

### III. RESEARCH METHOD

#### A. The Research Design

This research is a quantitative one in which the writer focuses on the significant difference of students' vocabulary achievement at the second year students of SMPN 4 Bandar Lampung taught through word mapping technique and memorizing game technique and to compare the results of the two techniques in teaching vocabulary by using statistical data. In this research, researcher uses intact group pretest-posttest design. Hatch and Farhady (1982: 22) says that this design will be dealt with two groups; both of the two groups received treatments. The research design is described below:

$$G_1 = T_1 \quad X_1 \quad T_2$$

$$G_2 = T_1 \quad X_2 \quad T_2$$

Note:

G1: experimental class 1

G2: experimental class 2

T1: test before treatment

T2: test after the treatment

X1: treatment by using word mapping

X2: treatment by using memorizing game

## **B. Population and Sample**

This research was conducted at SMPN 4 Bandar Lampung in odd semester 2009.

The population of the research was the second year of SMP N 4 Bandar Lampung.

There were 8 classes in the school which consist 30 – 32 students for each class.

There were two classes that were used as a sample in this research. These two classes were determined as the experimental class 1 and experimental class 2.

They were purposively sampling as a consideration from the teacher in the school that they had almost similar ability. The experimental class 1 was taught through word mapping technique and the experimental class 2 was taught through memorizing game technique. The researcher chose this school because from her teaching practice experience, most of students had difficulties in learning English because of the students' inability in vocabulary.

## **C. Variable**

Based on the problem of the research, the variables can be defined as follows:

1. The dependent variable is the students' achievement on vocabulary.
2. Independent variable is the treatments that are used in this research (X1: word mapping, X2: memorizing game).

## **D. Data Collecting Technique**

In collecting data, the researcher used the following techniques:

### **1. Pretest**

This test was given in order to determine whether the classes had equal capability of vocabulary. The researcher administered the pre-test to both classes unexpectedly in the first session. The test was in the multiple-choice form with four options and the sum of the test was 30 items. The time given was 80 minutes and the correct answer to each item received one point. There was no penalty for false responses.

### **2. Posttest**

After conducting the treatments, a posttest was administered to both classes. The posttest consists of 30 items in the form of multiple choices with four options and the time allocation was 80 minutes. The items of the posttest were the same as the pretest which the items had been analyzed. There was no penalty for false responses. It was done in order to find out the students' achievement after having the treatment.

In order to compare the students' vocabulary achievement which was taught through word mapping and memorizing game, the researcher computed the students' score.

## **E. Try Out of the Tests**

The try out was needed to be done to prove whether the test had a good quality or not. The try out was held to the different class from the sample classes.

The test has a good a quality if it has good validity, reliability, level difficulty and discrimination power. So, the try out of the test here is to determine whether the items can be used as pretest and posttest.

## 1. Validity

To see the validity of the test, the researcher emphasizes on the content and construct validity.

### a. Content Validity

Test is a good reflection of what has been taught and of knowledge, which the teacher wants his students to know. Content validity can be examined from the table of specification. If the table represents the material that the tester wanted to test, then it is a valid test from point a view (Shohamy, 1985: 74). The table of specification as follows:

Table 1. Table of specification (try out test)

Content	Aspect	Items	Total	Percent
Vocabulary	1. meaning	2,3,5,6,8,9,11,13,17,20,26, 27,30,31,32,39,40,46,50	19	38 %
	2. form	10,14,16,18,19,21,24,25,33, 35,37,38,41,42,43,45,47,48	18	36 %
	3. use	1,4,7,12,15,22,23,28,29, 34,36,44,49	13	26 %
Total			50	100 %

### b. Construct Validity

It examines whether the test actually in line with the theory, meaning that the test will measure an aspect or construct based on the indicator. Setiyadi (2006: 26) said that if the test only measures one skill, the construct validity of test can be known by evaluating the items used in test. If it is done the test is valid.

To know the construct validity of the test, researcher set it in a table of specification. Here, researcher correlates the items of the test with theories of the aspects of the skill itself. The table of specification as follows:

Table 2. The Table of Specification of Construct Validity

No	Aspect to be measured	Item	Total	Percent
1.	Vocabulary of noun	2,4,10,16,20,21,24,30,35, 43,44,47,50	13	26 %
2	Vocabulary of verb	5,6,8,9,12,13,17,31,32, 33,38,46,49	13	26 %
3	Vocabulary of adjective	1,3,7,11,15,22,23,26,27,28, 29,34,36,39,40,41	16	32 %
4	Vocabulary of adverb	14,18,19,25,37,42,45,47	8	16 %
	Total		50	100%

## 2. Reliability

Shohamy (1985: 70) states that “reliability refers to the extent to which is consistent in its score, and it gives one an indication of how accurate the test score is”. To find the reliability of this test the writer used Split Half Method, which has two steps, they are:

1. First, using Pearson Product Moment Correlation, we should find the correlation between odd and even number of the items.

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

Where:

$r_{xy}$  : coefficient of reliability between odd number and even number items

$\sum x^2$  : total square of odd number items

$\sum y^2$  : total square of even number items.

$\sum xy$  : total score of odd and even number items.

2. Second, after we get the coefficient Correlation between odd and even number, we continue to put them into the reliability formula.

The reliability formula is below:

$$R_{11} = \frac{2 \times r_{xy}}{1 + r_{xy}}$$

Where:

$R_{11}$  : reliability coefficient

$R_{xy}$  : coefficient between odd and even number

The criteria of reliability

0.80 – 1.00 : very high reliability

0.60 – 0.79 : high reliability

0.40 – 0.59 : medium reliability

0.21– 0.39 : low reliability

0.00 – 0.20 : very low reliability

(Arikunto, 1998:260)

In this research, the result of reliability was 0.95 (see appendix 4). It can be concluded that the test has very high reliability in which the criteria is in the range 0.80-1.00. It indicated that the instrument would produce consistent result when administered under similar condition, to the same participant and in different time (Hatch and Farhady, 1982:286). So, it can be stated that the test has fulfilled the criteria of reliability. In other word, the test was reliable.

### 3. Level of Difficulty

In determining the level of difficulty of the tests, the writer uses the following formula:

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

Note:

LD : level of difficulty

U : Upper group students who answer correctly

L : Lower group students who answer correctly

N : the total number of the students

The criteria are:

0.00-0.30 = difficult

0.31-0.70 = average

0.71-1.00 = easy

(Arikunto, 1997 :121)

The writer will use the item with if LD = average and others will be revised.

Based on the tryout test result related to the criteria there were 24 average items, the rest (26 items) was difficult items and there were no easy items. Some items which were difficult were dropped or revised, meanwhile for the average items were administered for pretest and posttest. The results of difficulty level of try out test are shown in Appendix 2.

#### **4. Discrimination Power**

To estimate the discrimination of power of the tests, the writer will use this following formula:

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

DP = discrimination power

U = the number of upper group students who answer correctly

L = the number of lower group students who answer correctly

N = the total number of students

The criteria are:

0.00 – 0.20 = poor

0.21-0.40 = satisfactory

0.41 – 0.70 = good

0.71 – 1.00 = excellent

(Arikunto, 1997 :121)

Based on the try out test result related to those criteria there were 16 poor items, eight items had negative discrimination power, 21 items were satisfactory, and the rest (5 items) were good items. Negative discrimination items were dropped while the good items and satisfactory were administered. Some of items, which have poor discrimination, were revised and used as pretest and posttest. The total items that were administered for pretest and posttest were 30 items (1,4,5,6,7,8,10,14, 16,18,19,20,21,22,23,24,25,27,28,30,32,33,35,36,37,38,39,44,45,50).

## **F. Data Analysis**

After collecting the data, it was computed through drawing conclusion from tabulated result of the pretest and posttest by using SPSS 17. In doing so, the researcher had analyzed the data statistically by administering random test, normal distribution test, homogeneity test of variance and hypothesis test.

### **1. Random Test**

To see whether the data in experimental class 1 and experimental class 2 were random, random test was computed. Here, the writer used Runs test.

The hypothesis for random test was:

H = the data is random

The data were random if it filled the criterion. In this research, the criterion for the hypothesis was:

The hypothesis was accepted if  $\text{sign} > \alpha$ . In this case, researcher used level of significant of 0.05.

Random test from the pretest in the experimental class 1 showed the significance value was 0.862 (see appendix 23). Seeing the result, it can be concluded that the data was random since  $\text{Sign} > \alpha$  ( $0.862 > 0.05$ ). Meanwhile, the result of random test of posttest in the experimental class 1 showed the number of 0.94 (see appendix 23). The value also  $> \alpha$ , in which  $0.94 > 0.05$ . It could be stated that the data was random.

The analysis of random test of pretest in the experimental class 2 showed the value of 0.27 (see appendix 24). Since it more than  $\alpha$ , it can be concluded that the data was random. The random test of posttest showed the value was 0.74 (see appendix 24). Because the value was higher than  $\alpha$  ( $0.74 > 0.05$ ), the data from this class was also determined random.

In short, the data from the experimental class 1 and the experimental class 2 showed the value higher than alpha ( $\text{Sign} > \alpha$ ), which meant that the data from both class were random.

## 2. Normal Distribution Test

This test was administered in order to find out whether the data from both groups were normally distributed. The hypothesis of the normal distribution test was:

H = The distribution of the data is normal

The criterion for the hypothesis was:

The hypothesis was accepted if  $\text{Sign} > \alpha$ . Level of significant that used in this research is 0.05.

The result of normality test of pretest in the experimental class 1 showed the value of 2.00 (see appendix 11). In this case, the hypothesis was accepted if sign higher than  $\alpha$ ,  $2.00 > 0.05$ . This meant that the distribution data of the test was normal.

Result of normality in the experimental class 1 of posttest showed the value 0.31 (see appendix 12). Since  $\text{Sign} > \alpha$ ,  $0.31 > 0.05$ , it could be stated that the data of the posttest was normal.

The same result was showed from the experimental class 2. The value of normality test in pretest from this class was 2.00 (see appendix 13). Here, the hypothesis proposed was accepted since the Sign is higher than  $\alpha$  (0.05). The calculation of normality test of posttest showed the number of 0.10 (see appendix 14). The hypothesis was accepted if  $\text{Sign} > \alpha$ . Since 0.10 is higher than 0.05, the data in this class were normally distributed.

Seeing the result above, it could be stated that the hypothesis proposed in both classes was accepted. This meant that the data in both classes were normally distributed.

### 3. Homogeneity Test of Variance

To find out whether the data from the two groups were met the criteria of the equality of variance, the researcher used homogeneity test.

In this research, the hypothesis for homogeneity test was:

H = the data is homogenous

Criterion for the hypothesis was:

The hypothesis was accepted if  $\text{Sign} > \alpha$ . In this case, researcher used level of significant of 0.05.

From the result of homogeneity test for the pretest scores both in the experimental class 1 and the experimental class 2 was 0.722 (see appendix 15). It showed that  $\text{Sign} > \alpha$  ( $0.722 > 0.05$ ). Therefore the hypothesis was accepted. In short, both classes were equal since the Sign was same and the research could be conducted to both classes.

### **G. Hypothesis Testing**

This test was calculated to find out whether the hypothesis proposed by the researcher is accepted or not. The hypothesis of research was:

“There is a significant difference of vocabulary achievement of students who are taught through word mapping technique(X1) and those who are taught through memorizing game technique(X2)”.

### **Statistical Testing**

The hypothesis was statistically analyzed by using Independent Group T-Test at the significant level 0.05. It means that the probability of error in the hypothesis is only about 5%.