CHAPTER III

RESEARCH METHOD

This research was conducted to find out the correlation between vocabulary and speaking ability in the ninth grade of SMP Muhammadiyah 1 Kota Jambi. To answer research problems, this chapter outlines several important points, such as Research Design, Population and Sample, Operational Definition of Variables, Research Instruments and Data Collection Techniques, Validity and Reliability, and Data Analysis Techniques.

3.1. Research Design and Method

The type of research used in this study is a quantitative research method using a correlational design. Quantitative research is research that uses quantitative data to test hypotheses. Sugiyono (2019) states that "quantitative research is a research method that is inductive, objective and scientific where the data obtained is in the form of numbers (scores, values) or statements that are assessed, and analyzed by statistical analysis". Supported by Creswell (2017) who defines quantitative research design as "a research approach that produces data that can be measured and analyzed with statistics to test hypotheses or answer research questions."

The research design outlines the researcher's actions, from hypothesis formulation and operational implications to data analysis. The purpose of this study is to determine the relationship between two variables, namely the independent variable

and the dependent variable. The independent variable (X) is students' vocabulary mastery, and the dependent variable (Y) is students' speaking ability.

3.2 Place and time of research

The researcher conducted this research on November 21- December 06, 2024, at SMP Muhammadiyah 1 Kota Jambi, located on Jl. Kh. Ahmad Dahlan No. 10, Pasar Jambi, kec, Pasar Jambi, kota Jambi.

3.3 Population and Sample

3.3.1 Population

In quantitative research, population refers to the group or whole element that is the subject of research interest to identify the correlation between two or more variables. According to Neil J (2012), that population is defined as all members of a well-defined class of people, events, or objects. The population in correlation quantitative research consists of all individuals, objects, or events that are relevant to the variables being studied regarding correlation. Thus, the population of this study was 9th-grade students who were divided into two classes, namely class IX A and B, totaling 40 people.

3.3.2 Sample

The definition of a research sample, according to Creswell (2012), is part of the target population that the researcher wants to examine to generalize the target population. Furthermore, according to Arikunto (2006), if the population is less than 100 people, the entire population should be taken, but if the population is more than

100 people, it is better to take 10-15%, 25%, or more. Based on the description of the population above, the population is less than 100 people. This shows that researchers can use the entire population as volunteers. Therefore, the researcher used the entire population as the research sample.

Table 3.1 Sample of SMP Muhammadiyah 1 Kota Jambi

No	Class	Number of students
1	IXA	20
2	IXB	20

3.4 The Operational Definition of the Variables

The operational definition of variables is used to describe the characteristics of the variables studied in the study.

3.4.1 Independent Variable (X)

Independent variables are variables that affect or cause changes or the emergence of dependent variables. In this case, the independent variable in this study is students' vocabulary mastery. Vocabulary mastery is a person's ability to understand and use vocabulary in a particular language effectively.

3.4.2 Dependent Variable (Y)

The dependent variable is the variable that is affected or that becomes the result because of the independent variable. In this case, the dependent variable of this study is the students' speaking ability, which is focused on descriptive text. Speaking ability is the ability to produce action and situation by determining words.

3.5 Research Instrument

Research instruments are tools needed or used to collect data. This indicates that data is obtained using these techniques. According to Ibnu Hadjar (1996), an instrument is a measuring tool used to collect quantitative information objectively about changes in a variable attribute. Research instruments are very important in quantitative research because the quality of the data collected is strongly influenced by the quality of the instrument. Furthermore, Creswell (2012:151) defines "instruments as tools for measuring, monitoring, or documenting quantitative data".

The instrument used can be a test, questionnaire, tally sheet, log, observational checklist, inventory, or assessment instrument. Therefore, the instrument that the researcher used in this study is a test, namely a vocabulary test and a speaking test. In the vocabulary test, students are given a vocabulary test consisting of 10 questions in the form of multiple-choice, 5 match up, and 5 fill the blank. Meanwhile, the vocabulary test focuses on describing themselves, or the classroom.

3.6 Data Collection and Technique

The data collection technique for written and spoken tests consists of five meetings, which are one meeting for the written test and four meetings for the spoken test.

3.6.1 Test

A test is a technique or process that can be used for measurement and assessment in education. It is in the form of a task or a series of tasks that create a value that represents behavior or achievement. Furthermore, Brown (2000) states that tests

are intended to assess the capacity of things that are seen. The test is used to assess the level of competence or development of students after they have completed the teaching and learning process within a certain period. In addition, the test serves as a measuring tool for the effectiveness of the teaching program, because the test will reveal the extent to which the teaching program has run and what has been achieved. Researchers use test techniques by using instruments in the form of tests or exam questions. The test questions consist of several items, each of which assesses different characteristics. The researcher will use two types of tests in this study:

3.6.1.1 Written test

A written test will be given by the researcher to determine the student's vocabulary score in the form of 10 multiple-choice questions, 5 matches up, and 5 fill the blank, with a focus on describing yourself or something.

Table 3.2 Scoring Classification

No	Formed	Score
1	Multiple choice	Right answer 5 Wrong answer 0
2	Match up	Right answer 5 Wrong answer 0
3	Fill the blank	Right answer 5 Wrong answer 0

3.6.1.2 Spoken test

The researcher used an oral test to measure students' speaking ability, which is focused on describing something or someone which could be yourself, an object, or the

classroom. This test will be applied to ninth-grade students of SMP Muhammadiyah 1 Kota Jambi.

To collect data, the researcher conducted the procedure of this study as follows: To begin with, the researcher gave instruments in the form of written tests to assess students' vocabulary and spoken test instruments to assess students' speaking ability. Next, the researcher enters the classroom to explain to the students about the test that will be carried out. Finally, the researcher conducted a test to collect data from students. for the written test students will answer 20 questions consisting of 10 multiple choices, 5 match up, and 5 fill the blank. while for the spoken test, students describe something or someone which includes themselves, an object, or the classroom for 3-5 minutes in English and assessed by the researcher and teacher using the inter-rater method, then to test the correlation the data processed using Pearson's product-moment correlation SPSS. To assess students' speaking ability, the researcher uses the following assessment:

Table 3.3 Oral proficiency scoring categories (Brown, 2004, p. 406-407)

Score	Vocabulary	Pronunciation	Grammar
(I) Very poor	Speaking vocabulary inadequate to express anything but the most elementary needs.	Errors in pronunciation are frequent but can be understood by a native speaker used to dealing with foreigners attempting to speak his language	Errors in grammar are frequent, but the speaker can be understood by a native speaker used to dealing with foreigners attempting to speak his language
(II) Poor	Has speaking vocabulary sufficient to express himself simply with some circumlocutions	The accent is intelligible through often quite faulty	Can usually handle elementary constructions quite accurately but does not have thorough or confident control of the grammar

(III) Average	Able to speak the language with sufficient vocabulary to participate effectively in the most formal and informal conversations on practical, social, and professional topics. Vocabulary is broad enough that he rarely has to group for words	Error never interferes with understanding and rarely disturbs the native speaker. The accent may be foreign.	Control of grammar is good. Able to speak the language with sufficient structural accuracy to participate effectively in most formal and informal conversations on practical, social, and professional topics.
(IV) Good	Can understand and participate in any conversation within the range of his experience with a high degree of precision of vocabulary	Errors in pronunciation are quite rare.	Able to use the language accurately on all levels normally pertinent to professional needs. Errors in grammar are quite rare
(V) Very good	Speech on all levels is fully accepted by educated native speakers in all its features including breadth of vocabulary and idioms, colloquialisms, and pertinent cultural references.	Equivalent to and fully accepted by educated native speakers	Equivalent to that of an educated native speaker

3.7 Validity and Reliability

3.7.1 Validity

Validity assesses the extent to which a research instrument or method can provide accurate and relevant results by the research objectives. According to Budiastuti (2018) “validity is the accuracy of the research tool/instrument in measuring

what is intended to be measured" (p.168). In this research, content validity was used to test the validity of vocabulary mastery and speaking ability. Content validity refers to the extent to which the items in an instrument adequately represent the construct being measured Zamanzadeh et al (2015). The researcher prepare a validity test of the research instrument based on the aspects measured and consulted with the supervisor and class teacher, and tested on the the sample subject. To test the validity of vocabulary mastery, researcher also used product moment correlation which was analyzed in the SPSS program. Validity always refers to the degree to which the evidence supports the conclusions made from the scores. The test criteria are:

- H0 is accepted if r count ≥ r table (the measuring instrument used is valid or valid)
- H0 is rejected if r statistics ≤ r table. (the measuring instrument used is not valid or valid)

Figure 3.1 product moment correlation formula

$$r_{xi} = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{[n \sum X^2 - (\sum X^2][n \sum X^2 - (\sum X^2)]}}$$

R = Coefficient of correlation between X variable and Y variable

N = Number of Class

ΣX = Sum of X score

ΣY = Sum of Y score

Σχ2 = Sum of X quadrate

Σy2 = Sum of Y quadrate

ΣXY = Sum of multiplication of X and Y score

3.7.2 Reliability

After the instrument is tested for validity, the vocabulary test and speaking test are tested for reliability. Reliability refers to the consistency of the score results on the items contained in the test or instrument to be used, so the reliability test tests the accuracy of the measurement scale of the research instrument. Thus, the main purpose of the research instrument reliability test is to measure the consistency of the measuring instruments used in quantitative research. In this context, the researcher wants to know whether there is an accuracy of measurement results on the same sample and at different times. In other words, a research instrument, such as a test, is said to be reliable if the instrument can provide consistent score results in each measurement. Therefore, the measuring instrument (statement/question item) still provides consistent measurement results at different times. In this study, the researcher used Cronbach's Alpha formula to determine the reliability of the vocabulary test to be calculated in the SPSS program.

Figure 3.2 Cronbach's Alpha formula:

$$r_{11} = \left[\frac{k}{k-1}\right]\left[1 - \frac{\sum Si}{S_t}\right]$$

Descriptions:

r11 = Reliability Value

Si = the sum of the variances of the scores of each item

St = total variance

k = number of items

While to test the reliability of speaking ability the researcher uses interrater reliability. The interrater reliability test is a type of test used to equalize perceptions, in this case

between researchers and other assessors. Inter-rater reliability will provide an overview (in the form of a score) about the extent of the level of consensus or agreement given by the expert. The IRR coefficient used is the Cohen Kappa (K) agreement coefficient. Cohen Kappa (K) is a measure of reliability that states the consistency of measurement by two raters and can also be used to measure the consistency of two measurement tools.

Figure 3.3 Cohen Kappa coefficient formula

$$K = \frac{\Pr(a) - \Pr(e)}{1 - \Pr(e)}]$$

Description:

K = Cohen kappa coefficient

Pr (a) = Number of agreements (actual oserved agreement)

Pr (e) = Number of agreements (chance agreement)

The reliability of the instrument can be determined through the calculation of the reliability value of the instrument used is directly proportional to the value of the reliability calculation results.

Table 3.4 Interpretation of Kappa Coefficient Value

Nilai Koefisien Kappa	Tingkat Reliabilitas	Persentase Reliabilitas
0 – 0,20	Tidak ada	0 – 4%
0,20 – 0,39	Minimal	4 – 15%
0,40 – 0,59	Lemah	15 – 35%
0,60 – 0,79	Sedang	35 – 63%
0,80 – 0,90	Kuat	64 – 81%
Diatas 0,90	Sangat Kuat	82 – 100%

(Sumber: Mary L. McHugh, 2012:281)

3.8 Data Analysis Technique

Data analysis is also known as quantitative analysis, statistical analysis, or statistical testing. The term quantitative analysis refers to data that has been quantified using mathematical models. The term "statistical analysis" is given to the process of analyzing data using statistical methods, but many also use quantitative approaches. It

is called statistical testing because data analysis is often used to evaluate hypotheses, especially in research that uses a correlation or association study design. In short, data analysis in quantitative research is the statistical processing of data. This activity is a numerical interpretation of the data. The purpose of data analysis is to get research conclusions. In this study, the researcher used correlational analysis to test the hypothesis, namely Pearson's Product Moment correlation. The purpose of this analysis is to determine the correlation between students' vocabulary mastery and students' speaking ability in learning English at SMP Muhammadiyah 1 Jambi City. Pearson's Product Moment correlation is one of the techniques commonly used to determine the correlation between two variables.

Figure 3.4 formula of correlation product moment Pearson

$$r_{xi} = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{[n \sum X^2 - (\sum X^2][n \sum X^2 - (\sum X^2)]}}$$

R = Coefficient of correlation between X variable and Y variable

N = Number of Class

ΣX = Sum of X score

ΣY = Sum of Y score

Σχ2 = Sum of X quadrate

Σy2 = Sum of Y quadrate

ΣXY = Sum of multiplication of X and Y score