

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

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

The form of research that was implemented in this research was experimental research. Singh (2006:135) stated that experimental method is a scientific method, it is oriented to the future in the sense that the researcher is seeking to evaluate something new. Another expert, Ary *et al* (2010 : 265) states, the goal of experimental research is to determine whether a casual relationship exist between two or more variables. An experimental research used to establish possible cause and effect between the independent and dependent variables.

The kind of experimental research used by the researcher in this research is pre-experimental research by using one group pre-test and post-test design. A pre-test is a test given before the experimental treatment in order to see if the groups are equal, the groups are then post-test with an alternate form of the same test, while a post-test is a test given after the experimental treatment Lodico, Spaulding, and Voegtle, (2010:228).

In this research, the researcher took one of three classes to know the students' reading comprehension. The researcher gave the pre-test before giving the treatment and after that, the researcher gave the treatment for students to know the effectiveness of Team Pair Solo Strategy in Teaching Reading Comprehension. Afterward, the researcher gave post-test to the students in order to know the result before and after giving the treatment.

The reason of choosing this strategy was to find out whether the strategy was effective or not. Ary *et al* (2010:303) mentioned that, the one group pre-test and post-test design usually involves three steps ((1) administering a pre-test measuring the dependent variable (2) applying the experimental treatment *X* to the subject and (3) administering a post-test, again measuring the dependent variable. Furthermore, to explain about how the

design works the researcher adopted the experimental design by Ary *et al* (2010:304), as follow:

**Table 3.1: One Group Pre-Test and Post-Test**

Pre-Test	Treatment	Post-Test
$Y_1$	$X$	$Y_2$

*Adopted from Ary et al (2010:304)*

Where:

$Y_1$  : Pre-test

$X$  : Treatment

$Y_2$  : Post-test

$Y_1$  was applying in order to know the students' mean score before giving the treatment. Then,  $X$  represents as the treatment.  $Y_2$  was applying in order to measure the students' achievement after the treatment given. A pre-experimental does not have a control group. The influence of experimental treatments could be seen by seeing the mean score between the pre-test and post-test. In this research, the researcher tried to investigate the effectiveness of reading comprehension by using Team Pair Solo Strategy to the Eighth Grade Students of SMP Negeri 1 Kuala Mandor B.

## **B. Population, Sample, and Sampling**

### **1. Research Population**

Population is a group of individuals that share one or more characteristics from which data can be gather and analysis. According to Singh (2007:88), a population is a group of individuals, objects, or items from among which samples were taken for measurement. The population in this research was all of the eighth grade students of SMPN 1 Kuala Mandor B. The total populations are 89 students that divided into three classes. The classes are VIII A, VIII B, and VIII C.

**Table 3.2 Population Table**

<b>NO</b>	<b>Eighth Grade students of SMPN 1 Kuala Mandor B</b>	
<b>1.</b>	VIII A	29 students
<b>2.</b>	VIII B	30 students
<b>3.</b>	VIII C	30 students
	Total	89 students

*Taken from: Administration of SMPN 1 Kuala Mandor B*

## 2. Research Sample

Sample is the part of the population that indicate all the population. As stated by Mc millan (1996:86), the sample is the group of elements, or a single element, from which data are obtained. Sample is that part of the population from which information is obtained. Therefore, in this research, the researcher took one sample to be observed randomly by using cluster random sampling. The class that selected was VIII B.

## 3. Research Sampling

Sampling is the fundamental to all the statistical techniques and statistical analysis. Kothari (2004:14) stated “sample design is a definite plan determined before any data are actually collected for obtaining a sample from a given population”. In cluster sampling the sample unit contain groups of element (cluster) instead of individual members or items in the population (Singh 2006:89)

In this research, the researcher would take cluster random sampling where the researcher would choose only one class randomly to make limitation of population. Cluster random sampling is type of sampling where each and every items in the population has an equal

change of inclusion in the sample and each one of the possible samples, in case of finite universe, has the same probability of being selected (Kothari 2004:15).

In this strategy, the number of students should not less than 30 participants. Cohen and Manion (2007:101) mentioned that a sample size of thirty is held by many to be minimum number of cases if researcher plan to use some form of statistical analysis on their data, though is a very small number and we would advise very considerably more. The researcher prepared a piece of paper and divide the paper in three pieces, then wrote each of paper with codes namely; VIII A, VIII B, VIII C. Afterwards, the researcher shook and took one of the paper from a container as a lottery.

### **C. Technique and Tool of Data Collecting**

#### **1. Technique of Collecting Data**

In this research, the researcher used measurement data collection technique. Measurement is a process of mapping aspects of a domain into other aspects of a range according to some rule of correspondence (Kothari, 2004:69). At the same concern, Creswell (2012:623) states that measurement means that the researcher observes and records the score on an instrument. This measurement technique intended to measure the students' reading comprehension before and after Team Pair Solo Strategy treatment.

#### **2. Tool of Collecting Data**

Tool of data collection is a device which is used by the researcher for collecting the data. Ary *et al* (2010:201) states that 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. The researcher used multiple choice test as the tool of data collecting that would be given in the pre-test and post-test to collect the students' score. As stated by Thornbury and Dactorow (2002: 132), multiple choice test is a popular way of

testing in that they are easy to score (a computer can do it) and they are easy to design. The test would consist of 25 items with four possible answers (A, B, C, and D). The questions were about identifying the main idea, identifying the factual information, making inference, identifying the reference and interpreting the meaning of vocabulary in form of reading text. The student answered the questions based on the work sheet prepared by researcher.

In order to validated the test as the tool of data collection, the researcher checked the test items by doing try out then calculated the data using Microsoft Excel.

a. Try Out

A test can be said as a good test if it is valid and reliable. Therefore, the test that would be tested to the students should be valid and reliable too. The suitable way to make a good test is done through try-out. Try-out was done before the test was administered to know the validity and reliability of the test items. From the results of try-out, it could be seen which items should be used in the test. In this research, try out was done. The researcher applied try out in VIII C class before the researcher do the treatment. The researcher applied the treatment in VIII B Class.

b. Validity Test

Before the researcher gave the instrument used as the tool for collecting the data, the researcher has done validity test. Validity is clearly the most important criteria for the quality of an instrument or test. According to Muijs (2004:66) "Content validity refers to whether or not the content of the manifest variable (e.g. items of a test or question of a test) is right to measure the latent concept (self-esteem, achievement, attitude) that we are trying to measure". The researcher checked the test items by doing try out then calculated the data using SPSS 16 to determine whether the test valid or not. In this

research, the test has been examined by using SPSS 16 and the result the test was valid.

Based on the table (see appendix viii and vii) the researcher concluded that test items for try-out are 40 items. After the researcher calculated to found the validity of the test only 29 items valid. But, the researcher only used 25 test items because adjust to the aspects researched.

Because the researcher compared  $r$  table and  $r$  value,  $r$  table for this research is  $30 - (30 - 2) = 28 = 0,374$  and the requirement valid if  $r$  value  $>$   $r$  table and  $r$  value  $<$   $r$  table is not valid.

#### c. Reliability of the Test

Reliability refers to the consistency of the scores obtained. How consistent they are for each individual from one administration of an instrument to another and from one set of items to another (Fraenkel, Wallen and Hyun: 2012:154). It means that if a reliable test was administered to a group or individuals it could provide consistent scores. In this research, the researcher used SPSS 16 version.

After calculated the validity of the test the researcher calculated the reliability to saw the test are reliable or not. The Cronbach's Alpha is 0,947 (see appendix vi and vii) the requirement reliable if  $\text{Alpha} >$   $r$  value, so the total of the test items valid are reliable.

### D. Technique of Analysing Data

This research used statistical analysis in order to find out of the answer of research questions and to test the hypotheses of the research procedures of data analysis were required. The numerical data analysed using windows-based program, Statistical Package for the Social Sciences (SPSS) statistic 16.

Cresswell (2012:183) states that descriptive statistics will help you summarize the overall trends or tendencies in your data, provide an understanding of how varied your scores might be, and provide insight into where one score stands in comparison with others. Therefore, the technique of data analysis in this research was descriptive statistic. In analyzing the data, the researcher firstly analysed students' individual score, then students' mean score, students' standard deviation, normality test and testing the hypotheses to answer the first question. And the last, the researcher analyzed the effect size to answer the second question: The technique of data analysis in this research as follow:

1. Students' Individual Scores of Pre-Test and Post- Test

In order to analyse the students' individual scores, the researcher would use the formula below:

$$X1 = \frac{A1}{N1} \times 100 \qquad X2 = \frac{A2}{N2} \times 100$$

Where:

X1 : an individual student's score Pretest

X2 : an individual student's score Posttest

A1 : the students' right answer of Pretest

A2 : the students' right answer of Posttest

N1 : the number of test items of Pretest

N2 : the number of test items of Posttest

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

To calculate the students' individual score, from a test result, the number of students' correct answer was multiplied by 100 and then divided by the total number of test items. After finding the individual score the researcher continued to analyse the means score.

2. Students' Mean Score of Pre-Test and Post-Test.

A mean is an average score that the students get from the test. In order to analyse the students' mean scores, the researcher used the formula below:

$$\bar{X}_1 = \frac{\sum X_1}{N_1} \qquad \bar{X}_2 = \frac{\sum X_2}{N_2}$$

Where:

$\bar{X}_1$  : the students' mean scores of Pretest

$\sum X_1$  : the total score of students Pretest

$\bar{X}_2$  : the students' mean score of Posttest

$\sum X_2$  : the total score of students Posttest

$N_1$  : the total number of students Pretest

$N_2$  : the total number of students Posttest

*Adopted from Khotari (2004:132)*

To find the mean score, the researcher has to sum all the students' individual score and divide it with the number of participants of the study. The mean score used to find the difference score of students in pre-test and post-test.

**Table 3.3**

**Mean Score Classifications**

Test Score	Classification
80-100	Good to Excellent
60-79	Average to Good
50-59	Poor to Average
0-49	Poor

*Adopted from Brown (2003:287)*

### 3. Standard Deviation

Standard deviation is a measure of variability indicating the average amount that scores vary from the mean. In order to analyse



the students' standard deviation, the researcher used the formula below:

$$SD = \sqrt{\frac{\sum X^2 - \frac{(\sum X)^2}{N}}{N-1}}$$

Where :

SD = Standard deviation

$\sum X^2$  = Sum of the squares of each score

$(\sum X)^2$  = Sum of the scores squared

$N$  = The number of elements in a sample

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

#### 4. Normality Test

After the researcher calculate the Individual score along with mean and the standard deviation from the individual score; then the researcher need to find out whether the data that acquired during the process is in normal state or not. This was recognized to be the preliminary step before the researcher test the hypothesis of this research and answering the research question by seeing the statistical significance from pretest and post-test. To test the normality of the data, Pearson index formula utilized to check the shape of the value distribution. The formula is as follows:

$$\text{Pearson's index} = \frac{3(\bar{x} - \text{median})}{s}$$

*Taken from Brase and Brase (2012:284)*

Where:

$\bar{x}$  =  $\bar{x}$  bar or Mean Score

Median	= The middle value of the data
$S$	= Standard Deviation of the data

Taking a note, that if the index value is greater than 1 or less than -1 it indicates skewness. If the distribution of the value is in skewed form it means that the data is not normal. (Brase and Brase 2012:284). When the data is in normal state it means that the researcher must use parametric test (t-test); however, when the data is not in normal state it means that the researcher must use non-parametric test (wilcoxon tests).

## 5. Testing Hypotheses

If the result from the Kolmogorov-Smirnov test is normal the researcher continues to t-test for a dependent sample. t-test for a dependent sample is a test used to compare sample's means before and after treatment. Ary *et al* (2010:176) said in a t-test for dependent sample "The measure to be analysed by the dependent  $t$  test is the mean difference between the paired scores. Pre-test and post-test scores of the same individuals are an example of paired scores". The formula for the t-test for dependent sample:

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

Where:

$t$	= t ratio
$\bar{D}$	= average difference
$\sum D^2$	= different scores squared, then summed
$(\sum D)^2$	= different scores summed, then square
$N$	= the number of elements in a sample

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

The result of data computation would be the conclusion for deciding the hypothesis. To answer the first question, whether Team Pair Solo Strategy effective or not, the researcher would use the p-value of t-test. If the value of  $(p) < \alpha$  (0,05) it means that Team Pair Solo Strategy is effective and  $H_0$  is rejected. If the value of  $(p) > \alpha$  (0,05) it means that Team Pair Solo Strategy is not effective and  $H_a$  is fail to be rejected. In simply way:

- a) If  $p - \text{value} < \alpha$ , the Alternative Hypothesis accepted
- b) If  $p - \text{value} > \alpha$ , the Null Hypothesis not accepted

#### 6. The Effect size

The second research question related to the strength of the effect of Team Pair Solo Strategy in Teaching Reading Comprehension. The formula to find effect size is as follow:

$$ES = \frac{\bar{X}_2 - \bar{X}_1}{SD}$$

Where:

ES = Effect size

$\bar{X}_2$  = the students' mean score of post-test

$\bar{X}_1$  = the students' mean score of pre-test

SD = the average standard deviation of both test

*Adopted from Creswell (2012:195)*

#### **Table 3.4**

#### **Effect Size**

A Cohen's Effect Size could be listed between 0 to 1 as followed:

<b>Effect Size</b>	<b>Qualification</b>
0 – 0.20	weak effect
0.21 – 0.50	modest effect
0.51 – 1.00	moderate effect
>1.00	strong effect

*Adopted from Cohen and Manion (2007:521)*

### **E. The Implementation of Research**

There was some procedure that researcher did while conducting this research. The procedure could be explained as bellow:

#### 1. Administration

At this stage, the researcher firstly asked permission to Headmaster of SMP Negeri 1 Kuala Mandor B to conduct the research. After gaining the permission, the researcher selected the sample from the eighth grade classes and contacting the teacher in charge of the class.

#### 2. Pre-test

The second stage, the researcher gave pre-test where the researcher tries to find out the samples real condition before implementing the treatment of Team Pair Solo Strategy. The pre-test was held on 3 November 2020.

#### 3. Giving Treatment

Next stage was implementing the treatment to the sample class by using Team Pair Solo Strategy. The treatment of Team Pair Solo Strategy was conducted four times. There were on 9 November to 19 November 2020.

#### 4. Post- Test

The researcher conducted a post-test to know the result of implementing of Team Pair Solo Strategy toward the samples' reading comprehension. The post-test was held on 23 November 2020.

#### 5. Analysing the Test Result

Last stage of the research was analysing the data collected from both pre-test and post-test using formulas in this chapter III.