

CHAPTER III

RESEARCH METHOD

This chapter explains about the research method in the present study. It consists of approach and type of the study, place and time of the study population and sample, instrument of the study, data collecting procedure, normal distribution test, linear regression and the data analysis procedures.

A. Approach and Type of the Study

Approach of this study is quantitative because it uses objective measurement to gather numeric data that are used to answer questions or test predetermined hypothesis. Quantitative research is inquiry employing operational definition to generate numeric data to answer predetermined hypotheses or questions.¹ It may be classified as either experimental or non-experimental. Experimental research involves a study of the effect of the systematic manipulation of one variable(s) on another variable. The manipulated variable is called the experimental treatment or the independent variable. The observed and measured variable is called the dependent variable.

In non-experimental quantitative research, the writer identifies variables and may look for correlations among them but does not manipulate the variables.² Major forms of non-experimental research are ex post facto research, correlational research, and survey research. So this way, the present study belongs to non-

¹Donald Ary, et. al., 2010, *Introduction to Research in Education*,... p.648.

²*Ibid.*, p.26.

experiment quantitative research because it investigated the correlation between two variables; morphological awareness and writing ability.

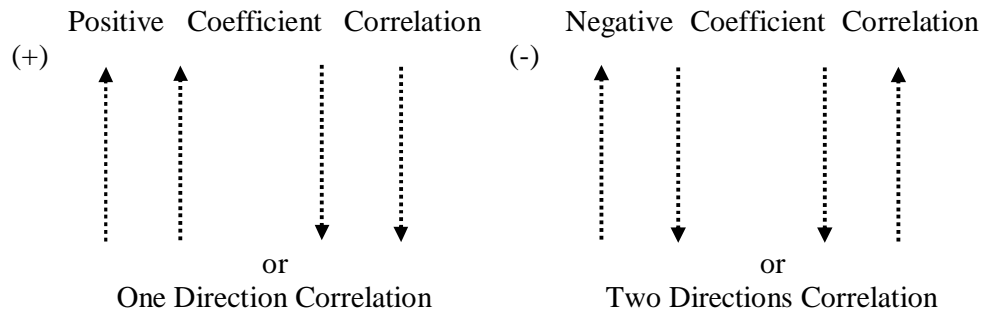
In this study, it used correlation design. This design was used to find out whether there is correlation, searched the level of correlation then the clarity obtained from the theory.³ According to Tony and Maggie, correlation studies are concerned with determining the extent of correlation between variables. They enable one to measure the extent to which variations in one variable are associated with variations in another the magnitude of the relation determined through the use of the coefficient of correlation.⁴ Correlation is simply the association between two variables.⁵ Correlation studies are used to look for relationship between variables. There are two possible results of a correlation study:

1. Positive correlations: Both variables increase or decrease at same time. A correlation coefficient close to + 1.00 indicate a strong positive correlation.
2. Negative correlations: indicates that as the amount of one variables increases, the other decreases (and vice versa). A correlation coefficient close to -1.00 indicates a strong negative correlation.

³Sambas Ali Muhidin and Maman Abdurahman, 2007, *Analisis Korelasi, Regresi, dan Jalur dalam Penelitian*, Bandung: Pustaka Setia, p.105.

⁴Dudley-evans Tony and JO st John Maggie, 1998, *Developments in English for specific Purpose*, Cambrigde: Cambrigde University press, p. 327.

⁵Roger Sapsford and Victor Jupp, 2006, *Data Collection and Analysis*, London: SAGE Publications Ltd, p.225.



Based definitions above, it can be concluded that correlation is to look for closeness of the correlation between two variable aspect that be related.⁶ In this case, it investigated the closeness of the correlation between morphological awareness and writing ability.

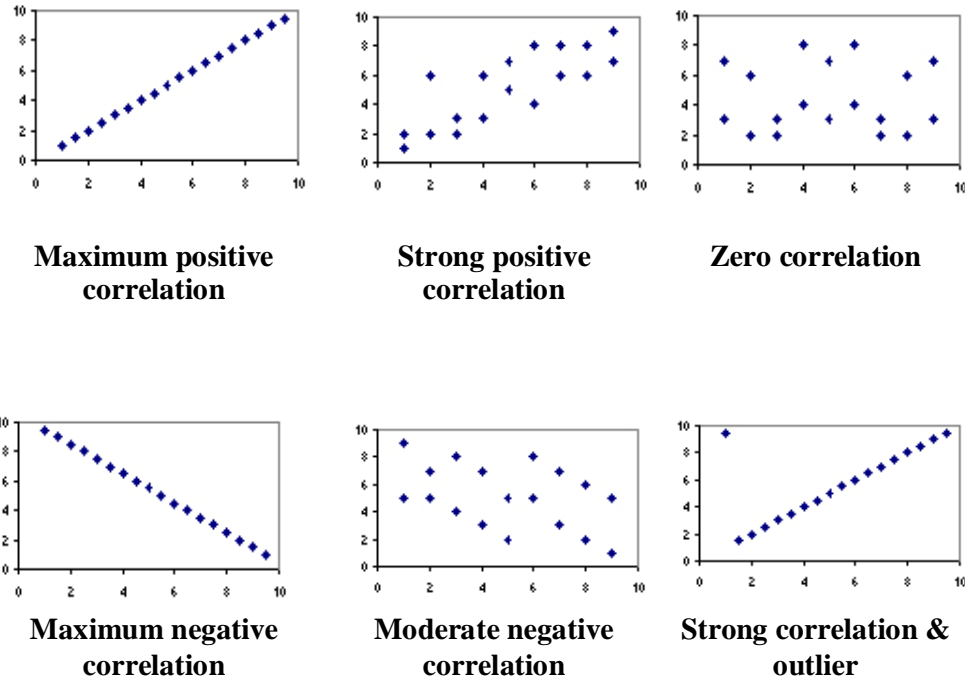
A scatterplot illustrates the direction of the correlation between the variables. A scatterplot with dots going from lower left to upper right indicate a positive correlation (as variable x goes up, variable y also goes up). One with dots going from upper left to lower right indicates a negative correlation (as variable x goes up, variable y goes down).⁷ A scatterplot of z scores also reveals the strength of the correlation between variables. If the dots in the scatterplot form a narrow band so that when a straight line is drawn through the band the dots will be near the line, there is a strong correlation between the variables. However, if the dots in the z score scatterplot scatter widely, the correlation between variables is relatively weak.⁸ The scatterplots below show how different patterns of data produce different degrees of correlation.⁹

⁶Roger Sapsford and Victor Jupp, 2006, *Data Collection and Analysis...* p.225.

⁷Donal Ary et. al., 2010, *Introduction to Research in Education...* p. 132.

⁸*Ibid.*

⁹Linear Correlation Coefficient, (Taken from) <http://stattrek.com/statistics/correlation.aspx>, (online on April 11, 2013).

Figure 3.1 The Scatterplots

As Arikunto stated, if the plots draw a straight line from an angle, it showed positive correlation between variable. If the plots draw a straight line from the right bottom side to the left corner up, it showed negative correlation between variable. Meanwhile, if the data spread irregularly, it means the data did not have correlation.¹⁰

B. Place and Time of the Study

The place of the current study is STAIN Palangka Raya, at Jl. G.Obos IX Palangka Raya Central Kalimantan. This study was conducted in Academic Year 2012/2013. About the time, this study was conducted on May 9 - July 9, 2013.

¹⁰Suharsimi Arikunto, 2002, *Prosedur Penelitian Suatu Pendekatan Praktik, (Edisi VI)*, Jakarta: PT. Asdi Mahastya, p.277-278.

C. Population and Sample

1. Population

Ary et al. stated that population is defined as all members of any well-defined class of people, events or object.¹¹ The population in the present study is sixth semester TBI students of STAIN Palangka Raya. There are 110 of sixth semester students that divided into three classes. It chose sixth semester students as the sample because in this semester English Phonology and Morphology subject has been being taught. Then, the students have enough learnt about writing because have taken Writing I , Writing II, Writing III, and Writing IV subjects. As the result, the sum of the population were 100 students because no all of sixth semester students have criterion as aforementioned.

2. Sample

According to Arikunto, sample is some or represent of population that is researched.¹² It is a group selected from population for observation in a study. About the number of sample, Bungin in *Metodologi Penelitian Kuantitatif* wrote a formula to calculate how many samples that will be taken in the research as follow:¹³

$$n = \frac{N}{N(d)^2 + 1}$$

¹¹Donald Ary et. al., 2010, *Introduction to Research in Education*,... p. 138.

¹²Suharsimi Arikunto, 2002, *Prosedur Penelitian Suatu Pendekatan Praktek*,... p. 131.

¹³Radiany in M. Burhan Bungin, 2005, *Metodologi Penelitian Kuantitatif*, Jakarta : Kencana Prenada Media Group, p. 105.

Where:

n = the number of sample

N = the amount of population

d = the precision ($a = 0.1$)

Based on the formula above, it calculated the number of samples as follow :

$$\begin{aligned}
 \mathbf{n} &= \frac{\mathbf{100}}{\mathbf{100 (0.1)^2 + 1}} \\
 &= \frac{\mathbf{100}}{\mathbf{100 (0.01) + 1}} \\
 &= \frac{\mathbf{100}}{\mathbf{1 + 1}} \\
 &= \frac{\mathbf{100}}{\mathbf{2}} \\
 &= \mathbf{50} \text{ students}
 \end{aligned}$$

Based on the calculation above, the number of sample in the present study were 50 students. It chose class B and C students of English Phonology and Morphology subject as the sample. There were 35 students of class B, and 35 students of class C that chosen by random. Meanwhile class A students that consist of 30 students as the subject of research instrument try out.¹⁴

¹⁴Based on present list of English Phonology and Morphology subset. (March 15, 2013).

D. Research Instruments

1. Type of research instrument

It used test as research instrument. The test consists of two kinds. They are morphological awareness test and writing ability test.

a. Morphological awareness test

There are many different tasks that have been used to measure morphological awareness skills. Tasks may have an oral or a written presentation and/or response. Different tasks require various amounts of knowledge. Tasks that involve more implicit or less conscious knowledge are generally known as morphological processing tasks. For example, in judgment tasks, participants are required to make a choice between a set of options by using their knowledge of morphology. Other types of tasks require students to produce words. The tasks that involve explicit knowledge of morphological structures are referred to as morphological awareness tasks and are often seen as a part of children's morphological knowledge. Morphological awareness skills can also be tested through morphological production or decomposition tasks, which also require explicit morphological awareness. In these tasks, students had to complete a sentence by using the morphologically complex word when given the base word.¹⁵

Kuo and Anderson in Katie Yan Yan Lam stated that studies on children's acquisition of morphology and morphological awareness in English have focused on the acquisition of three types of linguistically

¹⁵B.kelly Geier, 2010, "Morphological awareness, reading ability, and the reading of multi-morphemic words" *Thesis*, Ontario : Queen's University, p. 4-5. (Taken from) http://qspace.library.queensu.ca/bitstream/1974/5567/1/Geier_B_Kelly_20104MEd.pdf

complex words: inflections, derivatives, and compounds.¹⁶ In the present study, it used morphological analysis test which focus on analysis of complex words into inflectional morphemes and derivational morphemes. The student were asked to break word down into meaningful component and decide which one as the bound morpheme and which one as free morpheme, and mention the word type of bound morphemes (inflectional or derivational). For example:

No	Word	Free morphemes	Bound morphemes	Type of bound morpheme	
				Inflectional	Derivational
1.	Conception	concept	-ion,√.....

Some of words that would be analysis cited from the instrument of morphological awareness which Lisa Kay Maag used in her study.¹⁷ The morphological awareness test consists of 50 test items. Each test item consists of three or four morphemes (Appendix 9).

b. The writing ability test.

Writing ability test is used to measure students' ability in writing. There are some techniques for writing test. Weir in *Language Testing and Validation* discussed some example that have been constructed for specific

¹⁶Katie Yan Yan Lam, 2009, "The effects of morphological awareness on reading in Chinese and English among young chinese children", *Thesis*, Toronto : University of Toronto, p.7. (Taken from) <http://tspace.library.utoronto.ca/handle/1807/18085> (online on October 19, 2012).

¹⁷Lisa Kay Maag, 2007, "Measuring Morphological Awareness in Adult Readers Implications for Vocabulary Development",.. p.78.

students in specific contexts.¹⁸ The techniques are gap filling, open-ended essay tests, responding to given information, information transfer tasks and TOEFL new generation integrated writing task. In the current study, it used gap filling technique because the present study focused to investigate the students' ability in using correct words in writing. It asked the students to complete the missing words in an essay about certain topic. An essay has 50 words missing (Appendix 9).

The following table showed the content specification of the instruments which the items distributed to the students.

Table 3.1
The Content Specification of Research Instruments

No.	Variable	Sub-variable	Indicators	Number of Questions
1.	Morphological awareness	a. Compound words b. Complex words	The students able to: a. break word down into smallest unit morphemes b. identify type of morphemes c. classify morphemes into inflectional and derivational	a. compound words : 6, 8, 23, and 34. b. complex words : 1, 2, 3, 4, 5, 7,9,10,11, 12, 13, 14,15, 16, 17, 18, 19, 20, 21, 22, 24, 25,26,27, 28, 29,30,31,33, 35, 36, 37, 38, 39, 40, 41, 42, 43,44, 45,46, 47, 48, 49 and 50.

¹⁸Cyril J. Weir, 2005, *Language Testing and Validation*, New York: Palgrave Macmillan, p.162. (Taken from) <http://rnirumala.files.wordpress.com/2012/11/language-testing-and-validation.pdf> (online on April, 2013).

2.	Writing ability	a. morphological productivity in sentence	The students able to use the correct word in essay based on morphological rules.	1-50
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2. Research Instruments Validity

An instrument is considered being a good one if it meets some requirements. One of them is validity. Validity was defined as the extent to which instrument measured what it claimed to measure.¹⁹ The validity of a test is the extent to which it measures what is supposed to measure and nothing else. Every test, whether it is a short, informal classroom test or a public examination, should be a valid the constructor can make it. The test must aim to provide a true measure of a particular skill that it is intended to measure, to the extent that is measures external knowledge and other skills at the same time, it will not be a valid test. Content, criterion, and construct validity became three main foci for the test validation.²⁰

Content Validity referred to a test consisting of adequate content to measure the desired ability or trait.²¹ Content validity refers to the degree to which the sample of items, tasks, or questions on a test are representative of some defined universe or domain of content. In the present study, morphological awareness test consist of 50 test items. Each item consists of three or four morphemes. The students were asked to identify the morphemes

¹⁹Donald Ary et. al., 2010, *Introduction to Research in Education*,... p. 225.

²⁰Peggy O'neil, Cindy Moore, and Brian Huot, 2009, *A Guide to College Writing Assessment*, Utah: Utah State University Press, p.26.

²¹*Ibid.*

into free morphemes and bound morphemes. Then, they also classified the type of bound morpheme into derivational or inflectional morphemes. Meanwhile, writing ability test consist of 50 test items also. It was presented by multiple choice complement. The students are asked to choose which one of choices as the best answer.

Criterion validity made sure that performance on an examination was related to other performances or valued measures. Criterion validity has been the fount of many different types of validity referred to throughout the literature, including face, predictive, and concurrent. In the present study, the instrument was valid based on face validity because the instruments seem suitable to measure morphological awareness and writing ability. In other words, morphological awareness test measure the student morphological awareness, not measure students social awareness. Then, writing ability test measures the students' ability in writing. It is not measure students' speaking ability or students' reading comprehension. The instrument, especially morphological awareness instrument, is valid based on concurrent validity. Morphological awareness instrument in the present study is concurrent with the other morphological awareness instrument that used by previous study, such as the morphological awareness instrument that constructed by Lisa Kay Maag for her study. It was formulated into multiple choice test items. Meanwhile, morphological awareness instrument in the present study was formulated into word analyze test.

The last, construct validity introduced a new concept for validity theory and test validation. Construct validation introduced the question of whether or not a test was a worthy construct of the ability or trait being measured.²² So this way, it tried to match each of the items test with the syllabi that is used by English Education Study Program of STAIN Palangka Raya especially syllabi of English Phonology and Morphology subject in the formulating of test items. The purpose is to make the test is appropriate with the lesson that the students accepted in the moment when the research is done.

Based on syllabi, there are several topic discussions or basic competences. They are describing the definition of morphology, identifying and classifying the types of morphemes, how to identify and classify the lexical and functional morphemes, and how to identify and analyze the process of morphemes.²³ The instrument in the present study especially morphological awareness test is created based on that materials especially identify and analyze the process of morphemes. It's mean the instrument has construct validity.

Beside three types of validity, it also measured item validity (Appendix 6) to measure each item validity of the instrument, it used the formulation of Product Moment by Pearson as follows.²⁴

²²Peggy o'neil et al., 2009, *A guide to College Writing Assessment*,... p.26.

²³Syllabi of English Phonology and Morphology subject of TBI of STAIN Palangka Raya.

²⁴Donald Ary, et al., 2010, *Introduction to Research in Education*,... p.123.

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

Where:

r_{xy} = index number correlation “r” product moment

N = number of sample

$\sum XY$ = amount of multiplication result between X score Y score

$\sum X$ = amount of all X score

$\sum Y$ = amount of all Y score.

Furthermore, it was calculated using Test-t calculation below:

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

Where:

t = The value of $t_{observed}$

r = The coefficient of correlation of the result of $r_{observed}$

n = Number of students.²⁵

The distribution of t_{table} at alpha 5% and the degree of freedom (n-2)

with the measurement of validity using this criteria:

$$t_{observed} > t_{table} = \text{Valid}$$

$$t_{observed} < t_{table} = \text{Invalid}$$

²⁵Riduwan, 2004, *Metode dan teknik Menyusun Tesis*, Bandung: Alfabeta, p.110.

3. Research Instruments Reliability

The good instrument in a study is not only the instrument which has validity but also reliable to measure what suppose to be measured. Reliability of measuring instrument is the degree of consistency with which it measures whatever it is measuring.²⁶ In other words, reliability refers to the consistency of the test scores. Reliability is a necessary characteristic of any good test, for it to be valid at all a test must first be reliable as a measuring instrument. If the test is administered to the same candidates on different occasions (with no language practice work taking place between these occasions) then the extent that it produces differing result, it is not reliable.

There are several ways of estimating the reliability of a test. The three basic methods as follow:

- a. Test-retest method, which indicates the stability of the test scores over some given period of time
- b. Equivalent-form method, which indicates the consistency of the test scores over different forms of the test.
- c. Internal consistency method, which indicates the consistency of test scores over different parts of the test.²⁷

In addition to test the internal consistency of the whole of morphological awareness instrument can be estimated by using split-half method. The calculation steps in scoring are:

²⁶Donald Ary et al., 2010, *Introduction to Research in Education*,... p.236.

⁹¹Norman E.Gronlund, 1985, *Measurement and Evaluation in Teaching (Five Edition)*, New York: Macmillan Publishing Company, p.15.

- a. Dividing scores of test items into two parts. Because there are 60 test item for writing ability, so the test items number 1-30 become the first part (X), and test item number 31- 60 become the second part (Y).
- b. Calculating X², Y², XY, and find the correlation coefficient of X and Y.
- c. After the coefficient correlation is found, calculate the internal reliability or internal consistency of whole test by using *Spearman Brown* formula as follow²⁸

$$r_{11} = \frac{2 \cdot rb}{1+rb}$$

- d. The last, consulting the coefficient of reliability to r_{table} . If the coefficient of reliability is higher than r_{table} , its mean the instrument is reliable.

In other hand, to measure the reliability of writing ability instrument it used KR-21 formula, as follow:²⁹

$$r_{ii} = \left[\frac{k}{k-1} \right] \left[1 - \frac{\bar{x}(k-\bar{x})}{k \cdot s^2} \right]$$

Where:

- r_{11} =Instrument Reliability
- k = the number of items in the test
- \bar{x} = the mean score on the test for all the testers
- s^2 = the standard deviation of all the testers' score.

²⁸Sugiyono, 2004, *Statistika untuk Penelitian*, Bandung:Alfabeta, p.278.

²⁹Riduwan, 2004, *Metode dan Teknik Menyusun Tesis*,... p.120.

From the measurement of instrument try out reliability, it is known that the whole numbers of test items are reliable and can be used as the instrument of the study (Appendix 7).

4. Index of Difficulties

It is used to know the level of difficulties of test (Appendix 8). The formula as follow :

$$F.V = \frac{R}{N}$$

Where: F.V = facility value (index of difficulties)

R = represent of number of correct answer

N = the number of students taking the test.³⁰

The criteria of index difficulty such as:

F.V : 0, 00-0, 30 difficult

: 0, 30-0, 70 Fair

: 0, 70-1, 00 Easy.³¹

5. Research Instruments Try Out

Try out in the present study was used to measure are the instruments suitable for measuring students' morphological awareness and writing ability. The aim of instrument try out is to know are the test instruments relevant to be given to the students. It chose class A students of English Phonology and Morphology subject which consisted of 30 students as the subject of the instruments try out. Next, it analyzed the result of instrument try out to gain

³⁰J.B. Heaton, 1974, *Writing English Language Test*, San Fransisco: Longman, p. 134.

³¹Suharsimi Arikunto, 2002, *Prosedur Penelitian Suatu Pendekatan Praktek*,... p. 167.

the information about instrument validity, instrument reliability, and index difficulty of the test (Appendix 6, 7, and 8).

The procedures of the instrument that was used to test the students consisted of:

- a. planning; it consists of purpose formulation, determining the variable and categorizing the variable
- b. the writing of test items
- c. editing; it consists of work basic, answer key. etc.
- d. conducting the research instrument try out
- e. analyzing the result of research instrument try out.

In the try out of the instrument, it gave two kinds of tests, morphological awareness test and writing ability test. Morphological awareness test consist of sixty test items. But the result of try out showed that there were eight test items was not valid. The writing ability test also consists sixty test items. The test was constructed in the gap filling form. The result showed that there were ten test items of writing ability instrument were not valid. In this case, it also tried another writing ability test. It asked some students to write an essay of the certain topic about 400 words. The results have shown that gap filling form was more effective to measure the students' ability in using correct word in their writing than writing a particular topic in essay. In writing an essay, almost of the students wrote only several sentences although it asked them to write an essay about 400 words. They also wrote same word in many sentences. As the result, it chose gap filling form in writing test.

E. Data Collection Procedure

Permission to carry out the research is first obtained from the State Islamic College of Palangka Raya, The leader of English Study Program, the teacher, and subject of the study. To collect the data acquire in this research, it used some steps. They are:

1. Preparation
 - a) chose the place of the study.
 - b) asked permission to carry out this study.
 - c) created the research instrument
 - d) conducted the instrument try out in the class that has been determined
 - e) analyzed the result of research instrument try out.
2. Implementation
 - a) gave the students two kind of tests, morphological awareness tests and writing ability test.
 - b) asked the students to answer the tests. The time is 90 minutes.
 - c) checked the students answer and give the score.
 - d) analyzed the data.

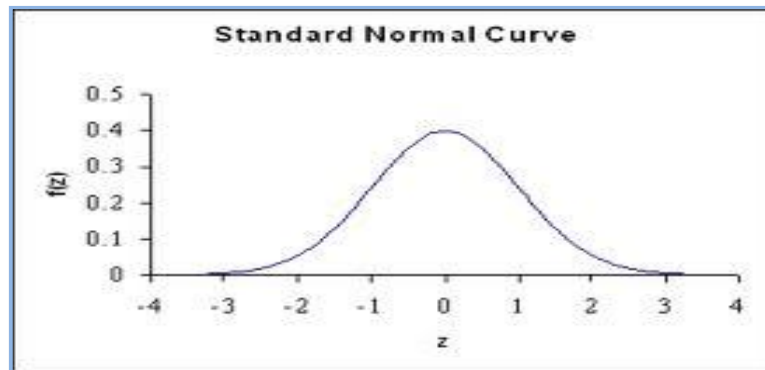
F. Normal Distribution Test

Before going to discuss about data analyzing, the important thing that should be done by the researcher is testing of data normality distribution. It is purposed to decide which statistic analyze type that will be used in analyzing process. If the data have normal distribution, the researcher use parametric statistic. On the other

hand, if the data do not have normal distribution, the researcher should use non-parametric statistic in analyzing process.

Data will make normal distribution if the sum of data under and upper the mean are same. It's also about its standard deviation.³² If the points of scores and its frequency are correlated, it will form a normal curve or standard curve as follow:

Figure 3.2
The Standard Normal Curve



The normal curve categorized into six parts. Three parts are upper the mean, and three part under the mean. The wide of each part are 2.7%, 13.53%, 34.13%, 34.13%, 13.53%, and 2.7%.³³

There are some ways to calculate data normal distribution, opportunity paper, kurtosis coefficient, percentile kurtosis coefficient, *Chi Square* and *Lillieford*.³⁴ It used chi-Square test because it suitable for big sample, the sample > 30 . Second,

³²Sugiyono, 2004, *Statistika untuk Penelitian*,... p.70.

³³*Ibid.* p.77.

³⁴Husaini Utman, and Purnomo Setiady Akbar, 1995, *Pengantar Statistika*, Jakarta : Bumi Aksara, p.109-110.

the data can be grouped in several intervals. The chi-square formula used on these data is:³⁵

$$X^2 = \sum \frac{(fo-fe)^2}{fe}$$

Where:

X^2 : Chi Square

\sum : sum of

fo : the Observed Frequency in each category

fe : the Expected Frequency in the corresponding category

Meanwhile, it used following formula to calculated fe .³⁶

$$fe = \frac{(\sum fk) \times (\sum fb)}{\sum T}$$

where :

fe = expected frequency

$\sum fk$ = total of frequency in a column

$\sum fb$ = total frequency in a row

$\sum T$ = total of frequency in column and row.

To determine whether chi square value is significance, consult the table of X^2 value. The number of degree of freedom is based on the number of observations that are free to vary once certain restrictions are place of the data. If

³⁵Riduwan, 2004, *Metode dan Teknik Menyusun Thesis*,... p.130.

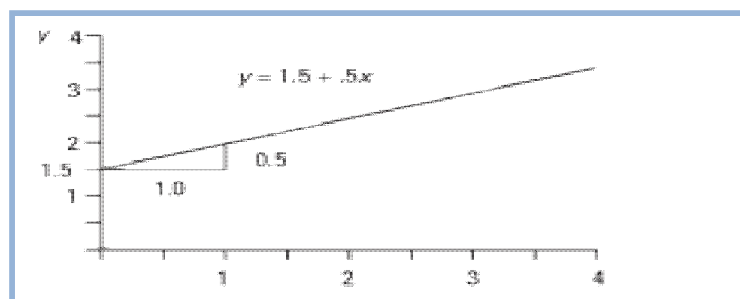
³⁶*Ibid.*

X_2 value is higher than X_2 table, it means the data have abnormal distribution. On the other hand, if X_2 value is lower than X_2 table, it means the data have normal distribution.³⁷ After calculate of X_2 , the result is shown in a scatterplot. The standard that the data have normal distribution is the data points are spread around the straight line of the plot.³⁸

G. Linear Regression

One of the condition before analyze the data by using product moment correlation is both of variable has linear association.³⁹ To describe the linear association between quantitative variables, a statistical procedure called regression often is used to construct a model. Regression is used to assess the contribution of one or more “explanatory” variables to one “response” variable. It also can be used to predict the value of one variable based on the values of others. When there is only one independent variable and when the correlation can be expressed as a straight line, the procedure is called simple linear regression. Figure 1 gives an example of the linear regression line.

Figure 3.3. A Straight Line of Linear.



³⁷Sugiyono, 2004, *Statistika untuk Penelitian*,... p.79.

³⁸Singgih Santoso, 2007, *Menguasai Statistik di Era Informasi dengan SPSS 15*, Jakarta: Elex Media Komputindo, p.155.

³⁹Hartono, 2011, *Statistik Untuk Penelitian*,... p.157.

Exploring linear data used to understand the data. For some relation there are clearly an independent, or operating, variable and a dependent, or response, variable — for example, time and distance. The choice when fitting lines does not always depend on the physical relation between the operating and response variables.⁴⁰ Any straight line in two-dimensional space can be represented by this equation:⁴¹

$$\hat{Y} = a + bX$$

where :

- \hat{Y} : the variable on the vertical axis,
- x : the variable on the horizontal axis,
- a : the y -value where the line crosses the vertical axis (often called the intercept), and
- b : the amount of change in y corresponding to a one-unit increase in x (often called the slope).

Where \hat{Y} is the variable on the vertical axis, X is the variable on the horizontal axis, a is the Y -value where the line crosses the vertical axis (often called the intercept), and b is the amount of change in y corresponding to a one-unit increase in X (often called the slope). The coefficient a and b can be calculated by the following formula:⁴²

⁴⁰Exploring Linear Data. (Taken from) <http://illuminations.nctm.org/LessonDetail.aspx?id=L298>. (online on March 21, 2013).

⁴¹Hartono, 2011, *Statistik untuk Penelitian*,...p. 160.

⁴²*Ibid.*

$$a = \frac{(\sum Y)(\sum X^2) - (\sum X)(\sum XY)}{n\sum X^2 - (\sum X)^2}$$

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

If the coefficient b is known at the first, coefficient a can be calculated by:⁴³

$$a = \bar{Y} - b\bar{X}$$

where :

\bar{Y} and \bar{X} are two sample mean

After calculated the data by using formula above, the result was presented in a figure. The data are named by linear if the data points spread and draw a straight line. On the other hand, if the data points spread disorderly and do not draw a straight line, it means the data do not have linear or non-linear.⁴⁴ Regression can be used to draw conclusions about populations based on samples randomly drawn from those population.

H. Data Analysis Procedures

To analyze the data of the research, it has some steps. They are:

1. Collecting the data

In the first step, it collected the data about the morphological awareness and writing ability. So, it gave the test to the subject of the study.

⁴³Hartono, 2011, *Statistik untuk Penelitian*,... p.160.

⁴⁴*Ibid.*, p.159.

2. Identifying the data

In this step, it checked the correct and incorrect answers of test.

3. Classifying the data

It made classification of the data. There are two kinds of data; morphological awareness test scores and writing ability test scores.

4. Analyzing the data

To analyze the data, it used the formula as below:

- a. Calculated the students' score

It calculated the scores by using formula:

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

Where:

S = students' score

n = number of true answer

N = number of test items.

- b. Find out the correlation coefficient

To find out the correlation coefficient of the morphological awareness and writing ability, it used the formula of Pearson Product Moment (PPM) as bellow;

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

Where :

r_{xy} = index number correlation “r” product moment

N = number of sample

$\sum XY$ = amount of multiplication result between X score Y score

$\sum X$ = amount of all X score

$\sum Y$ = amount of all Y score.⁴⁵

c. Make interpretation

After it found the index number correlation r_{observed} , it made interpretation by consultation with “ r_{table} ”. In the first step, it found degree of freedom. Degree of freedom (df) is the number of observation free to vary around a constant parameter. Each inferential statistic has a defined procedure for calculating its degree of freedom, which are used to determine the appropriate critical values in statistical tables for determining the probabilities of observed statistics.⁴⁶ It found the result of index correlation number “r” product moment toward the table of “r” product of result with seeking the degree of freedom (df) with the formula as follows:

⁴⁵Anas Sudijono. 2003. *Pengantar Statistik Pendidikan*, Jakarta: Raja Grafindo Persada, p.94.

⁴⁶Donald Ary et. al. 2010. *Intoduction to Reseasrch in Education*,... p. 640.

$$df = N - nr$$

where :

df = degrees of freedom

N = Number of case

nr = the amount of variable.⁴⁷

Next, it checked the table of product moment index that created by Pearson to find the degree of freedom significance level. It is used to decide which one hypothesis is accepted, and which one is refused. If “ r ” observe value is higher than “ r ” product moment index, H_a is accepted and H_o is rejected. Meanwhile, if the “ r ” observe is lower than “ r ” product moment index, H_o is accepted and H_a is rejected.

To know contribution variable X to variable Y, it used the following formula:

$$KP = r^2 \times 100 \%$$

Where:

KP = determinant coefficient score

r = correlation coefficient score⁴⁸

5. Evaluating

This step evaluated the result of the study. It discussed about the factors that influence the result of the study and the relation of the theory and the

⁴⁷Anas Sudijono, 2003, *Pengantar Statistik Pendidikan*,... p.103.

⁴⁸Riduwan, 2004, *Metode Menyusun Tesis*,... p.138.

result of the study. It found the evidence that corroborate or disagree with the theory that morphological has role in English skills especially writing ability.