

III. RESEARCH METHOD

This chapter discusses about research design, population and sample, research procedures, data collecting technique, instrument, data collecting instrument, level of difficulty, discrimination power, scoring system, data analysis, hypothesis testing.

3.1 Research Design

This research was intended to find out the result of application of clustering technique as teaching technique to increase student's vocabulary achievement. The researcher conducted a quantitative research. The researcher used the pretest, treatment and posttest. The design was one group pretest and posttest design. The design was as follow :

T1 X T2

T = Pretest
X = Treatments
T2 = Posttest
(Setiyadi, 2006)

In this research, the researcher gave pretest before treatment and post test after treatment.

3.2 Population and Sample

The population of this research was the first year students of SMA Gajah Mada Bandar Lampung in the second semester of 2010/2011 . There were eight classes of the first year. Through lottery drawing, the researcher took one class as a treatment class, it was class X.2 and class X.1 as a try out class. Class X.2 consisted of 41 students. Clustering technique was applied three times to the treatment class.

3.3 Research Procedures

The procedure of this research was as follow:

1. Selecting and determining the population and sample

The researcher choosed one class of eight classes of first year students at SMA Gajah Mada Bandar Lampung as the research sample. Through lottery drawing, the researcher took one class as a treatment class.

2. Administering try out

The try out was held to find out the quality of the test and to determine the items should be revised for the post test.

3. Giving the pretest

The purpose in giving pre test was to find out the level of students' capability on vocabulary, so that the researcher should be able to compare the result with the post test result later.

4. Arranging the materials to be taught

The researcher arranged the material would be taught based on KTSP curricullum for the first year of SMA students.

5. Conducting the treatments

The experimental class was taught by the researcher using clustering technique six times using material taken from school handbook.

6. Conducting the posttest

The result of the test was compared with the pre test result.

7. Analyzing the data

The data was analyzed by Repeated Measured T-Test using SPSS program and the result of the calculation was used to test the researcher's hypothesis.

3.4 Data Collecting Technique

1. Try out

To prove whether the tests have a good quality in this research, they were tried out. The researcher tried out the test to the try out class. The number of the item was 40 items, the type of the test was multiple choice and the option provided are a, b, c, and d. The test was said have a good quality if it has good validity and reliability.

2. Pretest

The purpose of the pretest was to know the students' mastery of vocabulary before they were given the treatment.

3. Treatment

The class was given the treatments with three lesson plans in different topics. The topics were about sport. Each lesson plan took two meetings.

4. Posttest

This test was given to know the students' improvement after they got the treatment.

3.5 Instrument

The researcher used test as the instrument in collecting the data. The test consisted of try out, pretest and posttest. The first, the try out test was given to know the quality of the test. The type of the try out test was multiple choices which items consisted of four options (A, B, C, and D), and the number items in the test were 40 questions. Second was pretest, the pretest was conducted before the treatment. The purpose of the pretest was to know the students' mastery of vocabulary before they were given the treatment. And the last was posttest, this test was given to know the students' improvement after they got the treatment. It was used to know how far the students had mastery English vocabulary after being taught through clustering technique. The researcher used objective test. The researcher used 20 items for pretest, the 20 items of pretest was arranged for posttest.

3.6 Data Collecting Instrument

3.6.1 Validity of The Instrument

According to Heaton (1991 : 159), the validity of the test is the extent to which it measures what it is supposed to measure and nothing else. There were two kinds of validity they were:

1. Content validity examines whether the test is a good representation of the material that need to be tasted. Content validity extend to which a test

measures a representative sample of the subject matter content. The materials are about sports. So the items should reflect the material taught. The focus of content validity is on adequacy of the sample and not simply on the appearance of the text. It means that the text should represent the material that will be taught. To fulfill this validity, the researcher saw all the indicator of the instrument and analyzed them whether the measuring instrument represented the material that is measured or not. Then content validity can also be examined from the table of specification. If the table represents the material that the tester wants to test, it means that it is a valid test from the point of view of content (Shohamy, 1985: 74).

Table I. Table of Specification of the Tryout Test

No.	Word Classes	Number of items	Percentage
1.	Nouns	4,11,13,16,18,23,32,33,34,35, 36,37,38,39,40.	40 %
2.	Verb	1,3,7,9,10,14,17,19,20,21,25,26, 27,31.	35 %
3.	Adjective	2,5,8,12,15,22,24,28,29,30.	25 %
Total			100 %

- Construct validity measures each aspect in specific instructional objectives. It examines the test is a true reflection of the theory of the trait – in our case – language – which is being measured. In making the test items, the theory of vocabulary should be considered as the basic criteria. Construct validity concerns with the test is actually in line with the theory of what it means to know certain language skill.

3.6.2 Reliability of the Instrument

The researcher used the split half technique to analyze the odd (X) and even number (Y) of the test items, to estimate the reliability of the test. To see whether the items are reliable. To measure the coefficient of the reliability between first and second half, the researcher used Persons Product Moment Formula, that is:

$$r = \frac{\sum xy}{\sqrt{[\sum x^2] [\sum y^2]}}$$

Where,

r means coefficient reliability between 1st half and 2nd half

X means total number of the 1st group

Y means total number of the 2nd group

X² means square of X

Y² means square of Y

(Lado, 1964:32)

Then to know the coefficient of the whole items, the researcher used Sperman

Brown Formula:

$$r = \frac{2r_1}{1+r_1}$$

rk refers to reliability of full test

r1 refers to reliability of half of the test

The criteria of reliability are:

0.80 – 1.00 is very high

0.60 – 0.79 is high

0.40 – 0.59 is average

0.20 – 0.39 is low

0.0 – 0.19 is very low

(Hatch and Farhady, 1982:246)

3.7 Level of Difficulty

A good test is the one which is not too easy or too difficult. The researcher used the following formula to see the difficulty level of the test:

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

LD means level of difficulty

R means the number of the students who answer correctly

N means number of students

The criteria are :

LD < 0.30 is difficult

LD = 0.30 – 0.70 is satisfactory

LD > 0.70 – 1.00 is easy

(Shohamy, 1985:79)

3.8 Discrimination Power

Discrimination Power is used to indicate discrimination of the fail and the success of the student. To know the discrimination power of the test, the researcher used the formula below :

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

DP refers to Discrimination Power

U refers to the number of upper class who answer correctly

L refers to the number of lower class who answer correctly

N refers to total number of the student

The criteria are:

D : 0.00 – 0.20 is poor items

D : 0.21 – 0.40 is satisfactory items

D : 0.41 – 0.70 is good items

D : 0.71 – 1.00 is excellent items

D : - (negative) is bad items, should be omitted

1. If the value is positive discrimination a large number of more knowledgeable students then poor students got 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)

3.9 Scoring System

In scoring the students' test result, the researcher used Arikunto's formula. The ideal higher score is 100. The scores of pretest and post test was calculated by using formula as follow:

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

Where:

S means the score of the test

R means the total of the right answers

N means the total items

(Arikunto, 1997:212)

3.10 Data Analysis

After conducting pretest and posttest, the data was analyzed. It was used to know whether clustering technique can increase the students' vocabulary achievement.

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

1. Scoring the pretest and posttest
2. Tabulating the result of the test and finding the mean of the pretest and the posttest.
3. Drawing conclusion from the tabulated result of the pretest and posttest administering, that was statistically analyzed using SPSS (Statistical Program for Social Sciences) in order to test whether increase of the students' gain.

3.11 Hypothesis Testing

The hypothesis testing was used to prove whether the hypothesis proposed in this research was accepted or no.

The hypothesis of this research is "There is a significant increase of students' vocabulary achievement after being taught through clustering technique especially in terms of single word."

The hypothesis was statistically analyzed using Repeated measures T-test that was used to draw the conclusion in significant level of 0.05 ($P < 0.05$) in which the hypothesis is proved if $Sig < .$ It means that the probability of error in the hypothesis is only about 5%.

The formula is as follow:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_{\bar{D}}} \quad \text{in which} \quad S_{\bar{D}} = \frac{S_D}{\sqrt{n}}$$

Notes:

\bar{X}_1 refers to mean of pretest

\bar{X}_2 refers to mean of posttest

$S_{\bar{D}}$ refers to standard error of differences between two means (denominator)

S_D refers to standard deviation

n refers to number of students

(Hatch and Farhady, 1982:116)