

## CHAPTER III

### RESEARCH METHODS

This chapter elaborates the method of the research to answer the two research questions stated in chapter one. It deals with research design, population and sample, data collecting instrument, and data processing.

#### 3.1 Research Design

The present research adopted experimental study, particularly quasi experiment with pretest and posttest. The researcher used quasi experimental design because in employing the devise, the researcher considered the feasibility of the research conducted which were limited time and access. Besides, true experimental design was not feasible to conduct since it requires a huge samples and time (Fraenkel & Wallen, 1990:237). Another experts' statement (Hatch and Farhady, 1982) argue that quasi experimental designs are practical compromises between true experimentation and the nature of human language behavior which the researcher wish to investigate. Furthermore, the following table is the formula used in the research:

**Table 3.1**  
**Pretest Posttest Group Design**

<b>Group</b>	<b>Pretest</b>	<b>Treatment</b>	<b>Posttest</b>
Experimental group (A)	√	X <sub>1</sub> , X <sub>2</sub> , X <sub>3</sub> , X <sub>4</sub>	√
Control group (B)	√	-, -, -, -	√

→ Time

- Note : (Fraenkel and Wallen, 1990)
- A √ : Pretest/posttest of the experimental group
  - X : Treatment for the experimental group
  - B √ : Pretest/posttest for control group

Based on the formula above, there were six meetings administered in this research; four meetings were for the treatments to the experimental group in which the pictures were applied as the teaching material and the other two meetings were for pretest, and posttest to the both experimental and control groups. Different from the teaching material in the experimental group, the control group's teaching materials were adapted from an available textbook. The pictures used as the treatments in experimental group consisted of five types of pictures namely flash card, cross word, posters, pic-word, and domino. Furthermore, the aim of the treatments was to improve the students' reading comprehension.

### **3.2 Population and Sample**

As reported in the first chapter, the population in this study was all of the students in one of junior high school in Bandung. Among the eight classes, the researcher selected two classes (VII A and VII B) as the sample by using purposive technique sampling. Some factors which were taken into consideration of choosing the junior high school level were: the descriptive text is included in junior high school curriculum and is delivered to seventh graders; the students were in the same grade; and most of them learn English only at school.

### **3.3 Data Collection: Research Procedures and Instruments**

There were procedures and instruments which were applied in this research in order to reveal important data in answering the research questions. Procedures of the research and instruments in acquiring the data are explained below:

#### **3.3.1 Procedures of the research**

To reveal the data for the research, the following steps were taken; preparing and creating teaching materials, and conducting pretest and posttest for both the experimental and control groups.

The researcher prepared the lesson plan related to descriptive text. It dealt with the selection of appropriate topics for reading during the treatments. In addition, the researcher also conducted the procedures by considering the time allotment, students' condition, and availability of teaching facilities. This stage was necessary to

provide guidelines for the teacher in doing treatments to the experimental group as well as to teach the control group.

The next steps was giving a pilot test to other class aside from the control and experimental groups to find the validity, discrimination, level of difficulty and reliability of the instruments. The pilot test result, then analyzed to reveal whether the pretest had reached both its validity and reliability to be administered to the sample groups. Giving the pretest to the sample groups was aimed to bare their equity in reading before giving the treatments. The tests given to both groups consist of multiple choice questions. Pretest itself was conducted to decide the sample becomes the experimental and control groups. After performing the pretest, the researcher conducted the treatments in experimental group, while control group received materials from available textbook. The treatments were accomplished in four times.

Similar to pretest, the posttest was administered in form of multiple choice questions after the treatments were completely conducted in experimental group. The score of posttest would be used as the final comparison to see whether the difference emerged between students' achievement in experimental and control group. After conducting the posttest, questionnaire and interview were conducted to only experimental group's students after posttest performed in that group. The last phase of the research conducted was to draw conclusions based on discussion of the data gained; and to propose some suggestions.

### 3.3.2 Instruments

To collect the data for the research, four kinds of instruments were utilized. They were a pretest, a posttest, a questionnaire, and an interview. In answering the first research question, the pretest was given to both the experimental and control groups. It was held to distinguish the students' equity in reading a descriptive text before administering the treatments. In addition, the pretest scores were used as data in assessing homogeneity variance and normality distribution and also independent t-test. In conducting a pretest, all of the students in experimental and control group were requested to answer multiple choice questions text based on the text given.

Furthermore, the questions in posttest were similar to those in the pretest, the students were asked to answer multiple choice questions. Accordingly, the researcher gave different text with the same level of difficulty to avoid students' answering the text based on remembering the answer instead of knowing the correct answer. However, the score of the posttest would be used as the final stage of comparison to see whether there were differences between students' achievement in experimental group and those in control group.

In answering the second research question, a set of questionnaire was given to each student to find their opinions about the benefits of pictures in increasing their reading ability. In addition, the criteria of respondents was based on the students' score (three highest achievers, four medium achievers, and three lowest achievers). Furthermore, the researcher described the schedule of the research in the following table:

**Table 3.2**  
**Schedule of the Research**

No.	Experimental Group		Control Group	
	Meeting	Material	Meeting	Material
1.	17 <sup>th</sup> January 2011	Pretest Students have to answer the multiple choice questions	17 <sup>th</sup> January 2011	Pretest Students have to answer the multiple choice questions
2.	19 <sup>th</sup> January 2011	Introduction descriptive text, the generic feature, language features: simple present tense then answer the question based on text	18 <sup>th</sup> January 2011	The generic structure in a descriptive text
3.	20 <sup>th</sup> January 2011	Describing an animal with visual color, shape and characteristic, language features : the use of linking verbs, then answering the question (identify singular and plural using flashcard)	19 <sup>th</sup> January 2011	Read aloud a text about animals and answering the questions (Guessing singular and plural using text)
4.	24 <sup>th</sup> January 2011	Describing physical characteristic of someone with pictures and a some text helper, flash card, crossword, language features the use of adjective, then read aloud the text	24 <sup>th</sup> January	Describing physical characteristic of someone with text
5.	26 <sup>th</sup> January 2011	Describing someone to identify degree comparison using domino pictures	25 <sup>th</sup> January 2011	Read aloud a text about present tense (have, has, am, is)
6.	27 <sup>st</sup> January 2011	Review, Posttest and administering questioner	26 <sup>th</sup> January 2011	Review and Posttest

### 3.4 Data Analysis

#### 3.4.1 Data Analysis on Pilot Test

The pretest instrument was carried out to thirty students which are neither the control nor experimental groups. The aim was to analyze the validity, discrimination, level of difficulty, and reliability of instrument. The following is a description of the pilot test instrument:

- Validity

McMillan and Schumacher (2001), as cited in Ramayanti (2010), define validity as the extent to which inferences and uses made on the basis of scores from an instrument are reasonable and appropriate. In line with them, Moskal and John (2000: 2) state that “Validation is the process of accumulating evidence that supports the appropriateness of the inferences that are made of student responses for specified assessment use.”

The data were calculated by SPSS 17 for windows. The criteria for the validity test were as follows:

**Table 3.3**  
**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)

- Level of Difficulty

The difficulty of test analysis is based on assumption that a good item should not be too difficult nor too easy (Arikunto, 2008 cited in Purbasari 2009). Then, in the test itself, test instrument can be accepted as a good test if it is not too easy nor too difficult for the population of whom the test will be assigned. However, the item value around 0.3 to 0.7 is acceptable, while 0.5 is

considered to be ideal (Henning, 1987:50 cited in Fulcher and Davidson, 2007). The following formula is used to calculate the index of difficulty in each item.

$$FV = R/N$$

Where:

- FV = Facility/ Index of difficulty  
R = The number of correct answer  
N = The number of students taking the test

(Heaton, 1955:178)

- Discrimination

The formula of discrimination was calculated manually. The formula was presented as follows:

$$D = \frac{\text{Correct } U - \text{Correct } L}{n}$$

(Heaton, 1995: 179)

Where:

- D = Discrimination Index  
U = Upper half  
L = Lower half  
n = Number of students in one group;  $n = \frac{1}{2} N$   
N = The number of students taking the test

Moreover, 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

Based on Moskal and Johns' (2000) finding, reliability refers to the consistency of assessment scores. The purpose of reliability according to Anderson et al. (1975: 325) is "a reliable measure in one that provides consistent and stable indication of the characteristic being investigated".

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. An alpha of 0.7 is normally considered to indicate a reliable set of item.

#### **3.4.2 Data Analysis on Pretest**

The pretest scores were assessed statistically by using SPSS 17. The calculation counts normality distribution, homogeneity variance, and t-test. In detail, the data analysis is presented below:

- Normality

The statistical calculation of normality test used Kolmogorov-Smirnov in SPSS 17. There are several steps below in order to see whether the continuous data are distributed normally:

- ✓ Setting the level of significance ( $p$ ) at 0.05 and establishing the hypotheses as follow:

Ho: the variances of experimental and control group are normally distributed.

- ✓ Analyzing the normality distribution with Kolmogorov-Smirnov test.
- ✓ Comparing the Asymp.sig with the level of significance ( $p$ ) to test the hypothesis. If Asymp. Sig  $> 0.05$ , the null hypothesis is not rejected which means the distribution of data is normal. In contrast, if Asymp. Sig  $< 0.05$ , the hypothesis is rejected which means the data is not normal (Field, 2005).

- Homogeneity Variance

After calculating the normality, the homogeneity of variance test was calculated used a SPSS 17 namely Levene test. The steps are as follows:

- ✓ Setting the level of significance ( $p$ ) at 0.05 and establishing the alternative hypotheses as follow:

Ho: the variances of experimental and control group are normally distributed.

- ✓ Analyzing the homogeneity of variance by using Levene test.
- ✓ Comparing the Asymp.sig with the level of significance to test the hypothesis. if Asymp.Sig  $> 0.05$ , the null hypothesis is not rejected which means the variance data of two groups are equal. It suggests that the variances of data are homogenous. In contrary, If Asymp.Sig  $< 0.05$ , null hypothesis is rejected which means the two groups are not equal. It clarifies that the variances are significantly different (Field, 2005).

- Independent t-test

After finding the result of normality and homogeneity test, the next statistical computation namely independent t-test was conducted. These are the procedures to follow in calculating the independent t-test of pretest and posttest data:

- ✓ Setting the level of significance ( $p$ ) at 0.05 and resolving the alternative hypothesis for the pretest and posttest data analysis. The hypothesis is stated as bellow:

Ho: the variances of experimental and control group are normally distributed.

- ✓ Analyzing the independent t-test by using SPSS 17.
- ✓ Comparing the  $t_{obt}$  and  $t_{crit}$  at  $p = 0.05$  and  $df^* = 58$  to examine the hypothesis. If  $t_{obt} < t_{crit}$ , it means that the null hypothesis is not rejected. It explains that there is difference of means between experimental and control group. In contrary, If  $t_{obt}^* > t_{crit}^*$ , the null hypothesis is rejected. It declares that there is no difference of means between experimental and control group (Coolidge, 2000).

<sup>\*)</sup>  $t_{obt}$ : the value of t obtained through the data.  $t_{crit}$ : to find out whether the  $t_{obt}$  is statistically significant. It is determined by  $df$  and by selected level of significant (see in Apendix).  $df$ : degrees of freedom ( $df = n_1 + n_2 - 2 = 30 + 30 - 2 = 58$ ).

### 3.4.3 Data Analysis on Posttest

Data analysis on posttest was applied with exactly the same steps as in the pretest data analysis which is included normality test, homogeneity test, and independent t-test. In addition, the dependent t-test was also calculated to certify that there is a significant difference between the pretest and posttest score in each group. Furthermore, effect size is used to determine how significant the impact of the treatments to the experimental group's score. It intends to measure in what extend the effect of independent variable on dependent variable (Coolidge, 2000). It is calculated manually without the assistance of SPSS. The formula for calculating the effect size is as follow:

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

Where:

- r* : Effect size  
*t* : Independent t-test value  
*df* : Degree of freedom (the amount of samples minus by 2 ( $df = N-2$ )).

After obtaining the *r* value, its effect size is analyzed by using the following scale:

**Table 3.4**  
**Effect Size Scale**

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

Coolidge (2000)

### 3.4.4 Data Analysis on Questionnaire

The administering of the questionnaire was aimed to answer the second question and to find out the students' opinions of the pictures in increasing their reading ability. In this case, the result of questionnaire was presented in table to show the comparison among each student's response. Moreover, the formula for counting students' answer in questionnaire is in the form of percentage as follows:

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

Where:

P : Percentage

F<sub>o</sub> : amount of each response for certain question

n : amount of all response for certain question

Afterward, the next chapter will explore the findings and discussions of the research.