III. RESEARCH METHOD

This chapter describes the design of the research, how to collect the data from the subject of the research, and how to analyze the data. This chapter also describes research procedure, validity and reliability of the test instrument, data treatment, and hypothesis testing.

3.1 Research Design

In conducting this research, the researcher used a quantitative design because she wanted to compare students' vocabulary achievement between those taught through visual dictionary and those taught through sequential art. The researcher applied the static-group comparison design. The researcher used two classes where the students received pretest before three-time treatments and they received a posttest after the treatments. The pretest was used to find out the students' preliminary ability. Then, the posttest was used to look how far the increase of the students' vocabulary mastery after treatments. The treatments were given to the students by applying visual dictionary and sequential art as the media. The research was intended to find out which one between visual dictionary and sequential art would be more effective to improve students' vocabulary

achievement. In this design, there were two classes: an experimental class 1 and an experimental class 2 which were received the treatments. Both experimental class 1 and experimental class 2 received the same pre-test and posttest.

The design can be presented as follows:

G1   : T1 X1 T2

G2   : T1 X2 T2

Where:

G1   : experimental class 1

G2   : experimental class 2

T1   : pretest

X1   : experimental class 1 treatment

X2   : experimental class 2 treatment

T2   : posttest

(Setiyadi, 2006:135)

3.2 Population and Sample

The population of this research was the third year students of SMP Muhammadiyah Trimurjo, Central Lampung in the year 2012/2013. There were four classes of grade IX students and each class consists of 30 students. Then, the researcher took three classes purposively as the subject of the research. There was

one class as the try out class, one class as an experimental class 1, and another as an experimental class 2. In order to see that the experimental class 1 and the experimental class 2 had approximately the same ability, the researcher took the data from conducting the pretest for the classes, experimental class 1 and experimental class 2. The results were then compared to the other result. It was necessary to measure whether the two classes had the same basic ability or in other words, they had equal knowledge.

3.3 Variables

This research consists of the following variables:

1. The students' vocabulary mastery (achievement) as dependent variable (Y),
2. Visual dictionary and sequential art as independent variables (X1 and X2).

3.4 Instrument

This research instrument was vocabulary test in the form of objective test. The instrument was used for pretest and posttest. Pretest was given to know how far the vocabulary achievement of the students. It was done before implementing the treatments. Posttest was used to get data of the students' vocabulary achievement after being given treatments. Then the researcher found out whether there was increase of the result between pretest and posttest. The tests (pretest and posttest) consisted of 30 multiple-choice questions and each item had 4 options of answer, one as the correct answer and the rests as distracters. The validity of the instrument concerned with the content and construct validity in which the

questions represented the vocabularies stated in the process of teaching vocabulary through visual dictionary and sequential art.

3.5 Data Collecting Technique

The data of this research was gained from:

1. Try Out

   This test had aim to know the validity and reliability of the test. The test was administered before the pretest. The total items were 40 and it was allocated within 60 minutes.

2. Pretest

   Pretest was conducted before the researcher conducts the treatment. It was used to know how far the students mastered the vocabulary. The test consisted of 30 items in multiple choices and each item had 4 options of answer. One is the correct answer and the rest are the distracters. It was conducted in 45 minutes. The pretest was administered once.

3. Posttest

   Posttest was conducted after the researcher conducts the treatment. It was used to know the increase of students' vocabulary after they were given the treatments. The questions in the posttest were the same as the pretest. However, the researcher changed the questions and the distracters in other numbers which were differed to those in pretest. The test consisted of 30 items in multiple choices and each item had 4 option answers. One was the correct

answer and the rest were distracters. It was conducted in 45 minutes. This test had the same difficulty level as pretest.

4. Observation

   The observation was conducted in the experimental class to observe the teaching-learning process during the treatment of teaching vocabulary through visual dictionary and sequential art.

5. Interview

   The interview was conducted in both experimental classes, in which the students' answers were classified and generalized as the resource. Interview used to find out the problems that students face/undergo in learning vocabulary through visual dictionary and sequential art.

3.6 Research Procedure

1. Pre-observation

   Pre-observation was conducted through interview to the English teacher of SMP Muhammadiyah Trimurjo to find out the background problems in English teaching and learning process before the researcher do her research there.

2. Determining the Subject of the Research

   The researcher chose three classes of grade IX students of SMP Muhammadiyah Trimurjo as the research subjects. IXC as the try out class, IXA as the experimental class 1, and IXB as the experimental class 2. Each

class consists of 30 students. In determining the experimental class 1 and experimental class 2, the researcher used coin.

3. Selecting and determining the material

    The researcher determined the material was taken from *www.thedeliciousrevolution.com* website. The selecting process considered material which would attract students' interest. The researcher used procedure texts that contained the target words from the vocabulary of content words (noun, verb, adjective, and adverb). The visual dictionary and sequential art was modified and composed by the researcher herself in accordance to the texts used for the treatments.

4. Conducting Try Out

    Try Out was conducted to measure the level of difficulty, discrimination power, validity and reliability of pretest and posttest. It was administered for 40 items in 60 minutes. The aim of try out was to know the quality of the test used as the instrument of the research, and determine which item should be revised for pretest and posttest. The try-out test conducted before the first meeting in one class out of the experimental class.

5. Conducting the Pretest

    Pretest was conducted to measure students' basic ability. It consisted of 30 items in multiple-choice questions and each item had 4 options of answer. It was conducted in 45 minutes.

6. Giving Treatments

    There were three times of treatments conducted in this research. Each treatment was conducted for 90 minutes consisting of vocabulary of content

words (noun, verb, adjective, and adverb) which learnt through visual dictionary in experimental class 1 and sequential art in experimental class 2.

7. Conducting the Posttest

The posttest was conducted for 30 items in multiple-choice questions and each item had 4 options of answer. It was conducted in 45 minutes to measure whether there was increase of students' vocabulary achievement after being given treatments.

8. Analyzing the Test Result

After conducting pretest and posttest, the researcher analyzed the data. The data was analyzed by using T-Test. It was used to compare the result of students' vocabulary achievement taught through visual dictionary and sequential art.

9. Conducting the Observation

The observation was conducted in the experimental classes to observe the teaching-learning process during the treatment of teaching vocabulary through visual dictionary and sequential art. There are four types of observer who do the observation; they are observer as complete participant, participant as observer, observer as participant, and complete observer (Setiyadi, 2006: 241). Here, the researcher acted to be an observer as participant. To be an observer as participant, the researcher did the observation while she taught the materials in the class. The researcher was the participant of teaching learning process and her appearance as an observer was not really realized by students and kept them to act naturally. This kind of condition helped the observer to get important information optimally. Observation sheet (note where the treatment

process is reported) was used to observe teaching-learning activity and to note the classroom events during the treatment process. The observation sheet was in the form of a checklist.

10. Conducting Interview

The interview was conducted in IXA and IXB as the experimental class 1 and experimental class 2, in which the students' answers were classified and generalized as the resource. Some representatives of the students as the interviewees were chosen from low and high scores based on the mean score of the post-test. The interview was in the form of open and formal questions (the questions must be in the form of explanation or description rather than "yes" or "no" answers, to avoid the students from being reluctant to answer the questions given). The interview was conducted to find out the problems the students face in learning vocabulary through visual dictionary and sequential art.

3.7 Scoring System

To score the students' work of the test, the researcher used percentage scoring. The ideal highest score was 100. The score were calculated by using the following formula:

$$PS = \frac{R}{N} \times 100$$

Where:

PS   : percentage score

R   : the total of right answer

N   : total item

(Henning, 1987: 17)

3.8 Criteria of Good Test

In this research, to prove whether the test had good quality, it was tried out first. The test is said having a good quality if it has a good quality, reliability, level of difficulty, and discrimination power. The try out test was given to the students to know how the quality of the test which was used as the instrument of the research. The try out test was given to another class that was not included in the sample. The data gained were analyzed to judge the level of difficulty, discrimination power, validity, and reliability of the test.

3.8.1 Validity

The validity of the test is the extent to which it measured what it is supposed to measure and nothing else (Heaton, 1991:159). In order to measure whether the test has a good validity, the researcher analyzes the test from content and construct validity.

Content validity is concerned with whether test is sufficiently representative and comprehensive for the test. In the content validity, the materials given are suitable with the curriculum. To fulfill this validity, the researcher saw all the indicators of the instrument and analyzed them whether the measuring instrument represent the material that was measured or not. While all indicators were based on the material, it meant that the instrument was fulfilled the criteria of content validity. In this case, the researcher used the

vocabulary of content words (noun, verb, adjective and adverb) related to procedure text that were supposed to comprehend by grade IX students.

The researcher used the table of specification to check content validity of the test items. The total percentage in the table indicated the relatives' degree of emphasis of each content area and each instructional objective given in the test. The table of specification can be used to determine which test is more relevant to our particular situation and is also necessary to check whether test items have good content validity.

Table 1. Table of Specification of Try Out Test

Content	Aspect	Items	Total	Percent
Vocabulary of Kitchen Area	1.Noun	1,2,3,4,5,6,7,8,9,10	10	25%
	2.Verb	11,12,13,14,15,16,17,18,19,20	10	25%
	3.Adjective	21,22,23,24,25,26,27,28,29,30	10	25%
	4.Adverb	31,32,33,34,35,36,37,38,39,40	10	25%
Total		40	40	100%

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). Construct validity focuses on the kind of test that is used to measure the ability. It means that the test items should really test the students whether they have mastered the material that has been taught or not. According to Setiyadi (2006:26), if the instrument just measures one aspect, for example vocabulary,

the construct validity can be measured by evaluating all items in the test. If all items have measured vocabulary mastery of the students, this instrument has fulfilled construct validity.

Then, in order to measure content validity and construct validity, the researcher uses *inter-rater analysis* to make the instrument more valid. Accordingly, the three English teachers of SMP Muhammadiyah Trimurjo took part in measuring the content and construct validity of the instrument. If the percentage of one test item is > 50%, the item will be taken.

3.8.2   Reliability

Hatch and Farhady (1982:243) state that reliability of a test can be defined as the extent to which a test produces consistent result when administered under similar conditions. To determine the reliability of the test, the researcher has used split-half method because this formula was simple to use since (1) it avoid troublesome correlations and (2) in addition to the number of item in the test, it involves only the test, mean and standard deviation, both of which are normally calculated anyhow as a matter of routine (Heaton, 1991: 164). To use split-half method, the researcher classified the test items into two similar parts, i.e. odd and even numbered. By splitting the test into two equal parts, it was made as if the whole test had been taken twice. To measure the coefficient of the reliability between odd and even group (reliability of half test), the researcher has used *Pearson Product Moment* in the following formula:

$$r_{xy} = \frac{N\sum xy - \left(\sum x\right)\left(\sum y\right)}{\sqrt{\left[N\sum x^2 - \left(\sum x\right)^2\right]\left[N\sum y^2 - \left(\sum y\right)^2\right]}}$$

Where:

r_{xy} : the correlation coefficient of reliability between odd and even

N   : the number of students who take part in the test

x   : the total numbers of odd number items

y   : the total numbers of even number items

x^2 : the square of x

y^2 : the square of y

$\sum x$: the total score of odd number items

$\sum y$: the total score of even number items

(Henning, 1987: 60)

Then the researcher uses *Spearman Brown's Prophecy formula* (Hatch and Farhady, 1982: 246) to know the coefficient correlation of whole items as follows:

$$r_k = \frac{2\left(r_{xy}\right)}{1 + r_{xy}}$$

Where:

r_k : the reliability of the test

r_{xy} : the reliability of half test

The criteria of reliability are:

0.90- 1.00 : high

0.50- 0.89 : moderate

0.0- 0.49   : low

(Hatch and Farhady, 1982: 247)

3.8.3   Level of Difficulty

To know whether the test items are easy or difficult from the students' perception that took the test, the researcher has calculated the level of difficulty. Difficulty level is calculated by dividing the number of students who get it right by the total number of students (Shohamy, 1985: 79).

The formula as follows:

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

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

0.31 – 0.70   : average

– 1.00   : easy

3.8.4 Discrimination Power

The discrimination power is used to discriminate between weak and strong examinees in the ability being tested. The results of the students' test were divided into two groups, upper and lower. The upper students meant that the students who answered the questions correctly were more than the lower students answered correctly. To determine the discrimination power, the researcher used the following formula:

$$DP = \frac{correctU - correctL}{1/2N}$$

(Shohamy, 1985: 81)

Where:

DP   : discrimination Power

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

The criteria are:

1. If the value is positive, it means that a larger number of more knowledgeable students than poor students get the item correct. If the value is zero, it means that there is no discrimination.

2. If the value is negative, it means that more low students than high level students get the item correct.

3. In general, the higher the discrimination index will be the better. In classroom situation, most items should be higher than 0.20 indexes.

3.9 Data Analysis

The purpose of analysis was to reduce data to be intelligible and interpretable so that the relation of research problem could be studied. Therefore, the data from the observation and interview were also collected and interpreted to describe the situation in the class and found out the problems the students face/undergo in learning vocabulary through visual dictionary and sequential art.

The researcher analyzed the data in order to compare the increase of the students' vocabulary mastery in the used of visual dictionary and sequential art as the media. The researcher analyzed the students' vocabulary achievement by doing these activities:

1. Scoring the pretest and posttest.
2. Tabulating the result of the test and calculating mean of the pretest and posttest.

$$Md = \frac{\sum d}{N}$$

Md = mean

$\sum d$ = total score of students

N = number of students

3. Drawing a conclusion from the tabulated results of the pre-test and post-test, then analyzing by using Independent Group T-test through the Statistical Package for Social Science (SPSS) 17 for windows.

Furthermore, in order to find out the problems the students face/undergo in learning vocabulary through visual dictionary and sequential art, triangulation method was used. The first instrument that used was observation, which conducted in the experimental classes to observe the teaching-learning process during the treatment of teaching vocabulary through visual dictionary and sequential art. In analyzing the data from the observation of students' learning activities, the researcher counts the number of activities done by the students and then calculates the percentage of the students' activities.

The criteria as follows:

The score for each activity is 10 to the total score 100

1. 40-50   : Poor
2. 60-70   : Enough
3. 80-90   : Good
4. 100   : Very good

Arikunto (2006:7)

The indicator of the students' activities is more than 75%. If more than 75% learning activities are done by the students, it means that the teaching learning process can be categorized as a good level (Arikunto, 2006:7).

The second instrument was interview, which also conducted in the experimental classes in the form of open and formal questions (the questions must be in the form of explanation or description rather than "yes" or "no"

answers, to avoid the students from being reluctant to answer the questions given). To analyze its qualitative data, matrix analysis, in this case description analysis was used since the researcher used her own idea, including her own interpretation toward the data (Setiyadi, 2006:262).

3.10 Data Treatment

According to Hatch and Farhady quoted by Setiyadi (2006: 168-169), using t-test for the hypothesis testing has three underlying assumptions, namely:

1. The data is interval ratio.
2. The data is taken from random sample in a population.
3. The data is distributed normally.

Therefore, the researcher used the following procedures to treat the data treatment:

3.10.1 Normality Test

The normality of test used to measure whether the data in experimental class 1 and experimental class 2 are normally distributed or not.

The hypothesis for the normality test is as follows:

H_0 : the data is not distributed normally

H_1 : the data is distributed normally

In this research, the criteria for the hypothesis are:

H_1 is accepted if $p > \alpha$, and the researcher uses level of significance 0.05

3.10.2 Homogeneity Test

This test was used to determine whether the data fulfill the criteria of the quality of variance. This test used T-Test to analyze the data.

The hypothesis for the homogeneity of variance is as follows:

H_0: there is no significant difference (equal)

H_1: there is a significant difference (not equal)

In this case, H_0 is accepted if $p > \alpha$ (p = the significant score of students, α = the significant level). Here, the researcher uses the significant level (α) 0.05.

3.11 Hypothesis Testing

The hypothesis was used to prove whether the hypothesis proposed in this research was accepted or not. *Independent Group T-Test* was used and the hypothesis was also statistically tested by using statistical computerization (SPSS 17). The hypothesis analyzed at the significant level of 0.05 in which the hypothesis will be approved if sign < α. It means that the probability of error in the hypothesis is only about 5%.

The hypotheses are:

1. There is a difference of students' vocabulary achievement as a result of teaching through visual dictionary and sequential art.

2. Visual dictionary is more effective to improve students' vocabulary achievement than sequential art.

Besides that, the observation and interview were implemented. The observation was done by the researcher during teaching learning process as an *observer as participant* while the researcher taught the materials. The observation sheet is available in appendix 32. Meanwhile, the interview in the experimental class was in the form of open and formal questions (the questions must be in the form of explanation or description rather than "yes" or "no" answers, to avoid the students from being reluctant to answer the questions given); to analyze its qualitative data in order to find out the problems the students face in learning vocabulary through visual dictionary and sequential art, matrix analysis, in this case description analysis was used, since the researcher used her own idea, including her own interpretation toward the data (Setiyadi, 2006:262).