CHAPTER III

RESEARCH METHODOLOGY

Chapter III 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.

3.1 Research Design

The present study applied quantitative method in the forms of quasi-experimental design. The researcher used quasi-experimental design because it was not feasible to use random selection. It is supported by Fraenkel and Wallen, (1993:241) who believe that quasi-experimental designs do not include the use of random assignment. In addition as suggested by Hatch and Farhady (1982:23) in classroom research, it is unreasonable to expect that we can ask a teacher of courses to randomly assign students to classes for the benefit of our research.

Furthermore, quasi-experimental was designed since the aims of the study were to find out the improvement of K-W-L as teaching technique in reading descriptive text to students' reading comprehension and students' responses towards the use of K-W-L technique in teaching reading descriptive text.

In this study, quasi-experimental research design used pre-test and post-test design. The following table is the formula used in the study:

Table 3.1
The Quasi-Experimental Design

Group	Pre-test	Treatment	Post-test
Experimental	Xe 1	T	Xe 2
Control	Xc 1	O	Xc 2

Where :

Xe 1 : Students' reading scores of experimental group on pre-test

Xc 1 : Students' reading scores of control group on pre-test

T : K-W-L treatment

O : Non- K-W-L treatment

Xe 2 : Students' reading scores of experimental group on post-test

Xc 2 : Students' reading scores of control group on post-test

The table shows that this study involves two groups of subjects, an experimental groups and a control group. The experimental group receives a treatment, while the control group receives non K-W-L treatment. In addition, as suggested by Hatch and Farhady (1982:18) a control group refers to a group of students whose selection and experiences are exactly the same as the experimental group except that they do not receive the experimental treatment. However the control group is important in experimental research. As suggested by Fraenkel & Wallen, (1993), the control group is important in all experimental research to determine whether the treatment has an effect or more effective than another.

3.1.1 Variable

A variable is an attribute of a person or an object which varies from person to person or object to object (Hatch and Farhady, 1982). In research, variable can be classified as independent and dependent variables. The independent variable is the treatment or manipulated variables, while the dependent variable is the criterion or outcome variable depend on what the independent variable affects it (Fraenkel & Wallen, 1993:50). Independent variable of the study is K-W-L technique and the dependent variable is students' reading comprehension of descriptive text.

3.1.2 Hypothesis

A hypothesis is a prediction of several kinds of possible results of a research (Fraenkel & Wallen, 1993:51). However, the null hypothesis (Ho) in this study is there is no difference of the improvement students' reading comprehension between students who used K-W-L technique and those who did not.

The null hypothesis (Ho) is formulated as follow:

$$Ho: \mu \text{ pre-test} = \mu \text{ post-test}$$

Where,

Ho   : there was no difference between reading descriptive text by using K-W-L technique in experimental group and in control group after being given the treatment.

μ Pre-test   : score of pre-test

μ Post-test   : score of post-test

3.2 Clarification of Terms

In this study, there were some terms that need to be clarified in order to avoid misunderstanding. Some terms are clarified:

a.   K-W-L

K-W-L is a teaching technique that helps students develop tactical ways to learn new material with the use of questioning and accessing information from reliable source (Ogle, 1986).

b.   Reading Comprehension

Reading comprehension is primarily a matter of developing appropriate efficient comprehension strategies for the majority of second language learners who are already literate in their native language (Brown, 2001).

c.   Descriptive text

Descriptive is a text that describes a particular person or thing (Sudarwati and Grace 2007).

3.3 Data Collection

3.3.1 Population and Sample

Fraenkel & Wallen (1993:78) said that population is the group which is intended to apply in a research, while a sample is a group in a research study which is aim to collect information. Since quasi-experimental design does not include random selection of subjects. As suggested by Fraenkel and Wallen (1990: 242) that quasi-experimental designs do not include the use of random assignments. Thus, the sample of this study was chosen purposively, based on the same number of students. As according to Fraenkel & Wallen (1993:88) that

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purposive sampling is used base on their judgment to select a sample which they believe, prior information, and then provide the data they need.

The population in this study was first grade students of a senior high school in Bandung, whereas the samples were only two classes, namely X-7 as the experimental group and X-6 as the control group. Both classes consist of thirty students. However, not all of the students of class become the sample of the research. Because it was due to the fact that some students were absent when the pre-test and post-test was held. As the result, there are 30 students became the sample of this study from each class.

3.3.2 Research instruments

Research instruments are media used by researchers in collecting data (Arikunto, 1996: 136). The data were collected to answer research questions of a study. As supported by Fraenkel & Wallen (1993:100) data is presented several types of instruments that can be used to collect data in study.

There were three kinds of research instruments used in this study, namely pre-test, post-test, and questionnaire. The pre-test and post-test were conducted to generate scores that were analyzed to find out whether or not K-W-L technique is improve the students' reading comprehension in teaching reading descriptive text. The pre-test was conducted to both experimental and control group before the treatment, in order to measure students' first ability of reading descriptive texts. Moreover, the post-test was conducted to both groups after the treatment, in order to see whether or not there is a change on students' ability of reading descriptive

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texts. After the post-test, questionnaire was also conducted to several students in experimental group.

Furthermore, the questionnaire is aimed to find out the students' responses of K-W-L technique. Arikunto (2002) explains that questionnaire is a number of written questions used to obtain information from respondents in the form of statements about themselves or things that they know. The questionnaire consisted of eleven open-ended questions exploring students' opinions about teaching reading descriptive text using K-W-L technique. The respondents of the questionnaire are selected from the experimental group.

3.4 Research Procedure

3.4.1 Organizing Teaching Procedure

In organizing teaching procedure, the researcher served as the teacher and facilitator for both experimental and control groups. The teaching procedure was organized through two steps. The first step was preparing appropriate materials for the teaching and learning processes during the treatment. The second step was organizing teaching procedure in experimental and control groups. The teaching procedure in experimental group used K-W-L technique and in control group used the conventional method.

3.4.2 Administering Pilot-test

Before pre-test and post-test, pilot-test was adiministered. The purpose of administering pilot-test was to measure the validity and reliability of the instrument. The pilot-test was administered in other classes which were not

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involved in the study as the control group and the experimental group. The pilot-test was conducted on April, 25, 2011. The pilot-test was administered to class X-8 of a senior high school in Bandung.

The pilot-test was used to find out whether the instruments were suitable for further usage in the study. The pilot-test consists of 50 items; all of questions are multiple choices type. The questions consist of descriptive text. Afterwards, more analyses were undertaken to check validity, reliability, discriminating power and level of difficulty to ensure that the instrument was usable.

Table 3.2
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 descriptive, 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	• Identifying the generic structures of the text which include theme, place, time, and actor/actress. • Identify type of the text.	2, 5, 6, 10, 13, 14, 16, 47, 48 1
		11.3 Giving response to the meaning and the rhetorical stage in accurately, clearly, and appropriately relates to the environment in the descriptive, recount and narrative	• Identify contents of the text. • Identify the synonyms of the word in a text	3, 12, 18, 19, 20, 25, 26, 27, 29, 46 4, 9, 11, 22, 50

3.4.3 Administering Pre-test to Experimental and Control Group

Administering pre-test to experimental and control group was conducted before conducting the treatment in order to find out students' initial ability of reading descriptive texts.

3.4.4 Conducting the Treatment

The treatment in the form of K-W-L technique only carried out in the experimental group, while the conventional method was carried out in the control group. Although the methods were different, the learning materials and context were approximately similar, as can be seen in the following teaching schedule:

Table 3.3
Schedule of the Study

No.	Experimental Group		Control Group	
	Meeting	Material	Meeting	Material
1.	27th April 2011	Pre-test Students have to answer the multiple choice questions	27th April 2011	Pre-test Students have to answer the multiple choice questions
2.	30th April 2011	Introduction descriptive text, the generic feature: simple present, and introduction K-W-L technique	30th April 2011	Introduction descriptive text and the generic feature: simple present
3.	4th May 2011	Descriptive text: Jatim Park used K-W-L technique, the purpose of the text, language feature: adjective and compound adjective.	4th May 2011	Descriptive text: Jatim Park, the purpose of the text, language feature: adjective and compound adjective.
4.	7th May 2011	Descriptive text: Palembang: A city by a river used K-W-L technique and language features: linking verbs/relating verb	7th May 2011	Descriptive text: Palembang: A city by a river and language features: linking verbs/relating verb

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5.	11th May 2011	Descriptive text: Orange, Indonesia used K-W-L technique and language features: degree of comparison	11th May 2011	Descriptive text: Orange, Indonesia and language features: degree of comparison
6.	14th May 2011	Post-test Students have to answer the multiple choice questions and answer questionnaire	14th May 2011	Post-test Students have to answer the multiple choice questions

3.4.5 Administering Post-test to Experimental and Control Group

After the treatment was given, post-test was administered to both experimental and control groups at the end of the meeting (see Table 3.3) in order to investigate the use of K-W-L technique in teaching reading descriptive texts.

3.4.6 Conducting the Questionnaire

In order to find out the students' responses about teaching reading descriptive text using K-W-L technique, eleven open-ended questions were given to students in experimental group. Arikunto (2002) explains that questionnaire is a number of written questions used to obtain information from respondents in the form of statements about themselves or things that they know. The questionnaires was aimed at supporting the data in gathering more information about the students' responses of using K-W-L technique based on students' point of view which was only administered to the experimental group.

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3.5 Data Analysis

3.5.1 Scoring

The instrument applied in the study 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 this study, the formula proposed by Arikunto (2010) is as follows:

S = R

Where,

S: Score

R: Right answer

3.5.2 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.

3.5.2.1 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. In addition Coolidge (2000: 250) states that validity defined as the extent to which the results of the procedure serve the uses for which they were intended. Pearson product moment can be used to analyze the validity items. The data were calculated by SPSS 17.0 for windows. The criteria for the validity test were as follow:

Table 3.4
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)

3.5.2.2 Level of Difficulty

This study adopted the formula of Heaton (1955:178) as cited in Banu (2010) states that the index of difficulty or facility value of an item illustrates how easy or difficult the certain item established in the test. In addition, the following formula is used to calculate the index of difficulty of an item.

$$FV = {}^R\!/_N$$

FV   = Facility/ Index of difficulty

R   = The number of correct answers

N   = The number of students taking the test

(Heaton, 1955:178)

Table 3.5
Criteria of difficulty Index

Index of Difficulty	Difficulty Degree
0.00 – 0.30	Difficult item
0.30 -0.70	Moderate item
0.70 – 1.00	Easy item

3.5.2.3 Discrimination

The formula of discrimination was calculated manually. The formula was presented as follows (Heaton, 1995: 179):

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

Where:

D   = Discrimination Index

U   = Upper half

L   = Lower half

n   = Number of students in one group; n= ½ N

N   = The number of students taking the test

Table 3.6
Criteria of discrimination index

Discrimination Index	Interpretation
00.00 – 0.20	Poor
0.20 – 0.40	Moderate
0.40 – 0.70	Good
0.70 – 1.00	Excellent

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).

3.5.2.4 Reliability

Hatch and Farhady (1982) stated that reliability is the extent which a test is produced in constant result when administered under similar condition. Another statement come from Arikunto (2002), an instrument is regarded as reliable if it is reliable to collect the data required.

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In this study, the reliability of instrument was measured by Cronbach's alpha formula in SPSS 17.0 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.

3.5.3 Data Analysis on the Pre-test and the Post-test Scores

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) state 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 17.0 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 students' 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

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groups. Then the calculation of effect size was conducted by using t_{obt} from the independent sample t-test of posttest.

Moreover, paired sample 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 K-W-L technique 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 in order to determine the effect of the influence of independent variable upon the dependent variable (Coolidge, 2000:151). 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 3.7
Effect Size Value

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

(Coolidge, 2000 p.151)

3.5.3.1 The Normal Distribution Test

In order to test the normality distribution of a set of data, the Kolmogorov-Smirnov test was used in this study. The test compares the scores in the sample to a normally distributed set of scores with the same mean and standard deviation (Field, 2005). The test was employed through SPSS 17.0 for Windows.

Conducting the normal distribution test includes three steps: stating the hypothesis and setting the alpha level; analyzing the groups' scores using the Kolmogorov-Smirnov formula; and interpreting the output data. For the first step, the alpha level set is at 0.05 (two-tailed test) and the hypothesis is as follows:

- 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 output data are interpreted by this way: if the result is non-significant ($p < 0.05$) it tells us that the distribution of the sample is significantly different from normal distribution (probably normal). If the result is significant ($p > 0.05$) then the distribution is not significantly different from normal distribution (Field, 2005).

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3.5.3.2 The Homogeneity of Variance Test

In order to analyze the homogeneity of variance of the scores, Levene's test was employed in this study. The Levene's test tests hypothesis is that the variances in the groups are equal; the difference between the variances is zero (Field, 2005). The test was employed through SPSS 17.0 for Windows.

Conducting the Levene's test includes three steps. Firstly, stating the hypothesis and setting the alpha level. The null hypothesis (H_0) is that the variances of the control and experimental groups are homogenous and for the alternative hypothesis (H_A) the variance of both groups are not homogenous. The alpha level is at 0.05 ($\alpha = .05$). This is the maximum error points that can be tolerated. Secondly, analyzing the scores using Levene's test through SPSS 17.0. Thirdly, interpreting the output data. The result of the test is interpreted to be significant at $p \leq .05$ and it is concluded that the null hypothesis is incorrect and the variances are significantly difference. On the contrary, the result is interpreted to be non-significant if $p > .05$ and it means that the null hypothesis is accepted and the variances are approximately equal (Field, 2005).

3.5.3.3 The Independent *t*-test

The independent group *t*-test is used to analyze a causative relationship between the independent variable and the dependent variable that is measured on both groups (Coolidge, 2000). Conducting the independent group *t*-test includes three steps. First, stating the hypothesis and setting the alpha level. Second, analyzing the groups' scores using the independent group *t*-test in SPSS 17.0 for Windows which results in the *t* value or t_{obt} and comparing the t_{obt} with the level

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of significance for testing the hypothesis. For the first step, the alpha level set is at 0.05 (two-tailed test) and the hypothesis is as follows:

- H_0 = the two samples are from the same population; there is no significant difference between the two samples.

- H_A = the two samples are from the same population; there is a significant difference between the two samples.

For the third step, if the t_{obt} is equal to or greater the level of significance (t_{crit}), the null hypothesis is rejected; the two groups are significantly different.

3.5.3.4 The Dependent t-test

The dependent t-test was used to analyze the pre-test and post-test score of experimental group and to investigate whether or not the difference of pre-test and post-test mean of experimental group's score was significant (Hatch and Farhady 1982). Conducting the dependent t-test includes three steps. Firstly, stating the hypothesis. Null hypothesis (Ho) is that there is no significant difference between the pre-test and post-test scores and alternative hypothesis (H_A) there is significant difference between pre-test and post-test scores. Secondly, analyzing the dependent t-test by using SPSS 17.0 for windows. Thirdly, comparing (t) sig 2 tailed with the level of significance. If (t) sig 2 tailed > 0.05, the null hypothesis is accepted which means there is no significant difference between the pre-test and post-test scores of experimental group. On the contrary, if (t) sig 2 tailed < 0.05, the null hypothesis is rejected which there is significant difference between the pre-test and post-test scores of experimental group.

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3.5.3.5 Data Analysis on the Questionnaire

Arikunto (2002) explains that questionnaire is a number of written questions used to obtain information from respondents in the form of statements about themselves or things that they know. This study used open-ended questionnaire so the result in percentage and essay explanation. The formula, used in analyzing the questionnaire, is described as follos:

$$\% = \frac{f}{N} \times 100\%$$

Where:

%   : Percentage
f : Frequency
N : Number of respondents

To interpret the questionnaire result, the following scale is used as guidance

Table 3.8

Percentage	Interpretation
0%	None
1% - 25%	Small number of
26% - 49%	Nearly half of
50%	Half of
51%-75%	More than half of
76% - 99%	Almost all of
100%	All of

(Kunjaraningrat cited in Mega, 2011)

The interpretation of percentage is used to analyze the questionnaire. It is aimed to find out the percentage of students' responses toward the use of K-W-L technique, which will be the answer to the second question of study.