III. RESEARCH METHODS

This chapter describes the method that used in conducting the data of the research such as design, population and sample, research instruments, variables, and procedure of the research, data collecting technique, instruments data analysis, and hypothesis testing.

3.1 Research Design

This study used quantitative because it was focused on the product (result of the test). In this research there was no control and no treatment to the subject. Hatch and Farhady (1982: 26) State that *ex post facto* design is often used when the study does not have control over the selection and manipulation of independent variables. The subject of the research was only one group, therefore the design of the research was ex post facto design, and the formula can be seen as follows:

$$X \longleftrightarrow Y$$

Note:

X : Vocabulary mastery test (independent variable)
Y : Reading comprehension test (dependent variable)

By using design above, this research found whether students' vocabulary has taken correlation toward reading comprehension or not.

3.2   Population and Sample

The population of this research was the second year students of SMA Negeri 1 Sidomulyo. This research was conducted in SMA Negeri 1 Sidomulyo, because the researcher is one of the alumni from that school. This study was interested in conducting a research in this school. This study used class XI in 2015/2016 academic year, consisting of 30 students. In this research, this study used individual simple probably random sampling. By using it, every student in the class in population gets the same opportunity to be chosen or to be the sample. The first of test gave vocabulary test covering; noun, verb, adverb and adjective that they have learned in class X. The researcher gave reading comprehension test. The test was about determining idea, identifying specific purpose, inference, reference, grammar and vocabulary. These are all they have learned in previous class. After testing vocabulary mastery and reading comprehension, the researcher analysed and interpreted the correlation between those variables.

3.3   Variables

In this research there were two variables, dependent and independent variables. They were vocabulary mastery as independent variable (X) and reading comprehension as dependent variable (Y). The score showed data of students' vocabulary mastery and reading comprehension which can be used to identify the correlation between students' vocabulary and their reading comprehension.

3.4   Research Procedure

Below are the procedures in administering the research:

1. Determining research problem

This study determines the problem based on the real observation, and then refers to the previous research; there was one issue that should be resolved.

2. Designing Research Instrument

In designing the reading instrument, the writer took from the student's text book. The designing process considered materials that had been taught to the students based on curriculum.

3. Determining Subject and Sample of the Research

The Subject of this research was the second year of SMA Negeri 1 Sidomulyo. This study determined the sample using simple probably random sampling. In statistics, a simple random sample is a subset of individuals (a sample) chosen from a larger set (a population). Each individual was chosen randomly and entirely by chance, such that each individual has the same probability of being chosen at any stage during the sampling process, and each subset of individuals has the same probability of being chosen for the sample as any other individuals.

4. Administering the Test

The research was held in two meetings. The first to conduct the vocabulary test and the second is to conduct reading test.

5. Analysing the Data

This study made steps after conducting research by using tests, this study analysed the data by using correlation in SPSS (Statistical Program for Social Science). This study collected the data by looking at the result of test of vocabulary mastery and reading comprehension to find out the result of students' vocabulary mastery and reading comprehension achievement. After getting the result, this study analysed the correlation between students' vocabulary and their reading comprehension.

3.5   Data Collecting Technique

This study administered the test as the instrument to the students for gathering data on students' vocabulary mastery and their reading comprehension ability. The table of specification of reading comprehension test and vocabulary mastery test can be seen as follows:

Table 1. Specification of Reading Comprehension Test Items

No.	Skill of the reading	Number of items	Total Items	Percentage of Items
1.	Identifying specific information	1., 5., 6., 10., 13., 14., 15., 19., 26., 28.,	10	25%
2.	Inference	3., 9., 12., 17., 21., 22, 24., 32, 33., 34.,	10	25%
3.	Reference	4., 8., 18., 20., 27., 31., 36., 37., 38, 40.,	10	25%
4.	Vocabulary	2., 7., 11., 16., 23., 25., 29., 30., 35., 39.,	10	25%
	total		40	100 %

The specification above was for try out test, consisting of 50 numbers that conducted in SMA N 1 Sidomulyo. After try out, the question selected to be 35 numbers after try out.

Table 2. Specification of Vocabulary Test Items

No.	Word Class	Item Number	Percentage of Item
1.	Noun	17., 21., 24., 25., 34., 35., 45, 48, 52,53,54,55	22.5 %
2.	Verb	2., 3., 7., 8., 9., 12., 14., 15., 18., 19., 20., 29., 33., 36., 41., 42., 44.,, 47	25%
3.	Adjective	1., 11., 16., 22., 23., 26., 28., 31., 37., 38., 46.49	21.2%
4.	Adverb	4., 5., 6., 10., 13., 27., 30., 32., 39, 40., 43., 50,51.	21.2%
5.	Vocabulary enlargement	56.57.58.59.60	10 %
	total	60	100 %

The specification above was consisted of 80 numbers that conducted in SMA N 1 Sidomulyo and each of them had a different percentage score.

3.5.1 Vocabulary Test

The test was prepared for measuring the deepth of students' vocabulary mastery. The primary aim of this test was to investigate students' ability in vocabulary. The test consisted of 80 items. The student's vocabulary mastery was gained by counting the number of correct answer was divided by total numbers of items and

multiplied by 20. From this vocabulary test can found the proportion of correct answer. Then, this study estimated the number of student's vocabulary mastery by multiplying it with the population 1000 words level. The formula was:

$$S = \frac{c}{20} \text{ X } 1000$$

Note:

S: the score of test

C: the total of right answer of vocabulary level test.

3.5.2 Reading Comprehension Test

There are 40 items for reading comprehension test. It was multiple choices with 5 options (a, b, c, d, e) with one correct answer and four distracters. There were five reading skill, they were: determining main idea, identifying, specific information, inference, reference, and vocabulary. The scoring criterion is determined around 0-100. The formula was;

$$S = \frac{r}{n} \text{ X } 100$$

Note:

S : the score of the test

r : the total of the right answer

n : the total items

3.6 Criteria of Good Test

Test is a tool that contains a series of tasks that must be done or the questions that must be answered by learners to measure a certain behavioural aspects. Thus, the function test is as a measuring tool. A test can be said to be good as a measure must meet the test requirements such as validity, reliability, level of difficulty, discrimination power and scoring system.

The description of the criteria of the tests

3.6.1 Validity of the Test

A test can be said valid if the test measure the object to be measured and suitable with the criteria (Hatch and Farhady, 1982: 250). Every test whether it is a short informal classroom test or a public examination test, it should be valid as the constructor can make it. The test used for collecting the data covers three validities: content, construct and face validity.

a. Content Validity

   Content Validity is the extent to which the test measures a representative sample of the subject matter content. The focus of the content validity is adequacy of the sample and not simply on the appearance of the test. Content validity is intended to know whether the test items are good reflection of what will be covered. The test items are adapted from the materials (Heaton, 1975: 60). To get the content validity, the items is determined according to the material that given to the students.

b. Construct Validity

Construct validity is concerned with whether the test is actually in line with the theory of what it means to know the language (Shohamy, 1985: 74). It means that construct validity can be found by relating the instrument with the theory of what it means to know certain knowledge skills. Then the instrument for measuring vocabulary mastery is vocabulary level test in the context. Then the instrument for measuring reading comprehension, there are five reading skills they are: determining main idea, identifying, specific information, inference, reference, and vocabulary.

3.6.2 Reliability

Reliability refers to the whether the test is consisted on its scoring and gives us an indication of how accurate the test score are (Shohamy, 1985: 70). This study used the Pearson Product Moment. The formula was:

$$R_{xy} = \frac{\sum XY}{\sqrt{[\sum X2][\sum Y2]}}$$

Notes:

Rxy: coefficient of reliability between the first half and the second half items

X : the total numbers of odd items (variable)

Y : the total numbers even items (variable)

X2 : square of X

Y2 : square of Y

<div align="right">(Lado, 1997)</div>

The criterion of reliability as follow:

- 0.90-1.00 : high
- 0.50-0.89 : moderate
- 0.0-0.49 : low

To know the reliability of the whole tests, this study used Spearman Brown's Prophecy Formula (Hatch and Farhady, 1982). The formula was as follows:

$$rk= \frac{2\ rl}{1 + rl}$$

In which,

rk : the reliability of the test

rl : coefficient of reliability between the first half and the second half items

<div align="right">(Hatch and Farhady, 1982:247)</div>

3.6.3 Level of Difficulty

Level of difficulty related to how easy or difficult the item taken from the point of view of the students who take the test. It was calculated by the following formula:

$$LD = \frac{R}{N}$$

Where:

LD : level of difficulty

R   : the number of students who answer correctly

N   : the total of students following the test

The criteria as follows:

<0.03   : difficult

0.03 – 0.70   : average

> 0.70   : easy

3.6.4 Discrimination power

Discriminations power refers to the extent to which the items are able to differentiate between high and low level students on that test. A good item according to this criterion is "one in which good students do well and bad student fail" (Shohamy, 1985: 81).

The discrimination power was calculated by this following formula:

$$D = \frac{U - L}{\frac{1}{2}\,N}$$

Where:

D   : Discrimination power

U   : The number of students from the upper level who answered correctly

L   : The number of students from the lower level who answered correctly

N   : The number of students

(Shohamy, 1985: 82)

The criteria of discriminations are:

0.00 – 0.20   : poor

0.21- 0.40   : satisfactory

0.41-0.70   : good

0.70-1.00   : excellent\

-(negative)   :bad items

3.6.5 Scoring System

To get the score of the students' result of the test, the score of vocabulary and reading comprehension was calculated by using formula as follow:

$$S= \frac{r}{n} \times 100$$

Where

S   : score of the test

r   : number of right answer

n   : total number of items on test

3.7 Data Analysis

Data analysis is the process of organizing the data in order to gain the regularity of the pattern and other form of the regularity of the research, while the data interpretation is the process giving meaning to the founded pattern and regularities (Setiadi, 2006: 255), in order to know the students' progress in mastering vocabulary and comprehending reading skill.

1. Scoring vocabulary and reading comprehension test.

2. Tabulating the result of vocabulary mastery, reading comprehension and scoring the data.

3. Analysing, interpreting and discussing the tabulated result.

4. Drawing conclusion from the tabulated result of the test.

3.8 Hypothesis

In hypothesis testing data from upper and lower score, level of difficulty and discrimination power were processed into the score and analysed by using SPSS 16 program for windows. Finally, the researcher can take the conclusion based on score from the result of SPSS 16.

This alternative hypothesis test is tested in null hypothesis (H_0) to be tested:

H_1: There is a positive correlation between vocabulary mastery and students' reading comprehension. In terms of concept reading skill there are four aspects (identifying specific information, reference, inference, and vocabulary) that correlate to vocabulary mastery (noun, verb, adjective, adverb and translation).

H_0 : There is no positive correlation between vocabulary mastery and students' reading comprehension. In terms of concept reading skill there are four aspects (identifying specific information, reference, inference, and vocabulary) that correlate to vocabulary mastery (noun, verb, adjective, adverb and translation).