

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

#### **A. Design of Research**

Research is a study to identify the problem solving from the research problem. In identifying the problem solving, the researcher was decided an appropriate research design in order the procedures of research would get the valid data. Creswell (2012:3) stated that research is a process of steps used to collect and analyse information to improve understanding of a topic or problem. From the explanation above, it can be concluded the study was a way to implement the research.

In this study the researcher would use experimental research as a research paper. Experimental research is one of research where the dependent variable will be affected by independent variable based. According to Ary et. Al., (2010:26) experimental research involves a study of the effect of the systematic manipulation of one variable(s) on another variable.

Experimental research study also has some its design, namely: pre-experimental, true-experimental, factorial experimental and quasi experimental (Sugiyono, 2010:73). In this study the writer would use pre-experimental design in the form of one-group pretest-posttest design. One group pretest-posttest design means that there is only one group will being subject of research. The researcher will be held pre-test to know the real situation or the basic situation of dependent variable, afterward after seeing the result of the pre-test. The researcher would use independent variable to see, whether it will affect the result of pre-test or not. After implementing the independent variable or doing treatment stage, the subject of research will be given post-test. Then the post-test result will show the changes or effect from the independent variable to dependent variable.

The design of this study is the One Group pretest-posttest design, which only consists of one class. The class has chosen to get treatment. According to

Gay and Airasian (2000, p.109) said that the design of a pretest-posttest group involves one pre-test group :

**Table 3.1**  
**One Group Pretest-Posttest Design**

Pretest	Treatment	Posttest
Y1	X	Y2

### **B. Time and Place**

The research of this study held at SMA PGRI 02 Kembayan. which is located at JL. Lintas Malindo, Kec. Kembayan , Kab. Sanggau, Prov. Kalimantan Barat. The researcher started the research on 3th - 17th of January 2023. The writer conducted 5 meeting for each both experiment class. The first meeting was used to give pre-test. Next, second meeting until fourth meeting did the treatment and last meeting the researcher gave the post test. The the researcher collet all of data and analyzed them.

### **C. Population and Sample**

Population is the generalization area which is containing subject or object was researched and studied. According to Sugiyono (2011:80) Population includes not only humans, but also the total amount of objects or objects to be learned, as well as the total amount of objects or object characteristics. The research target is senior high school at second semester of SMA PGRI 02 Kembayan in the academic year of 2022/2023.

1. Sample is a small part that can present all the population observed. Nawawi, (2012:166) state that “According to Arikunto (2010:183), purposive sampling is the process of selecting sample by taking subject that is not based on the level or area, but it is taken based on the specific purpose. In selecting the sample by purposive sampling because at the school only one class.

#### D. Instrument of Data Collection

In this research instrument to collect the data will be test. The test will be constructing by the researcher based on the standardize procedures of making test. The test will be dividing into two parts pre-test and post-test in the same class. They are the test for students that use QAR Strategy in reading. The test use to gain information about the students' reading comprehension after teaching process finish. Instrument of data collection can be show in the table below.

**Table 3.2**  
**The Indicator Instruments of Data Collection**

Basics Competencies	Test Material	Indicators	Types of Test	Number of Items	Total	References
<b>Reading:</b> 1.8. Respond the contextual meaning associated with social function, text structure, and explanation of linguistic texts in an accurate, fluent and acceptable context of daily life and to access knowledge in the form of explanation texts.	Explanation Text	1. Understanding the Factual Information	MC	1,2,3,4,7		a. Student Book b. National Exam c. Student's Worksheet Book
		2. Acknowledging the Main Idea	MC	9,11,14,15,18		
		3. Identifying Vocabulary	MC	5,17		
		4. Developing Inference	MC	6,10,12,13		
		5. Identifying References	MC	8,16,19,20		
<b>Total</b>					20	

In scoring students' work, researcher using the criteria as follows:

1. The 1 score was assigned if the students answer the test correctly.
2. The 0 score was assigned if the students answer the test incorrectly.

## **E. The Technique and Tool of Collecting Data**

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

The technique of data collecting for this research is a measurement technique used by the researcher for the data collecting purpose. Furthermore, Creswell (2012:623) states that "Measurement means that the researcher observe and records the scores on an instrument." Also, in this research measured the performance of the sample by utilizing a pre-test and a post-test in form of achievement test (Creswell 2012:151).

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

Test is some questions that given for people to show the condition or the level of development the people. The fundamental use of testing in educational program is to provide information for making decision that is for evaluation. In this research, test applied to measure the reading comprehension in explanation text of the tenth grade students of SMA PGRI 02 Kembayan in academic year 2022/2023. It used to analyze whether any significant difference about using QAR strategy in teaching reading. The data in the research are the result of the test. The researcher distributed pre-test and post-test as data collection technique. Pre-test will distribute in the first meeting to controlled class and experimental class. The pre-test aimed to measure students' reading comprehension on explanation text on both classes before conducting the treatment. After conducting the treatment in the experimental class, the researcher administered the post-test. It aims to obtain the effect of question-answer relationship strategy in students' reading comprehension on explanation text. Both pre-test and post-test has the similar instruction to answer question about explanation text.

1. The procedure of collecting data for experimental group

- 1) Pre-test

Pre-test is a test that is done at the beginning of the research in order to know the students' reading comprehension before the treatment. Pre-test was given at January 3<sup>th</sup> to 23 students.

- 2) Treatment

The treatment conducted for experimental group only. The researcher applied Question-answer Relationship in teaching reading comprehension in text as many as three meetings. For first treatment was given at January 6<sup>th</sup>, second treatment at January 10<sup>th</sup>, and third treatment at January 13<sup>th</sup>. The treatment class was X class.

- 3) Post-test

After giving treatments for three times, where the researcher taught test by using QAR strategy (for experimental class) the posttest was administered. In the post-test, the students will be assigned to answer the explanation text. Post-test was given at January 17<sup>th</sup>.

## **F. Data Analysis**

There are six kinds of data analysis used in this research such as student individual score, mean score, standard deviation, t-test, testing hypothesis and effect size. These data analysis clearly act as a critical point of this research in finding and answering both research question and finding the research hypothesis. Moreover, to analyse the data the Writer will use computer software SPSS Ver. 16.0. Reason over this choice is simply told by Cohen, Manion and Morrison (2007:501) state that "Numerical analysis can be performed using software, for example the Statistical Package for Social Sciences (SPSS, Minitab, Excel)." In other words, using such computer software would definitely help the Researcher in analysing the data especially in form of numbers where in quantitative research numbers can tell a lot of information within it if properly analysed. In relation with the tool of data collection where Reading test is the prime choice of the Researcher, the data

calculation resulted from the reading test evaluated through SPSS (with the exception of calculating effect size is done manually) to interpret figures resulted from calculating the data. The formula of data analyses of this research are as follow:

After conducting the research and distributing the test the Researcher then analyse the data by using formulas of Student Individual score, Mean Score and Standard Deviation (*SD*). Further explanations are as follow:

**1. Student Individual Score (*X*)**

Before counting the mean score the Researcher calculated the individual score from the test by using the formula below:

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

Where:

X = Student’s individual score

R = Student’s correct answer

N = The total of participants

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

The maximum score for the test is 100 and to calculate it the true answer of the test is multiplied by 100 and then divided by the total of participants (23). After calculating it the researcher classified the score based on Brown (2003:237) criteria for assessment (see **Table 3.3**)

**Table 3.3**  
**Student’s Score Criteria**

<b>Test Score</b>	<b>Classification</b>
80-100	Good to Excellent
60-79	Average to good
50-59	Poor to average
0-49	Poor

*Taken from Brown (2003:287)*

**b. Mean Score ( M )**

After the researcher calculates the whole individual score then the next step is to calculate the mean score of the individual score. According to Brase and Brase (2012:85) states that “The mean is the average usually used to compute a test average.” Furthermore, the formula on finding the Mean score as follows:

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

Where:

$\sum x$  = The sum of the students' individual score

$N$  = The total of participant

*Taken from Abbot (2011:52)*

Finding the Mean score is to find pre-treatment data from the test where the necessity of achieving the data is absolutely critical in comparing the pre-test and post-test result after the treatment have been conducted. And then after the researcher able to calculate the Mean score of each individual score then the next destination is to search for the Standard Deviation value from the question items.

**c. Standard Deviation (SD)**

Standard deviation is utilize by the researcher to calculate in depth of the Mean that previously acquired by the researcher. In depth here means that in order to see the distribution or the spread around the Mean score the correct formula to seek this data is through Standard Deviation formula. Furthermore, Brase and Brase (2012:95) argue that standard deviation is used to picture the dispersion around the Mean Score. The formula of standard deviation is as follow:

$$SD = \sqrt{\frac{\sum d^2}{N - 1}}$$

Where:

$d^2$  = The deviation of the score from the mean (average), squared

$\sum$  = The total value of students

$N$  = The number of participants

*Taken from Cohen, Manion and Morrison (2007:512)*

According to Cohen, Manion and Morrison (2007:512) argue that “A low standard deviation indicates that the scores cluster together, while a high standard deviation indicates that the scores are widely dispersed. In other words, to enrich the finding of this research seeking the dispersal value is a great addition to find the dispersal rate of the mean scores.

#### **d. Testing Hypothesis**

In order to test the hypothesis of this research the researcher calculated it using Wilcoxon Tests this is due to a circumstance that the data distribution is not normal or in form of non-parametric. Because the distribution of the data is not normal then the researcher calculated the data using Wilcoxon Tests that is provided in computer software SPSS Ver. 16.0. Cohen, Manion and Morrison (2007:552) suggest that the same formula as a T-Test for non-parametric data is Wilcoxon Test for two related samples and in this case the two related samples are student’s test score, to utilize Wilcoxon tests the researcher elaborated the instruction on how to operate this test in SPSS Ver. 16.0 as follow:

- 1) The first step is to determine each sample’s individual score by calculating it using the individual score formula as above.
- 2) After finding the each individual score then sort both pretest individual score and posttest individual score into their respective column.
- 3) The next thing to do is to click the “analyze” option on the upper side of the SPSS Window and then select “non-parametric test” and choose “2 related samples”.
- 4) After that input the pretest data into the first variable column and then followed by inputting the posttest data in the second variable column. Also, remember to check  on Wilcoxon Tests box below the variables column. In addition click the “option” that located just below the “exact” menu and check  the “descriptive” to enable in-depth data analysis and after that click continue to return to the previous window.

5) Lastly, after following each steps of this instruction simply click “ok” on the lower left of the window and then the software will automatically analyse the data

Furthermore, by finding the significance score the researcher can extract the data and assume which hypothesis is accepted and which hypothesis is rejected for this writer. Then, the researcher compared the significance score with the standard p value of  $p < .005$  to determine the significance score of the data and to determine the hypothesis for this research or usually in SPSS referred as “Sig.” value (Connolly 2007:176)

**e. Effect Size**

After testing the hypotheses, the researcher then continued to the next step of answering the second question of this research which is to determine the effect size from the treatment. In order to find it the researcher then use the non-parametric effect size formula. The formula as follows:

$$r = \frac{Z}{\sqrt{N}}$$

Where:

Z = The position of the student score

N = The total of participants

*Taken from Fritz, Morris and Richler (2012:12)*

This formula can be easily calculated manually, the result of this formula would reveal the value of the effect size from the treatment. Moreover, to interpret the value from this calculation the researcher refers to Muijs (2004:195) interpretation as described in the table below:

**Table 3.4**  
**Effect Size Level**

<b>Value</b>	<b>Level</b>
<b>0 - 0.1</b>	Weak Effect
<b>0.1 - 0.3</b>	Modest Effect
<b>0.3 – 0.5</b>	Moderate Effect
<b>&gt; 0.5</b>	Strong Effect

*Taken from Muijs (2004:195)*

## **G. The Procedures of Research**

In this part, the researcher explains the steps of conducting this research.

1. The first step is the researcher will give the pre-test to the students.
2. The next is giving treatment. In this phase, the researcher will use graphic organizer to determine the result of this research. The treatment will be given three times.
3. Posttest will be held after all the treatment activities conducted. The result of this data will be used to measure the students' Reading comprehension on explanation text after the students' get treatments. The result of the test will be analyzed statistically.
3. Give the students sample questions to answer in small groups and identify which of the OAR levels they used.
4. Have students work individually on questions from longer passages. Get students to examine the types of questions in their text books.