

CHAPTER III

RESEARCH METHODOLOGY

In this chapter the writer discussed about research methodology which consists of (a) research design, (b) population and sample, (c) instruments of the study, (d) research instrument try out, (e) research instrument validity, (f) research instrument reliability, (g) index of difficulty, (h) data collection procedures, and (i) data analysis.

A. Research Design

In this study, the writer used the experimental research. An experimental research is the general plan for carrying out a study with an active independent variable. The design is important because it determines the study's internal validity, which is the ability to reach valid conclusions about the effect of the experimental treatment on the dependent variable. Designs differ in their efficiency and their demands in terms of time and resources, but the major difference is in how effectively they rule out threats to internal validity.¹

In the study, the writer used quasi-experimental design, because the subject cannot be randomized since the class is already established. Quasi-experimental designs are similar to randomized experimental designs in that they involve manipulation of an independent variable but differ in that subjects are not randomly assigned to treatment groups.

¹ Donald Ary, Lucy Cheser Jacobs, Chris Sorensen and Asghar Razavieh, *Introduction to Research in Education 8th Edition*, (Canada: Nelson Education, Ltd, 2010), p.301.

Because the quasi-experimental design does not provide full control, it is extremely important that researchers be aware of the threats to both internal and external validity and consider these factors in their interpretation. Although subject cannot be randomly assigned, one can flip a coin to determine which of the groups that will be try out group, experimental group and control group.

The writer used nonrandomized control group pre-test post-test design. There were two groups in this design, they are control group and experimental group. Both groups were given pre-test to measure the score of students before the treatment was given. Then, the treatment was given for experiment group only. The control group was not given the treatment but another conventional strategy as usual. The post-test was given for both groups to measure the difference score of students between control and experiment group. Test materials in post-test was same with test in the pre-test.²

Table 3.1
Nonrandomized Control Group, Pretest–Posttest Design

Group	Pretest	Independent Variable	Posttest
E	Y ₁	X	Y ₂
C	Y ₁	–	Y ₂

Where :

E : Experimental group

C : Control group

X : Treatment

² *Ibid*, p.316.

Y_1 : Pre-test

Y_2 : Post-test

The students were divided into two groups, they were experimental group and control group. In this study, the writer taught the students directly with the same material. Therefore, the use of the jumbled letters game to teach vocabulary was applied on experimental group. Meanwhile, the control group was not given the treatment.

B. Population and Sample

1. Population

A population is defined as “all members of any well defined class of people, events or objects.”³ A population consists of all the subjects you want to study. A population comprises all the possible cases (persons, objects, events) that constitute a known whole.⁴

The population of the study was the third grade students of SDN-VIII Menteng Palangka Raya. The number of the population is 94 students.

Table 3.2
Number of Population

No	Class	Number of Students
1	III-A	32
2	III-B	32
3	III-C	30
Total of Students		94

³ Fred N. Kerlinger, *Foundations of Behavioral Research*, (New York: Holt Rinehart Winston, 1966), p.52.

⁴ Donald Ary, *Introduction to Research in Education 8nd Edition*, p.125.

2. Sample

Sample is part of population that affects the conclusions which refer to the result.⁵ The writer chose all of the third grade students of SDN-VIII Menteng Palangka Raya as the sample of the study. The writer chose all of the students because in the quasi-experimental research the subject cannot be randomized since the class is already established. The study was called research population. The sample were 94 students from III-A, III-B and III-C. In this study, III-A was experiment group which taught using jumbled letters game, III-B was control group which taught without using jumbled letters game and III-C was try out class.

In this research, the writer used cluster sampling to take the sample. Cluster sampling is used if the population is not consists of individuals, but groups or cluster.⁶ Therefore, the use of cluster sampling because the sample of study should be in group or class, where the class had been determined by the school. The writer determined the classes as experiment and control based on the similar amount and ability of the students that suggested by the teacher. The rest of the group will be as try out class.

⁵ Johnson D. M, *Approaches To Research in Second Language Learning*, (London: Longman Group Ltd, 1987), p.111.

⁶ Nurul Zuriah, *Metodologi Penelitian Sosial dan Pendidikan* , (Jakarta : Bumi Aksara, 2006), p. 124.

C. Instruments of the Study

Instruments of the study are tools or facilities that are used by the researcher in collecting the data of the study. Instruments of the study are very needed in the research. It is because the instruments are tool to get the data of study, in which the data are the important things to help the writer in answering the problem of the study and also to prove the hypothesis.⁷

The data also needed to found the aim of the study. It was to measure the significant effect of the jumbled letters game on the students' vocabulary scores at third grade students of SDN-VIII Menteng Palangka Raya. There were two instruments that used in this study to get the data, as follows:

1. Test

In this study the writer used test as the main instrument of the study. Test is an instrument in collecting data that is a series of question or treatment that applied to measure the skill of knowledge, intelligence, the ability or the talent that have by individual or group. Test is a systematic procedure for measuring a sample of behavior presumed to represent an educational or psychological characteristic.⁸

In this study, the writer used pre test and post test. The writer gave pre test and post test to the experimental group and control group. The test was given to know the students' vocabulary scores before the jumbled letters game was applied and to know the progress of the

⁷ Donald Ary, *Introduction to Research in Education 8th Edition*, p.651.

⁸ Riduwan, *Metode dan Teknik Menyusun Thesis*, (Bandung: Alfabeta, 2004), p. 105.

students' vocabulary scores after the jumbled letters game have been applied.

The writer gave pre-test for control group was held on Monday, August 12th, 2013 period 09.00-10.10 which followed by 32 students. Then, the writer gave pre-test for experimental group was held on Saturday, August 24th, 2013 period 09.00-10.10 which followed by 32 students. The writer gave post-test for control group was held on Monday, September 16th, 2013 period 09.00-10.10 which followed by 32 students. Then, the writer gave post-test for experimental group was held on Saturday, September 28th, 2013 period 09.00-10.10 which followed by 32 students. The total items of each test was 20 items and the time allocation of each test process was 70 minutes.

2. Documentation

Documentation is referred to get the data directly from the place of research, envelope of relevant book, rules, report of the activity, photos, film of documenter and research data relevant. Documentation is any communicable material that is used to describe, explain or instruct regarding some attributes of an object, system or procedure, such as its parts, assembly, installation, maintenance and use.⁹

The documentation needed to got the real data information and can support the data. This technique was aim at found the documents

⁹ A.S. Homby, *Oxford Advanced Learner's Dictionary*, (New York: Oxford University Press, 1995), p. 342.

related to the study and support the data that got by the writer. The documents that can support this study as follows:

- a. The names of third grade students of SDN-VIII Menteng Palangka Raya.
- b. The students' answer sheet.
- c. Lesson plan.
- d. Syllabus.

D. Research Instruments Try Out

The writer try out the test instrument before it applied to the real sample of the study. The writer obtained the instrument quality consisted of instrument validity and instrument reliability. The writer gave the instrument try out to the III-C students of SDN-VIII Menteng Palangka Raya. The try out test was held on Saturday, August 3rd, 2013 period 09.00-10.10 which followed by 30 students. The time allocation of try out test was 70 minutes. The total items of the try out test was 25 items with the total valid items based on validity calculation were 20 items and the total invalid items were 5 items.

The instrument try out was important because the result of try-out was used to analyze and to measure the instrument whether the test has some criteria of qualified test or not. There were some criteria in analyzing the test instrument to know the quality of the test, such as instrument validity, instrument reliability, and index difficulty. In this study, the

writer analyzed the quality of the test used validity of the test, reliability of the test, and index of difficulty. The procedures of the try out as follows:

1. The writer prepared the test instrument.
2. The writer gave the try out test to the students.
3. The writer gave score to the students' answer.
4. The writer calculated the result of the test.
5. The writer analyzed the obtained data to know the instrument validity and instrument reliability.

E. Research Instruments Validity

Instruments validity is the most important consideration in developing and evaluating measuring instruments. Historically, validity was defined as the extent to which an instrument measured what it claimed to measure.¹⁰ There were two types of the instrument validity in this research. They were content validity and construct validity.

1. Content Validity

Content validation is the process of determining the extent to which a set of test tasks provides a relevant and representatives sample of the domain of task under consideration. The procedure is by comparing the test to the test specifications describing the task domain under consideration. According to Wilmar Tinambunan, content validity is concerned with what goes into the test. A test will have content if the items are representative of the population of possible

¹⁰ Donald Ary, Lucy Cheser Jacobs, Chris Sorensen and Asghar Razavieh, *Introduction to Research in Education 8th Edition*, (Canada: Nelson Education, Ltd., 2010), p.225.

task.¹¹ The following table show the content specification of the instrument where the items distributed to the students.

Table 3.3 The Content Specification of Items in the Research Istrument

No	Indicators	Number of Items
1	Food and Drink	5 Items
2	Occupation	5 Items
3	Parts of Body	5 Items
4	Clothing	5 Items
Total		20 Items

2. Construct Validity

Construct validation is the process of determining the extent to which test performance can be interpreted in terms of one or more constructs. An instrument has construct validity if a specified construct accounts for the variations in student performance it elicit.¹²

To measure the validity of the test measurement, the writer used the formulation of Product Moment by Pearson as follows:¹³

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

Where :

r_{xy} : The Coefficient Correlation

$\sum X$: The Number of Score for Each Items

¹¹ Wilmar Tinambunan, *Evaluation of Students Achievement*, (Jakarta: Debdikbud, 1998), p. 11.

¹² Donald Ary, Lucy Cheser Jacobs, Chris Sorensen and Asghar Razavieh, *Introduction to Research in Education 8th Edition*, (Canada: Nelson Education, Ltd., 2010), p.83.

¹³ Riduwan, *Metode dan Teknik Menyusun Tesis*, (Bandung: Alfabeta, 2010), p.110.

ΣY : The Number of Total Score

n : The Number of Students

After the value of coefficient correlation (r_{xy}) had found, then it was calculated using the measurement of t (t-test) with the formula as follows:

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

Where :

t_o : The Value of $t_{observed}$

r : The Coefficient Correlation of r_{xy}

n : The Number of Students

The distribution of t_{table} at alpha 5% and the degree of freedom ($n - 2$) with the measurement of validity using these criteria:

$t_{observed} > t_{table} = \text{Valid}$ $t_{observed} < t_{table} = \text{Invalid}$
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To know the level of instruments validity, the result of the coefficient correlation would be interpreted to the criteria of the correlation index (r) as follows:¹⁴

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.

0.000 – 0.119 : Very Poor Validity

¹⁴ *Ibid*, p.110.

F. Research Instruments Reliability

Reliability is defined as the extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials. Reliability refers to consistency of measurement, which is how consistent test scores or other evaluation results are from one measurement to another. Reliability can be defined as the stability of test scores.¹⁵

To measure the reliability of the measurement, the writer used the formula of Kuder Richardson (KR-21). The formula was as follows:¹⁶

$$r_{11} = \left(\frac{K}{K-1} \right) \left(1 - \frac{M(K-M)}{K.Vt} \right)$$

Where :

r_{11} : Instrument reliability

K : The number of items in the test

M : The mean score on the test for all the testers

Vt : The standard deviation of all the testers' score

To know the reliability of the measurement, the writer used the criterion as follows:¹⁷

➤ If $r_{11} > r_{table}$ = Reliable

➤ If $r_{11} < r_{table}$ = Not Reliable

¹⁵ David P. Harris, *Testing English As Second Language*, (New York: Mc Graw Hill Book Company, 1969), p. 86.

¹⁶ Riduwan, *Metode dan Teknik Menyusun Tesis*, (Bandung: Alfabeta, 2010), p.120.

¹⁷ *Ibid*, p.128.

G. Index of Difficulty

According to Heaton the index of difficulty or facility value is the fraction or percentage of the students who answered the item correctly. It is used to show how easy or difficult the particular item proved in the test. The writer constructed the test by calculating the index of difficulty. The index of difficulty can be known by the formula:¹⁸

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

Where :

FV : Index of difficulty.

R : The number of correct answers.

N : The total students.

Then the result of the formula above is related to the value of F.V as the following classification:¹⁹

F.V 0.00-0.30 : Difficult.

F.V 0.30-0.70 : Fair.

F.V 0.70-1.00 : Easy.

H. Data Collection Procedures

In this study, the writer used some procedures to collect the data.

The procedures consist of some steps as follows:

1. The writer observed to SDN-VIII Menteng Palangka Raya.
2. The writer determined the class into experimental group, control group and try out class.

¹⁸ JB. Heaton, *Writing English Language Test*, (England: Longman, 1974), p. 172.

¹⁹ Anas Sudijono, *Pengantar Evaluasi Pendidikan*, (Jakarta: PT. Rajagrafindo Persada, 2007), p.372.

3. The writer gave the instrument try out to the try out class.
4. The writer analyzed the instrument try out to know the quality of the test, such as instrument validity, instrument reliability, and index difficulty.
5. The writer gave pre-test to the experimental group and control group.
6. The writer taught the experimental group by using jumbled letters game.
7. The writer taught the control group by using the pictures.
8. The writer gave post-test to the experimental group and control group.
9. The writer gave scores to the data from the experimental group and control group.
10. The writer found the normality and homogeneity of the data.
11. The writer analyzed the data from pre-test and post-test using t-test.
12. The writer made the interpreting and concluding the result of data analysis.

I. Data Analysis

In this research, the writer used the t-test to analysis the data. T-test is a statistical procedure for testing hypotheses concerning the difference between two means.²⁰ T-test formula showed to the following formula:

$$t_o = \frac{M_1 - M_2}{SE_{m1} - SE_{m2}}$$

Where :

$M_1 - M_2$: The difference of two means.

²⁰ Donald Ary, Lucy Cheser Jacobs, Chris Sorensen and Asghar Razavieh, *Introduction to Research in Education 8th Edition*, (Canada: Nelson Education, Ltd., 2010), p.224

$SE_{m1} - SE_{m2}$: The standard error of the difference between two means.

To know the hypothesis was accepted or rejected the writer used the criterion as follows:

- t-test (the value) $\geq$ t-table, it means that H_a was accepted and H_o was rejected.
- t-test (the value) $<$ t-table, it means that H_a was rejected and H_o was accepted.

Interpreting the result of t-test. Previously, the researcher accounts the degrees of freedom (df) with the formula: ²¹

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

Where :

df : Degrees of freedom

N_1 : Number of subject group 1

N_2 : Number of subject group 2

2 : Number of variable.

After that, the value of df was consulted on the t-table at the level of significance 1% and 5%. In this study, the researcher used the level of significance at 5%. If the result of t-test was higher than t-table, it means that H_a was accepted and H_o was rejected. But if the result of t-test was lower than t-table, it means that H_a was rejected and H_o was accepted.

²¹ Anas Sudjiono, *Pengantar Statistik Pendidikan*, (Jakarta: PT Raja Grafindo Persada, 2000), p. 372.

In addition, the writer also applied SPSS 17.0 program to compare the data. To sum up the procedures of the data collection and data analysis as described in figure 1.1:

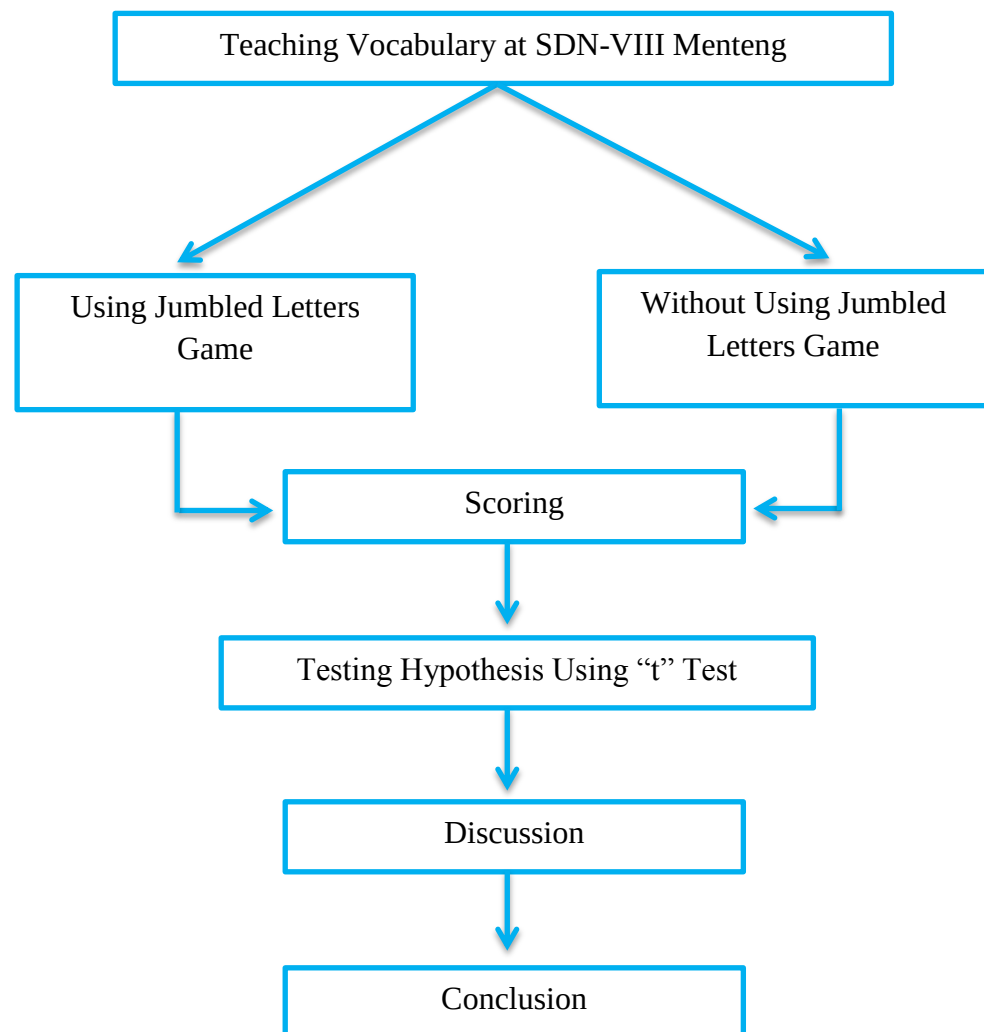


Figure 3.1 The Procedures of Data Collection and Data Analysis