III. RESEARCH METHODS

This part discusses the design of this research and how to collect the data from those samples. The researcher encloses the data collecting technique, the procedures and also the instrument of this research. The researcher gives the scoring system and how the data are analyzed.

3.1 Research Design

This research was quantitative research. Hatch and Farhady (1982: 22) state that quantitative was a kind of research in which the data used to tend to use statistic as measurement in deciding the conclusion.

Related to this, the researcher used **one group pretest posttest design** to investigate whether there was an increase of students' reading comprehension ability through reference word treatment. Then the writer administered pre-test and post-test. The pre-test was conducted to measure students' reading comprehension ability before treatment and the post-test was conducted to find the students' reading comprehension ability after being taught through reference word treatment. Then, the students' improvement was found out by comparing the means (average score) between pre-test and post-test. It was used to find out the progress before and after the treatment.

The researcher used one class as the experimental class where the students were given a pre-test before a treatment and post-test after the treatment. The design of this research was described as follows:

T1 X T2

T1 : Pre test

T2 : Post test

X   : Treatments

(Hatch and Farhady, 1982: 20)

This research was conducted to investigate whether reference word treatment can be used to increase students' reading comprehension to comprehend the English text by comparing the average score (mean) of the pre-test with the average score (mean) of the post-test.

If the average score of the pre-test will be higher than the average score of the post-test, it indicated that reference word treatment cannot be used to increase students' reading comprehension in comprehend the English text. However, if the average score (mean) of the post-test will be higher than the average score (mean) of the post-test, it means that reference word treatment can be used to increase students' reading comprehension in comprehend the English text.

3.2 Population and Sample of the Research

The population of this research was all tenth grade students of SMA YP Unila Bandar Lampung period of 2010/2011. The researcher had chosen the tenth grade because reading material of the tenth grade were normally complicated. The

writer of the reading materials usually hides some information through the use of reference word.

There were eleven classes in the tenth grade of SMA YP Unila Bandar Lampung which was divided in X_1 until X_{11} and consist of 38 students in each class. The students' ability in reading comprehension of all classes were similar, there was no higher or lower ability in reading comprehension. That was why in choosing the experimental class the researcher selected it randomly by using lottery. Class X_5 was chosen as the sample class of the research. The experimental class had gotten pre-test, post-test, and also three treatments. To test the reliability of the test, class X_6 was used as the try out class.

3.3 Data Collecting Technique

In collecting the data, the researcher administered a pre-test, treatments, and post-test. Then, she analyzed the result of those activities which can be clarified as follows:

a. Try Out

This test have been tried out in order to measure the level of difficulty and discrimination power as well as to find out the reliability and validity of the test. The try out test contained 40 items, which consist of multiple choice type with four option for examples a, b, c, and d.

b. Pre-test

The researcher gave pre test to the students before giving the treatment in order to know the basic of students' reading comprehension before treatment and also the

students' mean score in reading comprehension before treatment. The type of the test was multiple choices in which the students were asked to choose one correct answer from the options a, b, c, d. In this pre-test the students were given 20 items of reading comprehension which consist of reference questions types.

c. Treatment

The class was given treatments with three different lesson plans. Those three lesson plan consist of three different topics. It was necessary in order to increase the students' ability in comprehending the English text. The researcher taught the students by using mixed technique, such as   explanation, illustration, question and answer, and discussion. In this treatment the researcher taught the students by herself in order to make sure that the teaching learning Reference word process will be based on lesson plan which have been made.

d. Post-test

Post-test was conducted after the researcher gave the treatment to the class. It is used to know the result of students' reading comprehension after applying reference word. The type of the post-test was multiple- choice test. Each item of post-test related to the material that the students have learnt. It has similar difficulty with the pre-test. The scoring system and degree of difficulty of the pre-test similar to the post-test because both items were used to measure the students' ability in reading comprehension by using reference word treatment.

3.4 Research Procedure

The procedures of this research were as follows:

1. Determining the population and sample of the research

The population of this research was all tenth grade students of SMA YP Unila
Bandar Lampung consisting of eleven classes, which was divided in X_1 until X_{11}
and consist of 38 students in each class. But two classes have been chosen
randomly by using lottery as experimental class; X_5 and as try out class; X_6.

2. Administering reading test (try out) to know the quality of the test.

Try out was given in multiple choice with four option a, b, c, and d. This test
administered in order to measure the level of difficulty (LD) and discrimination
power (DP) as well as find out the reliability and validity of the test.

3. Preparing the materials which will be taught

The researcher took the material based on English book of eleven grade student.

4. Administering the pre-test and finding the result

In this research, there was one pre-test that was proper to the tenth grade students
of SMA YP Unila. The researcher administered the pre-test in order to find out the
student's basic ability before treatment. In this term the researcher asked the
student to do multiple choice test which consist of 20 items and the student should
choose the correct answer from four option, e.g. a, b, c, and d. The pre-test took
90 minutes.

5. Giving treatment

There were three times treatments have conducted in this term. It was require ninety minutes for each meeting. In each treatment, there were three different topics.

6. Administering the post-test

Post-test was used in order to check the students' reading comprehension ability after being given reference word treatments, to know whether the students reading comprehension improved or not. The post-test took 90 minutes which consist of 20 items and divided in four option a, b, c and d.

7. Analyzing the test result

After conducting the pre-test and post-test, the researcher analyzed the data. The data was analyzed by using T-test. It was used in order to know whether Reference word was able to increase students' ability on reading comprehension significantly. The data will be computed through SPSS Program.

3.5 Research Instrument

In this research, there were two research problems and both of them used similar instrument. This research used objective reading test as the instrument. Objective reading test was used for pre-test, and post-test, but before there test were used, there were tried out. Those tests were in the form of multiple choices. The multiple choice test was used since its marking was rapid, simple, and most importantly reliable, not subjective or influenced by the marker's judgement (Heaton, 1975).

3.6 Scoring System

In scoring the students' result of the test, the researcher used Arikunto's formula. The ideal highest score is 100. The scores of pre tests and post tests was calculated by using this below formula:

$$S = \frac{r}{n} X 100$$

Where:

S = The score of the test

r = The total of the right answer

n = The total items   (Arikunto; 1997)

3.7 Try Out of Instrument

This test have been tried out in order to measure the level of difficulty and discrimination power as well as to find out the reliability and validity of the test. Here some steps to do try out, there were:

1. *Validity of the test*

A test was considered valid if the test measure the object to be measured and suitable with the criteria (Hatch and farhady, 1982: 250). In this research, to measure whether the test has good validity or not, the researcher analyzed its content and construct validity.

a. Content Validity

Content validity means that the test was good reflection of what has been taught and the knowledge which the teacher wanted the students to know (Shohamy 1985: 74). It means that the items of the test should present the material being

discussed. Then, the test was determined according to the materials that have been taught to the students. In other words, the test was based on the materials in the English curriculum, so that it can be said that the test has content validity since the test was good representation of material studied in the classroom. In this research the researcher focused on one of aspect reading skill, there is reference word.

b. Construct Validity

Construct validity was concerned with whether the test was actually in line with the theory of what it means to know the language (Shohamy, 1985; 74). It means that the test items should really test the students or the test items should really measure the students' ability in reading comprehension.

Regarding the construct validity, it measures whether the construction had already referred to the theory, meaning that the test construction had already in line with the objective of the learning (Hatch and Farhady, 1982: 251). Basically, the construct and content validity are overlap. It is a representative of the material from the subject. In line with Nuttal (1985) the relation validity of the instrument refers to construct validity in which the question represents to one of aspect in reading skill, i. e. reference word.

Therefore the researcher used table of reference to judge the validity of the test in order to know whether the test represent four types of reference word, they were: personal pronoun, relative pronoun, demonstrative pronoun, and noun.

Table 3. **Specification of Reference Test**

No	Types of Reference	Item Numbers	Percentage of Items
1	Personal Pronoun	1, 2, 5, 7, 8, 9, 13, 18, 31, 37	25%
2	Relative Pronoun	11, 16, 17, 21, 22, 26, 30, 32, 19, 34,	25%
3	Demonstrative Pronoun	15, 20, 23, 25, 28, 29, 33, 35, 36, 39	25%
4	Noun	3, 4, 6, 10, 12, 14, 24, 27, 38, 40	25%

2. *Reliability of the Test*

To find out the reliability of the test, the researcher used spilt half technique which required her to split the test in two similar parts, first and second half (Hatch and farhady, 1982: 246). To measure the coefficient of the reliability between first and second half, the researcher used Person Product Moment formula. The formula was:

$$r1 = \frac{\sum XY}{\sqrt{\sum X^2 \sum Y^2}}$$

Where:
r_1: coefficient reliability between 1st and 2nd half

x : total number of the 1st group

y : total score of 2nd group

X^2: square of x

Y^2: square of y

(Lado, 1964 in Huges, 1989: 32)

Then the researcher used " Spearmen Brown's Prophecy formula" (Hatch and Farhady, 1982; 246) to know the coefficient correlation of whole items. The formula as follows:

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

rk : the reliability of test

rl : the reliability of half test

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

3. *Level of Difficulty*

Level of difficulty is used to classify the test items into difficult items and easy ones. The items should not be too easy for the students. To see the difficulty of the test items, this research used this following formula:

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

LD: Level of Difficulty

U : Number of the Upper group who answer correctly

L : Number of the Lower group who answer correctly

N : Total number of the students

The criteria were:

<0.30   = Difficult

0.30-0.70 = Satisfied

>0,70   = Easy

<div align="right">(Shohamy, 1985; 79)</div>

4. *Discrimination Power*

The discrimination power (DP) was the proportion of the high group students getting the items correct minus the proportion of the low-level students or who get the items correct.

 In calculating the discrimination power of each item the following formula was used:

$$\text{DP} = \frac{correct\ Upper - correct\ Lower}{1/2N}$$

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 were:

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)   (Heaton, 1975: 182)

3.8 Analysing the Data

The researcher analyzed the data statistically using repeated measure T-test. T-test was probably the most widely used statistical test for the comparison of two means because it can be used with very small simple size. In this research only used one class for experimental class and there was no control group so that repeated measure T-test used. Repeated measure T-test analyzed the data of students' increase in reading comprehension; the researcher used this following formula:

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

X_1 = Mean score of pretest

X_2 = Mean score of posttest

S_D = Standard error of differences between two means

S_D = Standard Deviation

n   = Number of students   (Hatch and Farhady, 1982:116)

In order to know whether there was a difference of students' reading comprehension before and after being taught through reference word and to see whether there was a significant increase of students' reading comprehension after being taught through reference word or not, the researcher compared the result of pre-test to the result of post-test. If the result of the post-test is higher than the pre-test it means that it can be used to increase student's ability in reading comprehension.

3.9 Hypothesis Testing

    a) There is a difference of students' reading comprehension ability before and after being taught reference word.

    b) H_1: There is a significant increase of students' reading comprehension ability after being taught reference word.

The hypothesis testing was used to prove whether the hypothesis proposes in this research was accepted or not. The hypothesis analyzed by using Repeated measure T-Test through computing with Statistical Package for Social Science (SPSS) version 15.0 for window. The researcher used the level of significance 0, 05 in which the hypothesis was approved if sign $< \alpha$. It means that the probability of error in the hypothesis was only about 5%.