

## **CHAPTER III RESEARCH METHODOLOGY**

### **A. Form of Research**

The form of research that was implemented in this research is experimental. According to Singh (2006: 134), “Experimental method is a scientific method. It is oriented to the future in the sense that the researcher is seeking to evaluate something new. It is a process of contribution to the already acquired fund of knowledge”. Another experts, Scott and Morrison (2006:103) Stated that experimental need the researcher to intervene in the natural setting and control of the variables to determine a causal relation of the properties to the individual or unit. It can be taken into conclusion that experimental research is used in investigating the relation between variables and how far it is effecting other variable by applying treatment to the experimental group.

In this study the researcher used experimental, the kind of experimental that was used in this study is pre-experimental research. Pre-experimental is also have several designs, the design that the researcher take interest is one group pre-test and posttest where the experiment was applied to the one group only without control group. Ary, *et al.* (2010: 303) stated that pre-experimental provide less control or no control to extraneous variables. Another expert, Cresswell (2009: 158) stated that with pre-experimental, the researcher studies a single group and provides an intervention during the experiment. This pre-experimental is the most

simple research of experimental which is this research does not have a control group to compare with the experimental group such as quasi-experimental does.

In this research, the researcher used one class to evaluate the students' reading comprehension. The researcher gave pre-test before the treatment, while the treatment was applied in the teaching process the researcher was using one stray rest stay in the teaching reading comprehension. After the treatment is completed using one stray rest stay strategy, the researcher gave the students post-test in order to find out the result whether or not the treatment with the effect of one stray rest stay (OSRS) strategy effective by comparing the score of pre-test with post-test.

**Table 3.1 One group pre-test and post-test design**

| Pre-Test | Treatment | Post-Test |
|----------|-----------|-----------|
| Y1       | X         | Y2        |

*Source: Ary, et al. (2010: 304)*

To understand the table above as follow, Y1 is pre-test that was applied in order to know the students' mean score before giving the treatment. Meanwhile, X represents as the treatment. Y2 is post-test that was applied in order to measure the students' achievement after the treatment given. As mentioned before that pre-experimental did not have control group. The result of the treatment could be found by comparing the pre-test and post-test score. The researcher in this research was attempted to evaluate the effectiveness of one stray rest stay (OSRS) strategy in teaching

reading comprehension to the eleventh grade students of SMAN 1 Subah in the academic year of 2015/2016.

## **B. The Research population and Sample**

### **a. Research Population**

Population is collection of the subjects in the research. Weiss (2012: 4) stated that population is the collection of all individuals or items under consideration in a statistical study. The population in this research were all students in the eleventh grade of SMAN 1 Subah which are consist of two classes XI IPA and XI IPS. The total population that was identified were 49 students.

**Table 3.2 Population**

| Eleventh Grade Students of SMAN 1 SUBAH |             |
|---|-------------|
| XIA (XI IPA)                            | 22 students |
| XIS (XI IPS)                            | 27 students |
| Total                                   | 49 students |

### **b. Research Sample**

Sample is part of the population that can represent all the population. Weiss (2012: 4) stated that sample is part of the population that the information is obtained from. The researcher formulate that the sample is representitative of the population which is involved in the research by giving expected information. In this research the researcher choose the sample through cluster random sampling by choosing the class of the population randomly as the experiment class. The researcher wrote in a piece of paper class XI IPA and XI IPS. It means that, there would be

two choices. After that, the researcher took one of the papers randomly. The class that would be chosen as the sample of this research is the class which is written in the paper that chosen by the researcher. XIA with 22 students was chosen as the sample of the population of this research.

**c. Homogeneity Test**

Homogeneity in this research was used to find out whether the data that obtained come from homogenous population. Homogeneity measure the consistency and reliability of the population which do not need to spilt into parts to score them separately. Ary, *et al.* (2010: 245) “Other internal-consistency measures of reliability do not require splitting the test into halves and scoring each half separately.” To conclude, by measuring the homogeneity of the population, the researcher did not need to formulate different test to test the population. As long as the population indicate homogenous the researcher can rely on the same instrument to test other member of the population. The homogeneity of the population was measured by using parametric test of different which is F-test. The data for testing the homogeneity was obtained from students’ English score and calculation was done with the help of Statistical package for the social science (SPSS) statistics 23. The formula that used to test the homogeneity is as follow:

$$F = \frac{S^2_1}{S^2_2}$$

Note:

Where  $S^2_1$  is treated  $S^2_2$

With df = (n-1)  
 With df =  $v_1 = (n_1 - 1)$  for greater variance  
 and df =  $v_2 = (n_2 - 1)$  for smaller variance

Adopted from Kothari (2004: 201)

The criteria that was used to accept or refuse the homogeneity of the data are as follow:

If F calculated  $>$  F table, the data are homogenous

If F calculated  $<$  F table, the data are not homogenous

$H_0$  = the classes data in the population are not homogenous

$H_a$  = the classes data in the population are homogenous

$\alpha$  = 0,05

The result of the data calculation of F-test which was calculated by using SPSS statistics 23 was showed as follow:

**Table 3.3 Test of Homogeneity of Variances**

| SCORE            |     |     |      |
|------------------|-----|-----|------|
| Levene Statistic | df1 | df2 | Sig. |
| ,274             | 1   | 47  | ,603 |

The result of the calculation was showed in the table 3.3 above, it was showed that the sig. value was 0,603 which was higher than the  $\alpha$  value (0,05). The higher value of sig. to the value of  $\alpha$  means that the data was indicate as homogenous. It can be concluded that the population were homogenous.

### **C. Technique of Data Collection**

The technique of data collection that was used by the researcher in this research was measurement technique. Ross (2005: 33) stated “Measurement is a process that assigns a numerical descriptive to some attributes of an object, person, or event.” Another expert, Kothari (2004: 69) states that measurement is a process of mapping aspects of a domain onto other aspects of a range according to some rule of correspondence. The measurement technique used to evaluate the students’ score before and after treatment in this research.

### **D. Tools of Data Collection**

Tools of data collection is a media which were used by the researcher for collecting the data. In this research the researcher is going to use test in form of multiple choice test. Ary, *et al.* (2010: 201), “A test is a set of stimuli presented to an individual in order to elicit responses on the basis of which a numerical score can be assigned”. Supported by Ross (2005: 36) in reading comprehension the test could be in form of passage followed by specific questions. From those experts can be concluded that test is list of questions used to obtain numerical data of the students, which in reading comprehension the test can be in form of passage followed by questions.

a. Validity Test

The important part that result the reliability of the research is the instrument that is used. Valid means appropriate and correct that make the data is trustable. Which according to Gronlund in Brown (2003: 22) stated that validity is the conclusion of the assessment result which related to appropriate, meaningful, and useful, in term of purpose of the assessment. To conclude, validity test is used to determine whether or not the test is appropriate to be used to collect the data. The researcher tried out 40 questions to the students in other class of experiment class and then the researcher took 25 valid items after the researcher measures the result of the try out by computing the data into SPSS statistics 23 for the process of validation. The formula that used to test validity is Pearson product moment (Pearson  $r$ ), the formula is as follow:

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{N}}{\sqrt{\left(\sum X^2 - \frac{(\sum X)^2}{N}\right)\left(\sum Y^2 - \frac{(\sum Y)^2}{N}\right)}}$$

Note:

- $r$  = Pearson  $r$
- $\sum X$  = sum of score in  $X$  distribution
- $\sum Y$  = sum of score in  $Y$  distribution
- $\sum X^2$  = sum of the squared score in  $X$  distribution
- $\sum Y^2$  = sum of the squared score in  $Y$  distribution
- $\sum XY$  = sum of products of paired  $X$  and  $Y$  score
- $N$  = number of paired  $X$  and  $Y$  score (subjects)

Adopted from Ary, *et al.* (2010: 130)

The criteria that used to accept and refuse the validity of the instrument are as follow:

If  $r_{\text{calculated}} > r_{\text{table}}$ , the test item is valid

If  $r_{\text{calculated}} < r_{\text{table}}$ , the item is not valid

The researcher was used two kinds of instrument validation, which was content validity which was done by the lecturer as the expert chosen for validating the test items in order to get valid instruments for the test items for the research. To make sure the content of the question valid, the researcher was also suggested to use statistical analysis for the proses of gaining valid test items that used for pre and post-test.

In order to get the data for the process of item validation, the researcher tried out the instrument to the other class beside experiment class. The XIS was available for the researcher to test the instrument, the XIS was consist of 47 students which were 22 students ( $n=22$ ) present at the time tried out taken. The data that was obtained was analysed by using SPSS statistic 23. The analysis of item tests, the researcher used score of  $r_{\text{table}}$  at 5% significance at  $n=22$  to compare with the test items score. The  $r_{\text{table}}$  at 5% significance with  $n=22$  was showed 0,432. The items with value below  $r_{\text{calculated}} < 0,432$  was eliminated because it was indicate that the items was not valid.

The result of validity test was showed that from 40 items, 31 test items were valid and 9 test items were invalid. Taken from the valid test items for the instrument, the researcher decided to use 25



of the valid items for the test of pre and post-test for gaining the data from the experiment class. The items used to test for pre and post-test were items number 1, 2, 4, 5, 6, 7, 10, 12, 15, 16, 17, 18, 19, 20, 22, 24, 25, 27, 29, 30, 31, 32, 35, 37, and 39.

#### b. Reliability Test

The reliability of the instrument decide the consistent result to the measurement that done in the identical conditions. Brown (2003: 19) stated that reliable test means the test is consistent and dependable. In order to measure the reliability of the instrument that will be used in this research, the researcher used SPSS statistics 23 to find out the reliable test that can be used to the research. The formula that used to test the reliability is Cronbach alpha, the formula is as follow:

$$\alpha = \frac{K}{K-1} \left( \frac{s_x^2 - \sum s_i^2}{s_x^2} \right)$$

Note:

K = number of items on the test

$\sum s_i^2$  = sum of variances of the item scores

$s_x^2$  = variance of the test scores (all K items)

Adopted from Ary, *et al.* (2010: 246)

The criteria that used to refuse and accept the reliability of the instrument are as follow:

If  $\alpha$  calculated  $>$  r table, the instrument is reliable

If  $\alpha$  calculated  $<$  r table, the instrument is not reliable

The researcher analyse the reliability of the test items by using Cronbach alpha in SPSS statistics 23. In determining items

reliability, the criteria for the reliable item tests should be above  $r_{table}$  value with  $n=22$  at 5% significance which was 0,432. The result of Cronbach alpha calculation which was done by using SPSS statistics 23 was as follow:

**Table 3.4 Reliability Statistics**

| Cronbach's Alpha | Cronbach's Alpha Based on Standardized Items | N of Items |
|------------------|--|------------|
| ,755             | ,948   | 26         |

The table 3.4 of reliability statistics above was showed that the value of Cronbach alpha was 0,755 for 25 test items. It was higher than the  $r_{table}$  value for  $n=22$  at 5% significance which was 0,432. It can be taken into conclusion that the test items were reliable.

#### **E. Techniques of Data Analysis**

Technique of data analysis comes from the interpretation of data collection and to obtain the result or answer of the research questions. It is also in use of testing the hypothesis of research. Singh (2006: 223) stated that analysis of data means studying the tabulated material in order to determine inherent facts or meanings. It involves breaking down existing complex factors into simpler parts and putting the parts together in new arrangements for the purpose of interpretation. The techniques of data analysis in this research are as follow:

a. Analysis of the Students' Individual Scores in Pre-Test and Post-Test.

The researcher analysed the students' pre-test and post-test score by using the formula below:

$$X = \frac{A}{N} \times 100$$

Note:

X = an individual score

A = the students' right answer

N = the number of test items

Adopted from Cohen, Manion, and Morrison (2007: 423)

b. Analysis of the Students' Mean Score of Pre-Test and Post-Test.

The researcher analysed the students' mean score of pre-test and post-test by using the formula below:

$$\bar{X} = \frac{\sum Xi}{n}$$

Note:

$\bar{X}$  = the students' mean score

$\sum Xi$  = the total score of students

n = the total number of students

Adopted from Kothari (2004: 132)

c. Analysis the Students' Difference Scores of Pre-test and Post-test.

The researcher analysed the students' different score of pre-test and post-test by using the formula as follow:

$$\bar{D} = X_2 - X_1$$

Note :

$\bar{D}$  = Interval of pretest and post test

$X_1$  = The mean score of pre test

$X_2$  = The mean score of post test

Adopted from Cohen, *et al.* (2007: 423)

d. The normality test

In order to find out the data was distributed as normal distribution or not, the researcher needed to calculate the normality of the data of pre-test and post-test. To analyse the normality of the data the researcher used Kolmogorov-Smirnov test that available in SPSS statistics 23. The Kolmogorov-Smirnov test would find out the data distribution by comparing the p-value ( $p$ ) to the alpha-value ( $\alpha$ ). If value of  $p < \alpha$  (0.05) it means the data is not normally distributed. If value  $p \geq \alpha$  (0.05) it means the data is normally distributed.

e. Testing hypotheses

The test that used for testing the hypotheses was depending on the result of the calculation of Shapiro Wilk test. If the result of Shapiro Wilk test indicate that the data is in normal distribution, the researcher would continue the calculation to determine the research hypotheses by using paired-sample t-test with the level of confidence 95% (parametric method) that available in SPSS statistics 23 to test the hypotheses. The formula to calculate the t-test is as followed:

$$t = \frac{\bar{D}}{\sqrt{\frac{\sum D^2 - \frac{(\sum D)^2}{N}}{N(N-1)}}$$

Note:

t = t ratio

$\bar{D}$  = average difference

$\sum D^2$  = different scores square, then summed

$(\sum D)^2$  = different scores summed, then square

N = number of pairs

Adopted from Ary, *et al.* (2010: 177)

If the result of Shapiro Wilk test showed that the data is not normally distributed, the researcher would use Wilcoxon-Mann-Whitney test or (U-test) (non-parametric method) that available in SPSS statistics 23 to test the hypotheses. The formula of U-test as follow:

$$U = n_1 \cdot n_2 + \frac{n_1(n_1 + 1)}{2} - R_1$$

Note:

$n_1, n_2$

= the sample sizes

$R_1$

= the sum of ranks assigned to the values of the first sample

Adopted from Kothari (2004: 294)

The result of data computation would be the conclusion for deciding the hypothesis. To answer the first question, whether or not the effect of OSRS strategy effective, the researcher would use the p-value of t-test or u-test. If the value of  $(p) < \alpha (0.05)$  it means that OSRS is effective and  $H_0$  is rejected. If the value of  $(p) \geq \alpha (0.05)$  it means that OSRS is not effective and  $H_0$  is fail to be rejected.

f. Analysis of the Students' Standard Deviation.

The researcher analysed students' standard deviation score by using the formula as follow:

$$(\sigma) = \sqrt{\frac{\sum(X_i - \bar{X})^2}{n}}$$

Note:

$\sum$  = to sum

$X_i$  = *i*th value of the variable X

$\bar{X}$  = the mean score

n = the number of items

$\sigma$  / SD = Standard deviation

Adopted from Khotari (2004: 135)

## g. Effect size

The researcher used effect size in order to answer question number two. According to Cresswell (2012: 188), “Effect size is a means for identifying the practical strength of the conclusion about group differences or about the relationship among variables in a quantitative study”. On the other words, Cohen, *et al.* (2007: 293) states that effect size is a measure of the degree to which a phenomenon is present or the degree to which a null hypothesis is not supported. To be concluded, the effect size is use to determine the strength of the effect of the treatment. The researcher used Cohen’s effect size which the formula of the effect size is as follow:

$$d = \frac{X_2 - X_1}{\alpha}$$

Note:

$d$  = Cohen’s  $d$  effect size  
 $X_2$  = Mean score of posttest  
 $X_1$  = Mean score of pretest  
 $\alpha$  = Standard deviation

An effect size can lie between 0 to 1.

0 – 0,20 = weak effect  
 0,21 – 0,50 = modest effect  
 0,51 – 1,00 = moderate effect  
 > 1,00 = strong effect

Adopted from Cohen, *et al.* (2007: 521)

#### h. The implementation of Research

There were some procedures that the researcher through in conducting the research. The procedures are explained below.

##### 1. Administration

The first stage for administration was making the letter of permission in conducting the research followed by asking permission to the education department also to the school destination where the researcher conducted the research. After getting the permission the researcher go on to the next stage.

##### 2. Choosing the sample

The second stage, the researcher write on the pieces of paper the classes that become the research population and put it into a glass than the researcher draw out one of the pieces of the written paper and it was XIA.

##### 3. Tryout test

The third stage was distributing the test for the tryout in another class beside experiment class for the process of instrument validation before using the instrument for the test on pre-test and post-test.

##### 4. Pre-test

The fourth stage was taking the pre-test score to the experimental class in order to find out the real condition of the sample before implementing the treatment with the OSRS strategy.

##### 5. Treatment

The fifth stage was implementing the treatment to the sample or experiment class by using OSRS strategy. The treatment with OSRS strategy was conducted in two meetings.

6. Post-test

In this stage the researcher taking the post-test in order to know the result of the implementation of OSRS strategy in teaching reading comprehension to the sample.

7. Analyzing the result

The last stage of the research was calculating, computing and analyzing the data obtained from the sample of the research.

