

CHAPTER III

RESEARCH METHOD

This chapter discuss as the methodology of doing this research. It consists of research design, data collection, research procedure, the instrument of this research, and also data analysis.

3.1. Research Design

This research is a quantitative research based on the experimental class.

Quantitative research is a kind of research in which the data used to tend to use statistic measurement in deciding the conclusion (Hatch and Farhady, 1982:22). It is conducted using one group pretest posttest design. It means that the researcher find out the improvement of students' reading comprehension by comparing the pretest with the posttest result. Reffering to Setiyadi (2000:40), the design can be presented as follows:

T1 X T2

T1 = Pretest

X = Treatment (by using Mind Mapping technique)

T2 = Posttest

Pretest is done to find out the prior students' reading comprehension before being taught using Mind Mapping technique. Then, the posttest is to find out the students' reading comprehension result after being taught using Mind Mapping technique. The score is compared to get the result.

In the situation that the average score of pretest is higher than posttest means that there is an increase of students' reading comprehension after being taught by using Mind Mapping (H_1). In contrast, if the average score of posttest is lower than pretest, it indicates that Mind Mapping can not improve students' reading comprehension (H_0).

3.2. Population and Sample of the Research

The population of this research was the second year students of SMAN 12 Bandar Lampung. The researcher choosed second year students since report text is one of their learning materials. The researcher determined the sample by using purposive sampling technique. The sample was class XI IPA 3 which consisted of 42 students. It was based on the finding of pre-observation that the researcher had done. It indicated that this class have a problem worse than the other classes in reading comprehension.

3.3. Data Collecting Technique

The researcher collected the data by administering three stages of activities. There are a pre-test, treatments, and post-test. Before doing those stages, the researcher conducted a try out test. The activity can be describe as follows:

1. Try Out

Try out test was conducted to know the quality of the test as the instrument of the research such as validity, reliability, level of difficulty and discrimination power. The try out test contained 40 multiple choice items with five options (a,b,c,d and e). The students were from one class that was choosen purposively, out of experimental class. The students were given 90 minutes to do the try out.

2. Pre-test

The researcher gave the pre-test before the treatment. It used for knowing the basic ability of the students' reading comprehension before treatment and also the mean score of students' reading comprehension. The pre-test consisted of 30 reading comprehension multiple choice items with five optional answer (a,b,c,d and e). The students were given 60 minutes to answer the pre-test. The material was given based on KTSP 2006 curriculum of senior high school.

3. Post-test

Post-test was given after the treatment done. It showed the final result of students' reading comprehension after been taught using Mind Mapping technique. The post-test consisted of 30 reading comprehension multiple choice items with five

choices (a,b,c,d and e). The questions were the same with the pre-test but the number was re-arrange.

3.4. Research Procedure

The procedure of this research are:

1. Determining the sample and population

The population of this research is the second year of SMAN 12 Bandar Lampung. There are ten classes of second year students, which is five science class and five social class.

2. Administering try out test to analyze the quality of reading comprehension test.

The try out class was given in multiple choice items with four answer choices. Through try out the researcher recognized the realibility and validity of the test.

3. Administering the pre-test

The researcher gave the pre-test for the experimental class. It was done before the treatment. The students answered 30 reading comprehension multiple choice items with four answer choices.

4. Treatment

There were three times of treatment that was done by the reserarcher. It consisted of three meetings with ninety minutes for each meeting.

5. Administering the post-test

After conducting the treatment, the researcher gave the post-test as the final result of this research. It was used to find out whether the students' reading comprehension increase or not after taught using Mind Mapping technique.

6. Analyzing the test result

The researcher analyzed the data from pre-test and post-test result by using T-test through SPSS program. It showed the result whether the Mind Mapping technique is able to increase students' reading comprehension of report text.

3.5. Research Instrument

The instrument of this research is objective reading test in forms of pre-test and post-test. The researcher chooses multiple choice form since its marking is rapid, simple, and most importantly reliable, not subjective or influenced by the marker's judgement (Heaton, 1975). In try out, the item is 40 number. It is selected to be 30 numbers for pre-test and post-test. The test items for pre-test and post-test was the same but in different order.

3.6. Try Out the Test

Try out the test purpose is for knowing the quality of the research instrument that was used in pretest and posttest. In order to get a good test, the test item should

fulfill some criteria such as: validity, reliability, level of difficulty, and discrimination power that will be discussed below.

1. Validity

Validity is defined as the extent to which inferences and uses made on the basis of scores from an instrument are reasonable and appropriate (McMillan and Schumacher, 2001:181). Validity indicates how deep the instrument can measure the target of the research. An instrument is valid when it is capable to provide the output according with the researcher's need of data.

In teaching English as foreign language, there are five kinds of validity: face validity, content validity, predictive validity, construct validity, and concurrent validity (Setiyadi, 2006:22). This research instrument has been analyzed based on content and construct validity.

a. Content Validity

As the name, content validity finds out the validity of what the instrument contains. Content validity is used to analyze the multiple choice items that will be applied to measure students' reading comprehension. According to Setiyadi (2006:23), to fulfill this type of validity the researcher should be aware of all the indicators of the test items and analyze whether the instrument, in this case reading comprehension test, has represented the material which will be measured.

b. Construct Validity

Construct validity is about the instrument form. It investigates the research instrument's appropriateness to the research object. Since this research needs the

data of reading comprehension score, the instrument must truly examine the students ability in comprehending the text. It means that the test construction is already in line with the objective of the learning (Hatch and Farhady, 1982:251). Related to this research, the test items should be questioning the five aspects of reading such as main idea, specific information, reference, inference, and vocabulary.

2. Reliability

Reliability means consistency and stability. A research instrument must have the consistency in giving the result. Then the result also has to be stable in describing the object. In practice, the test should shows the consistant findings if it is done for the same subject although in different times.

Determining the reliability of the test, the researcher uses the Spilt half method, The coefficient of the realibility the first and second half group measuring use the Spilt half method, the formula as follows:

$$r_1 = \frac{\sum XY}{\sqrt{\sum X^2 \sum Y^2}}$$

Where:

r_1 = coefficient of reliability between first half and second half

X = total number of the first group

Y = total number of the second group

X^2 = square of X

Y^2 = square of Y

(Lado in Hughes, 1991:3)

Next to find the coefficient correlation of the whole items, the researcher uses

Spearman Brown Formula :

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

Where:

Rk = the reliability of the 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

(Hatch and Farhady, 1982:246)

3. Level of Difficulty

Level of difficulty gives the description of students' perception about the test items. Test items should not be too easy and also not be too difficult for the students as research object.

To find out the level of difficulty of the test items, the researcher uses formula:

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

Where:

LD = level of difficulty

R = number of students who answer correctly

N = total number of students following the test

The criteria are:

<0.30 = difficult

0.30-0.70 = average

>0.70 = easy

(Shohamy, 1985:79)

4. Discrimination Power

Discrimination power is used to know whether the test items can differentiate the students' ability. To calculate the discrimination power, the researcher used the formula:

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

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 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)

3.7. Scoring System

The researcher has used Arikunto's formula in scoring the students' test result. The highest score is 100. The score of pretest and posttest are calculated using the formula as follows:

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

Where:

S = Score of the test

r = total of right answer

n = total of test items

(Arikunto; 1997)

3.7.Data Analysis

The researcher analyze the students' score in order to find out the students' improvement in reading report text using Mind Mapping technique using the following steps:

1. Scoring the pre-test and post-test
2. Tabulating the results of the test and calculating the score of pre-test and post-test.
3. Making conclusion from the tabulated-result of the pretest and posttest administered, that is using statistical computerization e.e. Repeated

Measure T-Test of Statistical Package for Social Science (SPSS) to test whether the increase of students' gain is significant or not, in which the significance is determined by $p < 0.05$. It is used as the data come from the two samples. (Hatch and Farhady, 1982:111)

3.9. Hypothesis Test

The researcher collected the data then analyzed it to determine whether there is an increase of students' reading comprehension of report text using Mind Mapping technique or not after treatment. The researcher used Repeated *Measure T-test* in analyzing the data collected. The significance level is in 0.05 even the hypothesis is approved if $\text{sign} < p$. Therefore the probability of error in the hypothesis is only about 5%.