CHAPTER III

RESEARCH METHODOLOGY

In this chapter consist of method, which was including of research design, the subject of the research, variables of research, data collection technique and instrumentation and the last is the way in data analysis.

A. Research Design

Research design refers to the overall strategy or plan that writer used to conduct a study. Research design defined as plans and the procedures for research, where the design spans the decisions from wide assumptions to detailed methods of data collection and analysis (Creswell, 2014, p.31). It means, the research design is a comprehensive outline for how research will be conducted. Moreover, it covers every stage of research process, guiding the researcher to align their goals, assumptions, and methods into a clear and logical plan.

There are three types of research design, one of which is quantitative research. This research is quantitative research method. Quantitative research is a method used to test objective theories by analyzing the relationships between variables. The research principles that involve the measurement of data through numerical methods are categorized as quantitative research. The quantitative research focuses on collecting and analyzing data in the form of numbers. This approach is uses to measure variables, identify patterns, and test relationships or hypotheses through statistical methods. In this research, the writer used pre-experimental research that use one group pre-test and post-test design. The pre-experimental design does not have a control group to compare, the researcher

considers a single group and provides an intervention during experiment (Creswell & Creswell, 2023, p.209).

Furthermore, one group pre-test post-test design used in this research tends to find out the effect of using picture series on students' speaking skill. Based on the pre-experimental design with one group pre-test and posttest, it can be described:

Table 3.1 The Illustration of Research Design

Pre-test	Independent Variable	Post-test
O1	X	O2

Addapt from Creswell (2014, p.220)

Where:

O1: Students' achievement on speaking before being taught by using picture series.

X: Picture series.

O2: Students' achievement on speaking after being taught by using picture series.

B. The Subject of Research

Subject refers to the individual, group, or entity that is being studied or observed. The subject plays an important role on any experiment, because they are the source from which researches collecting data to answer the research questions. The subject of this research is included the population and sample. Where the population and sample of this research are:

1. Population

   Population refers to the entire group of individuals, objects, or data points that writer focuses on studying. This group represents the broader context from which a sample is selected. The population encompasses all possible members that meet specific criteria relevant to the research. Leavy (2017, p.76) explain that population refers to the entire group of units from which the sample will be drawn. It means that the population is the whole group of people, objects, or things that a researcher is interested in studying. These objects share specific qualities or characteristics that are relevant to the research topic. In this research, the population of research was eighth grade students of MTsN 1 Sintang in academic year 2024/2025.

2. Sample

   Sample can be defined as a part of population that is selected for the research. A sample is a smaller group chosen from a larger population, which is examined to make inferences about the whole population. Moreover, sample refers to the total number of the population or individual cases selected, from which data is collected and analyzed (Leavy, 2017, p.76). The sample used in this research was only one class that became an experiment class. This one class as one group pre-test post-test was selected used purposive sampling technique. Pandey & Pandey (2015, p.54) state that the purposive sampling is chosen using a non-random method, the main goal is to select the participants based on

specific criteria that are considered important for the study. The sample criteria of this research were chosen based on the teacher's recommendation for the class that received the treatment. Therefore, in this research the sample was one class of the eighth grade of MTsN 1 Sintang in academic year 2024/2025. The class was class 8D which consist of 34 students that was taken as one group pre-test and post-test.

C. Variables of Research

Research variables refer to elements, characteristics, or factors that can be measured, manipulated, or observed in a study. These variables identified by the writer to be studied in order to gather information and draw conclusions based on the findings. Variables play a crucial role in the research that represent the aspects being examined to understand relationships, effects, or patterns. Grove, et al (2015, p.154) emphasize that variables refer to attributes, traits, or characteristics outlined in the research purpose, objectives, or questions that are observed or measured throughout a study. Moreover, these variables are essential for structuring research, guiding data collection, and supporting analysis that leads to conclusions and generating new insights.

There are various types of variables according to the relationship between one variable and another variable. This research is consisted of two variables. Based on the research design of this research, the two variables that will analyzed in this research are independent variable and dependent variable.

Moreover, Creswell (2014, p.84) explains about the independent variables and dependent variables, as follows:

1. Independent Variable

Independent variables are those that (probably) cause, influence, or affects outcomes. The independent variable refers to the key factor that the writer aims to examine. It is chosen, controlled, and measured throughout the study. This independent variable is the main element in research that the researcher focuses on. In this research, the writer selects the variable, changes or controls it to see how it affects other factors, and then measures its impact.

The independent variable in this research is picture series. Picture series is a sequence of images that arrange to tell or describe something. By using picture series, it can help to motivate students in learning practice in the classroom. Moreover, writer provide visual learning style using picture series treatment to overcome students' problem in speaking, particularly in the term fluency and pronunciation.

2. Dependent Variable

Dependent variables are those that depend on the independent variables; they are the outcomes or result of the influence of the independent variables. The dependent variable defined as the factor that is observed and measured to assess the impact of the independent variable. This variable is what the writer measure in research to see how it changes based on the independent variable, and also called the result because of independent

variable. It shows the effect or outcome of the experiment. The dependent variable of this research is speaking skill. Learning speaking through picture series as an aid of visual learning style is expected caused the speaking improvement. Therefore, the treatment using picture series expected to affect the students' speaking skill.

D. Data Collection Technique & Instrumentation

Data collection technique and instrumentation are crucial parts of the research process that provide the methods and tools which writer used to gather the necessary information to address the questions they are studying. Creswell & Creswell (2023, p.228) state that data collection process involves defining the study's scope through sampling and recruitment, obtaining necessary permissions, gathering information using various data sources, and creating protocols or guidelines for data collection. The data collection represents the key point of any research project. Data collection technique involves the process used to gather the data. There are various ways to collect the data, to help ensure the data collected is relevant and accurately. Moreover, the instruments are the tools that use in the data collection. These instruments are used to apply the technique of data collection.

1. Data Collection Technique

Data collection technique is crucial and influential stage in the research, because through data collection the research processes can be completed. The data collection can be done through various settings, sources, and ways. There

are various ways and techniques to collecting the data. In this research, based on the design which using pre-experimental design, the writer used quantitative research approach. To sustain the validity of the research result, the writer collects data which are derived from several ways such as measurement, indirect communication, and documentation.

a. Measurement

Measurement is a technique that carry out by giving the tests to the students. In this research the tests are in the form of pre-test and post-test. The tests are an oral test, to assess students' skill in speaking. In language learning, an oral test helps determine how well a person can speak the language. The pre-test is test that given by writer before the treatment which teaching speaking using picture series. This oral test given in the beginning of the writer attending the class 8D in order to know the students' knowledge and students' achievement in speaking skill. Subsequently, the writer given post-test after all the treatment by using picture series in the experimental teaching was done. Post-test is given to determine whether the visual learning technique had enhanced students' speaking skill.

b. Indirect Communication

Indirect communication in data collection technique involve writer gathering information without directly asking or answering questions from respondents. The indirect communication technique is done by providing the questionnaires. In this research, the questions or statements use are

closed. The questions or closed statements in the questionnaire are designed to be answered by students, who will complete them based on their personal feelings and experiences. The questionnaires will be given before pre-test and after post-test was done. Moreover, this technique is used to collect data in the form of answers or responses related to the variables being measured.

c. Documentation

Documentations are records of past events which involves gathering, recording, and arranging different sources of information, data, and materials related to the research topic. The documentation plays a crucial role in making research more reliable, clear, and confirmable, enabling others to comprehend and validate the research process and results. Documentation can take the form of written materials, images, or significant works. This method is utilized to collect data, such as grades, ATP, Modules, and recordings or videos of students' performance related to the teaching and learning process using picture series as a visual learning style, as well as archival data relevant to this research.

2. Instrumentation

Instrument of data collection is a series of equipment to assist the writer in collecting the data of research. Creswell & Creswell (2023, p.198) point out that research instruments are tools used to collect measurements of variables. This tool, the writer used to gather the data on particular aspects of the phenomena that being studying. Instrument helps measure or assess variables,

which are the things being observed or tested in the research. In this research, the writer used some instruments to collect the data such as test, questionnaires, and documents.

a. Test

Test is a structured method or procedure use to assess, measure, or evaluate something, typically in the form of questions or tasks. A test is a methodical set of questions, tasks, or tools designed to evaluate an individual or groups' knowledge, skills, intelligence, or abilities. The test is a method that utilize to measuring students' performance in speaking. The tests given is speaking test which an oral test that students do with speaking performance. According to the instruction of the teacher or writer, the students doing performance in front of the class. This test purposes as a tool to assess students' comprehension of the material and their ability to engage with visual learning through picture series to enhance their speaking skill.

At the beginning, the students will be given the pre-test to measure their ability in speaking before the researcher apply visual learning using picture series. Then, after got the treatment with learning speaking by using picture series, students doing the post-test using picture series in order to know their achievement in speaking skill. The results of this test will be analyzed to determine whether there are any differences in the students' learning outcomes before and after using picture series. The writer used scoring rubric to assess students' speaking test, as follows:

Table 3.2 Scoring Rubric of Speaking

Components	Description	Score
Pronunciation	Very clear pronunciation, almost no errors	5
	Clear pronunciation, with few minor errors	4
	Fairly clear pronunciation, but some errors may cause confusion	3
	Unclear pronunciation, with many errors making some parts difficult to understand	2
	Very unclear pronunciation, many errors that make it hard for the listener to follow instructions	1
Grammar	Excellent grammatical structure, fully appropriate for procedure text, with almost no errors	5
	Good grammatical structure, with only minor errors	4
	Acceptable grammatical structure, but some errors reduce the clarity of instructions	3
	Many grammatical errors, making some procedure steps hard to understand	2
	Very poor grammar with numerous errors, making instructions unclear	1
Vocabulary	Uses highly appropriate vocabulary for procedure text, with no errors	5
	Uses appropriate vocabulary for procedure text, with only a few errors	4
	Vocabulary is fairly appropriate, but some mistakes occur in procedural terms	3
	Vocabulary is limited and not fully suitable for procedure text, with some incorrect word usage	2

	Very limited vocabulary, inappropriate for procedure text, making instructions difficult to understand	1
Fluency	Speech is very fluent, with each procedural step conveyed smoothly and clearly	5
	Fluent speech, with only minor pauses but still easy to follow	4
	Speech is fairly fluent, but occasionally disjointed or with excessive pauses	3
	Speech is frequently disjointed and sounds hesitant	2
	Speech is highly disjointed, with long pauses that disrupt understanding	1
Comprehension	Instructions are very clear, easy to understand, and all procedural steps are well delivered	5
	Instructions are clear and easy to follow, with only minor confusion	4
	Instructions are fairly clear, but some parts are not well structured	3
	Instructions are somewhat difficult to understand, with some missing or unclear steps	2
	Instructions are very hard to understand, with many unclear steps	1

Adapted from Brown (cited in Hutagalung, et al., 2024, p.39)

The best performance with a predetermine value using the following formula:

$$S = \frac{O}{T} \ x \ 100$$

Where:

S = Score

O = The obtain score

T = The total score

Table 3.3 Main Score Qualification of Speaking Ability

Num	Scores	Probable Class Performance
1	86-100	Excellent
2	71-85	Good
3	51-70	Average
4	0-50	Poor

b. Questionnaire

Questionnaire is a research tool consisting of a series of written questions used to collect data from respondents. A questionnaire, also referred to a written form designed and given out to gather responses to specific questions. It serves as a tool to collect answers, which respondent completes on their own (Pandey & Pandey, 2015, p.58). It involves providing respondents with a list of written questions, which they answer on their own thoughts, feelings, or behaviours without need for direct interaction with the writer. The questionnaires are employed to examine subjects' perspectives.

This method is often utilized to gain insights to individuals' opinions, contributing valuable data for research or analysis. In this research, the questionnaire given in the form of students' opinions about the visual learning using picture series in learning speaking. In this research, the using of questionnaire helps writer be able to determine how is the effectiveness of using picture in teaching and learning, particularly in enhancing students' speaking skill. Moreover, the use of questionnaire

as an instrument that giving questions to respondents will make the writer easier to find and collect the data.

The questionnaires used in this research is closed-ended questionnaire. Closed-ended questionnaire is where the questions written have been provided with answer choice, so that the respondent only needs to choose one of the answers provided. The closed-ended questions provide respondents with a predetermined set of options from which they must select the most suitable answer. These questions simplifying the data analysis process for writer by allowing easier interpretation of the responses from all collected questionnaires. This made the process more efficient for both the respondent and the writer. For writer, closed-ended questions simplify data analysis because they are easier to categorized and compare across responses.

This research used the results of a closed questionnaire to find out students' perspectives about their process in learning that learning by using visual aid through picture series. These questionnaires also given to find how effective the picture series for students in enhancing their speaking skill. The questions were given to the students before and after the treatment, in order to know their opinions before and after being taught by using picture series. To measuring the instrument, the writer used a measurement scale. This measurement scale used to produce the quantitative data from the questionnaires.

In this research, the writer used likert scale to measure the students'
answer. This likert scale is utilize to assess individuals' or groups'
attitudes, opinions, and perceptions toward specific social phenomena.
The social phenomenon then determined specifically by the writer and is
referred as a research variable. The likert scale involves delineating the
variables to be measured into specific indicators. These indicators then
serve as the basis for constructing instrument items, which may take the
form of statements or questions. The questionnaire should include both
positive and negative statements or questions to encourage respondents
to provide more thoughtful and deliberate answers to each question.
Moreover, with the likert scale the answers to each item on the instrument
have a gradation ranging from very positive to very negative. Examples
of likert scale; Strongly agree (5), Agree (4), Doubt (3), Disagree (2),
Strongly disagree (1). Then, the questionnaire data collection technique
method was employed by distributing the instrument to a class consisting
of 34 students.

c. Documents

Document is a data collection technique utilized to gather
information in the form of research that related to the research activities.
These activities include video recording of students' speaking tests
performance, students' test scores, module, and data obtained from the
students of the eighth grade MTsN 1 Sintang.

E. Data Analysis

Following the experimental research, the writer needs to analyze the result. The data collected is quantitative, derived from the students' speaking scores. These scores were obtained from pre-test and post-test to measure the effect of using picture series on the students' speaking skill. The writer applied a measurement technique to evaluate students' speaking skill before and after the treatment that students taught by using picture series.

1. Analysis of the Speaking Test

In this research, the results of the speaking test were analyzed using SPSS version 25 and Microsoft Excel 2021. The descriptive statistics include the calculation of mean (average), standard deviation, minimum and maximum (range) scores, and percentage improvement. Although the formulas were presented to show the calculation concepts, the actual data was carried out using SPSS and Excel to ensure accuracy and efficiency. The steps of the tests analysis are follows:

a. Collected the data pre-test and post-test, which were scored using a speaking rubric assessment.

b. The second is calculating the mean (average) of the pre-test and posttest scores to observe the difference in the group's average scores before and after the treatment. Finding out the students' mean score of pre-test and post-test, the formula:

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

Where:

$\bar{X}$: The mean score

$\sum x$: The sum of all score

N: The total of number students

c. Calculated the standard deviation to determine the degree of variation or dispersion in students' speaking scores. A smaller standard deviation indicates that scores are closer to mean, while a larger one shows greater variability.

d. Calculated the range to determine the spread of the scores in both of pre-test and post-test. The range provides information on the difference between the highest and lowest scores obtained by the students. The formula used is:

$$\text{Range} = \text{Highest Score} - \text{Lowest Score}$$

e. Calculated the percentage of improvement to measure how much the students' speaking scores increased after the treatment. The formula used is follow:

$$\text{Percentage of Improvement} = \left(\frac{Post-test\ mean\ -Pre-test\ mean}{Pre-test\ mean}\right) \times 100\%$$

2. Statistical Hypothesis

To test the hypothesis and determine whether there was a significant difference between the pre-test and post-test scores, a normality test was carried out to assess whether the data were normally distributed. If the results showed that the data were normally distributed, a parametric test such as the paired sample t-test was used. On the other hand, if the data were not normally

distributed, a non-parametric alternative, such as the Wilcoxon signed-rank test, would be considered. The selection between a parametric or non-parametric test depended on the outcomes of the normality test, ensuring that the most appropriate statistical method was applied for hypothesis testing.

Therefore, the normality of the pre-test and post-test scores was examined using SPSS software. The acceptance of the data normality was determined based on the following hypothesis:

H_0 : The sample comes from a normally distributed population

H_a : The sample comes from a not normally distributed population

The significance value is compared with α. If the significance value $> \alpha$, then H_0 is accepted. If it is not normally distributed, the test will used nonparametric testing.

Furthermore, the hypothesis of the research can be formulated:

1.) Alternative Hypothesis (H_a): There is a significant difference between students' speaking scores taught by using picture series and without using picture series for eighth grade students of MTsN 1 Sintang.

2.) Null Hypothesis (H_0): There is no significant difference between students' speaking scores taught by using picture series and without using picture series for eighth grade students of MTsN 1 Sintang.

The result of t-test can be seen with the criteria:

If the t-test is higher than t-table, it means H_a is accepted, and H_0 is rejected.

If the t-test is lower than the t-table, it means Ho is accepted, and Ha is rejected.

In addition, if the significance value (sig.) or p-value is < 0.05, it means the result is statistically significant. Therefore, the alternative hypothesis (H_a) is accepted, and null hypothesis (H_0) is rejected. This demonstrates that the treatment had a significant effect on students' performance.

3. Analysis of The Questionnaires

The questionnaires data were statistically analyzed by calculating the percentage of students' responses for each item. The first questionnaire was distributed after the pre-test to gather initial information about students' speaking ability and previous experience with visual learning aid. The second questionnaire was given after the post-test to obtain their feedback on the use of picture series. The analysis aimed to compare students' perceptions before and after the use of picture series in speaking activities, emphasizing changes in students' attitudes and awareness regarding the learning strategy. The data obtained from the questionnaires were analyzed statistically by counting the percentage of the students' answers in each item of the questionnaires. The formula as follows:

$$P = \frac{F}{N} \times 100 \, \%$$

Where:
P = Percentage
F = Frequency
N = Number of samples
100% = Constant of value