CHAPTER III
RESEARCH METHODOLOGY

This chapter elaborates on the research methodology that was used in this study. The discussion of this chapter includes research design, population and samples of the research, data collection, data analysis, and concluding remarks that conclude this chapter.

3.1 Research Design

This study applied a quantitative method with a quasi-experimental design to investigate whether the drilling techniques help students to master English vocabulary. Quantitative research is describing phenomena by gathering numerical data that is analyzed mathematically based on methods in particular statistics (Aliaga & Gunderson, 2000; Kountour, 2004). Quasi-experimental is a research design that is used to find out the effect of certain treatments on experimental and control groups, but the control group cannot fully control the external variables that might affect the experiment execution (Sugiyono, 2006). The experimental group is treated with certain treatments with controllable conditions (Zuriah, 2007). In this study, the experimental group is taught using drilling techniques while the control group is taught without using drilling techniques. The experimental group

Furthermore, a quasi-experimental study is a type of evaluation that aims to determine whether a program has the intended effect on the participants. A quasi-experimental design is one of the experimental designs which compare means of group performance. In this study, the researcher compared the result between the students who are taught using drilling techniques and the students who are taught without using drilling techniques. The reason for choosing this design was the population did not consist of individuals but consisted of groups of individuals so that the students were not randomly chosen and assigned to the group (Jackson, 2008).

This study used a quasi-experimental non-equivalent pre-test post-test control design. This design is often used in classroom experiments when experimental and control groups were such naturally assembled groups as intact

classes which may be similar (Best & Kahn, 1986). Non-equivalent groups especially mean that participants' characteristics may not be balanced equally between the experimental and control groups. In addition, non-equivalent groups mean that the participants' experiences during the study may be different (Heiman, 1999). The non-equivalent experimental and control groups designed with pretest and post-test are represented in the following table.

Table 3.1
Research Design

Group	Pre-test	Treatment	Post-test
Experimental	O_1	X	O_2
Control	O_1	-	O_2

In this design, O_1 represents the pretest, X represents the treatment implemented, and O_2 represents the post-test (Cohen, Manion, & Morrison, 2007). Therefore, both experimental and control groups completed the pretest and post-test. The experimental group receives drilling technique in teaching vocabulary as the treatment, while the control group does not receive the drilling techniques in learning vocabulary.

Through this design, the sample was taken from two available classes, each class was assigned as experimental and control groups. Since this study attempted to find out the significance of the use of the drilling techniques in experimental and control groups, the researcher believed this design is suitable to use in this research.

3.1.1 Variables

The independent variable of this study was the use of the drilling techniques. Meanwhile, the dependent variable of this study was students' vocabulary mastery. The scores of students' pretest and post-tests are observed and measured in order to determine the effects of independent variables (drilling techniques).

3.1.2 Hypothesis

The hypothesis of this study is in the form of the Null Hypothesis (H_0) and alternative hypothesis (H_a). According to Coolidge (2000), hypotheses are stated as follows:

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

If the result of the test shows that the use of the drilling techniques in teaching English vocabulary does not improve students' vocabulary mastery, it means that H_0 (null hypothesis) is accepted. Yet, if the result shows that the use of the drilling techniques in teaching English vocabulary improves students' vocabulary mastery, it means H_a is accepted.

3.2 Population and Sample

The population of this research is taken from one junior high school in Bandung. This study uses two classes for the sample namely the experimental group and the control group. The participants of this research are eighth grade students in Junior High School. As for the samples, there are approximately 60 students who are coming from two classes VIII-7 and VIII-8. The researcher assigned class VIII-7 as an experimental group (which applies the drilling techniques) and class VIII-8 as a control group (which does not apply the techniques) to identify whether the drilling techniques can help students to master English vocabulary.

Additionally, the reasons of the researcher chose the aforementioned participants are: firstly, because of the eighth grade students are classified as young learner, according to Halliwell (1992) who stated that young learner enjoy imitating and skillful in listening accurately and mimicking what they have heard. So that, they are suitable to be involved in using drilling technique, especially in repetition and remembering the vocabulary. Secondly, based on the statement of a teacher

who taught in this junior high school, those students are difficult to learn English because of the limited English vocabulary understanding. By considering these reasons, the researcher assumed the eighth grade students are possible to be involved in this research.

3.3 Data Collection

According to Fraenkel, Wallen, and Hyun (2012), “data " refers to the types of information that the researcher obtains on the subject of the research. The data collected in this study included tests in the form of pretest and post-test and closed-ended questionnaires.

3.3.1 Research Instruments

This quasi-experimental research employs two research instruments to collect the data that further are used to answer the research questions of this study. The first instrument is a test that is divided into pretest and post-test. Pretest and post-test in the form of vocabulary tests were employed as the instruments to collect the data for this study in order to answer the first research question. The vocabulary test given was focused on collecting data on students’ vocabulary mastery. The vocabulary test given consisted of four kinds of tests. They were multiple choice questions, matching, filling the blank, and translating.

In addition, another instrument used in this study was closed-ended questionnaires. The questionnaire was only given to the experimental group. The result of the questionnaire was used to answer the second research question. In detail, the instruments of this study will be explained below.

3.3.1.1 Pilot Test

A Pilot test is pre-testing or trying out a particular research instrument (Baker, 1994). This test was conducted to test the instruments before the instruments were used in the study. The pilot test was done in another class to investigate and get the validity and reliability of the instruments. The test was given to twenty students who were not included in the experimental and control groups but were still at the same grade. In the pilot test, the students were given a

vocabulary test that included multiple choice questions, matching, filling the blank, and translating.

3.3.1.2 Pretest

The pretest was conducted on both groups in order to find out the students' initial ability before conducting the treatments on the experimental group. The pretest is given with the intention to know whether any of the students already know about the material to be taught. Pretests are conducted before the teaching activities are given. The pretest consisted of 50 questions in the form of multiple choice questions, matching, filling the blank, and translating. The student had 80 minutes to finish the questions.

3.3.1.3 Post-test

The post-test was administered to both experimental and control groups in the last meeting. It was held after the treatment had been done for the experimental group to find out the students' progress in terms of their vocabulary mastery after getting treatment. In other words, the post-test score is the data to find out whether there are any significant differences between the experimental group who has been treated with the use of the drilling techniques and the control group who has been treated without the treatment. Post-test questions have the same quality as pretest questions.

3.3.1.4 Questionnaire

A close-ended questionnaire is also used for collecting the data. This questionnaire is useful to deliver the data that is identified with the issue of the research (Creswell, 2012). The closed-ended questionnaires are only distributed to the experimental group to know the students' perceptions while using the drilling techniques. The questionnaire is administered to the students after they have already finished all of the vocabulary teaching sessions. In this research, closed-ended questionnaires in a form of a Likert scale are used for collecting the information. The questionnaire was conducted in the Bahasa Indonesia. This decision was supported by the statement from Pujihastuti (2010) who stated that one of important things in writing questionnaire is the language used need to be adjusted to the respondent's languagre related to thier education level, culture, and reference. So

that, it was better to use Bahasa Indonesia in the questionnaire in order to ease the student's answers and to avoid the misunderstanding about the questions. Due to this is a closed-ended questionnaire, the students can only answer by selecting an optional number with a rating scale (strongly disagree, disagree, agree, strongly agree).

3.4 Research Procedure

3.4.1 Administering Pilot Test

In order to find out whether or not both pretest and post-test have content validity, the instruments can be tested by administering the pilot test. The pilot test was conducted before giving the pretest. The pilot test was done in another class to investigate and get the validity and reliability of the instruments. The test was given to twenty students who were not included in the experimental and control groups but were still at the same grade.

3.4.2 Administering Pretest

As the first step of the study, a pretest was given before doing the treatment. It was conducted in both experimental and control groups. The pretest was administered by using a vocabulary test. Both experimental and control groups were asked to answer the questions. Furthermore, the pretest is aimed to investigate whether or not the students from both groups are equal in the terms of test results before receiving the treatment.

3.4.3 Conducting Treatment

In this study, the experimental group was treated using drilling techniques while the control group was not treated using drilling techniques. The control group was treated using the conventional method. Even though the methods were different, the teaching materials were similar. The lesson plans in this research are the same, but there are some highlight that differ the lesson plan for experimental group and lesson plan for control group.

There were four meetings conducted in both experimental and control groups. The duration of each meeting was 80 minutes (2 x 40). The topic of first meeting was Nouns, the second meeting was Verbs, the third meeting was

Adjectives, and the last meeting was translating the phases. The details of each meeting are explained as follows.

Table 3.2

The Scheme of the Treatment

Meeting	Date		Topic
	Experimental	Control	
1	25 July 2022	25 July 2022	Pre-test
2	1 August 2022 (Treatment 1)	1 August 2022	Nouns
3	2 August 2022 (Treatment 2)	2 August 2022	Verbs
4	8 August 2022 (Treatment 3)	8 August 2022	Adjectives
5	9 August 2022 (Treatment 4)	9 August 2022	Translating the phrases
6	10 August 2022	-	Post-test Distributing Questionnaire

3.4.4 Administering Post-test

The post-test was administered to the research participants after the whole treatment had been implemented. The post-test was administered to both experimental and control groups. The test aimed to find out the significant difference between scores gained by the students of experimental and control groups after implementing the treatment. Furthermore, the questions used in the post-test have the same quality as the pretest questions.

3.4.5 Administering Questionnaire

A set of questionnaires is administered at the last meeting to see the students' perceptions of the use of drilling techniques in learning English vocabulary. The questionnaire was administered to the experimental group only to

those who had experienced the treatment of the use of the drilling techniques in their learning process.

3.5 Data Analysis

The collected data were analyzed to answer the research questions and find out the result of this study. The data analysis included the scoring techniques, the data analysis on the pilot test, data analysis on the pretest and post-test, and data analysis of the result of the questionnaire.

3.5.1 Scoring Technique

Both pretest and post-test are administered in the form of multiple choice questions, matching, filling the blank, and translating. Pretest and post-test consist of 50 questions; 25 items in multiple choice questions, 10 items in matching, 10 items in filling the blank, and 5 items in translating. The correct answer for each question is given 2 (two) score and the incorrect answer is given a 0 (zero) score. The details of the score are shown in the following table:

Table 3.3
Scoring Technique

Series Number of Items	Form of Test	Total of Items	Score of Correct Answer
1-25	Multiple choice	25	25
26-35	Matching	10	10
36-45	Filling the blank	10	10
45-50	Translating	5	5
Total			100

$$\text{Students' final score} = \frac{Student\ raw\ score}{maximum\ score\ (100)} \text{ x } 100$$

After getting all of the students' scores, the researcher compared the result of the pretest and post-test to know whether there is any improvement after applying the drilling techniques.

3.5.2 Data Analysis on Pretest and Post-test

Pretest and post-test were given to both experimental and control groups. In analyzing the data of the pretest and post-test, the t-test is used to compare the means' difference between both tests. According to Coolidge (2000), the following criteria should be fulfilled before the data is analyzed by t-test. First, the data should have a normal distribution. Second, the variance of the two groups must be homogenous. Third, the participants must be different in each group. Therefore, the data will be analyzed using normality distribution, homogeneity of variance test, and will be continued using independent t-test, dependent t-test, and effect size. The data computation used Microsoft Excel 2010, SPSS 23 for Windows, and some statistical formulas. The details were explained as follows.

3.5.2.1 Normality Distribution Test

This test is performed to determine whether the data of both experimental and control groups are normally distributed or not. The statistical calculation of the normality distribution test used the Kolmogorov-Smirnov test with SPSS. According to Chakravart, Lara, and Roy (1967), this test is used to decide if the sample comes from a population with a specific distribution. The steps are described as follows.

1) Setting the level of significance (p) at 0.05 and establishing the hypothesis as follows:

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

   H_a : the variances of the experimental and control groups are not normally-distributed

2) Analyzing the normality distribution with Kolmogorov-Smirnov test in SPSS 23.0 for Windows.

3) Comparing the Asymp.sig with the level of significance (p) for testing the hypothesis. If the Asymp.sig is more than the level of significance (0.05), the null hypothesis is accepted, while the alternative hypothesis is rejected. It means that the scores are homogenous.

3.5.2.2 Homogeneity of Variance

The variance homogeneity test was conducted to find out whether the two groups in the t-test are equal or approximately equal (Coolidge, 2000). The homogeneity of variance test used the Lavene test in SPSS 23.0 for Windows. The steps are described as follows.

1) Setting the level of significance (p) at 0.05 and establishing the hypothesis as follows:
   H_0 : the variances of the experimental and control groups are homogenous
   H_a : the variances of the experimental and control groups are not homogenous
2) Analyzing the homogeneity of variance by using the Lavene test.
3) Comparing the Asymp.sig with the level of significance (p) for testing the hypothesis. If the Asymp.sig is more than the level of significance (0.05), the null hypothesis is accepted, while the alternative hypothesis is rejected. It means that the scores are homogenous.

3.5.2.3 Independent t-test

An Independent t-test is aimed to determine whether or not the means of two groups differ to a statistically significant degree (Kranzler & Moursund, 1999). The purpose of the independent t-test is to determine the significant difference between the experimental and control groups' means on the dependent variable (Coolidge, 2000). The procedures of testing the independent t-test were as follows.

1) Setting the level of significance (p) at 0.05 and establishing the hypothesis as follows:
   H_0 : there is no significant difference between students' scores of experimental and control groups

H_1 : there is a significant difference between students' scores of experimental and control groups

2) Analyzing the independent test by using SPSS 23 for Windows.
3) Comparing the Asymp.sig with the level of significance (p) for testing the hypothesis. If the Asymp.sig is less than the level of significance (0.05), it can be concluded that there is no significant difference between the means of these two samples; on the other hand, the null hypothesis is accepted.

3.5.3 The Calculation of Effect Size

The effect size here refers to the effect size calculated in the independent t-test of the research. Furthermore, the calculation of the effect size is important to be administered to determine the effect of the influence of an independent variable upon the dependent variable (Coolidge, 2000). The formula of effect size is as follows.

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

Where:

r : effect size

t : t obtain from the calculation of independent t-test

df : degree of freedom

(Coolidge, 2000)

After the value of effect size was calculated, the score was matched with the following scale.

Table 3.4

Effect Size Value

Effect Size	r Value
Small	0.100

Medium	0.243
Large	0.371

(Coolidge, 2000)

3.5.5 Data Analysis on Questionnaire

The questionnaire data analysis was done by using the formula percentage through SPSS 23.0 for Windows. The questionnaire was aimed to find out students' responses to the use of drilling techniques in teaching English vocabulary. According to Arikunto (1996), a questionnaire consists of several questions needed by the researcher to obtain some information from the respondents.

There were several steps in calculating the data. The first is the setting variable. In the setting variable, the data gathered from students' answers to the questionnaire were identified based on the variables. The questionnaire consisted of close-ended questions in a form of Likert 4 scale responses. The answer for the response to the question was labeled "Strongly Agree" as scored 4, "Agree" as scored 3, "Disagree" as scored 2, and "Strongly Disagree" as scored 1.

The second step was inputting the data to SPSS data view, and then the data was computed using the frequencies data formula. Finally, the data frequencies gained from the computation were presented in graphs in order to clarify the data presented.

3.6 Concluding Remark

This chapter has presented the methodology of this study, including the research design, hypothesis, population and sample, instruments, data collection, and data analysis. Quasi-experimental research was employed as the research design and the data used in this research were collected from two classes that were known as the experimental and control groups in the eighth grade of junior high school in Bandung where this research was conducted. The data were analyzed by statistical computation using SPSS 23 for Windows. The result of this chapter will be elaborated on in chapter IV.