

III. RESEARCH METHOD

A. Research Design

In conducting the research, the researcher intended to find out the significant difference of students' reading comprehension achievement by applying Graphic Organizers Technique and Translation Technique in reading.

The researcher applied true experiment pretest posttest group design (Hatch and Farhady, 1982:22). The researcher selected two classes, one as experimental group one and another one as the experimental group two. The experimental groups are given treatment of teaching for three times. The experimental group one was taught by applying Graphic Organizers technique and the experimental group two was taught by Translation technique. The research design can be presented as follows:

$G1 \text{ (random)} = T1 \ X1 \ T2$

$G2 \text{ (random)} = T1 \ X2 \ T2$

where:

G1 : experimental group I

G2 : experimental group II

T1 : pretest

T2 : posttest

X1 : applying graphic organizers technique in reading.

X2 : applying translation technique in reading.

(Hatch and Farhady, 1982:22)

In the research, both class received the same pretest and posttest. Pretest was conducted by using a reading test provided by the researcher. And, the posttest was given after the treatments done. The treatment was conducted for three times.

B. Population and Sample

The population of the research was the first year students of SMAN 5 Bandar Lampung. The research took one class as try out class and two classes as the sample of the research, one class as experimental class I and another class as experimental class II. In choosing two experimental classes the researcher used simple random probability sampling by firstly made sure that the students' abilities were homogeneous. To make sure that the students' abilities were homogeneous the researcher saw from the data of the teacher in the school. The classes that posed homogeneous ability were X.5 and X.4. The two experimental classes were chosen randomly by using lottery drawing. The experimental class I is class X.5 and experimental class II is X.4.

C. Research Procedures

The procedures of the research were as follows:

1. Determining the samples of the research

The first step in the research was selecting two classes as the sample. The sample was chosen by using simple probability sampling. The researcher took three classes, as try out class (X.6), experimental class I (X.5) and experimental class II (X.4).

2. Determining the research instrument

The materials which were used in reading tests (pretest and posttest) were taken from the students' textbook and authentic materials (i.e. taken from internet). The tests were in form of multiple choice tests consisted of 20 items. In giving treatments, the researcher has been using reading texts which were taken from English textbook for first year students of SMA and authentic materials. The researcher used three texts in his research. The topics of the texts were about health, sport and society.

3. Administering the try out test

The researcher conducted try out test in order to find out whether the test items that would be used in the research were good or not considered from the validity, reliability, level of difficulty, and discrimination power.

In this test, the researcher provided 50 items of multiple choices tests with five options (a, b, c, d or e), one was correct answer and the rest were distracters. The period took 90 minutes. The scoring system was that the load of each correct answer is 2 points. Therefore, if one participant answers all the items correctly, she/he gets 100 points.

The researcher used split-half method to measure the reliability which requires him to divide the test into same groups, first half and second half.

Some items were dropped and revised to administer in pretest and posttest.

The try out test consisted of 17 easy items, 15 average items and 18 difficult items. Meanwhile, for discrimination indexes, 15 items were bad, 12 items were poor, ten items were good, eight items were satisfactory, and five items were excellent. For detail information, see Appendix 4.

Items that have average remark in the level of difficulty and excellent or satisfactory or good for the discrimination power were selected used for the test (4,7,26,27,28,30,41,42,46,49,50). Moreover, the items that were easy and difficult but had excellent, satisfactory and good discrimination were revised. The revised items are 2,3,8,9,16,17,44,45,47. The items with negative and zero discrimination power were dropped and also the items that were easy and difficult in the level of difficulty and also had poor discrimination power were dropped. Eventually, the items that were administered for both of the pretest and posttest were 20 items.

4. Administering the pretest

This test was designed to find out students' basic reading comprehension ability. The researcher conducted pretest before treatment by using reading text and 20 items of multiple choice test. The scoring system was that the load of each correct answer is 5 points. If one participant answered all the items correctly, she/he got 100 points. The test period took 45 minutes.

5. Conducting Treatment

After giving the pretest to the students, researcher taught the students reading comprehension in reading a text by using Graphic Organizers Technique for the experimental class I and Translation Technique for the experimental class II. The researcher conducted three times of treatment in three meetings, which took 90 minutes in each meeting.

6. Administering the posttest

The researcher has administered posttest after treatment. This test consisted of reading text and 20 items of multiple choices test. The scoring system was that the load of each correct answer was 5 points. So, if one student answered all the items correctly, he or she got 100 points. The posttest took 45 minutes.

7. Analyzing the data (pretest and posttest of two experimental classes)

This step was conducted to find out the students' reading comprehension achievement. Independent group T-test formula was used to compare the means between the pretest to posttest of experimental class I and experimental class II. The data were computed through the statistical package for social sciences (SPSS) version 13.0.

8. Testing Hypothesis (posttest between two experimental classes)

The hypothesis testing taken from the comparison between the students' mean of posttest scores in both classes that computed through SPSS version 13.0.

The hypothesis was analyzed at the significant level of 0.05 in which the hypothesis was approved if $\text{sig.} < \alpha$. Therefore if the result of SPSS' calculation showed the sig. (2 tailed) was less than α it can be stated that the hypothesis was accepted. In other words, there is a significant different of

students' reading comprehension achievement between the students who are taught by using graphic organizers technique and those who are taught by using translation technique.

D. Data Collecting Technique

The researcher prepared this reading test as the instrument to gather the data. The reading test consists of pretest and posttest in multiple choice forms. The items of pretest and posttest were the same but in different arrangement of question items and options. Meanwhile, the length of the time between pretest and posttest were about three weeks.

1. Pretest

The pretest was given before the students get the treatment in order to measure students' basic reading comprehension ability and to see their abilities. The test consists of 20 items of multiple choice forms with five options. The materials of test were taken from some of try out test items with the topic: health, sport and society. The test was conducted within 45 minutes.

2. Posttest

The researcher administered posttest after the treatments given. The purpose of conducting posttest was to find out the result of students' reading comprehension achievement after applying Graphic Organizers Technique and Translation Technique in their reading. The test consists of reading text with

20 items of multiple choice tests. The posttest was conducted within 45 minutes.

E. Scoring System

The researcher used Arikunto's formula (2005: 71) in scoring the students' work.

The ideal highest score was 100. The score of pretest and posttest calculated by using the following formula:

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

Where:

S = the score of the test

R = the total of the right answer

N = the total of items.

F. Data Treatment

There were several steps in doing the data treatment. First, the try out test result were computed. Here the reliability, level of difficulty and discrimination power of the test were computed. Second, the result of pretest and posttest were searched simultaneously with the normality, homogeneity and random. The complete procedure can be seen as the following.

1. The Treatment of Try out Test Result

The try out test aimed to meet the quality of the test, so that the test had good reliability, validity, level of difficulty and discrimination power. Once the test had met the four criteria, it indicated that the test could be used as the base of arranging pretest and posttest. These were some elements tested as follows:

a. Validity

A test is said to be valid if it measures accurately what is intended to measure (Hughes, 1991: 22). There are four kinds of validity, namely face validity, content validity, construct validity, and empirical or criterion-related validity. To measure whether the test has a good validity, the researcher used content and construct validity.

Content validity is the extent to which a test measures representative sample of the subject matter contents. It means that the test should represent the materials that have been taught. Here, all items were made based on the materials taught and the 2006 curriculum for the second year of SMA.

A test, part of a test, or a testing technique is said to have construct validity if it can be demonstrated that it measures just the ability which it supposed to measure. The word 'construct' refers to any underlying ability (or trait) which is hypothesized in a theory of language ability (Hughes, 1991: 26). The table specification of the instrument test can be seen on the table below:

Table 1. Table Specification of Try out Test

No.	Skills of reading	Items number	Percentage of items
1	Determining main idea	1, 6, 13, 16, 21, 26, 31, 37, 41, 48	20 %
2	Finding specific information	5, 8, 15, 17, 19, 22, 29, 30, 32, 40, 44, 49,	24 %
3	Inference	50, 45, 36, 35, 23, 20, 12, 7, 3	18 %
4	Reference	4, 10, 11, 24, 27, 33, 39, 42, 46	18 %
5	Vocabulary	2, 9, 14, 18, 25, 28, 34, 38, 43, 47	20 %
Total		50 items	100%

Table 2. Table Specification of Pretest

No.	Skills of reading	Items number	Percentage of items
1	Determining main idea	7, 9, 13	15%
2	Finding specific information	5, 8, 12, 15, 19	25%
3	Inference	2, 4, 16, 20	20%
4	Reference	3, 10, 14, 17	20%
5	Vocabulary	1, 6, 11, 18	20%
Total		20 items	100%

Table 3. Table Specification of Posttest

No.	Skills of reading	Items number	Percentage of items
1	Determining main idea	5, 12, 14	15%
2	Finding specific information	3, 8, 10, 13, 16	25%
3	Inference	4, 9, 17, 19	20%
4	Reference	1, 6, 15, 20	20%
5	Vocabulary	2, 7, 11, 18	20%
Total		20 items	100%

2. Reliability

Reliability refers to the extent to which the test is consistent in its score, and it gives us an indicator of how accurate the test scores are (Shohamy, 1985: 70).

To estimate the reliability of the test, the researcher used the split-half method. To measure the coefficient of the reliability between odd and even number, the researcher used the following formula:

$$r1 = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}}$$

Where:

$r1$ = coefficient of reliability between odd and even numbers

X = total score of odd number

Y = total score of even number

x^2 = square of x

y^2 = square of y

Then the researcher used “Spearman Brown’s Prophecy Formula” (Hatch and Farhady, 1982: 286) to know the coefficient correlation of whole items.

The formula is as follows:

$$r11 = \frac{2r1}{1 + r1}$$

Where:

r_k = the reliability of the test

$r1$ = the reliability of half test

The criteria of reliability are:

0.90 – 1.00 : high

0.50 – 0.89 : moderate

0.00 – 0.49 : low

The result of the reliability found through this research is 0.992 (see appendix 5).

By referring to the criteria of the reliability proposed by Hatch and Farhady

(1982:247), the test has high reliability that is in the range of 0.90-1.00. It

indicated that the instrument produced consistent result when administered under

similar condition, to the same participant and in different time (Hatch and

Farhady, 1982:244).

3. Level of Difficulty

To see the level of difficulty, the researcher used the following formula:

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

Where:

LD : level of difficulty

U : the proportion of upper group students

L : the proportion of lower group students

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)

Based on the try out test related to those criteria there are 17 easy items, 15 average items, and 18 difficult items.

4. Discrimination Power

To see the discrimination power, the writer used the following formula:

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

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:

1. If the value is positive discrimination-a larger number of more knowledgeable students than poor students got the item 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)

In accordance with Shohamy (1985: 81), there are some criteria of discrimination power of an item. An item is excellent if the discrimination index ranges from 0.10 to 1.00. A good item ranges from 0.41 to 0.70. A satisfactory item ranges from 0.21 to 0.40. An item is poor if the discrimination index ranges from 0.00 to 0.20, and an item is bad if the discrimination index is negative.

Based on the try out test related to those criteria there are 15 bad items, 12 items are poor, 10 items are good, 8 items are satisfactory, and 5 items are excellent.

2. The Treatment of Pretest and Posttest Result

After having the result of the try out test, the researcher continued to analyze the data of the pretest and posttest of both groups. The SPSS version 13 was implemented in the treatment of data. The steps of analyzing the data were as follows:

a. Normality Testing

The normality testing was held twice. These tests are employed to know whether the data of pretest and posttest are normally distributed or not. The normality of pretest is assumed if the significance is greater than 0.05. The result of the normality testing can be seen in table 4 below:

Table 4. Normality Testing

	Kolmogrov- Smirnov Z	
	N	Sig. (2-tailed)
Pretest X 5	29	0.799
Posttest X5	29	0.824
Pretest X4	30	0.885
Posttest X4	30	0.100

Table 4 inferred that the significance of pretest in the experimental class I (X5) was 0.799. Since the significance is higher than 0.05, it could be concluded that the data of the pretest in the experimental class I is normally distributed. While in the experimental class II (X4), the significance is 0.885. The significance is more than 0.05 and it means that the data of pretest in the experimental class II is also normally distributed. These indicated that the data of pretest to both classes are normally distributed.

Moreover, Table 4 also shows that the data of the posttest in the experimental class I is normally distributed since the significance is 0.824. The significance is higher than 0.05, it could be concluded that the data is normally distributed. In the experimental class II, the significance is 0.100, which more than 0.05. So, the data in the experimental class II is also distributed normally. Furthermore, the result of computation of normality can be seen completely in Appendices 15 and 16.

2. Homogeneity Testing

The homogeneity testing is intended to test whether the variance of the data in the experimental class I and experimental class II is equal or not. The homogeneity is assumed if the significance is greater than 0.05. The result of homogeneity testing is as follows:

Table 5. Homogeneity Testing of Pretest

Variables	Sig. (2-tailed)	Conclusion
Experimental Class I Experimental Class II	.717	Homogeneous

Table 5 shows that the data are homogeneous since the significance is 0.717.

As the significance is more than 0.05, it illustrates that the data of both classes are homogeneous. The complete result of computation can be seen in Appendix 21.

3. Random Test

The statistical formula of runs test is used to determine whether the data of both classes are taken from the population at random. It is accepted if the significance is greater than 0.05. The result of random test is stated in the Table 6 below.

Table 6. The Random Test of Pretest in the Experimental I and Experimental Class II

Variables	Test Value (a)	Sig. (2- tailed)	Conclusion
Experimental Class I	54.13	.316	Random
Experimental Class II	55.16	1.000	Random

Table 6 indicates that the significance of the data is greater than 0.05. It could be concluded that the data of both classes are taken from the population at random.

Table 7. The Random Test of Posttest in the Experimental Class I and Experimental Class II

Variables	Test Value (a)	Sig. (2- tailed)	Conclusion
Experimental Class I	71.72	.824	Random
Experimental Class II	62.16	.100	Random

Table 7 indicates that the significance of the data is greater than 0.05. It could be concluded that the data in the experimental class I and experimental class II are taken from the population at random.

G. Hypothesis Test

Research findings were used to test the hypothesis- that was:

- H₀: There is no significant difference of students' reading comprehension achievement between students who are taught through Graphic Organizers Technique and those who are taught through Translation Technique.
- H₁: There is significant difference of students' reading comprehension achievement between students who are taught through Graphic Organizers Technique and those who are taught through Translation Technique.

The hypothesis was analyzed by using *independent group t-test* to compare the mean of posttest result of both classes. The hypothesis was analyzed at the significant level of 0.05 ($p < 0.05$); it means that the probability of error was only about 5 %.