

CHAPTER III

RESEARCH METHODOLOGY

This chapter mostly discusses research methodology applied in the study to investigate to what extent flashcards or word list as strategies in helping students' vocabulary mastery, and to examine students' responses toward both strategies in learning vocabulary. It comprises research design, population and sample, data collection techniques which include research instrument and research procedures and data analysis.

3.1 Research Design

This study used a quasi-experimental design to investigate whether or not the use of flashcards and word list could help students' vocabulary mastery. According to Hatch and Farhady (1982), a quasi-experimental design is practical agreement between true experimental and the nature of human language behaviour. Porte (2002 cited in Nurjanah 2012), also explains that quasi experimental design is appropriate for educational study since many studies of that field usually involved the use of classes that have already been assigned before. Hatch and Farhady (1982) also state that pre-test and post-test are often used in classroom experiments when experimental and control groups are naturally assembled groups.

Two classes were employed in this study. One class was the experimental class which was applied with the treatment of flashcards. Another class was the

control class which got word list as a treatment. The formula of quasi-experimental design is described as follows:

G1	T1	X	T2
G2	T1		T2

- G1 : Group 1 (experimental group)
- G2 : Group 2 (control group)
- T1 : Pre-test
- X : Treatment
- T2 : Post-test

(Hatch and Farhady, 1982)

3.2 Research Hypothesis

According to Fraenkel and Wallen (2009), a hypothesis was a prediction, an explanation of the research outcome. Hatch and Farhady (1982) stated that a null hypothesis predict neither a positive nor a negative relationship between two variables. Therefore, the hypothesis must first turn into null hypothesis (H_0) along with the alternative hypothesis (H_a). In short, the hypothesis was stated as follows:

H_0 = there is no significant difference between students' vocabulary in pre-test and post-test score; means the use of flashcards and word list cannot help students' vocabulary mastery.

The null hypothesis was chosen because there is no specific study which discusses the use of flashcards and word list in helping students' vocabulary mastery.

3.3 Population and Samples

According to Fraenkel and Wallen (1990), population means the group interest to the writer that would like to generalize the result of the study. The population of this study was the fifth graders of a private elementary school in Binjai, North Sumatra. The fifth grade students were chosen based on the consideration that they were still learning basic vocabulary. In this stage, they need more guidance and learn vocabulary with an effective way. Due to the limited time, not at all the students were considered as sample.

Sample is "the group in the research on which the information is obtained, preferably selected in such a way that the sample represents the larger group (population) from which it was selected" (Fraenkel & Wallen, 1990). The sample of the study was two classes, it had been chosen based on purposive sampling technique to become sample of the research. The two classes were chosen based on teacher's recommendation because the two classes have the same proficiency level of English lesson.

There are two classes employed as the sample of the study. Class 5A, consisting of 30 students, was experimental group that received flashcards as a

treatment. The second class is 5B consisting of 30 students took part as the control group of this study and received word list.

3.4 Data Collection Techniques

The data in this study were collected by administering some instruments. These included: The instruments were adjusted based on study need in order to answer the research questions. Each of them will be elaborated further in the following sections.

3.4.1 Research Instrument

In this study, pre-test, post-test are the instruments to answer the research question about the use of flashcards and word list in teaching vocabulary. While interview is used to investigate the responses of the students toward the use of flashcards and word list in learning vocabulary.

3.4.1.1 Pre-test

Pre-test was employed to both groups as the first step of the study. This was purposed to obtain the data of the students' vocabulary knowledge and to find out that students from both groups had the same capability of English before they received the treatment. It comprised twenty five multiple choice questions related to the material which consisted of vocabulary taught. The example of pre-test can be seen in Appendix C.

3.4.1.2 Post-test

The study employed the post-test at the end of the study. It measured the students' vocabulary mastery after the treatments. It was employed in both groups; experimental and control group. This was intended to find the differences between students' score of both groups. This test comprised twenty five multiple choice questions. It was same as the pre-test which consisted of flashcards and vocabulary taught. While in the post-test, the numbers of items were changed. The example of post-test can be seen in Appendix C.

3.4.1.3 Interviews

Interview is useful and crucial since the researcher can clarify questions that are needed to gain more information from the respondents (Alwasilah, 2011). The interviews were conducted at the last section of the study. The interviews were done individually in the form of open ended questions. The open ended questions are used to get students' responses and more information about the use of flashcards and word list in learning vocabulary.

3.4.2 Research Procedures

There were some steps which were taken in collecting data.

3.4.2.1 Preparing lesson plans

There were some lesson plans which were used during the treatment sessions. Those lesson plans were designed for six meeting. The first and last meetings were allocated for pre-test and post-test, while the rest four meetings were allocated for the treatment sessions.

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3.4.2.2 Administering the try-out test

Before the instrument used in the study, the researcher administered try out test to investigate the validity and reliability of the instrument. Try-out test comprised fifty multiple choice questions related to materials. The test materials were adapted from several textbooks used by the fifth graders elementary school students. The try-out test was administered out of the samples of the study. The example of try-out test can be seen in Appendix C.

3.4.2.3 Administering the pre-test

After getting the valid and reliable questions from try-out test, the pre-test was administered to 60 students in two classes. Then the pre-test score from experimental and control group were analyzed.

3.4.2.4 Treatment

In this study, the flashcards was used for implementing the treatment in teaching vocabulary to the experimental group, yet the control group was treated by using word list.

3.4.2.5 A teaching program in both experimental and control group

In conducting a teaching program in experimental and control groups, the researcher acted as a teacher who used flashcards strategy in experimental group and word list in control group during teaching-learning process. The teaching vocabulary for the experimental and control groups were carried out in the same

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procedure by using pre-activities, whilst-activities and post-activities. (see lesson plans for experimental and control groups in Appendix B). The following table shows a brief sample of classroom activities for experimental and control groups.

Table 3.1
The Sample of Teaching Procedures

No.	Experimental group (storytelling strategy)	Control group (word list strategy)
1.	Pre activities <ul style="list-style-type: none"> • The teacher greets the students • The teacher asks something about the vocabulary that had been discussed in previous meeting • The teacher tells the objective of the lesson and explains the activity that students will do • The teacher presents flashcards related to the topic once 	Pre activities <ul style="list-style-type: none"> • The teacher greets the students • The teacher asks something about the vocabulary that had been discussed in previous meeting • The teacher tells the objective of the lesson and explains the activity that students will do • The teacher attracts the students to mention some words related to the topic
2	Whilst activities <ul style="list-style-type: none"> • The teacher presents flashcards and pronounce the words repeatedly • Periodically, the teacher backtracks and changes the order • The teacher drills the words and lets the Ss follow her • The teacher flips the card quickly and lets the students guess which one it is • The teacher ensures all the students know the meanings of the words • The teacher gives the students opportunity to ask something related to their activity 	Whilst activities <ul style="list-style-type: none"> • The teacher writes the words on the whiteboard • The students pronounces the words • The students follow the teacher pronouncing the words • The teacher asks the students the meanings of the words • The students writes the word list in their note book • The teacher gives the students opportunity to ask something related to their activity
3	Post activities <ul style="list-style-type: none"> • The teacher asks the students the meanings of the words • The teacher asks the students to pronounce the words at home • The teacher and the students summerize the lesson 	Post activities <ul style="list-style-type: none"> • The teacher gives a task according to the lesson which they learn • The teacher and the students summerize the lesson

The next is the schedule of teaching phase in both experimental and control groups. The schedule of teaching phase is presented in the table below:

Table 3.2
Time Schedule of Research

No	Experimental Group		Control Group	
	Date	Material	Date	Material
1.	February 19 th , 2013	Pre-test	February 19 th , 2013	Pre-test
2.	February 20 th , 2013	Treatment 1: Food and Drink	February 20 th , 2013	Food and Drink
3.	February 23 th , 2013	Treatment 2: At the Weekend	February 26 th , 2013	At the Weekend
4.	February 23 th , 2013	Treatment 3: My Pets	February 27 th , 2013	My Pets
5.	March 4 th , 2013	Treatment 4: In My Classroom	March 5 th , 2013	In My Classroom
6.	March 6 th , 2013	Post-test Interview	March 6 th , 2013	Post-test Interview

3.4.2.6 Administering the post-test

The post-test was given to both experimental and control group after the treatments were given to both groups for several sessions.

3.4.2.7 Conducting the interview

The interview as conducted to the experimental and control group to discover students' responses toward using flashcards and word list in helping students' vocabulary mastery. Ten students in each group were selected to be the participants in the interview. During the interview, the conversation was recorded

and was transcribed for further analyses. The questions of interview and the transcription can be seen in Appendix E.

3.5. Data Analysis

After collecting data, the result from the three instruments (pre-test, post-test and interview) were analyzed in order to answer the research questions. The analysis of each instrument is presented in descriptive explanation.

3.5.1. Scoring System

The test used in this study was multiple choice tests. Two types of formula can be used to process the multiple choice item data; the formula with or without punishment (Arikunto, 2002). This study used the formula without punishment. The formula is stated as follow:

$$S = R$$

In which S is score and R is the right answer.

3.5.2 Data analysis on Try-out Test

Try-out test was administered to check the validity, reliability, difficulty index of the instrument and discrimination power. Fifty multiple choices questions were tested to the students out of sample.

3.5.2.1 Validity

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According to Arikunto (2002), validity is measurements which show the validity level of quality level of an instrument. The data were calculated using Anates. The criteria of validity are shown in the following table:

Table 3.3
Category of Coefficient Correlation of Validity

Raw Score	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

(Arikunto, 2002)

The table shows the criteria of validity which determines whether the instrument is valid or not (Rudiwan and Sunarto, 2010). Thus, the instrument can reveal the result from the variable.

3.5.2.2 Reliability

According to Hatch and Farhady (1982), reliability is the extent to which a test procedure reveals a consistent result when administered under similar condition. This study used Anates to reveal the item's reliability. It was used to assure whether or not the test was reliable to be used in pre-test and post-test. The criteria of reliability are shown in the following table

Table 3.4
Category of Coefficient Correlation of Reliability

Coefficient Correlation	Interpretation
0.0-0.20	Low
0.20-0.40	Moderate
0.40-0.70	High

Above 0.70	Very high
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(Arikunto, 2002)

The table shows the criteria of reliability whether the test items are consistent or not (Riduwan and Sunarto, 2010). The test item is reliable if the raw scores are 0.40-0.70.

3.5.2.3 Difficulty Level

Difficulty level was used to measure how far the test items were relevant with the participants' ability (Arikunto, 2006). It aimed to investigate whether the test items were too easy or difficult for the participants. It can be analyzed using items difficulty index or facility value.

Table 3.5
Criteria of Difficulty Index

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

(Arikunto, 2006)

The table shows the criteria of difficulty level whether the item test was interpreted as difficult, moderate or easy.

3.5.2.4 Discrimination Power

Arikunto (2006) suggests that discrimination index is used to indicate how far a single test item can distinguish the upper group from the lower group of the class.

Table 3.6
Criteria of Discrimination Power

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

(Arikunto, 2006)

The table shows the criteria of discrimination power which differ the upper and lower group.

3.5.3 Data Analysis on Pre-test

The data collected from pre-test was analyzed using SPSS 17.0 because SPSS 17.0 had characteristics which were needed in analysing the instruments. The procedure of analyzing the data comprised several steps. First, the data collected from experimental group and control group were computing to get the score of both groups. Second, the scores were calculated in order to find out the means of both groups. After that, the means of these tests were compared using independent t-test with the assist of SPSS 17.0 to find out whether or not the flashcards strategy can help teaching vocabulary for young learners. Before conducting independent t-test, the normal distribution and homogeneity variance test were done.

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3.5.3.1 Normal Distribution Test

Normal distribution test was calculated before t-test. It aimed to investigate whether or not the distribution of pre-test and post-test scores in two groups were normally distributed. The statistical calculation of normal test used *Kolmogorov-Smirnov* because it had characteristics which were needed in the study (Riduwan and Sunarto, 2010). The steps are as follows:

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

H_0 : the variances of experimental and control group are normally distributed.

H_1 : the variances of experimental and control group are not normally distributed.

The level of significance at 0.05 is used because it is a standard which is applied in social studies (Rudiwan and Sunarto, 2010).

2. Analyzing the normality distribution with One-Sample *Kolmogorov-Smirnov test*.
3. Comparing the *asymp.sig* with the level of significance (p) to test the hypothesis. If the *asymp.sig* > 0.05, the null hypothesis is not rejected and the distribution of data is normal. Hence if the *asymp.sig* < 0.05, the null hypothesis is rejected and it means the data is not normally distributed.

3.5.3.2 Homogeneity of Variance

The homogeneity of variance test used a SPSS program namely *Levene test* because it had characteristics which were used in the study (Riduwan and Sunarto, 2010). Homogeneity of variance in the pre-test are needed to find out the initial vocabulary mastery before treatment. The steps are as follows:

1. Setting the hypothesis of variance, H_0 = data between the two groups are homogeny
2. Setting the level of significance (p) at 0.05
3. Measuring the homogeneity variance using *Levene's test*
4. Comparing the result of *Levene's test* and alpha level of significance if $asympt.sig < 0.05$, the null hypothesis is rejected which means the two groups are not equal. In contrary, if $asympt.sig > 0.05$, the hypothesis is not rejected which means variance data of two groups are equal or the data are homogenous.

3.5.3.3 Independent t-test

The independent t-test was used in this study to see whether the difference of mean between the experimental and control groups,. Moreover, the independent t-test had characteristics which were needed in conducting the study (Rudiwan and Sunarto, 2010). There were three steps in analyzing the independent t-test.

1. Stating the hypothesis and setting the alpha level at 0.05. The null hypothesis (H_0) is that there is no significant difference between the pre-test and post-test mean for experimental and control groups. H_1 is that

there is significant difference between the means in experimental and control groups.

2. Calculating independent t-test by using SPSS 17.
3. Comparing (t) significance 2 tailed with level of significance. If (t) significance 2 tailed >0.05 , the null hypothesis is accepted which means there is no difference of means between experimental and control groups. On the contrary, if (t) significance 2 tailed <0.05 , the null hypothesis is rejected that means there is difference of means between experimental and control groups. (t) significance 2 tailed is used in the study because it is needed to see whether the means in the experimental and control groups are different or not.

3.5.3.4 The Dependent t-test

The dependent t-test was used to compare the score of pre-test and post-test of experimental group. The pre-test score of experimental class are compared to the post-test score (Collidge, 2000). Moreover, Hatch and Farhady (1982) state that dependent t-test or matched t-test is used to analyze the pre-test and post-test score and to investigate whether or not the difference of pre-test and post-test means of each group are significant. The steps are as follows:

1. Setting the level of significance (p) at 0.05 and establishing the null hypothesis for the pre-test and post-test data analysis. Null hypothesis (H_0) is that there is no significant difference between the pre-test and post-test scores.

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2. Analyzing the dependent t-test by using SPSS 17 for windows.
3. Comparing (t) significance 2 tailed with the level of significance for testing the hypothesis. If (t) significance 2 tailed >0.05 , the null hypothesis is accepted, we can conclude that there is no significant difference between the pre-test and post-test scores of experimental group. Meanwhile, if (t) significance 2 tailed < 0.05 , the null hypothesis is rejected which means there is significant difference between the pre-test and post-test scores of experimental group.

3.5.4 Data Analysis on Post-test

Data analysis on post-test employed exactly the same steps as in the pre-test data analysis which is included normality test, homogeneity test and independent t-test by using SPSS 17 for windows.

3.5.4.1 The Calculation of Effect Size

Effect size is the effect of the influence of independent variable upon the dependent variable (Coolidge, 2001). It means that effect size is a way to consider how well the treatment works if there is a large different between the two group's means. It states that the treatment really works, and then there is said to be a much effect size. If the differences between the two groups' means are small, then there are said to a small effect size.

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

Notes:

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r = Effect size

t = t obt or t value from the calculation of independent t -test

df = $N_1 + N_2 - 2$

After gaining the effect size, then the score will be 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)

3.5.5 Analysis of Interview Data

The data from interview were transcribed to reaffirm the issue. The transcriptions were labeled and coded based on the respondents' answers and then the answers were classified into some aspects. The result of the interviews will be more discussed in Chapter 4. The transcription of the interviews can be seen in Appendix E.

3.6 Concluding Remark

This chapter explained the research design, population and samples, data collection, research procedures and data analysis. The following chapter will be described the findings and discussion.