III. RESEARCH METHOD

This chapter discusses some aspects: research design, population and sample, data colleting technique, step in collecting data, instrument of the test, criteria of the test, scoring system, data analysis, and hypothesis testing. They are classifying like the followings.

3.1 Research Design

This research is a quantitative study which has *one group pretest-posttest design.* The research selects one class as the experimental group using simple probability sampling. The aim of this research is to find out whether there is a significant difference of the student's vocabulary achievement at the first grade of SMA Negeri 1 B.Lampung before and after being taught through derivational affixes.

T1 X T2

T1 = Pretest

X = Treatment

T2 = Posttest

(Setiyadi, 2006:133)

3.2 Population and Sample of the Research

The population of this research was the students at the first grade of SMA Negeri 1 B.Lampung. There were six classes of the first grade in that school. The number

of the students of each class consists about of 35-38 students. In relation to the design, the researcher took one class as the experimental class of the research randomly through lottery. The name of each class was written on small piece of paper. Then, the paper were rolled and put into a box after that the box was shaken, and then researcher took two pieces of the rolled paper, the first paper as try out class, and the second paper as experimental class. The first year students were chosen because they have studied English for three years at SMP and they still have chance to apply the technique of learning vocabulary proposed in this study.

3.3 Data Collecting Technique

The data of the research was the students` vocabulary achievement before and after the treatments. The instrument of the research was test in form of multiple choices, where the pretest and posttest were given in order to evaluate, to measure the vocabulary achievement.

In collecting data, this research used the following procedures:

1. Pretest

The pretest was conducted before treatments. It was used to know how far the students had mastered the vocabulary before the treatments were given. The pretest used by researcher was multiple choices. The number of item of the test was 35 items and each item had four options of answers. One is the correct answer and the other options are the distracters.

2. Treatment

After giving the pretest, the writer treated the students by teaching them through derivational affixes. The treatment was given in three meetings. Each meeting was taken 2x45 minutes. The material was presented which focused on teaching derivational affixes.

3. Posttest

The posttest was conducted after the researcher gave the treatments. It was used to know how far the students had achieved the English vocabulary after being taught through derivational affixes. Similar to the pretest, in the posttest the researcher used of multiple choices. The questions were the same as the pretest. But, the researcher changed the order of the questions from those in the pretest in order that the students not only memorize or remember the order of the answer for each question but they can really understand the questions. The posttest consists of 35 items.

3.4 Steps in Collecting Data

3.4.1. Determining the subjects of the research

The subject of the research was selected using simple probability sampling, which was by using lottery. The subjects of the research followed pretest, treatment, and posttest.

3.4.2. Selecting instrument materials

The test is proper to the first grade of SMA Negeri 1 B.Lampung. The materials were taken from students' handbook that was based on the educational unit level curriculum.

3.4.3. Conducting try out

The try out was conducted in the different class of the experimental class in first grade class of SMA Negeri 1 B.Lampung. Try out was conducted to measure the reliability of pretest and posttest. It was administered for 50 items in 90 minutes. The aim of try out was to know the quality of the test which used as the instrument of the research, and determine which item should be revised for the pretest and posttest. This research used the result of the try out test to measure the level of difficulty and discrimination power, to find out the validity and reliability.

3.4.4. Conducting the pre test

Pretest was conducted for 35 items in 45 minutes to measure students' basic ability in derivational affixes.

3.4.5. Conducting the treatments

After giving pretest, the students were given three treatments by using derivational affixes based on the lesson plan which has prepared. Each treatment was held for 90 minutes.

3.4.6. Administering post test

The post test was administered after the application of derivational affixes. It was conducted for 35 items in 45 minutes and the aim was to find out the students` vocabulary achievement before and after being taught through derivational affixes.

3.4.7. Analyzing the data

After doing all procedures, the researcher calculated the percentages between the pretest and posttest. In order to know whether derivational

affixes have a difference of the students` vocabulary achievement before and after being taught through derivational affixes.

3.5 Instrument of the Research

The instrument was held for pretest and posttest. Pretest was given before the treatment in order to know how far the students` achievement in vocabulary and posttest was given after presenting the treatment in order to know the difference of students` vocabulary. Then, the researcher found out whether there was a difference on the result between pretest and posttest.

3.6 Criteria of Good Test

In this research, to prove whether the test has good quality, it must be tried out first. The test can be said good quality if it has a good validity, reliability, level of difficulty, and discrimination power.

3.6.1. Validity

The test can be said valid if the test measures the object to be measured and it is suitable with the criteria (Hatch and Farhady, 1982:250). To measure whether the test has a good validity, this research ware used content validity and construct validity.

a. Content validity is concerned with whether the test is sufficiently representative and comprehensive for the test. In the content validity, the material given was suitable with the curriculum. The researcher uses the vocabulary that was supposed to be comprehended by grade X students. In this research, the researcher had arranged the instrument based on the material that was already given, which is vocabulary and the instruments

related to the content word. Content validity also can be examined from the table of specification. The table presents the material that the researcher had applied the test. The content validity was constructed by including vocabulary material in the training they vocabulary.

The content of try out test was presented in the table of specification below:

Table 1. Table of Specification of try out test.

No	Word Class	Number of Items		Percentage
		Prefix	Suffix	
1.	Verb	33,34,35,36,37,38,39.	8,9,10,11,12,13,14.	28%
2.	Noun	26,27,28,29,30,31,32.	1,2,3,4,5,6,7.	28%
3.	Adjectives	40,41,42,43,44,45,46.	15,16,17,18,19,20,21, 22.	30%
4.	Adverb	23,24,25,47,48,49,50.		14%
Total		Number: 50		100%

The researcher used the vocabulary that was supposed to be comprehended by the first grade of SMA students. In this research, the researcher had arranged the instrument based on the material that was given, which is vocabulary, and the researcher made the instrument related to vocabulary of content words (noun, verb, adjective, and adverb). If the instrument has represented all the ideas that connected with the material that was measured, that measuring instrument has fulfilled the aspect of content validity.

b. Construct validity is concerned with whether the test is actually in line with the theory of what it means to know the language (Hatch and Farhady 1982:252). It means that the items should really measure the students' vocabulary achievement.

To fulfill this validity, the researcher would see the indicator of the instrument and analyze them whether measuring instrument have represented the material that measured or not. In this research, the researcher arranged the instrument based on the material given that was vocabulary and the researcher made the instrument related to vocabulary that was content word (noun, verb, and adjective). The writer only used content word because content words cover the materials.

3.6.2. Reliability

Reliability of test can be defined as the extent to which a test produces consistent result when administrated under similar conditions (Hatch and Farhady, 1982:243). To estimate the reliability of the test this research used split-half technique. To measure the coefficient of the reliability between odd and even group, this research used the pearson product moment formula as follows:

$$r = \frac{\sum XY - \frac{\left(\sum x\right)\left(\sum y\right)}{n}}{\sqrt{\left[\sum x^2 - \frac{\left(\sum x\right)^2}{n}\right]\left[\sum y^2 - \frac{\left(\sum y\right)^2}{n}\right]}}$$

Where:

r : coefficient of reliability between odd numbers and even numbers items

x : total numbers of odd numbers items

y : total numbers of even numbers items

n : numbers of students who take part in the test

x^2 : square of x

y^2 : square of y

$\sum x$: Total score of odd number items

$\sum y$: Total score of even number items

(Arikunto, 1997:69)

The criteria of reliability are:

0.80 - 1.00 : very high

0.60 – 0.79 : high

0.40 – 0.59 : average

0.20 – 0.39 : low

0.00 – 0.19 : very low

Then this research used Spearmen Brown`s prophecy formula to know the coefficient correlation of whole items.

The formula is as follows:

$$rk = \frac{2r1}{1+r1}$$

Where:

rk : the reliability of the test

*r*1 : the reliability of half of the test

(Hatch and Farhady, 1982:246)

3.6.3. Level of Difficulty

Difficulty level related to how easy or difficult the item was from point of view of the students who take the test. This was important since test items, which are too easy, tell us nothing about differences is discarded. To see the level of difficulty, this research was used the following formula:

$$\mathbf{LD} = \frac{R}{N}$$

Where:

LD : level of difficulty

R : the number of students who answer correctly

N : the total number of students following the test

The criteria are:

<0.30 = difficult

0.30-0.70 = average

<0.70 = easy

(Shohamy, 1985; 79)

3.6.4. Discrimination Power

The discrimination power (DP) refers to the extent to which the item differentiates between high and low level students on the test. A good item according to this criterion is one which good students do well on and bad students fail.

To know the discrimination power of the test, the writer used the following formula:

$$\mathbf{DP} = \frac{U - L}{\frac{1}{2}N}$$

Where:

DP : discrimination power

U : the proportion of upper group students

L : the proportion of lower group students

N : total number of students

The criteria are:

DP: 0.00-0.19 : Poor

DP: 0.20-0.39 : Satisfactory

DP: 0.40-0.69 : Good

DP: 0.70-1.00 : Excellent

DP : Bad items, should be omitted

1. If the value is positive discrimination a large number of more knowledgeable students then poor students good the item in correct. If the value is zero, no discrimination.
2. If the value is negative, means that more low-students than high level students got the item correct.
3. In general, the higher the discrimination index, the better. In classroom situation most items should be higher than 0.20 indexes.

(Shohamy, 1985:81)

3.7 Scoring System

In scoring the students result of the test, this research used Arikunto`s formula. The ideal higher scores of pre test and post test was calculated by using formula as follows:

$$S = \frac{R}{N}100$$

Where:

S : the score of the test

R : the total of the right answers

N : the total items

(Arikunto, 1997:212)

3.8 Data Analysis

After conducting pretest and posttest, the researcher analyzed the data. It was used to know whether there is significant difference of the student's vocabulary achievement before and after being taught through derivational affixes. The researcher examines the students score using the following steps:

1. Scoring the pretest and posttest.
2. Tabulating the score of student's vocabulary test results using Repeated measures T-test.
3. Conclusion from the result of the pretest and posttest administering, that was statistically analyzed using SPSS (Statistical Program for Social Sciences) in order to test whether effect of the students gain is significant or not.

3.9 Hypothesis Testing

The hypothesis is:

There is a significant difference of students' vocabulary achievement before and after being taught through derivational affixes.

To check whether the effect of teaching derivational affixes on students' vocabulary achievement after treatment is statistically significant to support the hypothesis or not, the writer used *Repeated measures T-test* in *SPSS* program.

The hypothesis was statistically analyzed using Repeated measures T-test that was used to draw the conclusion in significant level of 0.05 ($P<0.05$).