

### III. RESEARCH METHODS

This chapter discusses the design of this research and how to collect the data from the sample. In this chapter, the researcher also encloses the data collecting technique, the procedures of this research, the scoring system and how to analyze the data.

#### 3.1. Research Design

This research is quantitative study which is intended to find out the significant difference of the students' reading comprehension after the implementation of predictive technique and making inferences technique and to determine which of the two techniques is more effective. The design of the research used intact group pre-test post-test design which the sample was randomly assigned (Hatch and Farhady, 1982:22). The design used two classes as the experimental class and control class. The experimental class was treated through predictive technique. Meanwhile, in control class was treated through making inferences technique.

The design of the research was as follow:

$$\begin{array}{l} G1 = T1 \quad X1 \quad T2 \\ G2 = T1 \quad X2 \quad T2 \end{array}$$

Notes:

G1 : Experimental group

- G2 : Control group
- T1 : Pre-test
- T2 : Post-test
- X1 : Treatment 1 (using predictive technique)
- X2 : Treatment 2 (using making inferences technique)

Firstly, the pre-test was administered to identify the ability of the students before the students got the treatment. Then, the students were given 3 times treatments for the experimental class and control class. In each treatment the teaching reading was concerned about five reading aspects (main idea, specific information, references, inference, and vocabulary) through predictive technique for the experimental class and making inferences technique for the control class. Then, the post-test was administered to evaluate the students' reading comprehension after the treatments.

### **3.2. Setting of the Research**

#### **1. Time**

The research was conducted on July, 12<sup>th</sup>, 2012 until September 12<sup>th</sup>, 2012. The first activity was the observation to determine which class was as the tryout class, the experimental class, control class, the researcher used coin by flipping it. Then, continue to administering the try out test, administering the pre-test, after that the treatments as long 3 times meeting. And then the last was administering the post-test to see the result after conducting the treatments both for experimental class and control class.

## **2. Place**

This research was conducted for the second grade of SMAN 1 Kotagajah. There were seven classes of second grade at SMAN 1 Kotagajah. There were 224 of students and seven classes of second grade at SMA N 1 Kotagajah which consist of 32 students in every class.

### **3.3. Population and Sample**

The population of this research was the second grade of SMAN 1 Kotagajah. There are 224 of students and seven classes of second grade at SMA N 1 Kotagajah which consist of 32 students in every class. One class was taken as the tryout class and two classes was taken as the samples of this research, one as the experimental class and the other as the control class. In determining the experimental class and control class, the researcher used random sampling technique, so the entire second classes got the same opportunity to be selected as samples. To determine which class was as the experimental class and control class, the researcher used coin by flipping it.

### **3.4. Variables**

In this research there are two variables, they are:

1. The independent variables were predictive and making inferences techniques. The predictive and making inferences technique were the factors that might be influence reading achievement.
2. The dependent variable was reading comprehension achievement. This variable was called dependent variable because reading comprehension

achievement was one factor that would be measured by the researcher or as the main topic to be discussed.

### **3.5. Data Collecting Techniques**

In collecting the data, the researcher used the reading tests which consist of pre-test and post-test. The results will be discussed in detail in the following sections:

#### **3.5.1. Types of Data Collecting Technique**

##### **a. Pre-Test**

The pre-test was administered on August, 4<sup>th</sup> 2012 before the treatment, in order to know the competence of students in reading. The researcher used the objective test with four options of each item. One of the options was correct answer and the rests were as distracters. In order to see the complete elaboration of the result of pre-test can be found in chapter 4 (p.46).

##### **b. Post-Test**

The post-test was administered on September, 8<sup>th</sup>, 2012 after finishing the treatments. It was aimed to identify whether there was a difference between the students' achievement in reading comprehension or not after the implementing of predictive and making inferences techniques. In order to see the complete elaboration of the result of pre-test can be found in chapter 4 (p.47).

### **3.5.2. Try Out of The Instruments and The Results**

Before the data collecting technique were used, they were tried out to measure the quality of the instrument. A try out of the test was conducted before having the pre-test and the post-test to investigate the quality of the test items. It was carried out to make sure the quality of the instruments before the test was used to gather the data. The test was conducted on July, 31<sup>st</sup> 2012. The try out test was administered in the class which did not belong to the experimental class and control class that is XI Social 1 class. The test comprised for 50 items with time allocation 2 x 45 minutes.

#### **3.5.2.1. Criteria of a Good Instrument**

The instrument was said to have a good quality if it has a good validity, reliability, level of difficulty, and discrimination power. Therefore, the try out of the test was carried to achieve the objectives. The results of which are elaborated in the following sections:

##### **3.5.2.1.1. Validity**

The validity test was the test which measures what was intended to measure. The test can be said valid if the test measure the object to be measured and suitable with the criteria (Heaton, 1988:159). According to Heaton (1988:159) there are four types of validity: face validity, content validity, construct validity, and empirical validity. Face validity was aimed to measure whether a test in line with the target variable or not. The content validity was extended to measure the sample of subject content, construct validity was a measure intended to what it's

supposed to measure, and the empirical validity was statistical evidence that a diagnostic instrument measures what it was supposed to measure. But, in this research the researcher used content validity and construct validity since the other two are considered to be less needed. Therefore, two types of validity used in this research as follows:

#### a. Content Validity

Content validity was extended to measure the sample of subject content. It means that the test was a good reflection of what has been taught and the knowledge of what the teacher wants his/her students need to know. The content validity of the test was reflected in the following table:

**Table 1. Table of specification of try out test**

No	Objectives	Item Numbers	Total Items	Percentage
1	Identifying the main idea	1,7,12,21,24,29,31,39,43,45,46,47	12	24%
2	Specific Information	4,5,6,15,22,23,30,32,40,44,48,49	12	24%
3	Inference	3,9,10,13,14,20,25,28,33,35,50	11	22%
4	Reference	11,17,27,34,37,41	6	12%
5	Vocabulary	1,9,16,18,19,26,36,38,42	9	18%
TOTAL			50	100%

There were 50 items test with 4 optional, one as the correct answer and the rests as the distracters. The total score was 100 point, so if the students could answer the whole question correctly, they got 100 point.

**Table 2. Table of specification of Pre-Test**

No	Objectives	Item Numbers	Total Items	Percentage
1	Identifying the main idea	1,7,12,21,22,26,28,33,35,36,37,38	12	30%
2	Specific Information	4,5,6,9,15,21,23,27,39	10	25%
3	Inference	3,8,13,14,19,25,30,40	8	20%
4	Reference	10,17,29,31	4	10%
5	Vocabulary	2,16,18,24,32,34	6	15%
TOTAL			40	100%

**Table 3. Table of specification of Post-Test**

No	Objectives	Item Numbers	Total Items	Percentage
1	Identifying the main idea	1,3,7,11,14,22,24,29,31,32,33,34	12	30%
2	Specific Information	2,4,9,12,15,16,23,38,39,40	10	25%
3	Inference	6,8,13,17,21,26,36,37	8	20%
4	Reference	10,19,25,27	4	10%
5	Vocabulary	5,18,20,28,30,35	6	15%
TOTAL			40	100%

In the pre-test and post-test, there were 40 items test with 4 optional, one as the correct answer and the rests as the distracters. The total score was 100 point, so if the students could answer the whole question correctly, they got 100 point.

#### **b. Construct Validity**

Construct Validity refers to the ability of a measurement tool (e.g. a survey, test, etc) to actually measure the psychological concept being studied. In other words, it is properly to measure what was supposed to be measured. It was

concern whether the test was actually in line with the language theory or not (Shohamy, 1985:74).

### 3.5.2.1.2. Reliability

Reliability was aimed to measure how accurate the result of test. In this research, the researcher used the split-half method to estimate the reliability of the test. To measure the coefficient reliability between the first half and the second half items, the researcher used the Pearson product moment formula as follows:

$$rk = \frac{\sum XY}{\sqrt{[\sum x^2][\sum y^2]}}$$

Where:

rk : coefficient of reliability between the first half and the second half items

X : total of items that the students got right in the first half of the test

Y : total of items that the students got right in the second half of test

$\sum XY$  : total score of X times Y

$\sum x^2$  : total score of  $X^2$

$\sum y^2$  : total score of  $Y^2$

(Lado: 1961 in Hughes. 1989:32)

After having the reliability of the half of the test, the researcher used “Spearman Brown’s Prophecy formula” (Hatch and Farhady, 1982:246) to determine the coefficient correlation of whole items. The formula is:

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

Where:

$r_k$  : the reliability of the test

$r_l$  : the reliability of half test

The criteria are:

0,90 – 1,00 is high

0,50 – 0,89 is moderate (satisfactory)

0,0 – 0,49 is low

After conducted the try out test, the result of reliability found through this research was 0.75 (see Appendix 5). By referring to the criteria of the reliability proposed by Hatch and Farhady (1982:268), the test had moderate or satisfactory reliability in the range of 0,50 – 0,89. It indicated that this instrument would produce consistent result when administered in the similar condition to the same participants and in different time (Hatch and Farhady, 1982).

#### **3.5.2.1.3. Level of Difficulty**

The test was used to measure the difficulties of the item test. The try out test had given before the treatment and the researcher counted the students correct answer. If the amount of students who answer correctly was higher than the amount of students who failed, it was assumed that the test is easy for the students. To determine the level of difficulty, the researcher used the following formula:

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

Where:

LD : Level of Difficulty

R : The number of students who answer correctly

N : The total 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 computation result of level difficulty (see Appendix 6), the researcher found that there were 8 items which were more than 0.70 which means that the items were easy and 2 items were below 0.30 which means difficult. Meanwhile there were 40 items which were between the ranges 0.30 – 0.70 or belonged to average.

#### **3.5.2.1.4. Discrimination Power**

It was used to discriminate among the different candidates and reflects the different performances of the individuals in a group of students. It was also used to discriminate the number of upper group students who answer correctly and who do not answer correctly. To find out the discrimination of power, the researcher uses this formula:

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

Where:

DP : Discrimination Power

U : The number of upper group students who answer correctly

L : The number of lower group students who answer correctly

n : Total number of the students

The criteria are:

DP: 0.00-0.19 = Poor.

DP: 0.20-0.39 = Satisfactory.

DP: 0.40-0.69 = Good.

DP: 0.70-1.00 = Excellent.

DP: - (negative) = Bad items, should be omitted.

- a. If the value is positive discrimination- a large number of more knowledgeable students then poor students get the item correct. If the value is zero, it means no discrimination.
- b. If the value is negative, means that more low students than high level students get the item correct.
- c. In general, the higher the discrimination index is better. But, in the classroom situation most items should be higher than 0.20 indexes.

Based on the computation result of discrimination of power (see Appendix 6) the researcher got 10 items were poor (having less than 2.00 index), 31 items were satisfactory (having more than 2.00 index), and 9 items were good (having more than 4.00 index). In general, it can be stated that all items tested had good

discrimination power and positive value. In this research, the researcher omitted 10 items that were unsatisfactory to be used. Eventually, after analyzing the data, the researcher got 40 items were good and 10 items were poor and should be dropped. Then finally, the items tests that were administered were 40 items for pre-test and post-test.

### **3.6. Research Procedures**

The research procedures of collecting data are as following:

#### **1. Determining the Research Problems**

Determining the Research Problems was aimed to determine the students' commonly problems in reading activity, i.e. the students can not get the main idea and specific information quickly.

#### **2. Determining the Population and Sample**

Determining the population and sample was aimed to determine the students which were appropriate as the participation in this research. The classes were not divided in a matter of their cleverness but, it had chosen by using simple probability sampling by using flipping coin.

#### **3. Preparing the Materials**

The materials (reading tests) were chosen from the students' textbook or the material from other sources, such as from internet.

#### **4. Determining the Research Instruments**

For reading test (try out test, pre-test and post-test), most of the materials were taken from students; textbook and the internet. It was aimed to make an equal proportion both pre-test and post-test.

## **5. Administering Tryout Test**

Tryout test was conducted before the pre-test and the post-test to investigate the quality of the test items, whether the test was appropriate for the students or not. The test consists of 50 items of multiple choices test.

## **6. Administering the Pre-Test**

Pre-test was aimed to identify the ability of the students before the students got the treatment. The researcher used the objective test with four options of each item. One of the options was correct answer and the rests are as distracters.

## **7. Conducting the Treatments**

Implementing the predictive for one experimental class and making inferences technique for the control class. To see the difference of their interest during the activity, the researcher gave the explanation about the techniques and exercises in reading activity.

## **8. Administering the Post-Test**

Post-test was given after the treatment, to identify whether there is a difference between the students' achievement in reading comprehension or not. It was also used to evaluate the students' reading comprehension after giving the treatments.

## **9. Analyzing the Data**

Analyzing the data was used to compare the pre-test and post-test result by using the Statistical Package for Social Science (SPSS) version 17.0. The students' average scores of the reading test both from pre-test and post-test were analyzed, then the researcher made discussions from the result.

### 3.7. Data Analysis

Analyzing data was aimed to determine whether the students' reading comprehension achievements increase or not. In analyzing the data, the researcher used 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. Drawing conclusion from tabulated results of pre-test and post-test by using independent group T-Test where the two means of two different groups (experimental and control group) were compared. The data was statistically computed through the statistical package for Social Science (SPSS) version 17.0.

#### 3.7.1. Scoring System

In scoring the result of students' scores in pre-test and post-test, the researcher used percentage correct system (Lyman, 1971:95). The percentage correct score was used to report the result of classroom achievement tests. The researcher calculated the average of pre-test and post-test by using this formula:

$$X_{\%c} = 100 \frac{R}{T}$$

Where:

$X_{\%c}$  : Percentage of correct score

R : Number of the correct answer

T : Total number of the item test

(Lyman, 1971:95)

### 3.7.2. Calculating the Mean Score

Mean told us about how difficult or easy the test was. According to Heaton (1991, p.175), the mean score of one test is arithmetical average i.e. the sum of separate score which is divided by the total number of students. It was efficient to measure the central tendency, even it was not always appropriate. To calculate the mean, the researcher uses the formula as follow:

$$X = \frac{\sum x}{N}$$

Where:

X : Mean

$\sum x$  : total scores

N : Number of students

(Heaton, 1991:175)

### 3.8. Data Treatment

According to Hatch and Farhady (1982) in Setiyadi (2006: 168-169), using t-test for hypothesis testing has three basic assumptions:

- a. The data is interval or ratio
- b. The data is taken from random sample in a population
- c. The data is distributed normally.

Therefore, the researcher used these following procedures in data treatment:

#### 1. Random Test

This test was used to make sure whether the data are random or not. The researcher used SPSS version 17.0. In this case, the researcher used mean as the cit point run test.

The hypothesis if for the random test is formulated as follows:

$H_0$  : the data is not random

$H_1$  : the data is random

In this research report, the criteria for the hypothesis are:

$H_1$  is accepted if  $\text{sig} > \alpha$ . In this case, the researcher uses the level of significant 0.05.

## **2. Normality Test**

The researcher used normality test to investigate whether the data from the experimental class and control class are normally distributed or not. The hypothesis for the normality test is as follows:

$H_0$  : the data is not distributed normally

$H_1$  : the data is distributed normally

The criteria are:

$H_1$  is accepted if  $\text{sig} > \alpha$ . In this case, the researcher uses the level of significant 0.05.

## **3. Homogeneity Test**

This test was used to know the data from the experimental class and control class are homogenous or not. In this research, the researcher used Independent Samples Test in SPSS 17.0 to know the homogeneity of the test. The hypothesis for homogeneity of variance test was:

$H_0$  : there is no significant difference (equal)

$H_1$  : there is a significant difference (not equal)

The criteria are:

$H_0$  is accepted if  $\text{sig} > \alpha$ . In this case, the researcher uses the level of significant 0.05.

### 3.9. Hypothesis Testing

After collecting the data, the researcher recorded and analyzed them in order to find out whether there is a difference of students' achievement in reading comprehension of narrative text or not after the treatment. The researcher used independent group T-test to know the level of significance of the treatment effect by using this formula:

$$t = \frac{\bar{X}_e - \bar{X}_c}{S_{(\bar{X}_e - \bar{X}_c)}}$$

With:

$$S_{(\bar{X}_e - \bar{X}_c)} = \sqrt{\left(\frac{S_e}{\sqrt{n_1}}\right)^2 + \left(\frac{S_e}{\sqrt{n_2}}\right)^2}$$

Where:

$\bar{X}_e$  : Mean from the difference pre-test and post-test of experimental class

$\bar{X}_c$  : Mean from the difference pre-test and post-test of control class

$S_{(\bar{X}_e - \bar{X}_c)}$  : Standard error of differences between means

n : Subjects on sample

The criteria are:

If the t-ratio is higher than t-table :  $H_1$  is accepted

If the t-ratio is lower than t-table :  $H_0$  is accepted

(Hatch and Farhady, 1982:111)