III. RESEARCH METHODS

This chapter consists of some points. It covers research design, population and sample, data collecting technique, variables, research instrument, try out, research procedure, data analysis and hypothesis testing.

3.1 Research Design

This is a quantitative research. According to Setiyadi (2006: 5), quantitative design aims to investigate a theory have been existed and the researcher should look for the data to support or reject it. In conducting the research, the researcher applied *one-group pretest-post test design*. In the form of objective test, the researcher gave a pretest before treatments and a post test after the three treatments (Hatch and Farhady, 1982). The researcher used two classes, the experimental class and try out class. The pretest is used to find out the students' preliminary ability and the post test is used to see how far the difference of the students' vocabulary achievement after the treatments. The research was intended find out whether there is difference of the students' English vocabulary achievement related to concrete noun through projected picture and whether the projected picture can increase the students' English vocabulary achievement of the first year at SMPN 1 Seputih Banyak. The research design is described as follows:

T1 X T2

Where:
T1 : pretest
T2 : post test
X : treatments (projected picture)

(Hatch and Farhady, 1982: 20)

3.2 Population and Sample

Population is all of people who become the object of the research while sample is people who give the data (Setiyadi, 2006: 38). The population of the research was the first grade of SMPN 1 Seputih Banyak in the 2012/2013 academic year. There were seven classes of the first grade (VII A-VII G) which consisted of 230 students. Each class in SMPN 1 Seputih Banyak class seven consisted of 32-33 students. The researcher took two classes, class VII A as experimental class consisting of 32 students and class VII C as try out class consisting of 33 students. In this research, the researcher used simple random probability sampling by lottery (Setiyadi, 2006: 39). It was applied based on that consideration that every class in the population has the same chance to be chosen and in order to avoid the subjectivity in the research.

3.3 Data Collecting Technique

In order to collect the data, the researcher applied vocabulary test.

3.3.1 Vocabulary Test

Vocabulary test was used to get the data of students' English vocabulary achievement. The vocabulary test was about the vocabularies related to the things at home, shop and school. In vocabulary test, there were two tests

which conducted. The aim of the researcher in giving two tests was to find out whether there is difference in students' vocabulary achievement before and after taught through projected picture. Those tests were pretest and post test.

3.3.1.1 Pretest

This test conducted in order to find out the pretest score of the students and to know the students' ability in vocabulary before the treatments were given. The test was about 30 items consisted of 20 multiple choices with four options (A, B, C, and D) and 10 in form of matching tests. The time allocation was 45 minutes. The result of the pretest was compared with the post test result to find out their achievement.

3.3.1.2 Post test

After conducting the treatments, the post test was conducted. The post test consisted of 20 items in form of multiple choices and 10 in form of matching tests. The time allocation was about 45 minutes. It was done in order to know the students' achievement after having the treatments. The questions in post test were same as the pretest. The researcher just changed the question and the distracters in other number differ that those in pretest.

3.4 Variables

In this research, the researcher organized two variables; they were dependent and independent variable. The dependent variable is the variable which the researcher observes and measures to determine the effect of independent variable. Then, the independent variable is the major variable which the researcher hopes to

investigate. It is the variable which is selected; manipulated and measured by the researcher (Hatch and Farhady, 1982: 15).

From the explanation above, the researcher determined the variables as follows:

1. Students' achievement on vocabulary as dependent variable.
2. Projected picture as independent variable.

3.5 Research Instrument

In this research, the researcher conducted two tests. They were pretest and post test. Pretest was given in order to know the students' vocabulary achievement before the treatments. Post test was given in order to know the students' vocabulary achievement after the treatments. The form of the try out of the test, pretest and post test were in multiple choice and matching tests. The total number of the try out items was 40 items and the total number of the items of the pretest and post test was 30 items from the items of try out of the test. The try out of the test was administrated about 60 minutes and the pretest and post test was administrated about 45 minutes.

3.6 Try Out

The try out of the test was done to prove whether the test had good quality or not. It was said to have a good quality if it had a good validity, reliability, level of difficulty and discrimination power. The try out was held to different class from the experimental class. This test was about 40 items consisted of 25 multiple

choices with four options (A, B, C, and D) and 15 items in form of matching tests. There were some elements that were tested as follow:

3.6.1 Validity

A test can be said valid if the test measure the object to be measured and suitable with the criteria (Hatch and Farhady, 1982: 250). A test must aim to provide true measure of the particular skill which it is intended to measure. There are four types of validity that are: (1) face validity, concerns with the lay out of the test; (2) content validity, depends on a careful analysis of the language being stated; (3) construct validity; measures certain specific characteristic in accordance with a theory of language learning; (4) criterion-related/concurrent validity, concerns with measuring the success in the future, as in replacement test.

Based on the types of validity above, the researcher will use content and construct validity because the other two are considered to be less needed. Both of them will be explained as follows:

a. Content validity

Content validity is extended to which a test measures representative sample of the subject matter contents, the focus of the content validity is adequacy of the sample and simply on the appearance of the test (Hatch and Farhady, 1982: 251). It means that the test should be correct and represent the materials that are taught such as concrete nouns. In the content validity, the materials given are appropriate with the standard competence in syllabus for the first grade junior high school students. That is the students are able to express the meaning in short written functional

text to interact with the closest environment. In this case, the students must comprehend the vocabulary with a topic; that is things around us which are often used in our daily life. The researcher also made a table of specification to judge the content validity already good or not.

Table 1. Specification of the Vocabulary Test.

Subtopic	Items Number	Sum
Things at home (30%)	2, 3, 9, 13, 15, 19, 21, 26, 29, 32, 37, 39.	**12**
Things at shop (35%)	5, 6, 14, 16, 20, 22, 23, 24, 25, 28, 30, 31, 38, 40.	**14**
Things at school (35%)	1, 4, 7, 8, 10, 11, 12, 17, 18, 27, 33, 34, 35, 36.	**14**
Total (100%)		**40**

b. Construct validity

Construct validity is concerned with whether the test is actually in line with the theory of what it means to know the language (Shohamy, 1985:74). To find construct validity of the test, formulation of the test is based on the concept of Hatch and Brown (1995: 1) who define vocabulary as a list or set of words for a particular language or a list or set of word that individual speakers of language might use.

In order to judge the construct validity of the test, inter-rater was also used. The items of the test were discussed with the English teacher of SMPN 1 Seputih Banyak as the rater. The rater checked the items whether the items had good construct validity or not. All test items which had good validity were used to collect the data for this research and the bad one should be revised.

3.6.2 Reliability

Reliability is simple a consistency of a test. In other words, how far it can measure the same subject at separated time, but it shows the same result relatively (Setiyadi, 2006: 113). Reliability of a test can be defined as the extent to which a test produced consistent results when administer under similar conditions (Hatch and Farhady, 1982: 243). In order to estimate the reliability of the test, this research used split-half technique and to measure the coefficient of the reliability between odd and even group, this research used "The Pearson Product Moment Formula" as follows:

$$r_{xy} = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}}$$

Where:

r_{xy} : coefficient of reliability between odd and even numbers items
x : odd number
y : even number
$\sum x^2$: total score of odd number items
$\sum y^2$: total score of even number items
$\sum xy$: total score of odd and even number

Then, this research used Spearman Brown's Prophecy Formula to know the coefficient correlation of the whole items. The formula is as follows:

$$r_k = \frac{2\, r_{xy}}{1 + r_{xy}}$$

Where:

r_k : the reliability of the whole tests
r_{xy} : the reliability of half test

(Hatch and Farhady, 1982:247)

The criteria of reliability

0.00 – 0.20 : very low
0.21 – 0.39 : low
0.40 – 0.59 : average
0.60 – 0.79 : high

0.80 – 1.00 : very high

(Hatch and Farhady, 1982: 246)

3.6.3 Level of Difficulty

Level of difficulty relates to "how easy of difficult the item is from the point of view of the students who took the test. It is important since test items which are too easy (that all students get right) can tell us nothing about differences within the test population" (Shohamy, 1985:79). In order to find out the level of difficulty, this research used the following formula:

$$LD = \frac{U+L}{N}$$

Where:
LD : level of difficulty
U : the number of upper group students who are answer correctly
L : the number of lower group students who are answer correctly
N : the total number of students who take the test

The criteria are:
<0.30 : difficult
0.30-0.70 : good
>0.70 : easy (Shohamy, 1985: 79)

3.6.4 Discrimination Power

Discrimination power refers to "the extent to which the item differentiates between high and low level students on that test. A good item according to his criterion is one in which good students did well and bad students failed" (Shohamy, 1985: 81). To find out the discrimination power, this research used the following formula:

$$DP = \frac{Upper-Lower}{{}^{1}/_{2}(N)}$$

Where:
DP : discrimination power
Upper : proportion of "high group" students getting the item correct
Lower : proportion of "low group" students getting the item correct
N : total number of students

(Shohamy, 1985: 82)

The criteria are:
0.00-0.20 : Poor
0.21-0.40 : Satisfied
0.41-0.70 : Good
0.71-1.00 : Excellent
(Negative) : Bad items (should be omitted)

(Heaton, 1975: 182)

3.7 Research Procedure

In doing the research, the researcher used procedure as follows:

1. Selecting and determining the population and the sample of the research.

   The researcher chose two classes of the first year at SMPN 1 Seputih Banyak, which were divided as experimental class and try out class.

2. Trying out the instrument

   The instrument, vocabulary test, was tried previously in the try out class. It was aimed at making sure the tests in this study were valid and reliable. The number of the items was 40 items consisted of 25 items in form of multiple choices and 15 items in form of matching tests. The time allocation for the try out was 60 minutes. The try out was held to find out the quality of the test and to determine the items that might be revised for the pretest and the post test.

3. Administering pretest

   The purpose in giving pretest was to measure the students' mastery of vocabulary before the treatments given. So that, the researcher was able to

compare the result with the post test results later. The pretest was 30 items consisted of 20 items in form of multiple choices and 10 items in form of matching tests. The pretest was administrated for 45 minutes in the experimental class.

4. Arranging the materials will be taught

   The topic of the materials was things around us which were divided into three subtopics, things at home, shop and school. The vocabularies were taught to the students classified into content words, especially concrete nouns.

5. Implementing the treatments

   The experimental class was taught by using projected picture. While the teaching and learning occurs, the researcher observed the whole process.

6. Administering post test

   The post test was administered to the experimental class. The result of the test was compared with the pretest to find out whether there was any increase from the pretest and post test result. It was 30 items consisted of 20 items in form of multiple choices and 10 items in form of matching tests. The post test was administrated about 45 minutes.

7. Analyzing the data

   The data were analyzed by comparing the average score (mean) of pretest and post test to know whether there was difference in students' vocabulary achievement before and after being taught through projected picture.

8. Reporting the result

   The data were arranged systematically based on the pretest and post test to find out whether there was difference of the students' vocabulary achievement before and after being taught through projected picture.

3.8 Data Analysis

After conducting pretest and post test, the researcher analyzed the data. It was used to know whether there was difference of the students' vocabulary achievement at first grade of SMPN 1 Seputih Banyak before and after being taught through projected picture.

The researcher examined the students' score using the following steps:

1. Scoring the pretest and post test

   In scoring the result of students' test, the researcher has used Percentage Correct (Lyman, 1971: 95). The percentage correct score is used in reporting the result of classroom achievement tests. The researcher has calculated the result of the test by using this formula:

   $$X\%c = 100\,\frac{R}{T}$$

   (Lyman, 1971:95)

   Where:

   X%c : percentage of correct score
   R : number of right answers
   T : total number of the items on test

2. Tabulating the result of the test and calculating the mean of pretest and post test.

To compute the average score or mean of the pretest and post test, the researcher used a very simple formula as follows:

$$M = \frac{\sum x}{N}$$

Where:

M : (Mean) Average score
∑x : Total students' score
N : Total number of students

The average is total students' score divided by total number of students.

(Hatch and Farhady, 1982: 55)

3. Drawing conclusion from the tabulated result of the pretest and post test administrated. The data were analyzed by using statistical computerization Repeated Measures t-test of SPSS 15 for Windows i.e. $t = \frac{\overline{x_1} - \overline{x_2}}{\overline{S_D}}$ to test whether the difference between pretest and post test is significant or not, in which the significance is determined by $p<0.05$ (Hatch and Farhady, 1982: 114). Whereas:

$$\overline{S_D} = \frac{SD}{\sqrt{n}}$$

$$SD = \overline{\frac{\sum D^2 - (1/n) - (\sum D)^2}{n-1}}$$

Where :

t : hypothesis test
$\overline{X_1}$: mean score pretest
$\overline{X_2}$: mean score post test
$\overline{S_D}$: standard error of differences between two means
SD : standard deviation
N : number of students

(Hatch and Farhady, 1982:116)

Since, the data were gained from one group and the research was intended to find out whether there was difference of the students' English vocabulary achievement.

3.9 Data Treatment

Repeated Measures t-test for hypothesis testing has three basic assumptions, namely:

The data is interval or ratio

a. The data is taken from random sample in a population
b. The data is distributed normally.

(Setiyadi, 2006: 168-169)

Therefore, the researcher employed these following procedures:

1. **Random test**

   Run test is used to make sure whether the data random or not. The researcher used SPSS version 15.0 to help her. In this case, the researcher used the mean as the cut point run t-test. The hypothesis for the random test is formulated as follows:

   H_0 : The data are random

   H_1 : The data are not random

   In this research, the criteria for the hypothesis are:

   H_0 is accepted if Sig.>α. In this case, the researcher uses the level of significance 0.05.

2. Normality test

Normality test is used to know whether the data in pretest and post test are distributed normally. The hypothesis of the normality test is as follows:

H_0 : The distribution of the data is normal

H_1 : The distribution of the data is not normal

In this research, the criteria for the hypothesis are:

H_0 is accepted if significant value exceeds level of significance at 0.05 (Sig.>α). Meanwhile, H_0 is rejected if significant value does not exceed level of significance at 0.05.

3.10 Hypothesis Testing

Hypothesis testing is intended to see whether the hypothesis that is proposed in this research is accepted or not. To test the hypothesis, *repeated measures T-test* was conducted at the significant level of 0.05 (P<0.05). The hypotheses are:

H_0 : There is no difference of the students' vocabulary achievement before and after being taught through projected picture.

H_1 : There is difference of the students' vocabulary achievement before and after being taught through projected picture.

(Hatch and Farhady, 1982: 111)

The criteria are:

1. If the t-ratio is lower than t-table: H_0 is accepted there is no difference of the students' vocabulary achievement before and after being taught through projected picture.
2. If the t-ratio is higher than t-table: H_1 is accepted there is difference of the students' achievement before and after being taught through projected picture.