

III. METHOD

This chapter discusses about the methods of research used in this study, such as research design, subject of the research, data collecting technique, research procedures, and data analysis.

3.1. The Research Design

The researcher was conducted a quantitative research. In conducting the research, the researcher applied *One Group Pretest-Posttest Design*. In this research, the researcher used one class as the experimental class. In the form of objectives test, the researcher gave a pretest before treatments and post test after the three treatments. Thus, the formula of the research design is shown as below:

T1 X T2

Notes:

T1 : pretest

X : treatment (derivational exercise)

T2 : posttest

(Hatch and Farhady, 1982: 20)

To see the students' basic vocabulary ability, pre-test was administered before the treatment. Then the treatment was derivational exercise in teaching vocabulary. To analyze how the improvement of their vocabulary through derivational exercise the posttest was administered afterward.

3.2. Population and Sample

The population of the research was the second grade students of SMA YP UNILA at second semester of 2013/2014 academic year. There were six classes of the second grade (XI IPA 1 – XI IPA 6). The researcher used class XI IPA 2 that consisted of 34 students as the experimental class and class XI IPA 1 as the tryout class consisted of 34 students. The researcher used simple random probability sampling by lottery so that all of the population had the same opportunities to be chosen as the sample.

3.3. Data Collecting Technique

The data of the research were students' vocabulary achievement and the students' problem. In order to collect the data, the researcher applied vocabulary test and interview.

3.3.1 Vocabulary Test

In collecting the data, this research used vocabulary test in form of multiple choice test. There were two kinds of tests, pre-test and posttest. Pre-test was given to know how far the students' competence in vocabulary before the treatment, and

posttest was given after presenting the treatment. Those tests were pretest and posttest.

1. Pretest

The pretest was administered before the treatment. It was used to know the students' ability in vocabulary before the treatment was given. The researcher used multiple choices in pretest. The test consisted of 50 multiple choices and each item has four options of answers.

2. Post test

The posttest was conducted after the researcher conducting the treatments. It was used to know the students' achievement after being taught derivational exercise. The post test consisted of 50 multiple choices with the same quality and difficulty to pretest. The researcher changed the number of question and the distracters in each question and also it still focused on the target word.

3.3.2. Interview

The researcher administered interview after giving posttest. Interview was given to the students' to find out the problems that students face in learning vocabulary through derivational exercise. The researcher asked the question on the spot but she had provided some questions. The question changed depending on the situation of the class.

3.4. Research Procedure

The procedures of the research were as follows:

1. Determining the subject of the research

The subject of the research was the second grade student of SMA YP UNILA at the second semester of 2013/2014. The researcher took two classes, one class as experimental class and the other for tryout class.

2. Administering try-out

The researcher used vocabulary test in form of multiple choice test that consisted of 60 multiple choice items in 90 minutes. The try-out test was given to know the quality of the test which would be used to take the data. The researcher conducted a try out test at the first meeting. It was administered in order to know the quality of the test as the instrument of the research. The try-out test was administered in one class. This class was not included as the participant in experimental class. In order to know the quality of the test, the researcher analyze four aspects, they are: the validity, the reliability, the difficulty level and discrimination power.

3. Administering pre-test

The researcher administered the pretest before the treatment was given. It used to measure the students' vocabulary before being taught through derivational exercise. The pretest consisted of 50 items in form of multiple choices with four options and time allocation was 60 minutes in the experimental class.

4. Conducting treatments

In this research, the treatment was done in three meetings with 90 minutes in every meeting. The experimental class was taught by using derivational exercise. Before conducting the treatment, the researcher prepared the material and lesson plan.

5. Administering the post-test

The post-test was administered to the students after the treatment. The post test consisted of 50 items in the form of multiple choices with four options and time allocation was 60 minutes. The questions or the items in post test were the same as the pretest. However, the researcher changed the questions number and the distracters than those in pretest. This test had the same difficulty as pretest.

6. Analyzing the data

The data were analyzed using t-test 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 derivational exercise.

3.4.1. The Validity

The test can be said valid if the test measures the object that should be measured and suitable with the criteria (Hatch and Farhady, 1982:250). The validity of a test is the extent to which it measures what it is supposed to measure and nothing else.

The researcher analyzed the test from content and construct validity.

1. Content Validity

This kind of validity depends on a careful analysis of the language being tested and of the particular course objectives. The test should be so constructed as to contain a representative sample of the course. The test should be a good reflection of what has been taught and the knowledge. The specification of test was completely served in the following table:

Table1. Table of Specification of Test

No	Aspect	Items	Total	Percent
1	Noun	4, 6, 7, 21, 23, 33, 34, 36, 39, 44, 46, 47, 49, 51, 54, 55, 57, 60.	18	30%
2	Verb	2,3,8,11,14,16,18,20, 30, 41, 42, 45, 50, 59.	14	23%
3	Adjective	1, 5, 10, 13, 15, 17, 19, 22, 25, 26, 28, 29, 31, 38, 40, 58.	16	26,7%
4	Adverb	9,12, 24, 27, 32, 35, 37, 43, 48, 52, 56.	11	18,3%
	Total		60	100%

2. Construct Validity

According to Shomamy (1987:74) construct validity is concerned with whether the test is actually in line with the theory of what it means to know the language. This type of validity assumes the existence of certain learning theories or constructs underlying the acquisition of abilities and skills.

3.4.2. Reliability

Reliability also means the consistency with which a test measures the same thing all the time. 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. There are therefore three aspects to reliability; the circumstances in which the test is taken, the way in which it is marked and the uniformity of the assessment it makes. This research used Pearson Product Moment formula as follows:

$$rl = \frac{\sum xy}{\sqrt{\sum x^2 \sum y^2}}$$

rl : Coefficient of reliability between odd and even number of items

x : Odd number

y : Even number

x^2 : Total score of odd number items

y^2 : Total score of even number items

xy : Total score of odd and even numbers

The criteria of reliability are:

0.80 – 1.00 = very high

0.50 – 0.79 = moderate

0.00 - 0.49 = low

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

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

rk : the reliability of the test

rl : the reliability of the half test

(Hatch and Farhady, 1985:247)

3.4.3. Level of Difficulty

Level of difficulty is related to show how easy or difficult the particular item proved in the test. Index of difficulty is generally expressed as the fraction (percentage) of the students who answered correctly. The formula is:

$$FV = \frac{R}{N}$$

FV : Index 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 = good

>0.70 = easy

3.4.4. Discrimination Power

Discrimination power is used to extend that the test is able to discriminate. To find out the discrimination power, the researcher used the following formula:

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

DP : Discrimination Power

U : the proportion of upper group students

L : the proportion of lower group students

N : total number of the students

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)

(Shomamy, 1985: 82)

3.5. Data Analysis

After conducting pretest and posttest, the researcher analyzed the data statistically. Data analysis is a process for organizing the data in order to get the explanation form. After collecting the data, the researcher calculated the student's achievement. The researcher used these following steps:

1. Scoring the pretest and posttest.
2. Tabulating the score of the test and calculating the mean of pretest and posttest students' vocabulary.
3. Drawing a conclusion from the tabulated results of pre-test and post-test, then analyzing by using SPSS 16 to test how significant the difference between the score of pre-test and post-test, in which the significance will be determined by $p < 0.05$.

3.6. Hypothesis Testing

The hypothesis is used to prove whether the hypothesis propose by the researcher is accepted or not. The hypothesis tested by using Repeated measure T-Test

through computing with statistical Package for Social Science (SPSS) at the significance level of 0.05 ($P < 0.05$).

H_0 : There is no significant improvement of the student's vocabulary after being taught through derivational exercise.

H_1 : There is a significant improvement of the student's vocabulary after being taught through derivational exercise.

Those are the describing part of the design of the research in this chapter. The further explanation will be discussed in next chapter.