a text based on the sentences that they have written. Finally, the students and the teacher discussed it to know the mistakes. Besides, the only

difference between two groups was the media given to the students. The treatments using series of pictures was given in the experimental group, while a single pictures as medium was given to control group. Moreover, the researcher employed four stages in teaching as proposed in GBA the researcher discussed in chapter 2. The steps were building of knowledge, modeling of text, joint construction of text, and independent construction of text.

3.4.5 Administering Posttest

Posttest was conducted after whole treatments had been given to both groups. It was conducted on June 2nd 2011 for experimental and control groups where each groups consisted of 35 students. The text in posttest was the same as the pretest and posttest was conducted to measure the students' writing skill after the treatments.

Table 3.3

Schedule of the Study

No	Experimental Group (Using series of pictures)		Control Group (conventional teaching)	
	Date	**Material**	**Date**	**Material**
Pilot test on April, 21st 2011 was administered to 35 students outside the experimental and control group.				
1	May, 3rd 2011	Pretest	May, 3rd 2011	Pretest
2	May, 5th 2011	Topic: how to make a cup of coffee.	May, 5th 2011	Topic: how to make a cup of coffee
3	May, 12th 2011	Topic: how to make instant noodle	May, 12th 2011	Topic: how to make instant noodle
4	May, 17th 2011	Topic: how to print document	May, 17th 2011	Topic: how to print document
5	May, 19th 2011	Topic: how to make instant porridge	May, 19th 2011	Topic: how to make instant porridge
6	May, 24th	Review: materials that have	May, 24th 2011	Review: materials that have

	2011	been taught		been taught
7	June, 2nd 2011	Posttest	June, 2nd 2011	Posttest

3.5 Scoring Rubric

In this study, the collected data from pretest and posttest would be analyzed by scoring sheet because tests were in the form of written test document. The criteria of scoring sheet in this study were developed by Rose (2007, as cited in Emilia, 2011) to measure the results of pretest and posttest. The adapted scoring sheet consists of five aspects; those were genre, register, discourse, grammar and graphic features. For further detail, it can be seen in the appendix D.

3.6 Data Analysis

The data collected by the means of the test instrument was analyzed differently based on specific purposes. In this case, there were three kinds of analyses was carried out. First is test instrument analysis. It was used to know the validity and reliability of the instrument. Second, pretest and posttest analysis which was used to measure the normality distribution, homogeneity of variance and t-test. Third, index gain which was used to know the improvement of the experimental group. From the detailed explanation, it can be seen below.

3.6.1 Test instrument analysis

3.6.1.1 Validity

The data obtained in pilot test were analyzed to investigate face validity and content validity. In the pilot test, the instruction contained in the pretest and posttest items was found to be understandable and clear enough. Therefore, it was proven that the test items had face validity. After the pilot test, the students' works were examined to check whether or not the content validity had been possessed.

3.6.1.2 Reliability

Furthermore, it is also important to investigate the reliability of the test instrument. Hatch and Farhady (1982:224) define reliability as the extent to which a test produces consistent result when administered under similar condition. A test can be accepted as reliable test if it can be a consistent test to obtain scores. Finally, Cronbach's Alpha formula in SPSS 17.0 for windows program is used to compute the reliability of instruments. The criteria for the reliability test can be seen in the following table:

Table 3.4

Coefficient reliability

Coefficient reliability	**Interpretation**
0.00-0.19	Very low
0.20-0.39	Low
0.40-0.59	Moderate
0.60-0.79	High
0.80-1.0	Very high

(Arikunto, 2006:276)

3.6.2 Pretest and Posttest data analysis

After the pretest on both groups were held, the next step was analyzing the output data. According to Fraenkel and Wallen (2007), the output data were analyzed using independent t-test to determine whether there was a significant difference between the means of two independent samples. Before performing in t-test, the output data of pretest should fulfill the criteria underlying t-test as stated in Coolidge (2000) as follows.

1. The data should have a normal distribution.

2. The variance of the two groups must be homogenous.

3. The participant must be different in each group.

For the reason, normality distribution test, variance homogeneity test, and independent t-test were performed before calculating the data by using t-test formula. Moreover, if the data do not fulfill the criteria above, the data is not normal distribution. So, the *Mann-Whitney* test will be operated to test the hypothesis.

3.6.2.1 Normality Distribution Test

One-Sample-Kolmogorov-sminov test in SPPS version 17.0 was used to analyze the normal distribution. It was aimed at finding out whether or not the distributions of pretest and posttest score in the two groups were normally distributed. In this case, the result of the normality distribution was also used to find out whether or not the hypothesis that had been determined was accepted.

The first step in calculating the normality distribution test stated that hypothesis:

H_0: the scores of the experimental and the control groups are normally distributed.

$H_{1:}$ the scores of the experimental and the control groups are not normally distributed.

The second step in calculating the normality distribution test is to determine the significance level in the level α=0.05. The level significance criterion for normality distribution states that if the probability > 0.05, H_0 is accepted. Whereas if the probability < 0.05, H_0 is rejected (Hatch & Farhady, 1982:88). As a result, If the probability is more than the level of significance (0.05), the null hypothesis is accepted and the score are normally distributed.

3.6.2.2 Variance Homogeneity Test

After knowing that the pretest and posttest were normally distributed, the next step was to analyze its homogeneity. To examine whether the data are

homogenous or not, test of homogeneity of variance using Levene's test for equality of variance in SPSS version 17.0 was used.

The first step in calculating the variance homogeneity test stated that hypothesis:

H_0: the scores of both experimental and control groups are homogenous.

H_1: the scores of both experimental and control groups are not homogenous.

The second step is to determine the significance level in the level α=0.05. The level significance criterion for homogeneity test states that if the probability > 0.05, then H_0 is accepted. Whereas if the probability < 0.05, H_0 is rejected (Hatch &Farhady, 1982:88).

Moreover, if the data do not have normal distribution, the *Mann-Whitney* test will be operated to test the hypothesis. The writer also used SPSS 17.0 to calculate the result.

3.6.2.3 t-test Computation

3.6.2.3.1 Independent t-test

Independent t-test is used to analyze a causative relationship between the independent variable (treatment) and the dependent variable that measure on both groups (Coolidge, 2000).

Therefore, after the data had been proven as a normal distribution, the data were calculated using independent t-test. The independent t-test was analyzed using SPSS version 17.0 for windows. According to Kranzler & Moursund (1999:94), the level of significance used in independent t-test is 0.05. The criterion stated to determine t-test is if t_{obt} is lower than t_{crit}, H_0 is accepted and there is no significant difference between both of groups in the pretest mean. Whereas, if t_{obt} is higher than t_{crit}, the result is statistically significant difference in the pretest means of two groups and H_0 is rejected.

3.6.2.3.2 Dependent t-test

Dependent t-test was calculated certify that there is a significant difference between the pretest and posttest scores in each group. According to Coolidge (2000), dependent t-test is used to analyzed the difference between two groups' means in experimental design where in both groups are related to each other in some way.

In this study, the dependent sample test was analyzed using computation with SPSS version 17.0 for windows by comparing the significance value with the level of significance to test the hypothesis. If the significance value is more than or equal to the level of significance (0.05), the null hypothesis is accepted and it will be concluded that there is no significance differences between the two means. On the other hand, if the significance value is less than the level of significance (0.05), the null hypothesis is rejected and it will be concluded that the mean is significantly different from the other mean.

3.6.2.4 The Calculation of Effect Size

The effect size refers to the effect of independent variable upon the dependent variable (Coolidge, 2000:151). The calculation of effect size was conducted to measure how well the treatment worked. For instance, if the difference between the two groups' mean is large, there is said to be a large effect size; if the difference between the two groups' mean is small, there is said to be a small effect size.

In order to determine the effect size in the independent t-test, a correlation coefficient of effect size can be derived as follows:

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

Where:

r = effect size

t = t_{obt} or t_{value} from the calculation of independent t-test (post-test score)

df = degree of freedom

To interpret the computational result, the following scale was use as guidance in determining the effect size on dependent variable.

Table 3.5

The effect size scale by Coolidge (2000)

Effect size	*r* value

Small	.100
Medium	.243
Large	.371

3.6.2.5 The Calculation of Index Gain

Index gain was calculated to answer the second research question in this study as to what extent series of pictures improves students' writing abilities in the experimental group. It is also used to investigate the improvement of students' writing score between pretest and posttest. In addition, the gain of each aspect of writing skills were calculated with the formula below:

$$g = \frac{post\ test\ score - pre\ test\ score}{maximum\ score - pre\ test\ score}$$

(Hake, 1999)

Then, the index gain was interpreted by using the following criteria:

Index gain < 0.3 = low-gain.

0.7 > Index gain > 0.3 = medium-gain.

Index gain > 0.7 = high-gain.

(Hake, 1999)

Having calculated index gain, there were two examples of students' hand writing from experimental and control groups. In this part, analysis texts was conducted to answer the second research question. The analysis of texts was based on the scoring technique by Rose (2007, cited in Emilia, 2011). There were some aspects of scoring in this text analysis which are genre, register, and discourse,

grammar aspectt. By using those aspects, students' hand writing texts were analyzed whether those texts contained all aspects in scoring technique of writing.