CHAPTER III
RESEARCH METHOD

In this chapter, the writerpresents research type, research design, variables of the study, population and sample, reserach instruments, technique for collecting data and technique for analyzing data.

A. Research Type

This study is classified into quantitative research. "Quantitative research deals with question of relationship, cause and effect, or current status that researcher can answer by gathering and statistically analyzing numeric data. It can be further classified as experimental and non-experimental"[1].

It is the study which compared the vocabulary mastery between the students social science class and nature science class of eleventh grade students of SMAN 1 Kapuas Hilir, in order to find the similarities and the differences. The writer found of casual-effect based relationship or casual comparative research (Expost Facto research).

In this study the writer took the eleventh graders of SMAN 1 Kapuas Hilir as subject of the study. The subjects are divided into two groups based on the student social science class and nature science class. Then the two groups are tested to know the differences on their English vocabulary mastery.

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[1]DonalAry, Lucy Cheser Jacobs, AsgharRazavieh, & Chris Sorensen, *Introduction to Research in Education*,8th ed, New York:Wadswroth/Cengage Learning, 2010, p. 26.

B. Research Design

The writer used th 32) method to do this research. Ex Post Facto research is a type of research that attempts to determine the causes for, or consequence of, differences that already exist in groups of individuals[2]. In doing this research, the writer selected students where their social science class and nature science class from randomly and then placed the chosen students into one of two groups, it based on social science class and natural science class. The group received the same tests based on their syllabus of English subject then the writer compared the result of their tests.

C. Variable of the Study

There were two free variables (independent X1 and X2) in this study they are as follow:

1. Independent variable X1 is the English vocabulary mastery of social science class (IPS).
2. Independent variable X2 is the English vocabulary mastery of natural scince class (IPA).

D. Population and Sample

[2]*Ibid,* p. 331.

1. **Population**

Population is the larger group to which a researcher wishes to generalize, it includes all members of a defined class of people, events, or objects[3]. Population of this research is the eleventh of grade students SMAN 1 Kapuas Hilir. The population this study is 80 students, 40 students of social science class and 40 students of natural science class.

2. **Sample**

Sample is the process of selecting a portion of the population to represent the entire population is known as sample.[4] Sample of this research is the eleventh of grade students of social science clas and students of natural science class at SMAN 1 Kapuas Hilir. The writer took all of the population as the sample of the research.

Table 3.1 Number of Sample.

STUDENTS	**RESPONDENTS**
SOCIAL SCIENCE CLASS	40
NATURE SCIENCE CLASS	40
TOTAL	80

E. Research Instrument

[3]DonalAry, Lucy Cheser Jacobs, AsgharRazavieh, & Chris Sorensen, *Introduction to Research in Education*,8th ed, New York:Wadswroth/Cengage Learning, 2010, p. 647.

[4]*Ibid*, p. 148.

In this study, the data collection is conducted by writing test. The data need to prove and support this study. By this collecting data, the researcher can compare the English vocabulary mastery between the students social science class and natural science class at eleventh grade of SMAN 1 Kapuas Hilir. There is an instrument that is used in this study, it is writing test.

1. Test

Test is a systematic procedure for measuring a sample of behavior presumed to represent an educational or psychological characteristic. The main data of this study is the data of the students' English vocabulary mastery. In order to get the data, the writer conducted a test. It is conducted after the writer measured the validity and the reliability of the test instrument.

The test is constructed in the form of multiple choices which consisted of 50 items test.[5]19 items test of noun, 11 items test of verb, and 9 items test of adjective, 11 items test of adverb as shown in table 3.2. The writer took these four kinds of vocabulary because they are included as four main forms of word.

Table 3.2 The Content Specification of Test Items

No	INDICATORS	NUMBER
1	Noun	19

[5]Marianne Celce and Murcia, Teaching English as a Second of Foreign Language((Third Edition), Amerika: United States of Amerika,2001,p.532

2	Verb	11
3	Adjective	9
4	Adverb	11
TOTAL		50

According to Murcia, the writertook the test to know the differences in mastering vocabulary of students social science class and nature science class using the form as four main forms of word, they are noun, verb, adjective and adverb.

2. Instruments of Try Out

The writer tried out the test instrument before it is applied to the real sample in the study. The tried out test is given to the students social science class and natural science class. In this case, the students are assigned to do a vocabulary test which consist of four parts; Noun, Verb, Adjective and Adverb. They are required to match the words with it suitable meaning in the questions. Then, the writer gave score and analyzed data obtained to check the validity, reliability and index of difficulty of the instrument. There are some procedures done by the writer in carrying out the try out as follow:

a. The writer prepared the test instrument.

b. The writer gave try out to the respondents at eleventh graders of (social science class and natural science class). They are the eleventh graders students in the 2014/2015 academic year at SMAN-1 Kapuas Timur.

c. The writer collected the answers and gave score to the respondents.

d. The writer calculated the result of the test.

e. The writer analyzed the data obtained to know the instrument validity, instrument reliability, and index of difficulty.

3. Research Instruments Validity

Validity is defined as the extent to which scores on a test enable one to make meaningful and appropriate interpretations.[6]

The validity of the test material in this research would be checked by content validity. It is a form of validity which is based on the degree to which a test adequately and sufficiently measures the particular skill or behavior is set out to measure.

a. Content validity

"Content validity is to have teachers or subject matter experts examine the test and judge whether it is an adequate sample of the content and objectives to be measures".[7] The course objective can be found on appendix.

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[6]DonalAry, Lucy Cheser Jacobs, AsgharRazavieh, & Chris Sorensen, *Introduction to Research in Education*,8th ed, New York:Wadswroth/Cengage Learning, 2010, p. 224.

[7]*Ibid*, p. 235.

b. Contruct validity

A test is said tp have content validity if its content constitutes a representative sample.[8] It refers to the extent to which the instrument represents the content of interest. In the other words, it is concerned with the question how well does the content of the instrument represent the entire universe of content which might be measured.[9]

4. Research Instruments Realibility

The writer examined the reliability of the item by using Kuder-Richardson formula 20 (K-R 20), which is based on the proportion of correct and incorrect responses to each of the items on a test and the variance of the total score. The formula is :

$r_{xx} = \frac{K s_x^2 - \bar{X}\ (K - \overline{X})}{s_x^2 (K-1))}$

where :

r_{xx} = reliability of the whole test

K = number of items in the test

s_x^2 = variance of scores on the total test (squared standard deviation)

$\bar{X}$= mean of the scores

F. Data CollectionProcedures

[8]*Ibid*, p. 410.
[9]*Ibid*, p. 411

The writer used interval data. Interval data is a data of measurement that orders objects or events and has points equidistant from one another[10].To collect the objective data, the writer applies the steps as follows:

1. The writer observed the class.
2. The writer determined the class.
3. The writer gave the try out to the students.
4. The writer gave the test to the students.
5. The writer gave score to the students' answer.
6. The writer analyzed the obtained data using t-test.
7. The writer interpreted the analysis result.
8. The writer concluded the English vocabulary mastery of studentssocial science class and nature science class, whether there is difference or not, it based on the obtained data.

G. Data AnalysisProcedures

The writer analyzed the data in three steps. There are individual scores, Conversion of Percentage Ranges, and then match t-test. To analyze the data, the writer apllied the steps as follows:

1. Thewriter collected the main data (score);

[10]*Ibid*, p. 102.

2. Before the writer arranged the distribution of frequency table, the writer determined the Range of Score, the Class Interval, and Interval of Temporary, using formula[11]:

   a. The Range of Score (R)

      $R = H - L + 1$

      Where :

      H = Highest score

      L = Lowest score

3. The writer arranged the collected score into the distribution of frequency of score table.
4. The writer calculated Mean, Median, and Modus.

   a. Mean

      $M_x = \frac{\Sigma fX}{N}$

      Where:

      Mx = Mean value

      ΣfX= Sum of each midpoint times by it frequency

      N = Number of case [12]

[11]Abdulrahman Ritonga, *Statistic Terapan Untuk Penelitian,* Jakarta: Lembaga Penerbit Fakultas Ekonomi UI, 1987, p. 56.

b. Median

$$Mdn = \ell + \frac{\frac{1}{2}N - fkb}{fi} X\ i$$

Where :

Mdn = Median

ℓ = Lower limit (lower limit from score that contain Median)

fkb = Cumulative frequency that reside below the score that contain Median

ft = Genuine frequency

N = Number of case

u = Upper limit (upper limit from score that contain Median)

fkb = Cumulative frequency that reside above the score that contain Median.[13]

c. Modus

$$Mo = \ell + \left(\frac{fa}{fa+fb}\right) xi$$

Where :

Mo = Modus

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[12]Anas Sudijono, *Pengantar Statistik Pendidikan*, Jakarta: PT. Raja Grafindo Persada, 2008, P. 85.

[13]*Ibid*., p. 103.

ℓ = Lower limit (lower limit from interval that contain Modus)

fa = Frequency that reside above interval that contain Modus

fb = Frequency that reside below interval that contain Modus

u = Upper limit (upper limit from interval that contain Median)

I = Interval class.[14]

5. The writer calculated the standard deviation using the formula:

   SD = $\frac{\sqrt{\sum fx^2}}{N}$ - $\frac{\sqrt{\sum (fx)^2}}{N}$

   Where :

   SD = Standard Deviation

   $\sum fx^2$ = Sum of the multiplication result betwen each skor frekuency with the squared deviation score.

   N = Number of cases [15]

6. The writer calculated the variance homogeneity[16]:

   F = $\frac{The\ biggest\ \ variance}{The\ smal lest\ \ variance}$

7. The writer calculated the data by using t-test to test the hypothesis of the study.[17]

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[14]*Ibid*., p. 106

[15]*Ibid.*, p.163.

[16]Sugiyono, *MetodePenelitianPendidikan (PendekatanKuantitatif ,Kualitatif, dan R&D),* Bandung: Alfabeta, 2007, p. 273.

[17]Anas Sudijono, *Pengantar Statistik Pendidikan*, Jakarta: PT. Raja Grafindo Persada, 2008, P. 317.

a. The formula

For two samples that are not related, t_o can be got with these formulas:

$$t_o = \frac{M_1 - M_2}{\sqrt{\left(\frac{\sum X1^2}{N_{1+N_2-2}}\right)\left(\frac{N_1+N_2}{N_1 \,.\, N_2}\right)}}$$

b. The step of calculations:

Variable I can be as X_1, variable II can be as X_2, score deviation of variable I can be as x_1, and score deviation variable II can be as x_2. The steps are:

1) Determine Mean of variable X_1, the formula: $M_1 = \sum X_1 / N_1$
2) Determine Mean of variable X_2, the formula: $M_2 = \sum X_2 / N_2$
3) Determine score deviation of variable X_1, the formula: $x_1 = X_1 - M1_.$

   Note: Total x_1 or $\sum x_1$ should be equals null.
4) Determine score deviation variable X_2, the formula: $x_2 = X_2 - M_{2.}$

   Note: Total x_2 or $\sum x_2$ should be equals null.
5) To make quadrant x_1, then summed; the result $\sum x_1^2$.
6) To make quadrant x_2, then summed; the result $\sum x_2^2$
7) Determine t_o with the second formula or Fisher formula.
8) Interprete to $t_o$by using value table "t" with the same way.
9) Make a conclution.

8. The writer used the level of significance at 5%. If the result of test is higher than t-table, it means Ha is accepted but if the result of t-test is lower than t-table, it means Ho is accepted.
9. The writer used t-test to conclude the answer of the problem of the study.
   a. If the $t_{observed}$ is equal or higher than t value in the table (with t-table sign), so the null hypothesis stating that there is no Mean difference from the both sample is rejected. It means the difference is significant.
   b. If the $t_{observed}$ is lower than t_{table}, it means the null hypothesis stating that there is no Mean difference from the both sample is accepted[18]. It means the difference is not significant.
10. The writer calculated the degree of freedom.

    Df= (N1 + N2- 2)

    Where :

    Df = degree of freedom

    N = Number of cases
11. The writer determined the significant level of $t_{observed}$ by comparing the $t_{observed}$ with the $t_{table.}$
12. The writer interpreted the analysis result.
13. The writer gave conclusion.

[18]Anas Sudijono,*PengantarStatistikPendidikan*, Jakarta: Raja GrafindoPersada, 2003, p. 284-285.