CHAPTER III
RESEARCH METHODS

3.1 Research Method

This research was quantitative research. The researcher was used correlational research design. Creswell (2012, p. 338) stated that correlational research design provide an opportunity to the researcher to be able to describe and measure the degree of relationship between two variables or more. It is used to know whether the variables have correlation or not. In this case, the researcher was used correlational research design because the researcher wants to investigate and get empirical evidence about the direct relationship between X variable and Y variable without giving any treatment. The X variable of the research is vocabulary mastery which is called as independent variable and Y variable is students' achievement in writing descriptive text which is called as dependent variable.

3.2 Population, Sample and Sampling Technique

3.2.1 Population

Population is one of the important aspects in a research. It consist all the subject of the research. According to Sugiyono (2018, p. 130) population is generalization of region that consists of the subject that have certain quantities and characteristics determined by the researcher. It can be concluded that population are group of individuals that have similar characteristics that involved in a

research. Based on the statement above, the population of this research was all of the eighth grade students in SMP Negeri 3 Kotabumi which consist of eight classes and the total of population consist 256 students. The details of the population are as follows:

TABLE 6
RESEARCH POPULATION

No	Class	Total
1	VIII A	32
2	VIII B	32
3	VIII C	32
4	VIII D	32
5	VIII E	32
6	VIII F	32
7	VIII G	32
8	VIII H	32
Total of the population		**256**

Source: Documentation data of SMP Negeri 3 Kotabumi

3.2.2 Sample

Sample is part of population which becomes the subject in the research. Arikunto (2010, p. 174) explains that sample is a small group that will be observed in a research. Meanwhile, Sugiyono (2018, p. 131) states that sample is a part of total characteristics which is owned by the population. Regarding to the explanation above, it can be concluded that the sample is part of population that will be observed in a research. In addition, Arikunto (2006, p. 134) notes that if the sample in a research is quite large or more than 100 it could be taken 10—15% or 20—25% or more. However, if the sample less than 100 it should be taken all. In line with Arikunto, in this research the researcher took 15% of students as the representatives of each class as the research sample because the total number of students in eighth grade at SMP Negeri 3 Kotabumi is more than 100 or 256

students. In conclusion, from the result calculation of 15% students of each class, the total of the research samples were 40 students.

3.2.3 Sampling Technique

Sampling technique is a way how to choose the sample in a research. In this research, the researcher chose the sample by using proportional random sampling technique. According to Sugiyono (2010, p. 64) proportional random sampling technique is used if the population has a member or element that is not homogeneous and stratify proportionally. It means that proportional random sampling technique allowed all the population have the same opportunity to be chosen as the research sample. In addition, for taking the sample the researcher took 15% of students in every class as the research sample. Additionally, in taking the research sample by using proportional random sampling technique can be done by some ways, one of them can be done by lottery. In this case, the researcher made a lottery by writing the students' absence number of class VIII A until VIII H into a small piece of paper and rolled the paper. After that, the researcher mixed the paper and took the paper randomly. Then, the researcher matched the absence number of the students with their name. The name of students who has been selected were the research sample. This way was repeated several times and was done in every class of eighth grade with the same proportion.

TABLE 7
SAMPLE OF THE RESEARCH

No	Class	Sample Calculation	Total
1	VIII A	32	5 Students
2	VIII B	32	5 Students
3	VIII C	32	5 Students

4	VIII D	32	5 Students
5	VIII E	32	5 Students
6	VIII F	32	5 Students
7	VIII G	32	5 Students
8	VIII H	32	5 Students
Total		**256**	**40 Students**

3.3 Research Instrument

The instrument was used to collect the data. Sugiyono (2018, p. 151) states that instrument in a research is used as a tool to measure the variable. It means that instrument plays important role in conducting a research that is to gather the data accurately. The research instrument in this research was a test. There are two test that has been given to the students. The first test was vocabulary mastery test with multiple choice form. It was used to measure students' vocabulary mastery. The second test was written test. It was used to measure the students' achievement related to the writing especially in writing descriptive text. In the test, the students were asked to write descriptive text based on their own version related with the topic that they choose.

3.3.1 Research Instrument of Vocabulary Test

a. Conceptual Definition of Vocabulary Mastery

Vocabulary mastery can be defined as students' ability in understanding all English words that they had learned in certain situation, obtained through long process and a lot practice. Mastering many vocabularies in English, the students will be able to write effectively and easily. In this case, the students is not only can master just one skill but also three others English language skills and understand the meaning of the context.

b. Operational Definition of Vocabulary Mastery

Operational definition is used to give information about the variables which can be observed and measured. In this case, in measuring the students' vocabulary mastery, the researcher used multiple choice test which consist of 20 items with four options; a, b, c, and d. In this test, the students were asked to choose the correct answer of the question. In addition, the researcher was analyzed the result of the test by giving one (1) score for the correct answer and 0 (zero) score for incorrect answer. Then, the number of correct answer was divided by the total number of question and multiplied by one hundred (100).

c. The Specification of Vocabulary Mastery Test Instrument

Based on the conceptual and operational definition as discussed above, the specification of the vocabulary mastery test can be seen in the table below:

TABLE 8
SPECIFICATION OF VOCABULARY MASTERY TEST

No	Aspect	Sub-variables	Indicators	Number of item	Total item
1	Word Class	a. Noun	Identifying the appropriate noun in the sentence.	15, 22, 31, 33	4
		b. Verb	Identifying the appropriate verb in the sentence.	19, 24, 32, 36	4
		c. Adverb	Identifying the appropriate adverb in the sentence.	8,10, 14	3
		d. Adjective	Identifying the appropriate adjective in the sentence.	11, 21	2
2	Word Meaning	e. Synonym	Identifying the appropriate synonym in the sentence	12, 20, 38, 39	4
		f. Antonym	Identifying the appropriate antonym in the sentence	16, 28, 35	3
Total items				**20**	

In making the test, the researcher adapted the question from several sources in the internet. Additionally, to know the students score, the scoring was

conducted by dividing the total of students' correct answers and the total of item question and multiplied by one hundred. After that, to know the students level of vocabulary mastery, the researcher was classified the students' score into some categories. Depdikbud (2004, p. 10) explain that there are five classifications of students' score. The classifications can be seen as follows:

TABLE 9
THE CLASSIFICATIONS OF STUDENTS' VOCABULARY SCORE

No	Interval	Criteria
1	86 – 100	Excellent
2	66 – 85	Good
3	46 – 65	Enough
4	26 – 45	Poor
5	Under 25	Failed

3.3.2 Research Instrument of Writing Test

a. Conceptual Definition of Achievement in Writing Descriptive Text

Achievement in writing descriptive text is accomplishment of students in writing descriptive text which requires the students to be able use language patterns to express their ideas which is done successfully by students using her or his own efforts. It is about how the students can develop their ideas by constructing the words into the sentence and linking the sentence into the paragraph related to the material that will be described appropriate with the characteristic of the text and the generic structures. Therefore, the students not only can write well the text but also got high score in writing test.

b. Operational Definition of Achievement in Writing Descriptive Text

Operationally, achievement in writing descriptive text is a score that was obtained by students in written test. In this research, the researcher used written

test to measure the achievement of students in writing descriptive text. The researcher gave three topics about person. Then, the students choose one topic and write a short descriptive text based on the topic that they choose. In addition, to get the data on students' achievement in making descriptive text, the researcher used two raters as the raters to give the score of students' writing result and those two raters used Brown scoring writing criteria in analyzing the students' work. The aspects that were assessed consist of organization, content, grammar, mechanic, style and quality of expression.

c. Assessment Rubric Criteria of Writing Achievement

Based on the conceptual and operational definition above, in analyzing the students' work, it was used Brown scoring criteria for scoring writing test. Brown (2004, p. 244—246) states that there are five aspects that must be assessed in writing. The aspects are organization, content, grammar, mechanic, style and quality of expression. In every aspect the highest score is 20. If the students get 20 score in every aspects they will get 100 score as the maximum score or the highest score. The details of the scoring criteria are as follows:

TABLE 10
ASSESSMENT RUBRIC CRITERIA OF WRITING ACHIEVEMENT

Writing task	Aspects	Indicators	Score
Writing descriptive text	Organization	The students are able to make a text based on the organization completely and coherent with the topic.	1 — 20
	Content	The students are able to deliver the ideas clearly based on the topic and explore all information of the topic which unities one into another.	1 — 20

	Grammar	The students are able to use present tense in arranging the sentences.	1 — 20
	Mechanic	The students are able to use appropriate spelling, punctuation and capitalization in arranging the sentences.	1 — 20
	Style and quality of expression	The students are able to mastery the use of the vocabulary and diction which suitable with the topic.	1 — 20
Total score			**100**

Then, the result of the students' score was classified into some categories. Haris (as cited in Yeni et.al, 2017, p. 64) notes that there are five classifications of students' score. The classifications can be seen as follows:

TABLE 11
THE CLASSIFICATIONS OF STUDENTS' WRITING SCORE

No	Interval	Criteria
1	80 – 100	Excellent
2	60 – 79	Good
3	50 – 59	Fair
4	0 – 49	Poor

3.3.3 Validity of Instrument

The validity of the instrument is very important aspect which must be done in a research to make the instrument to be valid. According to Setiyadi (2006, p. 21) the validity relates to the use of measurement in a research and relates to the reliability of a measurement. In this research, to measure the validity of the writing instrument, the researcher was used construct validity. Sugiyono (2018, p. 197) stated that construct validity was designed based on the concept of the variable from experts judgment. It means that the instrument that was used by the researcher to assess the aspects of students' writing ability was consulted with the experts to measure the instrument was valid or not. In this case, the experts that

has been chosen as the experts judgment in this research were Rulik Setiani, S.Pd., M.Pd and Dewi Sartipa, S.Pd., M.Pd, BI. Additionally, in measuring the validity of the vocabulary mastery instrument the researcher used the formula of Point Biserial. The formula of Point Biserial are as follows:

$$r_{pbis} = \frac{M_p - M_t}{s_t}\sqrt{\frac{p}{q}}$$ (Arikunto, 2010, p. 326).

Notes:

r_{pbis} : Coefficient of point biserial correlation

M_p : The mean scores subject who answered correctly

M_p : Mean of total score (average score from the total number of subjects)

S_t : Standard deviation of total score

p : The proportion of subjects who answered correctly the correlated items.

q : 1- p

The validity of the items in the instrument of vocabulary mastery was determined through the testing by using the formula above. This testing was used to compare the value of $r_{observed}$ with the value of r_{table}. The item of the instrument can be said valid if the value of $r_{observed}$ is higher than r_{table}. However, if the value of $r_{observed}$ is lower than r_{table} the instrument is invalid and must be corrected.

3.3.4 Reliability of Instrument

In every research, it is important to measure the consistency of a test (reliability). Winarmo (2013, p. 111) states that reliability is the consistency of the instrument. It is needed to know whether the instrument that will be used in a

research is reliable or not. In this research, there were two formula to calculate the reliability of the instrument. First, the researcher was used Kuder Richardson-20 formula or KR-20 to measure the reliability of the instrument of vocabulary mastery test. Second, to measure the reliability of the instrument of writing test, the researcher was used inter-rater reliability and used two raters as the rater to give the final score on the students' writing test result. This decision was in line with the statement of Creswell (2012, p. 338) who said in using the formula of interrater reliability, there must be two or more individuals observe an individual's behavior and record scores, and then the scores of the observers are compared to determine whether they are similar. Thus, the researcher only used two raters in this research because those two raters are ideal and have quite experienced to assess the students' writing skills.

Additionally, to know the reliability of the instrument of vocabulary mastery test, here is the formula of Kuder Richardson-20:

$$r_i = \frac{k}{k-1}\left\{\frac{s_t^2 - \sum p_i q_i}{s_t^2}\right\}$$ (Sugiyono, 2010, p. 359).

Notes:

r_i : Reliability of the instrument

k : The Total number of item in the instrument

p_i : The proportion of subjects who answered correctly of an item

q_i : $1 - p_i$

s_t^2 : Total variant

Then, the formula of inter-rater reliability are as follows:

$$r_{xx'} = \frac{(S_s^2 - S_e^2)}{S_s^2}$$ (Azwar, 2012, p. 90)

Notes:

rxx' : Coefficient reliability variable Y

S_s^2 : Variance between subjects that is influenced by rating.

S_e^2 : Variance error is variance interact between subject and rater.

The formula to calculate S_s^2 and S_e^2 are:

$$S_e^2 = \frac{\sum i^2 - (\sum R^2)/n - (\sum T^2)/k + (\sum i)^2/nk}{(n-1)(k-1)}$$

$$S_s^2 = \frac{(\sum T^2)/k - (\sum i)^2/nk}{n-1}$$

Notes:

i : Rating number that is given by a rater to a subject.

T : The number of rating that is received by a subject to all rater.

R : The number of rating that is given by a rater to all subjects.

n : The number of subject.

k : The number of rater

Additionally, to know the reliability of an instrument, there are some experts which explained about the criteria reliability coefficient. Litwin (as cited in khumaedi, 2012, p. 29) stated that the reliability coefficient of an instrument can be said reliable if the value is about 0,70 or more. Therefore, the researcher used the theory above to determine whether the instruments are reliable or not.

3.4 Data Collecting Technique

In collecting the data, vocabulary mastery test and writing test used by the researcher. In the vocabulary test, the students were asked to answer the question with multiple choice forms. The test consist of 20 items with four answer choices. Moreover, in the wriring test. The students were requested to make a descriptive text about the topic that they choose based on their own version. Additionally, the test was conducted by online because this research was done during the pandemic of Covid-19. Thus, it is impossible to conduct the test by face to face with the student. Therefore, as the alternative ways the researcher conducted the test by online and used Google Formulir as a media to conduct the test and collect the data of the research.

3.5 Data Analysis

Data analysis was used to determine the final result of the students after doing the test. It was used to draw the conclusion of the research data. In this research, the data were analyzed by using statistical technique. The technique were the normality test, homogeneity test, hypothesis test, and significant test. The details for the technique are as follows:

3.5.1 Normality Test

Normality test was used to know whether the data were normally distributed or not. In this research, to calculate the normality of the data the researcher used Lilliefor's formula. The steps to measure the normality of the data are as follows:

a. Verify the raw score by using this formula:

$$Z_i = \frac{x_i - \bar{x}}{s}$$ (Sudjana, 2005, p. 466)

Notes:

Z_i : number of raw

x_i : the values obtained

$\overline{x}$: average

s : standard deviation

b. Verify the opportunities each raw number with the formula:

$F(Z_i) = P(Z \leq Z_i)$

c. Verify the proportion by using this formula:

$$S(Zi) = \frac{\text{Numbers } z_1, z_2, \ldots..z_n \text{ that} \leq z_i}{n}$$

d. Calculate the absolute price use form ula: $F(Z_i) - S(Z_i)$

e. Verify the largest absolute value, L_o then compare L_o with L_{table}

f. The normal criteria if $L_o < L_{table}$, then the group has normal distribution.

3.5.2 Homogeneity Test

Homogeneity test is the second steps to analyzed the data. It was used to know whether the samples of the research were homogeneous or not. In this research, the researcher used Bartlett formula to measure the homogeneity of research data. According to Sudjana (2005, p. 263) there are some steps in Bartlett formula. The steps are as follows:

1. Determine the combination of variant from all the samples by using the formula:

$$s^2 = \frac{\sum(n_i - 1)s_i^2}{\sum(n_i - 1)}$$

Notes:

n_i = Number of students

s_i = The variance score

2. Determine B score by using the formula below:

$B = (\log s^2) \sum(n_i - 1)$

3. Calculate χ^2 by using the formula below:

$\chi^2 = (In10) \{B - \sum(n-1) \log s_i^2\}$

The testing criteria of homogeneity test by using Bartlett formula are as follows:

- If $\chi^2{}_{count}$ is smaller than $\chi^2{}_{table}$, it can be concluded that the variance of data are homogeneous.
- If $\chi^2{}_{count}$ is higher than $\chi^2{}_{table}$, it can be concluded that the variance of data are not homogeneous.

3.5.3 Hypothesis Test

In this research, the researcher used Pearson Product Moment Correlation in analyzing the data of the research and measuring the correlation between X variable or vocabulary mastery and Y variable or students' achievement in writing descriptive text. This technique was used to determine the relationship between two variables and proved the research hypothesis. The formula of Pearson Product Moment Correlation are as follows:

$$r_{xy} = \frac{n.\sum xy - (\sum x)(\sum y)}{\sqrt{\{n \sum x^2 - (\sum x)^2\}\{n \sum y^2 - (\sum y)^2\}}}$$ (Arikunto, 2010, p. 317)

Notes:

r_{xy} = Coefficient of correlation

n = The total number of sample

$\sum xy$ = The total of multiple score of variable x and y

$\sum x$ = The score of students' vocabulary mastery

$\sum y$ = The score of students' writing achievement

$\sum x^2$ = The sum square of x variable

$\sum y^2$ = The sum square of y variable

The hypothesis to be proved if:

- If $r_{xy} < r_{table}$, it means that H_0 is accepted and H_a is rejected. It can be concluded that there is no correlation between vocabulary mastery and students' achievement in writing descriptive text at the eighth graders of SMP Negeri 3 Kotabumi in academic year 2020/2021.
- If $r_{xy} > r_{table}$, it means that H_0 is rejected and H_a is accepted. It can be concluded that there is correlation between vocabulary mastery and students' achievement in writing descriptive text at the eighth graders of SMP Negeri 3 Kotabumi in academic year 2020/2021.

3.4.5 Significant Test

After analyzing the hypothesis test, in order to know how far the significance of the correlation between vocabulary mastery and students' achievement in writing descriptive text, the researcher was used a significance test (t-test). The formula of t-test are as follows:

$$t = \frac{r\sqrt{n-2}}{\sqrt{1-r^2}}$$ (Sugiyono, 2018, p. 275)

Notes:

t = Significant of correlation

r = Coefficient correlation or r_{xy}

n = Total sample

The testing criteria of significant test are if $t_{observed}$ is higher than t_{table}, it can be concluded that the correlation between X variable and Y variable is significant. However, if $t_{observed}$ is smaller than t_{table}, it can be concluded that the correlation between X variable and Y variable is not significant.