

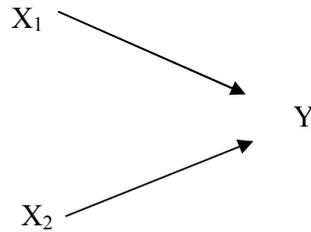
III. METHODS

In this chapter discuss about research methods which consist of design, variable (data), source of data, instruments, procedures, data analysis, and hypothesis testing. These topics will be explained as follows.

3.1.Design

This research aimed to find the correlation between students' vocabulary and grammar mastery and their achievement reading comprehension. This research was about multiple correlation research. To conduct the research, the researcher used a co-relational design of *ex post facto designs* (Setiyadi, 2006). Here, the researcher administered the tests to know both mastering of vocabulary and grammar in reading comprehension to a group of students. So, there was no treatment or experiment of any kind to subjects. After that, the data that was gained from the test was analyzed to see whether mastering vocabulary and grammar related to the ability of reading comprehension or not. The researcher used quantitative method to analyze the result of research. This method was used to find out the correlation between students' vocabulary and grammar mastery and their achievement in reading comprehension.

The research design that was a group of students test design is formulated as follow:



In which,

X₁: the test of vocabulary mastery

X₂: the test of grammar mastery

Y: the test of reading comprehension

By using design above, this research found whether students' vocabulary and grammar mastery has taken correlation and their achievement in reading comprehension or not.

3.2.Variables

In this research there were three variables, i.e. dependent and two independent variables. The dependent variable was students' score in reading comprehension test. On the other hand, independent variables were students' score vocabulary and grammar mastery test. The score showed the data of students' achievement in vocabulary mastery, grammar mastery, and reading comprehension which were used to identify the correlation between students' vocabulary and grammar mastery and their reading comprehension.

3.3.Sources of Data

The population of this research was all the students of the second grade of SMAN 1 Tumijajar. There were 10 classes of the second grade students that consist of 35 students for each class. The students were divided into 2 groups, XI MIA and XI IIS. From those numbers of the students, the researcher chose one group that was XI MIA. Then, the researcher had chose XI MIA² through random sampling as a sample in order to find the validity, reliability, difficulty level, and discrimination power of the test item. After getting a good test items, by the random sampling technique, the researcher used XI MIA³ at the SMAN 1 Tumijajar as the subject to collect the data. It is in line with Gay, Mills, and Airasian who suggest that there should be at least 30 (thirty) participants in correlation study to establish relationship.

3.4.Instruments

In this research, the researcher used three instruments for conducting the research. The instruments were the test of vocabulary mastery, grammar mastery and reading comprehension in form of multiple choice tests. So, the researcher tried out 70 items of vocabulary and grammar mastery test and 60 items of reading comprehension test. After that, the researcher analyzed those items to see their difficulty level and discrimination power. Then, only 50 items of vocabulary, 50 items of grammar mastery test and 50 items of reading comprehension test were chosen by the researcher, which had the perfectness of level difficulty and the ideal of discrimination power. The following were the description of instrument, the level difficulty, discrimination power of the test items, validity and reliability.

3.4.1. Reading Comprehension Test

The test consisted of 50 test items in the form of the passage. These items had been analyzed the validity, reliability, difficulty level, and discrimination power based on the try out test. The students need to read the passage first so that they can identify the main idea, specific information, reference, inference, and vocabulary of the passage. Then, they scrolled back to the relevant point in the text as the students do each question. The test was conducted in 90 minutes for the tryout and 90 minutes of the test.

3.4.2. Vocabulary Mastery Test

The test consists of 50 items in the form of multiple choices, where the researcher divided into two forms of question, choosing similar word and appropriate word. Then, the students had to choose the correct word from five given words. These items had been analyzed the validity, reliability, difficulty level, and discrimination power based on the try out test. The test was conducted in 60 minutes for the tryout and 60 minutes for the test.

3.4.3. Grammar Mastery Test

For the test of grammar mastery, the researcher prepared 50 test items in the form of multiple choices. Then, the students had to choose the correct word from five given words. These items had been analyzed the validity, reliability, difficulty level, and discrimination power based on the try out test. The test was conducted in 60 minutes for the tryout and 60 minutes for the test.

3.5. Validity of The Instrument

3.5.1. Validity of The Reading Test

- Content Validity

In relation to the content validity, it is intended to see whether or not the tests are a good representation of the materials to be tested. The ways to find out this kind of validity are formulating the questions based on the aim of teaching reading for the second grade of senior high school students and choosing the topics of the texts concern on the report text that is provided in English book for second grade of senior high school.

Table 3.1. Table of Reading Comprehension Test Specification

No.	Skills of Reading	Item Number	Percentage of Item
1.	Identify the main idea	1., 5., 20., 28., 32., 33., 41., 43., 47.,	18%
2.	Specific information	6., 10., 13., 17., 25., 29., 37., 38., 44., 48.,	20%
3.	Reference	4., 8., 15., 18., 24., 27., 31., 39., 46., 49.,	20%
4.	Inference	3., 9., 12., 16., 19., 35., 22., 40., 45., 50.,	20%
5.	Vocabulary	2., 7., 11., 14., 21., 23., 26., 30., 34., 36., 42.,	22%
Total			100%

- Construct Validity

Construct validity is concerned whether the test is actually in line with the theory of what reading comprehension means (Hatch and Farhady, 1982). To make sure the test reflects the theory in reading comprehension, the researcher examined whether the test questions actually reflect the means of reading comprehension or not.

3.5.2. Validity of Vocabulary Mastery Test

- Content Validity

In vocabulary mastery test, the content validity was concerned on choosing some vocabularies that was used in the report text of reading test and in English book for second of senior high school.

Table 3.2. Table of Vocabulary Mastery Test Specification

No.	Word Class	Item Number	Percentage of Item
1.	Noun	16., 19., 20., 30., 36., 37., 40., 42., 44., 48., 49.,	22%
2.	Verb	1., 4., 5., 8., 10., 13., 14., 15., 22., 24., 26., 29., 32.,	26%
3.	Adjective	7., 11., 17., 18., 21., 27., 31., 33., 34., 38., 39., 46., 50.,	26%
4.	Adverb	2., 3., 6., 9., 12., 23., 25., 28., 35., 37., 41., 45., 47.,	26%
Total		50 items	100%

- Construct Validity

Construct validity examines whether or not the test actually is in line with the theory of what it means to know. A test can be considered valid in its construction if the tests item measure every aspect that suitable with the

specific objective of the instruction. In this case, the test was designed by nature and the concept of vocabulary.

3.5.3. Validity of Grammar Mastery Test

- Content Validity

In grammar mastery test, the content validity is grammar that is used in the report text of reading test.

Table 3.3. Table of Grammar Mastery Test Specification

No.	Tenses	Item Number	Percentage of Item
1.	Part of Speech	1., 18., 27., 40., 48.,	10%
2.	Noun Types	12., 22., 26., 39., 44.,	10%
3.	Verb Types	15., 23., 35., 43., 47.,	10%
4.	Verb Forms	9., 19., 21., 29., 31.,	10%
5.	Pronouns	7., 33., 34., 42., 49.,	10%
6.	Adjectives	3., 13., 29., 41., 46.,	10%
7.	Adverbs	14., 24., 32., 38., 50.,	10%
8.	Prepositions	8., 11., 30., 36., 45.,	10%
9.	Articles	6., 16., 20., 28., 36.,	10%
10.	Conjunctions and Conditionals	2., 10., 17., 25., 37.,	10%
Total		50 Items	100%

- Construct Validity

Construct validity examines whether or not the test actually is in line with the theory of what it mean to know. A test can be considered valid in its construction if the tests item measure every aspect that suitable with the

specific objective of the instruction. In this case, the test was designed by nature and the concept of grammar.

3.6. Reliability of The Instruments

Shohamy (1985) states that reliability refers to the extent to which the test is consistent in its score. It can also give an indication of how accurate the test score. The researcher used split-half method to estimate the reliability of the test, since the formula is simple. It is because (1) it avoid troublesome correlation and (2) in addition to the number of item in the test, it involves only the test, mean, and standard deviation, both of which are normally calculated anyhow as a matter of routine. To measure the coefficient of the reliability between odd and even group, the research uses the Pearson Product Moment formula as follows:

$$r_{xy} = \frac{\sum XY}{\sqrt{[\sum X^2][\sum Y^2]}}$$

In which,

r_{xy} : 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)

X^2 : square of X

Y^2 : square of Y

(Lado, 1997)

Before get the final data, the researcher gave the tryout of vocabulary and grammar mastery and reading comprehension test. Then, the researcher used the formula to calculate the reliability of the vocabulary and grammar mastery and reading comprehension test in order to know the items in the test show the consistency in its score. The test items are reliable when the value closes to 1.

The criterion of reliability as follow:

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

To know the coefficient correlation of whole items, the researcher used Spearman Brown's Prophecy Formula (Hatch and Farhady, 1982). The formula is as follows:

$$rk = \frac{2 r_{xy}}{1 + r_{xy}}$$

In which,

rk : the reliability of the test

r_{xy} : coefficient of reliability between the first half and the second half items

The researcher found that the reliability of reading comprehension, vocabulary mastery and grammar mastery try out test were high reliability, 0.99 (on reading

comprehension), 0.98 (on vocabulary mastery), and 0.99 (on grammar mastery). (See Appendices 14, 19, and 24).

3.7. The Level Difficulty of the Instruments

Difficulty level relates to how easy or difficult the item is from the point of view of the students who take the test. It is important since the items, which are too easy (that students get right) can tell us nothing about differences within the test population. To see the level difficulty, the research used the formula as follow:

$$LD = \frac{U + L}{N}$$

in which:

LD : Level of Difficulty

U: the total of correct answer of the higher group

L: the total of correct answer of the lower group

N: the total of students following the test

The criteria are:

- Less than 0.30 = difficult
- 0.30-0.70 = average (good item)
- More than 0.70-1.00 = easy

(Shohamy, 1985;75)

The researcher has found that there were 5 items (8.3%) were difficult, 50 items (83.33%) were average, and 5 items (8.3%) were easy in reading comprehension test, 2 items (2.86%) were difficult, 62 items (88.57%) were average, and 6 items (8.57%) were easy in vocabulary mastery test, and 2 items (2.86%) were difficult, 65 items (92.86%) were average, and 3 items (4.28%) in grammar mastery test. However, the researcher omitted all the difficult and easy items to get good items test. (See Appendices 15, 20, and 25).

3.8. The Discrimination Power of the Test Item

This index refers to the extent to which the item differentiates between high and lower levels students on the test. A good item according to this criterion is one that good students do well on and bad students fail. To see the discrimination index, the researcher uses the following formula:

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

In which,

DP: Discrimination Power

U: the total of correct answer of the higher group

L: the total of correct answer of the lower group

N: total number of students

The criteria are:

1. If the value is positive discrimination – a large number or more knowledgeable students than poor students get the item correct. If the value is zero, it means that there is no discrimination.
2. If the value is negative, it means that more low students than high level students get the item correct.
3. In general, the higher, the discrimination index, the better. In classroom situation most items should be higher than 0.20 indexes.

(Shohamy, 1985)

Based on the criteria of the try out test that analyzed by the researcher (See Appendices 15, 20, and 25), the researcher concluded that 10 items (16.67%) were poor and 50 items (83.33%) were good or positive discrimination in reading comprehension test, 16 items (22.86%) were poor and 54 items (77.14%) were good in vocabulary mastery test, and 1 items (1.42%) was no discrimination, 7 items (10%) were poor, and 62 items (88.58%) were positive discrimination or good in grammar test.

After counting the level difficulty and discrimination power of each items, the researcher found that 10 of 60 items of reading comprehension test, 17 of 70 items of vocabulary mastery test, and 12 of 70 items of grammar mastery test could not get good test items and should be dropped.

3.9. Scoring

In scoring students' result of the test, the researcher used Percentage Correct. The ideal highest score is 100.

The score of vocabulary and grammar mastery and reading comprehension calculated by using as follow:

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

Where:

S = the score of the test

r = the total of the right answer

n = the total of test items

(Henning,1987)

3.10. Procedures

The procedure of this research explained as follow:

1. Constructing the instruments for getting appropriate test items.
2. Selecting the population and sample for getting appropriate test items.
3. Trying of two kinds of the instruments (test of vocabulary and grammar mastery and reading comprehension) in order to check its validity, reliability, difficulty level and discrimination power.
4. Identifying which test items that appropriate for getting the data (see from the difficulty level and discrimination power).
5. Giving those tests to the students in order to identify the vocabulary mastery, grammar mastery and reading comprehension achievement.

6. Scoring the students' test in order to find how far the students can answer all the test items.
7. After getting all the data, the researcher will analyze the data by using SPSS to know the result.
8. The last, making the conclusion of the research.

3.11.Data Analysis

The researcher collected the data by looking at the result of test of vocabulary mastery, grammar mastery and reading comprehension to find out the result of students' vocabulary mastery, grammar mastery, and reading comprehension achievement. The result of the test was in form of score or interval data. After getting the result, the researcher analyzed the correlation between students' vocabulary and grammar mastery and their achievement in reading comprehension. The researcher analyzed the data by using the formula as follows:

$$r_{xy} = \frac{N\sum XY - \sum X \sum Y}{\sqrt{N\sum X^2 - (\sum X)^2} \sqrt{N\sum Y^2 - (\sum Y)^2}}$$

rx_y: correlation value

N: number of students

X: independent variable (vocabulary and grammar mastery)

Y: dependent variable (reading comprehension)

In order to find out the correlation between vocabulary and grammar mastery in their achievement in reading comprehension, the formula is

$$Y' = a + b_1X_1 + b_2X_2 + \dots + b_n$$

In which,

Y' : dependent variable

X₁ and X₂ : independent variables

a: constant (Y' value if X₁, X₂, X_n=0)

b: regression coefficient

but, the researcher practically used pearson product moment in SPSS 16.0 (Statistical Program for Social Science).

3.12. Hypothesis Testing

After collecting the data, the researcher analyzed them in order to find the correlation of students' vocabulary and grammar mastery and their achievement in reading comprehension. To determine whether the first hypothesis is accepted or rejected, the following criteria for acceptance:

$$H_{01} = r_{\text{value}} < r_{\text{table}}$$

$$H_1 = r_{\text{value}} > r_{\text{table}}$$

$$H_{02} = r_{\text{value}} < r_{\text{table}}$$

$$H_2 = r_{\text{value}} > r_{\text{table}}$$

$$H_{03} = r_{\text{value}} < r_{\text{table}}$$

$$H_3 = r_{\text{value}} > r_{\text{table}}$$

The hypothesis would be as follow:

H₀₁ : “There is no correlation between students’ vocabulary mastery and their achievement in reading comprehension”

H₁ : “There is correlation between students’ vocabulary mastery and their achievement in reading comprehension”

H₀₂: “There is no correlation between students’ grammar mastery and their achievement in reading comprehension”

H₂: “There is correlation between students’ grammar mastery and their achievement in reading comprehension”

H₀₃: “Both of students’ vocabulary and grammar mastery has no simultaneous correlation with their achievement in reading comprehension”

H₃: “Both of students’ vocabulary and grammar mastery has simultaneous correlation with their achievement in reading comprehension”