# CHAPTER III
# RESEARCH METHODOLOGY

In the chapter, the researcher would like to present the reseach method, population, sample, sampling techique, research instrument, validity and reliability of the instrument, the techique of collecting data, and the data analysis.

## 3.1 Research Method

This research would be conducted by using quantitative approach. The purpose of this research was to get empirical evidence of the relationship between two variables covering independent variable and dependent variable. The independent variable was students' vocabulary mastery, and the dependent variable was students' writing ability in report text. By using this method, the result of the research reflected the facts objectively.

According to Arikunto (2010:161), a variable is something that varies from one case to another. In a research there is two variables, they are independent variable (x) and dependent variable (y). According to Sugiyono (2010:37), interactive correlation is a correlation that has influence one variable to other variables which implement quantitative data.

## 3.2 Population, Sample, and Sampling Techique.

### 3.2.1 The Population

Population is not only to know number of object/subject which is studied, but whole characteristics of the object/subject. Sugiyono (2012:80) stated that population is generalization area that consist of object or subject which has quality and certainly and certain characteristic is determined by researcher to be learnt and then make conclusion. The population of the research was the students of the twelfth grade students of SMA Kemala Bhayangkari academic year 2018/2019. It consist of five classes, they are devided into two programs; sciences and social XII IPA 1, XII IPA 2, XII IPA 3, XII IPS 1, XII IPS 2. So, the total number of students' in twelfth grade of SMA Kemala Bhayangkari is 153. The detail at the population is illustrated in the table as follow:

**TABLE 6**
**POPULATION OF RESEARCH**

| No | Class | Total |
|---|---|---|
| 1 | XII IPA 1 | 32 |
| 2 | XII IPA 2 | 33 |
| 3 | XII IPA 3 | 31 |
| 4 | XII IPS 1 | 29 |
| 5 | XII IPS 2 | 28 |
| | Total | 153 |

Source: Staff Administration of SMA Kemala Bhayangkari

### 3.2.2 Sample

Sample is group of individual as part of population. Setiyadi (2006:38) says that. Sample is the individual group that represents all of individual as a part

of target groups. So, it can be concluded that sample is a representation of population being investigated. From the five of the IPA and IPS classes above, the researcher took representation from each of class as the research sample. According to Arikunto (2006:134), if the sample is less than 100, it should be taken all, but if the sample is quite large or more than 100 it could be taken 10-15% or 20-25% or more.

The total of students in twelfth grade of SMA Kemala Bhayangkari is 153. In this case, the researcher took 25% from each classes bacause the total of students are more than 100. So, the calculation result 25% from each class is 38 students. Based on the result above, it can be seen in the table.

**TABLE 7**
**RESEARCH SAMPLE**

| Class | Gendre | | Total |
|---|---|---|---|
| | Male | Female | |
| XII IPA 1 | 15 | 17 | 32 |
| XII IPA 2 | 12 | 21 | 33 |
| XII IPA 3 | 9 | 22 | 31 |
| XII IPS 1 | 18 | 11 | 29 |
| XII IPS 2 | 15 | 13 | 28 |
| **Total** | **69** | **84** | **153** |

Source: Staff Administration of SMA Kemala Bhayangkari

### 3.2.3 Sampling Techique

In this research the researcher used proportional random sampling. According to Sugiyono (2010:82), this technique is used if the population has a member/element that is not homogeneous and stratify proportionally. By using this technique, all of individual in population get the same opportunity to be chosen as the sample of the research. Based on the theory above, this study took

25% out of each class that would be taken as the sample of the research. The sample of the research can be illustrated in the table as follow:

**TABLE 8**
**RESEARCH SAMPLE**

| No | Class | Population | Sample | Uprounding |
|---|---|---|---|---|
| 1. | XII IPA 1 | 32 | 25% x 32 = 8 | 8 |
| 2. | XII IPA 2 | 33 | 25% x 33 = 8,25 | 8 |
| 3 | XII IPA 3 | 31 | 25%x31 = 7,75 | 8 |
| 4 | XII IPS 1 | 29 | 25% x 29 = 7,25 | 7 |
| 5 | XII IPS 2 | 28 | 25% x 28 = 7 | 7 |
| **Total** | | **153** | | **38** |

Furthermore, the way to take the sample in this research are the researcher wrote the name of Science students and Social students into piece of papers. Then, the papers were roled and be enter into a tin. After that, the can mixed and one of the papers were dropped out from the can. The students' name which is come out from the can was as the used sample of the research. The number which is needed should be appropriate with the sample of the research.

### 3.3 Research Instrument

In this research there were two variables, the first in students vocabulary mastery (X) and the second is writing ability in report text (Y). The instrument is used to get the data. In this research the researcher used the test to get the score of students' writing ability, and the test was as the used is multiple choice for measure students' vocabulary mastery and writing test for measure students' writing ability.

### 3.3.1 Research Instrument of Writing Ability in Report Text

#### a. Conceptual Definition of Writing Ability in Report Text

Writing is a process of expressing ideas. by writing process the students also express their ideas by the write a report text.

#### b. Operational Definition of Writing Ability in Report Text

Operational is the process of strictly define variable into measur able factor. To get the data in writing ability, the researcher used writing test, and researcher gave report text as the material of the test.

#### c. The Specification of Writing Ability

Based on the conceptual and operational definition above, the specification of students' writing ability in report text can be seen in below:

**TABLE 9**
**SPECIFICATION OF WRITING REPORT TEXT**

| **Variabel** | **Aspect** | **Indicator** | **Interval Score** |
|---|---|---|---|
| Writing Report Text ability (y) | Content | The students are table to build their idea with suitable topic | 1-20 |
| | Organization | The students are able to express their idea clearly. | 1-20 |
| | Vocabulary | The students are able to choose suitable vocabulary | 1-20 |
| | Grammar | The students are able to compose setencest effectivelly | 1-20 |
| | Mechanics | The students are able to master the rules in writing | 1-20 |
| | | | **100** |

*Modifed from Brown (2004:246)*

### 3.3.2 Research Instrument of Vocabulary Mastery

**a. Conceptual Definition of Vocabulary Mastery**

Vocabulary mastery is a key united in building up skills and knowledge. Vocabulary refers to words being used to communicate by direct or indirect speaking and writing. So, vocabulary is very important for English learning.

**b. Operational Definition of Vocabulary Mastery**

To get the data in vocabulary mastery, the researcher used multiple choice test. The instruments for vocabulary mastery that will be used in research are 20 items. But for the purpose of try out at SMA Prima Kotabumi North Lampung,it is made into 40 items. This is intended to avoid any invalid items.

**c. The specification of vocabulary mastery**

Based on the conceptual and operational definition above, the specification of students' vocabulary mastery can be seen below:

**TABLE 10**
**INSTRUMENT SPECIFICATION OF VOCABULARY MASTERY**

| Variable | Aspect | Indicator | Number of item | Total item |
|---|---|---|---|---|
| Vocabulary Mastery | Word- Class<br>a. Noun<br>b. Verb<br>c. Adjective<br>d. Adverb | a. Identifying the appropriate noun in the sentence | 1,2,9,12,32,33,34 | 8 |
| | | b. Identifying the appropriate verb in the sentence | 4,5,7,15,20,36,37,38,39 | 9 |
| | | c. Indentifying the appropriate adjective in the sentence. | 10,13,17,18,23,24,25,40 | 8 |
| | | d. Identifying the appropriate adverb in the sentence. | 8,11,19,21,27,29 | 5 |

| | | | | |
|---|---|---|---|---|
| | Word Meaning<br>a. Synonym<br>b. Antonym | a. Identifiying the synonym of words in a sentence. | 3,6,16,28, 30 | 5 |
| | | b. Identifiying the antonym of words in a sentence. | 14,22,26,3 1,35 | 5 |
| | Total | | | 40 |

*Modifed from Widiawati (2015:31)*

### 3.3.3 Validity of the Test

Validity is a measurement tool that showing how far the instrument test for measure something what it should be measure. The purpose of this analyze is used to know the validity of the test. The instrument that was valid have high validity. On the contrary, the instrument that was less of valid have low validity. Then, to measure the validity of test instrument from the students' ability in writing report text , it is used construct and content validity. To get construct validity of the test instrument in report text, the researcher used the opinions from expert or usually called as *expert's judgment*. In this case, there are two experts. The experts are Mrs. Rulik Setiani, S.S., M.Pd, and Mrs. Dewi Sri Kuning, S.Pd.,M.Pd. Content validity is used to gave try out to another students out of the sample. The researcher took XII IPA and XII IPS as try out class.

In other hand, according to Arikunto (2010:326), validity is tool that shows the level validity or validity of an instrument. A test can be be said valid, if the test measurea the object to be measure and suitable with the criteria. Validity is the extent to which inference made from test results are appropriate, meaningful, and useful in terms of the purpose of the test. To measure the validity vocabulary mastery instrument, the researcher used *r biserial or point biserial correlation.* the formula is :

$$r_{pbis} = \frac{Mp - Mt}{St}\sqrt{\frac{p}{q}}$$

Notes;

$r_{pbis}$ = Coefficient of point bisserial correlation

$M_p$ = Mean scores of subjects who answer correctly the correlated items

$M_t$ = Mean of total score (avarage score from the total number of students)

$S_t$ = Standard deviation of total score

P = Proportion of subjects who answer correctly the correlated items.

q = Proportional of subject who answer incorrectly (q=1-p)

The criteria of validity test is the result of calculation *r pbis* ($r_{count}$) counsult by $r_{table}$ score of product moment. If $r_{count} > r_{table}$, so the item test is valid.

### 3.3.4 Reliability of The Test

To analyze reliability test in this research, the research used two technic, Kuder Richardson-20 method (KR-20) is used for vocabulary mastery and inter rater reliability is used for writing ability in report text.

To know the coefficient of reability between the odd and even numbers, the writer used statistical formula, nameli Kuder dan Richardson (*KR-20)* the formula is:

$$r_{11} = \left(\frac{k}{k-1}\right)\left(\frac{v_t - \sum pq}{v_t}\right)$$

Notes:

$R_{11}$= Reliability of Instrument

k = Number of Item

Vt = Variant Total

P = subject proportion the answer true in every items

q = wrong proposition

To measure the reliability of the test instrument from students' ability in writing report text, the researcher used interrater reliability. Inter rater reliability is done by two raters who would assess the students' ability in report text, they are Ana Mariana, S.Pd., Yusi Lestari, S.Pd., and Gresika Ahri, S.Pd. According to Cresswell (2008:171), interpreter reliability is a procedure used when making observation of behavior.

In addition, Azwar (2012:13) says that the limitation of different analyze result among rater is about 0.0 – 0.1. If the coefficient reliability get the scores like above. So, there is a consistency result of test instrument between rater and the test instrument could be said reliable. On the other hand, if the coefficient reliability is more than 1.0. So, there was an inconsistency result of test instrument among rater and the test instrument is not reliable. According to Ebel in Azwar (2012:90), the formula to estimate interrater reliability which is done by *k* rater toward *n* subject as follow:

$$r_{xx'} = \frac{(S_s^2 - S_e^2)}{S_s^2}$$

Notes:

$r_{xx}'$: Coefficient reliability X

$s_s^2$ : Variance between subjects that is influence by rating

$s_e^2$ : Variance error is variance interact between subject and rater

The formula to calculate $S_e^2$ and $S_S^2$ are:

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

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

Notes :

i : Rating number which is given by rater to a subject

T : The number of rating which is receive by a subject to all raters

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

n : Total subject

k : Total rate

the amount of coefficient reability started from 0, 0until 1,0 can be said reable.

### 3.4 Data Collecting Technique

To collect the data in this research, the researcher used the instrument. The instrument is a tool that is used in the research. The instrument of this research is

test. The researcher used two instruments to collect the data, and the instrument is made in two form.

The first is multiple choice to measure students' vocabulary mastery. The form consist of 40 items. The second form is writing test. The writing test was used to measure students' writing ability in report text.

### 3.5 The Data Analysis

The data analysis is an activity after the data from all the respondents or all source are collected. It is used to draw the conclusion of the research data. In analyzing, the researcher used the statistical technique by using inferential analysis was categorize into parametric statistic. The sample should be tested by using normality and homogeneity test.

#### 3.5.1 Normality Test

Normality test is used to know whether the data of the sample which was as the used in the research has normal distribution. According to Sudjana (2005:466), to measure the normality of the data is used Lilliefor's test is used the following steps:

a. Determine the standard number used the formula

$$Z_i = \frac{\times_i - \bar{x}}{S}$$

Notes:

$Z_i$= Raw Number

$X_i$= The values obtaine

$\bar{x}$= The Mean

S= Standard Deviation

b. Opportunity determines each raw numbers with the formula:

$F(z_i) = p(z \leq z_i)$

c. Determine the proportion using the formula:

S (zi) = $\frac{total\ Z_1 Z_2 Z_3 ,,,, Z_n which\ is \leq Z_i}{n}$

d. Calculate the absolute number using the formula:

$F = |(z_i) - S(z_i)|$

e. Determine the larges absolute value which is call $L_o$, then compare the $L_o$ with $L_{table.}$ The normal criteria is; $H_o$ is accept if $L_o < L_{table}$ (the data has normal distribution).

### 3.5.2 Homogeneity Test

Homogeneity test is done know that sample which is taken are really homogenous. To measure the homogeneity, it was used formula of *Bartlett*. The test criteria are : $H_o$ is accepted if $x^2_{count} \leq x^2_{table}$ of chi square; it means that the data is homogenous. According to sudjana (2005:263), to measure homogeneity of the data is used the following steps as follow:

a. Determine the combination of variant from all of the sample used the formula:

$$S^2 = \frac{\sum n_1 - 1) {S_i}^2}{\sum (n_1 - 1)}$$

Notes:

$n_1$ = Number of students

$S_i$ = The variances score

b. Determine B score by used the formula:

$$B = (\log S2) \sum (n_1 - 1)$$

c. Calculate $x^2$ by used the formula below:

$$x^2 = (in\ 10)\left\{B - \sum (n_1 - 1) log {S_i}^2\right\}$$

The testing criteria is if $x^2_{count} < x^2_{table}$, the data are homogenous.

### 3.5.3 Hypothesis Test

To measure the correlation between two variables; students' vocabulary mastery and writing ability in report text, *Product Moment Correlation* was as the used. According to Arikunto (2006:274), Product Moment Correlation formula is:

$$r_{xy} = \frac{n.\sum xy - (\sum x)(\sum y)}{\sqrt{\{n\sum x^2 - (\sum x)^2\}\{n\sum y^2 - (\sum y)^2\}}}$$

Notes:

$r_{xy}$ = Coefficient of correlation

N = Total sample

xy = Total x and y

X = The students' vocabulary mastery

Y = The students' writing in report text

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

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

And the hypotheses that should be prove are:

$H_o$ is accepted if $r_{xy} \leq r_{table}$ ; it means that there is no correlation between students' vocabulary mastery and writing ability in report text .

$H_a$ is accept if $r_{xy} \geq r_{table}$ ; it means that there is correlation between students' vocabulary mastery and writing ability in report text. Because rxy only show about coefficient of correlation.

### 3.5.4 Significant Test

To find out the significant test, it used t-test. The formula of t-test according to Sugiyono (2012:187) is as follow:

$$t = r\frac{\sqrt{n-2}}{\sqrt{1-r^2}}$$

Notes:

T = Significant test

r = Coefficient correlation or $r_{xy}$

n = The total sample

The testing criterian is if $t_{count} >$ t table, the correlation between dependent and independent variable is significant.