CHAPTER III
METHODOLOGY

This chapter discusses the method employed in this study in order to answer the research questions. It covers research questions, research design, research variable, research hypothesis, research subject, data collection, research procedure, and data analysis.

3.1. Research Questions

Based on the background of this research, the purpose of the study is intended to answer these two questions:

1   How effective is the theme-based teaching in improving student's grammar skill?
2   What is the student's response towards the theme-based teaching that is implemented to improve their grammar skill?

3.2. Research Design

This research applied the quantitative method since this research intended to find out the effectiveness of theme-based teaching in improving students' grammar skills. Quantitative method is used to establish the relationships between the variables and explain the causes of the relationship (Fraenkel & Wallen, 2009). It is also stated by Ledy and Ormrod cited in William (2007), quantitative method is specific in its surveying and experimentation, since it is built up upon existing theories. Thus, quantitative method is suitable with this research.

Moreover, in this research, the researcher used the experimental design which compares two treatments in order to studying their effects. In this study, the researcher compared the use of theme-based teaching with the not theme-based teaching to find the effect on the students' grammar skill improvement. The type of experimental design was quasi-experimental design because the participants in this method are not randomly assigned (Creswell, 2003).

In this research, two classes were taken as the sample namely experimental group and control group. The experimental group is taught using the theme-based teaching while the control group using the not theme-based teaching. The teaching procedures are conducted in both experimental and the control group with different lesson plans. The lesson plan in the experimental employed the theme-based teaching, while the lesson plan for the control group used the conventional procedures.

The scheme of the study will be as follows:

Scheme of the Study

Group	Pre-test	Treatment	Post-test
Experimental Group	Y_1	X	Y_2
Control Group	Y_1	-	Y_2

Table 3. 1 Scheme of Study

(Campbell & Stanley, 1963)

Information:

Y_1: the test before the treatment (pretest)

Y_2: the test after the treatment (posttest)

T: treatment

3.3.Research Variables

Variable is a characteristic of an individual or an organization that can be measured or observed and that varies among the people or organization being studied (Creswell, 2003). In this research, there are two variables; independent variable and dependent variable. It is stated that the independent variable is something that cause, influence or affect the outcomes while dependent variable is something that resulted by the treatment (Creswell, 2003). In this research, the independent variable is the implementation of theme-based teaching while the dependent variable is the students' grammar skill.

3.4. Research Hypothesis

It is stated that a hypothesis is a prediction, an explanation of the research outcome. Moreover, in order to test the research hypothesis or the alternative hypothesis (Ha) the researcher must formulate the null hypothesis (H0) (Fraenkel & Wallen, 2009). A null hypothesis predicts neither a positive nor a negative relationship between two variables. In short, the hypothesis of this research is stated below:

H_0: the implementation of theme-based teaching does not give significant difference in learning grammar.

H_1 : the implementation of theme-based teaching gives significant difference in learning grammar.

Therefore, if the outcome of the study showed a significant difference of grammar skill in the experimental group, the null hypothesis will be rejected.

3.5. Research Subject

3.5.1. Population

Population is the group interest that would like to generalize the result of the study (Fraenkel & Wallen, 1990). In this research, the population is the students of seventh grade in one of junior high school in Lembang. It is chosen since the student of sevent grade is still in the early stage of English learning process.

3.5.2. Sample

Sample is a part of the whole population where the data is gained. It is stated that the sample should reflect the characteristics of the selected population (Kahn, 1990). Since the research design is quasi-experimental, the sample of the research will be two classes; experimental and control group. In this research VII-I and VII-J are taken as the sample. VII-I was labeled as the control group while VII-J was labeled as the experimental group.

3.6.Data Collection

The data in this study will be collected by administering some instruments that will be elaborated in this section.

3.6.1 Research Instrument

In this study, pre-test and posttest are the instrument used to gain the data related to the effectiveness of theme-based teaching while the questionnaire is used to gain the data related students' responses toward the treatment.

3.6.1.1 Pre-test and posttest

Pre-test and posttest will be conducted in this study. It is believed that pretest-posttest is widely used in behavioral research, especially in comparing groups and/or measuring the changes that is caused by the experimental treatments (Dimitrov & Rumrill). Thus, it well suited to investigate the effects of educational innovations (Dugard & Todman, 2006).

Pre-test is conducted in the first meeting for both experimental and control group. Meanwhile, the posttest is conducted in the 6th meeting which is the last meeting. The test given was about the short description related to the family. The test instrument of the pre-test and the posttest was on the same level.

3.6.1.2 Questionnaire

It is said that the questionnaire is an instrument that can be employed in the study of research problem. Moreover, it said that the questionnaire should be standardized and a questionnaire is said to be standardize when each respondent is to be exposed to the same questions and the same system of coding responses (Siniscalco & Auriat, 2005). The formal standardized questionnaire is a survey instrument used to collect data from individual about themselves, or about social unit such as a household or a school. In order to see the students' response toward the treatment, Guttman scaling is applied. It is stated that the goal of Guttman scaling is to derive a single dimension that can be used to position both the questions and the subject that can be used to give a numerical value (Abdi, 2010).

3.7. Research Procedure

In collecting the data, the researcher employed some steps.

3.7.1. Materials

The material chosen for the teaching and learning process during the treatments is taken from the book titled When English Rings the Bell (2016). The material consisted of descriptive text.

3.7.2. Preparing the lesson plan

There are some lesson plans that are used during the treatments. The lesson plans are designed differently for the experimental and control group. The lesson plan for the experimental group employed the theme-based teaching while the control group employed the not theme-based teaching. Since the main point of theme-based teaching is a theme, therefore the difference between experimental group and control group will be in a theme chosen. The further detail is presented in the following table:

The Distribution of Lesson Plan

No	Experimental Group		Control Group	
	Date	**Material**	**Date**	**Material**
1.	April 5th 2017	Pre-test	April 5th 2017	Pre-test
2.	April 11th 2017	Treatment 1: My happy family	April 11th 2017	Treatment 1: The butterfly flies in the sky.
3.	April 12th 2017	Treatment 2: What does she look like?	April 12th 2017	Treatment 2: I sit on the chair.
4.	April 25th 2017	Treatment 3: My father works every day.	April 25th 2017	Treatment 3: The flower beautifies our school.
5.	April 26th 2017	Treatment 4: I	April 26th 2017	Treatment 4: I

		love my family.		love my notebook.
6.	April 26th 2017	Post-test	April 26th 2017	Post-test

Table 3. 2 The Distribution of Lesson Plan

3.7.3. Conducting the pilot test

The pilot test is held before the instrument delivered to both experimental and control group. This step is done in order to measure the validity and reliability of the instrument. Therefore, the instrument is delivered to the students who did not belong to the both experimental and control group.

3.7.4. Conducting the pre-test

The pre-test is conducted before the treatment is given to both experimental and control group. The students are required to fill 20 blanks in the descriptive text.

3.7.5. Treatment

In this study, the two classes got different treatments. The experimental group is treated using theme-based teaching while the control group is treated using the not theme-based teaching. There will be two types of lesson plans in this research; for the experimental group and the control group.

There are four meetings conducted in both experimental and control group. The duration of each meeting was 80 minutes. The topic of first meeting was My Happy Family while the second meeting was My Mother Is Beautiful. The third meeting is conducted with My Father Works Every day as a topic and the last meeting used I Love My Family as the topic. The details of each meeting are explained below:

The Scheme of the Treatment

Meeting	Topic	Indicators
1	Pre-test	

2	My happy family	• Identifying the status of each family member. • Mention the status of each family member. • Understanding the use of possessive verb
3	My mother is beautiful	• Identifying the adjective related to the topic. • Describe the family member in one sentence
4	My father works everyday	• Identifying the verbs related to the topic. • Complete the paragraph related to the topic.
5	I love my family	• Make a short description about one of the family member in a group • Present the descriptive text in front of the classroom.
6	Posttest Distributing Questionnaire	

Table 3. 3 The Scheme of the Treatment

3.7.6. Conducting posttest

The posttest will be given to both experimental and control group after the treatments were given to both groups.

3.8.Data Analysis

3.8.1. Scoring technique

According to Creswell innovations (2009), data analysis is a step where the researcher explains the type of statistical analysis that will be used during the

experiment. There are two types of formula that can be used in the process of scoring (Arikunto, 2003). They are formula with punishment and formula with no punishment. In this research, the researcher applied the formula with no punishment which means there are no minus score when the answer chosen is wrong.

In which:

S: Score

R: Right Answer

3.8.2. Data analysis on the pilot test

3.8.2.1 Validity

The pilot test should be given to measure its validity and reliability before conducting pre-test and posttest (Brown,1988). Moreover, Arikunto (2002) stated that validity is measurements which show the validity level of quality level of an instrument. Thus, the following formula is used to measure the validity of the instrument:

$$r_{xy} = \frac{n\left(\sum(XY) - (\sum X)(\sum Y)\right)}{\sqrt{[n\sum x^2 - (\sum X)][n\sum Y^2 - (\sum Y)^2]}}$$

In which:

 r = correlation coefficient

X = item score

Y = total score

n = number of subject

. The criteria of validity are shown in the following table:

The Interpretation of Validity Test

Raw Score of	Interpretation
0.80 – 1.00	Very High
0.60 – 0.80	High
0.40 - 0.60	Moderate
0.20 – 0.40	Low
0.00 – 0.20	Very Low

Table 3. 4 The Interpretation of Validity Test

(Arikunto, 2007)

It is stated that the accepted criteria are the criteria whose score above 0.20. The table indicates the criteria of validity which determines whether the instrument is valid or not.

3.8.2.2 Reliability

Reliability is the extent which a test is produced in constant result when administered under similar condition (Hatch & Farady, 1982). Furthermore, Hughes (1989) stated that an instrument is regarded as reliable if the score of the test is similar. In order to find out the reliability of the test items, the Spearmen-Brown formula is used. The formula of Spearman-Brown is as follows:

$$r_{11} = \frac{2\,r_{\frac{11}{12}}}{(1 + r_{\frac{11}{12}})}$$

In which:

r_{11} = reliability

$r_{\frac{11}{12}}$ = correlation between scores in each group of item

Moreover, below are the criteria of reliability:

The Interpretation of Reliability Test

Coefficient Correlation	Interpretation
0.0 – 0.20	Low
0.20 – 0.40	Moderate
0.40 – 0.70	High
Above 0.70	Very High

Table 3. 5 The Interpretation of Reliability Test

(Arikunto, 2007)

3.8.2.3 Difficulty Level

Difficulty level is used to measure how far the test items were relevant with the participants' ability (Arikunto, 2007). It aims to investigate whether the test items were too easy or difficult for the participants. It can be analyzed using the items difficulty index or facility value and the index of difficulty can be calculates using the formula as follows:

$$P = \frac{\sum X}{SmN}$$

In which:

P   : Index of difficulty

$\sum X$: sum of students that answer the item correctly

Sm   : maximum score

N   : the number of students that taking the test

Here is the interpretation of the index of difficulty:

The Interpretation of Difficulty Test

Index of Difficulty	Interpretation
0.00 – 0.30	Difficult
0.30 – 0.70	Moderate
0.70 – 1.00	Easy

Table 3. 6 The Interpretation of Difficulty Test

(Arikunto, 2007).

3.8.2.4 Discrimination Power

In order to reveal how far a single test item can distinguish the upper group from the lower group of the class, the discrimination index is used in this test (Arikunto, 2007). The formula used to find the discrimination index is as follows:

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B}$$

In which:

D   : Discrimination index

B_A : Sum of right answer of upper group

B_B : Sum of right answer of lower group

J_A : Number of students in upper group

J_B : Number of students in lower group

The criteria of discrimination power are shown in the following table.

Interpretation of Discrimination Power Test

Discrimination Index	Interpretation
00.00 – 0.020	Poor
0.20 – 0.40	Moderate
0.40 – 0.70	Good
0.70 – 1.00	Excellent

Table 3. 7 The Interpretation of Discrimination Power Test

(Arikunto, 2007)

3.8.3. Data Analysis on The Pre-test and Posttest

Data collected from the pretest and posttest will be analyzed quantitatively using the t-test. It is stated that the t-test is used to analyze the pretest and posttest score and to investigate whether there is significance difference on each group or not

(Hatch & Faradhy, 1982). Furthermore, t-test will be used to find out whether the hypothesis (null hypothesis) was rejected or accepted. If the null hypothesis is accepted, it means that there is no difference between the experimental and control groups after implementing the theme-based teaching.

The following process conducted after the pilot test analyses are conducted. The whole processes were administered using SPSS 16.00 for windows.

3.8.3.1 Normality of Distribution Test

The score from pre-test and posttest is analyzed before t-test to see whether the distributions of pre-test and posttest score in two groups are normally distributed. The statistical calculation of normal test is using Saphiro-Wilk formula. The steps are as follows:

1. Looking at the hypothesis

   H_0: The data of experimental and control group are normally distributed.

   H_1: The data of experimental and control group are not normally distributed.

2. Analyzing the normal distribution by using the Saphiro-Wilk formula in SPSS 16.0 for windows.

3. Comparing the level of significance to test hypothesis. If the result is more than level of significance (0.05), the null hypothesis is accepted, the score are normally distributed.

3.8.3.2 Homogeneity of Variance Test

The homogeneity of variance test used a Levene test in SPSS 16.0 for windows. Moreover, there are several steps conducted, which are:

1. Stating the hypothesis

   (H_0): the variance of the experimental and control group are homogeneous

   (H_1): the variance of the experimental and control group are not homogeneous

2. Setting the level of significance (*p)* at 0.05.

3. Analyzing the homogeneity of variance test using Levene test in SPSS 16.0 for windows

4. Comparing the level of significance value to test the hypothesis. If Levene's test is significant at $p \leq 0.05$, it indicates that the null hypothesis is incorrect and the variances are significantly difference. But when the Levene's test is not significant at *p>0.05,* it indicates that the variance is approximately equal.

3.8.3.3 Independent t-test

The independent t-test is used to investigate the difference of mean between the experimental and control groups. The steps as follows:

1. Stating the hypothesis

   (H_0): there is no significant difference between students' grammar skill in pre-test and posttest score for the experimental and control group.

   (H_1): there is significant difference between students'' grammar skill in pre-test and posttest score experimental and control group.

2. Finding the t value with independent sample test computation in SPSS 16.00 for windows. The formula used is as follows:

$$t_{obt} = \frac{M1 - M2}{S_{M1-M2}}$$

   In which   :

   M1 = Mean of group 1

M2 = Mean of group 2

S = variance

3. Comparing the significance value with the level of significance for testing hypothesis. If the significance value is less than the level of significance (0.05), the null hypothesis is accepted. It means that the two groups are equivalent. However, if the significance value is more than the level of significance (0.05), the null hypothesis is rejected.

3.8.3.4 Dependent t-test

The dependent t-test is applied to analyze whether or not the pre-test and posttest of the experimental group different significantly. The steps as follows:

1. Stating the hypothesis

   (H_0): there is no significant difference between pre-test and posttest score.

   (H_1): there is significant difference between students' pre-test and posttest score.

2. Finding the t value with independent sample test computation in SPSS 16.00 for windows. The formula used is as follows:

$$t_{obt} = \frac{M_D}{\sqrt{\dfrac{n\sum D^2 - (\sum D)^2}{n\,(n-1)}}}$$

   In which :

   $\sum D$: the sum of posttest score – pre-test score

   M_D : the mean difference

   N   : the number of pair scores

3. Comparing the level of significance from the calculation of dependent t- test with the level of significance for testing the hypothesis. If the probability is more than or equal than the level of significance, the null hypothesis is accepted, but if the probability is less than the level of significance, the null hypothesis is rejected.

3.8.3.5 The calculation of effect size

In this research, in order to verify the influence of independent variable to the dependent variable and to distinguish how well the treatments works, the research is employed the calculation of size effect. Thus, to determine the effect size in the independent t-test, a correlation coefficient of effect size can be derived as shown below:

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

In which

r = effect size

t − t_{obt} or t value from the calculation of independent t-test

df = N1+N2-2

(Rosenthal, 1991:19)

After obtaining the value of r, the score will be matched with the following scale to interpret the effect size.

The Interpretation of Effect Size

Effect size	r value
Small	0.100
Medium	0.243
Large	0.371

Table 3. 8 The Interpretation of Effect Size

(Collidge, 2000)

3.8.4. Data Analysis of the questionnaires

Data collected from the questionnaire will be analyzed quantitatively. The data will be shown in percentage. The formula of the analysis is shown as below:

$$P = \frac{fo}{n} \; x \; 100\%$$

In which:

P = percentage

fo = frequency of observed

n = number of samples

In this study, the "yes" answer will be counted as one and "no" will be counted as zero. After the result is calculated with the formula, the result can be shown by using percentages as follows:

Interpretation of Questionnaire Analysis

No	Percentage (%)	Criterion
1	0	None
2	1-25	Small number
3	26-49	Nearly half
4	50	Half
5	51-75	More than half
6	76-99	Almost all
7	100	All of

Table 3. 9 The Interpretation of Questionnaire Analysis

(Sudjana, 1984)

3.1 Concluding Remark

This chapter explained the research design, research variable, research hypothesis, research subject, data collection, research procedure, and data analysis. The following chapter will be explaining the findings and discussion of the research.