

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

This chapter deals with research methodological procedures. This includes research design, population and samples, instruments, data collection, and data analysis.

#### **3.1 Research Method**

According to Saunders, Lewis, and Thornhill (2019), research methods are the structured and organized techniques that guide how data is collected and analyzed in a study. These methods are not chosen randomly they follow a clear and logical process that ensures the research is valid, reliable, and capable of answering the research question effectively. By applying systematic procedures, researchers can ensure that the data gathered is relevant and that the analysis is accurate, which leads to meaningful conclusions. In essence, research methods serve as a roadmap for conducting a study, helping researchers stay focused and methodical throughout the research process.

This research using the quantitative approach. The researcher will use quantitative approach because this research focuses on the calculation between the result of pre-test and post-test. Arikunto (2006:12) stated that quantitative research is a kind of research that requires the use of number, ranging from the data collection, data interpretation and the appearance of the result. The use of numbers allows researchers to measure variables precisely, perform statistical analyses, and draw objective conclusions. This type of research is often used to test hypotheses, identify patterns, and determine relationships between variables in a structured and

systematic way. Therefore, quantitative research is characterized by its focus on measurable and observable data.

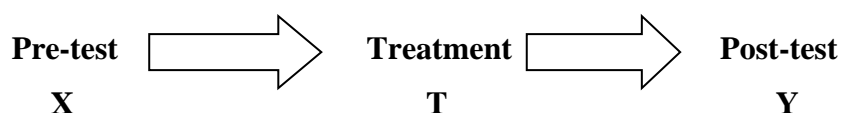
### **3.2 Research Design**

The model of the research design used by researcher is pre-experimental design of one group pre-test post-test design since there was only one experimental class which received treatments and got pre-test and post-test. Leavy (2019) a research design refers to the overall strategy that a researcher chooses to integrate the different components of the study in a coherent and logical way. The statement means that a research design is a comprehensive plan or strategy that a researcher adopts to organize all the components of a study in a clear and systematic manner. It serves as a blueprint that connects the research questions, methodology, data collection techniques, and analysis procedures into a unified and logical structure. By using a well-thought-out research design, the researcher ensures that each step of the study is aligned and contributes meaningfully to addressing the research objectives.

According to Sukmadinata (2016:194), experimental research tries to decide the influence of one or more variables to other variables. It is a trial by the researcher to maintain control over all factors that may affect the result of the experiment. It means that the students in the class were given the test in reading before treatment, while in post-test they were given the test after getting treatment. It aims to make the researcher become easier to find out the mastery of students in reading ability and to know the significant difference of students' score.

The researcher applied the treatment or teaching toward the first-grade students of MAN 4 Aceh Besar. The researcher gave treatment by applying WH questions technique. The teaching was held in three meetings. This research is related to two variables, there are a dependent variable and an independent variable. The dependent variable is the variable that is being measured throughout the experiment. The dependent variable in this research is reading comprehension. Moreover, the independent variable is the variable which manipulates and affects in another variable in the research. Therefore, WH questions technique is the independent variable of this research. Therefore, the experimental class treated by using WH questions technique and the experimental class provided with pre-test, treatment, and post-test.

### **One Group Pre-Test and Post-Test Research Design**



Where: X: Pre-test

Y: Post-test

T: Treatment

### **3.3 Location of the Research**

The researcher conducts the research at MAN 4 Aceh Besar. It is one of the schools in Aceh Besar. The location of it is at Jln. Teuku Nyak Arief, Tungkob, Darussalam, Aceh Besar regency, and Aceh Province.

### **3.4 Population and Sample**

Population of this research is all the first-grade students of MAN 4 Aceh Besar in academic years 2024/2025. There are six classes of the first grades, X1-X6. Population and sample cannot be separated in quantitative method. According to Arikunto (2017), population is the entire sample who are going to be observed in research. In this study, the process of determining population and sample is conducted.

According to Arikunto (2017:62), sample is partial or representative of a particular population that is expected to be able to represent the characteristics of any individual in a population. It means that sample is the part of population. In other words, the sample should possess traits that are similar to those found in the larger group, allowing researchers to generalize the findings. This means that a sample is not the whole population but a part of it, chosen carefully to ensure it accurately represents the population as a whole. Using a sample is especially useful in research when it is impractical or impossible to study every individual in the population due to time, cost, or accessibility constraints. In this case, the researcher used random sampling as the sampling procedure.

Random sampling is a part of the sampling technique in which each sample has an equal probability of being chosen. A sample chosen randomly is meant to be an unbiased representation of the total population. In other words, random sampling is one of the simplest forms of collecting data from the total population. In this

study, the total population is all the class of the first-grade student in MAN 4 Aceh Besar. They were divided into six classes: X1-X6. When researchers did teaching practice a few months ago, researchers taught in three classes, namely X1, X2, X3. Class X1 is a digital class, which is a class that uses technology in its learning system, while classes X2 and X3 are regular classes, which use blackboards, books, and physical learning media, so they are related to the techniques that researchers will apply in learning. So, because this study will only conduct research on one class as an experimental class, the researcher chose class X2 as the sample.

### **3.5 Research Instruments**

The research instruments are devices which are used by the researcher to collect the required data. According to Arikunto (2017: 160), an instrument is a tool or facility used in collecting data to make the work easier and the better result. In other words, the result is complete and systemic, so it is easy to be processed. In collecting the data, the instruments used in this research is test.

#### **3.5.1 Test**

According to Arikunto (2017:150), test is a series of questions or exercises, sother tools are used to measure the skills, knowledge, intelligence, ability, or talent possessed by individuals or groups. Test is one of components to collect data in this research. There are two kinds of tests in this research, pre-test, and post-test. Pre-test is a test that is given in the first meeting. This activity is given to identify the student's comprehension in reading before treatment. Meanwhile post-test is a test

that is given by researcher to the students after the treatment is done. The test aimed to know the improvement score of reading after the treatment is done.

### **3.6 Data Collection**

Data is needed to answer research questions. In this research, the data is collected by using several techniques of collecting data from the test.

#### **3.6.1 Pre-test**

At the first meeting, the researcher gave a pre-test for the experimental class. Before giving the test, researchers asked students about analytical exposition texts they had studied previously. The purpose is to know the student's reading comprehension before being given treatment. The pre-test was carried out at the first meeting. Testing was carried out within 90 minutes, with a time of 2JP x 45 minutes.

#### **3.6.2 Treatment**

The researcher was carrying the class in three meetings. In each meeting the students learned by using WH- questions technique in improving their reading comprehension. the researcher was given third meeting. First meeting was taken for pre-test, after that give treatment and last meeting was taken for post-test.

#### **3.6.3 Post-test**

After treatment, the post-test is administered to know the students' reading comprehension after using WH- question technique. It was conducted at the last meeting of the treatment.

### 3.7 Data Analysis

According to Creswell (2018) Data analysis is the process of evaluating data using analytical and statistical tools to discover useful information, draw conclusions, and support decision-making. Thus, data analysis is a systematic process in which collected data is examined and interpreted using various analytical and statistical tools. The main goal of this process is to uncover meaningful patterns, trends, or insights that are not immediately obvious. By analyzing the data, researchers or decision-makers can draw valid conclusions based on evidence rather than assumptions. This process also plays a crucial role in supporting effective decision-making, as it provides a factual basis for understanding issues, evaluating alternatives, and choosing the best course of action. In essence, data analysis transforms raw data into valuable information that guides informed decisions.

In conducting this research, the researcher used quantitative data. Data and information collected from the results of pre-test and post-test. The data analysis process was carried out through the following steps:

#### 3.7.1 Scoring Students Pre-test and Post-test

After the students did their test, the researcher then processed the results of students' reading comprehension and the students' scores were classified into the following levels:

*Table 3. 1 The Classification of students' Score*

<b>Score</b>	<b>Categories</b>
<b>80-100</b>	<b>Very good</b>

<b>66-79</b>	<b>Good</b>
<b>56-65</b>	<b>Enough</b>
<b>40-55</b>	<b>Less</b>
<b>30-39</b>	<b>Fail</b>

### 3.7.2 Mean Score

After scoring students' pre-test and post-test, the researcher used SPSS Version 25 to calculate the mean score to find out the average performance of the students after and before the treatment.

### 3.7.3 T-Test

This section aims to examine whether there is a significant difference between students' reading comprehension scores before and after the treatment. The researcher used SPSS Version 25. Since the result of the normality test showed that the data are normally distributed, the researcher used Paired Sample T-Test.

Research Hypothesis:

- a. Ho (Null Hypothesis): There is no significant difference between students' scores before and after the treatment.
- b. Ha (Alternative Hypothesis): There is a significant difference between students' scores before and after the treatment

The criteria for the T-Test are as follows:

- a. If the Sig. (2-tailed)  $< 0.05$ , it means Ho is rejected and Ha is accepted.
- b. If the Sig. (2-tailed)  $> 0.05$ , it means Ho is accepted and Ha is rejected.