

CHAPTER III

RESEARCH METHOD

A. Research Design

This study is Quantitative research; quantitative research is inquiry employing operational definitions to generate numeric data to answer predetermined hypothesis or questions.¹ It is using quantitative approach because quantitative is the data that from of number using statistic data. The type of this study is Quasi-Experimental design that was not based on the random assignment of subject to the experiment group and control group. This design was chosen based the situation of the subject of the study. The writer uses the experimental design because the writer wants to know the effect of using animation pictures in the teaching learning English vocabulary process.

In a typical group situation, schedules cannot be disturbed nor classes reorganized to accommodate a research study. In such a case, one uses groups already organized into classes or other pre-existing intact groups.

The nonrandomized control group, pre-test and post-test design is one of the most widely used quasi-experimental designs in educational research.

Table 3.1

Design of pre-test and post-test

Group	Pre-test	Treatment	Post-test
Experiment Group	Y 1	X	Y 1
Control Group	Y 2	-	Y 2

¹Donal Ary, et all. *Introduction to research in education eight*, united state : Wadsworth (engage Learning, 2010) p.648

Where :

E : Experiment Group

C : Control Group

X : Treatment

Y 1 : Pre- Test

Y 2 : Post- Test

The writer uses the Quasi-Experimental design in this study. Because this study was compare with two ways and the writer wants to measure the effectiveness of teaching vocabulary animation picture using that ways.

B. Place of The Study

The studies conducted at academic year 2015/2016. It was conducted until the data complete from students and to support the data from the English teacher at SMKN 1 Palangka Raya. The study was about the effect of using animation pictures in teaching English vocabulary to the tenth grade of SMKN 1 Palangka Raya located in Tambun Bungai street number 77.

C. Population and Sample Of The Study

1. Population of The Study

According to Ary stated that population is defined as all members of any well-defined class of people, events, or objects.² The population of this study the students of the tenth grade student of SMKN 1 Palangka Raya. There are 457 of the tenth grade students that divided into thirteen classes.

Table 3.2 The Population of Study

NO	CLASSES	NUMBER OF STUDENTS
1	X Tehnik Geomatika	34
2	X Tehnik Gambar Bangunan	36
3	X Tehnik Konst Batu dan Beton	32
4	X Tehnik Instalasi Pemanfaatan Tenaga Listrik	40
5	X Tehnik Audio video	33
6	X Tehnik Pengelasan	31
7	X Tehnik Pemesinan	30
8	X Tehnik Kendaraan Ringan	40
9	X Tehnik Alat Berat	27
10	X Tehnik Sepeda Motor	37
11	X Tehnik Perangkat Lunak 1	42
12	X Tehnik Perangkat Lunak 2	42
13	X Tehnik Energi Terbarukan	33
	Total	457

2 Sample of The Study

According to Arikunto, sample is some or represent of population that is researched.³ It is a group selected from population for observation in a study.

It is class X Tehnique SPM (*Tehnik Sepeda Motor*) and class X TKR (*Tehnik Kendaraan Ringan*) students who as the sample of the study. There is a condition to take a sample for this study. That is the teaching of vocabulary of content words of noun, adverb, adjective and verb of words. In this study the writer was used cluster sampling technique to select group of sample.

Cluster sampling is to list all the members of a target population and select the sample from among them. Because the unit chosen is not and individual but a group of individual who are naturally together or group by the school.⁴

³ Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktek*, Jakarta: PT. Rineka Cipta, 2002. p. 131.

⁴Donal Ary et al, *Introduction To Research In Education*, Eight Edition, Canada, 2006, p.154.

Based on the explanation above, the writer took two classes X TSPM and X TKR which was related to this study. The sample of the study is as shown in the following table:

Table 3.3

Number of Sample

NO	Group	Class of student	Number of students
1	E	X TSPM	37
2	C	X TKR	40
Total Number			77

E : Experiment Group

C : Control

D. Research Instrument

1. Instruments of The Study

Instrument is very needed in the study. It is because the instrument is tool to get the data of study, in which the data is the important things to help the writer in answering the problem of the study and also to prove the hypothesis. The data also needed to find the aim of study. It is to measure the effect of using animation picture in teaching english vocabulary to the tenth grade student at SMKN 1 Palangka Raya. In collecting the data, the writer used instruments as follows:

Test

The writer collected the data of this study by using a test and the result of the test was used to measurement the students' vocabulary scores about animation pictures. The test is vocabulary test. According to Heaton, a test of vocabulary measures the students' knowledge of the meaning

of certain words and word group.⁵ In this study, the writer used multiple - choice to check the students' vocabulary scores and the total number of test is 50 questions.

Table 3.4
The Content Specification of Test Items

No	Indicators	Number
1	Noun	25 Items
2	Adjectives	25 Items
Total		50 Items

The writer made test based on the material and be appropriated with syllabus that used by the school. In this study, the writer uses multiple-choice to check the students' vocabulary mastery. As Madsen's suggestion that a good vocabulary test type for students who can read in the foreign language is multiple-choice completion because it makes the students depend on the context clues and sentences meaning.⁶ According to J.B Heaton, he states multiple choices in this type of recognition item the stem is replaced by a picture. The testis sees the picture and has to select the most appropriate word relating to the picture from 4 or 5 options.⁷

The writer gave pre-test and post-test to the both experimental and control group. Where the items of the test consisted of 40 items, pre test is a test given before the writer gives treatment. The function of pre test is to know how are the students' vocabulary scores before they taught by using animation pictures. Post test is a test given after a lesson or a period of instruction. The function of post test is to know how are the students' vocabulary scores after they taught by using animation pictures.

⁵ J.B. Heaton, *Writing English Language Test*, England: Longman, 1975. P. 5.

⁶ Harold S. Madsen, *technique in testing*, New York: Oxford University Press, 1983, p.16

⁷ J. B Heaton, *Writing English Language Testes*, Hong Kong: longman Group Limited, 1975 p. 43.

2. Research Instrument Try Out

The instrument try out is important because the result of try out is used to analyze and to measure the instrument whether the test has some criterias of qualified test or not. The try out was given to class X TPM of SMKN 1 Palangka Raya. The were procedures that in carrying out this try out as follows:

- a. The writer made and prepared the instrument of try out consisted of 50 items.
- b. The writer tells the students how they must do the test of try out.
- c. The writer gave the test items to the students
- d. The writer collected the student's work.
- e. The writer calculated the result of the test
- f. The writer analyzed the result of the test
- g. If the results were valid, it meant that the test items as the instrument of this study is suitable to be give.
- h. Based on the analysis of validity found that there were 40 valid items and 10 invalid items.

3. Research Instrument Validity

Validity is the extent to which theory and evidence support the proposed interpretations of test scores for an intended purpose.⁸ The test must aim to provide a true measure of the particular skill which it is intended to measure.⁹ So, the writer used test which validity. Validity, on the other hand, involves the degree to which we are measuring what we are supposed to, more simply, the accuracy of the measurement does not accurately measure what is it supposed to,

⁸ *Ibid*, p. 258

⁹ *Ibid*, p. 258

there is no reason to use it even if it measures consistently (reliably). The test can be said valid if it is able to measure what it is suppose to be measure.

To measure the validity of the instrument, the writer used the formulation of Product Moment by Pearson as follow.¹⁰

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

Where:

- r_{xy} : Total coefficient of correlation
- $\sum X$: Total Value of Score X
- $\sum Y$: Total Value of Score Y
- $\sum XY$: Multiplication Result between Score X and Y
- N : Number of students

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.¹¹

¹⁰ Anas Sudijono, Pengantar Statistik Pendidikan, (Jakarta: PT. Raja Grafindo Persada, 2008), P. 206.

¹¹Riduwan, *Metode dan teknik Menyusun Tesis*, Bandung: Alfabeta, 2004. p.110.

Validity is divided into *face validity*, *content validity*, *construct validity*, and *empirical validity*. Here, only the first two have been dealt with.¹²

With the measurement of validity using this criteria :

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

1) Face Validity

If a test item looks right to other testers, teachers, moderators, and testers.¹³ It can be described as having face validity. The test used by the writer is suitable to others and at the same level that is secondary school level. The face validity of the test items as follow:

- a) The kind of test is vocabulary test “which is about nouns and adjective”.
- b) The form of test items is multiple choice.
- c) The language of item used English.
- d) The test items are suitable to the secondary school.

Face validity concerns the appeal of the test to the lay judgment, typically that of the candidate, the candidate’s family, members of the public and so on. Sometimes the students do not know what is being tested when they tackle a test.

Sometimes they feel that the test doesn’t test what it is supposed to test. A test has face validity if it is carefully constructed, it has a sic well thought-out format, its items are clear and

¹² Lotfollah Karimi and Ali Gholami Mehrdad, *Investigating Administered Essay and Multiple choice Tests in the English Department of Islamic Azad University*, Hamedan Branch, Iran: Canadian Center of Science and Education, 2012, P. 70.

¹³ J. B. Heaton, *Language Testing*, (Published Tests, May 1989), P. 153.

uncomplicated, its difficulty level is appropriate for students, and the condition for all students is the same.

2). Construct Validity

This type of validity assumes the existence of certain learning theories or construct underlying the acquisition of abilities and skills.¹⁴ It is concerned with the extent to which a test measure a specific trait or construct. Specifically, the construct validity measure vocabulary mastery?¹⁵ It is type of validity that is essential for tests that are used to individuals on certain abilities. Then, to measure the validity of the instrument, the writer is used the formulation product moment by Pearson as follow:¹⁶

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

where:

r : Pearson r

$\sum x$: sum of score in X distribution

$\sum y$: sum of score in Y distribution

$\sum X^2$: sum of squared score in X distribution

$\sum Y^2$: sum of squared score in Y distribution

$\sum XY$: sum of product of paired X and Y score

¹⁴ J. B. Heaton, *language testing*. 1989. p. 154

¹⁵ Donald Ary, *Introduction to research in Education*; third edition,.... 1985, p 218

¹⁶ Riduan, *Metode dan teknik menyusun tesis*, Bandung: Alfabeta, 2010, p. 116

N : Number of paired X and Y score

The criteria of interpretation for the validity:¹⁷

0.800 – 1.000 = Very High Validity

0.600 – 0.799 = High Validity

0.400 – 0.599 = Fair Validity

0.200 – 0.399 = Poor Validity

0.00 – 0.199 = Very Poor Validity

3) Content Validity

This kind of validity depends on a careful analysis of language being tested and of the particular course objectives. The test should be constructed as to contain a representative sample of the course, the relationship between the test items and the course objective always being apparent.¹⁸ The writer makes question based on syllabus where the topic about descriptive text.

A test is said to be content valid if its content constitutes a representative sample of the language skills, structures, etc. with which it is meant to be concerned. Other terms used for *content validity* are *curricular validity*, *course validity*, and, *text validity*.

According to Gronlund “content validity is the process of determining the extent to which a set of test task provides relevant and representative sample of the domain of tasks under consideration.”¹⁹ To fulfil the content validity, the test content is directly related with have been taught to the student that have two ways namely using animation pictures like the method of loci and without using animation pictures.

¹⁷ *Ibid*, p. 116

¹⁸ J. B. Heaton, *Writing English Language Test*, Logman, 1975, p. 153

¹⁹ Norman E. Gronlund, *Measurement and Evaluations in Teaching*, New York: Macmillan Publishing Company, 1985. P. 83.

To know the level of test validity, the result was correlated to criteria of r value they are:

0,800 - 1,000 : very high validity

0,600 - 0,799 : high validity

0,400 – 0,599: fair validity

0,200 – 0,399: low validity

0,000 – 0,199: very poor validity.²⁰

The result of validity measurement of test instrument based on the criteria as follows:

- (a) If the value of t_{observed} is greater than t_{table} , it means that the test item is valid and it can be used as the instrument of the study.
- (b) If the value of t_{observed} is lower than t_{table} , it means that the test item is invalid and it cannot be used as the instrument of the study.

4. Research Instrument Reliability

Reliability also means the consistency with which a test measures the same thing all the time. Reliability of a test refers to its consistency with which it yields the same rank for an individual taking the test several times.²¹ The reliability of the whole test can be estimated by using the formula:

J.B Heaton state Reliability is a necessary characteristic of any good test: for it to be valid data all, a test must first be reliable as a measuring instrument. If the test is administrated to the

²⁰ Riduwan, *Metode & Teknik Menyusun Thesis*, Bandung: ALFABETA, 2004, P.110

²¹ Norman E. Gronlund, *Measurement And Evaluation In Teaching (Fifth Edition)*, New York: Macmilan Publishing Company, 1985, p. 14.

same candidates on different occasions (with no language practice work taking place between these occasions). Then, to extent that is produces differing result, it is not reliable.²²

$$\Gamma_{11} = \frac{\kappa}{\kappa - 1} \times \left(1 - \frac{M(k - M)}{k.Vt} \right)$$

Γ_{11} = Reliability of instrument

k = the number of items

M = the mean score for all the testers

Vt = the total variants

The steps in determining the reliability of the test were:

- 1) Making tabulating of testees's scores.
- 2) Measuring the mean of the testees's scores with the formula :

$$M = \frac{\sum Y}{N}$$

- 3) Measuring the total variants with the formula:

$$Vt = \frac{\sum Y^2 - \frac{(\sum Y)^2}{N}}{N}$$

Where:

Vt = the total variants

$\sum Yq$ = the total of score

²² J. B Heaton, *Writing English Language*, England : Longmant, 1974, p.155

$\sum Y^2$ = the square of score total

N = the number of testes

4) Calculating the instrument reliability using KR-21.

5) The last decision is comparing the value of Γ_{11} and Γ_t

$\Gamma_{11} > \Gamma_{\text{table}} = \text{Reliable}$

$\Gamma_{11} < \Gamma_{\text{table}} = \text{Not Reliable}$

6) To know the level of reliability of instrument, the value of Γ_{11} was interpreted based on the qualification of reliability as follows:

0.800- 1.000 : Very High Reliability

0.600-0.799 : High Reliability

0.400-0.599 : Fair Reliability

0.200-0.399 : Poor Reliability

0.000-.0199 : Very Poor Reliability

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.

5. Index of difficulty

According to Heaton the index of difficulty or facility value is the fraction or percentage of the students who answer the item correctly.²³ It is use to show how easy or difficult the particular item proved in the test. The index difficulty can be known by the formula:

²³ J.B Heaton, *Language Testing*, 1974, P. 172.

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

Where:

FV = facility value (index of difficulty).

R = represent the number of correct answer.

N = the number of students taking the test.

Then the result of the formula above is related to be value of F.V as in the following on:

F.V 0.00-0.30 = Difficult

F.V 0.30-0.70 = Fair

F.V 0.70-1.00 = Easy

6. Index Homogeneity

Is use to know whether experimental group and control group, that are decided, come from population that has relatively same variant or not. The formula is: ²⁴

$$F = \frac{\text{Bigger Variant}}{\text{Smaller Variant}}$$

Notice:

F: Frequence

The hypothesis in homogeneity:

$F_{\text{value}} \leq F_{\text{table}}$, Means both of variant are homogeneity.

²⁴ J.B. Heaton, *Writing English Language Test*, Longman, 1975, p. 172.

$F_{\text{value}} > F_{\text{table}}$, Both of variant are homogeneity.

If calculation result of F is lower than F table by 5% degree of significance so H_0 is accepted, it means both groups have same variant.

7. Index normality

It is used to know the normality of the data that is going to be analyzed whether both group have normal distribution or not.

Chi square is used here: ²⁵

$$\chi^2 = \sum \left[\frac{(f_o - f_h)^2}{f_h} \right]$$

Notice:

χ^2 = Chi square

f_o = frequency from observation

f_h = expected frequency

Calculation result of χ^2 is compared with x table by 5% degree of significance. If χ^2 is lower than x table so the distribution list is normal.

²⁵ Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996),p.273.

The formula

They are: ²⁶

a. Mean : $Mx = \frac{\sum fx}{N}$

Where:

Mx: Mean

N: Number of case

Fx: Total result product between each score with frequency.

b. Median : $Mdn = 1 + \frac{\frac{1}{2}N - f_{ka}}{f_i} X i$

Where:

Mdn: Median

N: Number of ease

Fkb: Cumulative Frequency located in underscore content median

Fi: Authentic frequency (frequency of score content median)

I: interval class

c. Modus : $Mo = 1 + \frac{f_a}{f_a - f_b} X i$

Where:

²⁶ Hartono, *Statistik Untuk Penelitian*, Yogyakarta: pustaka belajar, 2011, p.33.

Mo: Modus

Fa: Frequency located in above interval content modus.

Fb: Frequency located in under content modus

d. Standard Deviation

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

Where:

SD: Deviation Standard

I: interval class

Fx': total result product between frequency each interval with X

N: Number of class

e. Standard Error

$$Sem = \frac{sd}{\sqrt{n-1}}$$

E. Data Collection Procedures

To get the data, the writer uses some ways in this study. Those ways are:

1. The writer chose the place of the study.
2. The writer made instrument try out.
3. The writer showed the try out to the class that have been determined
4. The writer gave instruction to the students to do the test of try out.

5. The writer checked the result of test of try out.
6. The writer gave pre test to both classes.
7. The writer checked the result of pre test.
8. The writer was gave treatment to both classes. Experiment group using (animation picture) and than control group using another media that is using (plash card)
9. The writer gave post test to both classes.
10. The writer checked the result of post test.
11. The writer gave score to students' answer (pre test and post test).

A. Data Analysis Procedures

To analyze the data has been collected; the writer uses some procedures in this study:

1. The writer collected score of test (pre test and post test).
2. The writer analyzed the data have been collected.
3. The writer gave score to the students' test result by using the formula:

$$\text{Score} : \frac{B}{N} \times 100\%$$

B: frequency of the correct answers

N: number of test item

4. Tabulating the students' score into distribution of frequency in the table, then find out the mean of students' score, standard deviation, and standard error of variable X1 (Experimental group) and X2 (Control group).
5. Calculating the data by using t-test to test the hypothesis of the study, whether the use animation pictures give effect to the students' score or not. To examine the hypothesis, the

writer used *t-test*. Test “t” or “t” Test is statistical test which is used to examine the truth or falseness of null hypotheses states that between two of Sample Mean taken randomly from the same population, there is no significant different. ²⁷ “t test” is used to measure whether animation pictures give effect to students’ english score using the formula as follows: ²⁸

$$t_0 = \frac{M_1 - M_2}{SEm_1 - m_2}$$

Note:

$M_1 - M_2$: The difference of two means

$SEm_1 - m_2$: The standard error of the difference between two means

To know the hypothesis is accepted or rejected using the criterion:

If t-test (the value) $\geq t_{table}$, it means H_a is accepted and H_o is rejected.

If t-test (the value) $< t_{table}$, it means H_a is rejected and H_o is accepted.

B. Interpreting the result of t-test. Previously, the writer counted the degrees of freedom (df) with the formula: ²⁹

$$df = (N_1 + N_2 - 2)$$

Note : df : degrees of freedom

N_1 : Number of subject group 1

N_2 : Number of subject group 2

2 : Number of variables

²⁷ Anas Sudijono, *Pengantar Statistik Pendidikan*, Jakarta : RajaGrafindoPersada, 1987, p.278.

²⁸ Ibid, p. 284.

²⁹ Ibid, p. 285.

After that, the value of t_{test} was consulted on the t_{table} at the level of significance 1 % and 5 %. In this research, the writer uses the level of significance at 5 %. If the result or t-test is higher than t_{table} , it means H_a is accepted.

6. The writer made the conclusion of data analysis obtained.

7. Discussing and concluding the result of data analysis.