

CHAPTER III

RESEARCH METHODOLOGY

This chapter discusses research methodology applied in the study. This chapter consists of research method, population and sample, data collection, data collection instruments, pilot-testing the data collection instruments, the experiment, and data analysis.

3.1 Research Method

3.1.1 Research design

Non equivalent control group design of quasi experimental design was used in this study. Non equivalent control group design of quasi experimental design was used because there is no opportunity for the researcher to mess up the subject. Besides, the study used non equivalent of quasi experimental design for the reason that the study wanted to investigate the effectiveness of certain method. The design is used to investigate the effectiveness of certain method by scrutinizing the effect of treatment (Saughnessy et al., 2003:335).

A nonequivalent control group design can be formulated as follows:

Experimental Group (R)	O ₁	x	O ₂
Control Group (R)	O ₁		O ₂

Note:

O_1 refers to the first observation of a group or pretest.

O_2 refers to the second observation of a group or posttest.

X indicates a treatment.

The dash line indicates that neither experimental group nor control group is randomly chosen to the condition (Campbell and Stanley, 1966 as cited in Saughnessy et al., 2003:333, 335).

3.1.2 Variable

There are two variables in this study. The first variable is independent variable. Independent variable is a variable that is selected and manipulated by the researcher to find its effect or relationship with dependent variable (Brown, 2001). Independent variable in this study is TPR method.

The second variable is dependent variable. The dependent variable in this study is young learners' vocabulary mastery.

3.2 Population and Sample

A population is a group of people that become research subject, whereas, a sample is a part of population that is assigned through some process for investigating the properties of population (Govil, A.K, 1984:112).

The population of this study is the students of SDN Harapan Bandung; meanwhile, the sample in this study is two classes of 4th grade students of the elementary school. The experimental group in this study is class IV B and the control group in this study is class IV A. The sample of this study was selected through

purposive sampling since three main reasons: (1) the school is near to the researcher's resident, (2) the number of participants in each group is the same and, (3) the English teacher of the school does not come from English educational background.

3.3 Data Collection

The combined method was used in collecting and analyzing data. Combined method is a method in which the researcher uses multiple methods of data collection and analysis (Creswell, 1994). The data were collected through pretest, posttest, and interview.

3.3.1 Data collection instruments

There are two kinds of instruments used in collecting the data. The first instrument is vocabulary achievement test and the second instrument is interview. For more detail, the following are the explanations.

3.3.1.1 Vocabulary achievement test

3.3.1.1.1 Pretest

Pretest was given to the experimental group and the control group to find out their initial knowledge of vocabulary. The type of items in the pretest is multiple-choice items. Multiple-choice items were chosen because they are suitable in measuring students' ability to recognize grammatical structure. Besides, the multiple-choice items can help the teacher and the students to identify the area of difficulty (Heaton, 1975:27).

3.3.1.1.2 Post-test

Posttest was given to find out whether there is a different result between the experimental group that was given a treatment and control group that did not receive a treatment. The items of the posttest are the same as the pretest.

The items in pretest and posttest were collected based on the standard in Indonesian National Curriculum of teaching English for 4th graders of elementary school.

Table 3.1

Table of Specification of Vocabulary Achievement Test

Standard competency	Basic Competency	Indicator	Number of item	Percentage
<i>Membaca</i> <i>1. Memahami tulisan bahasa Inggris sangat sederhana dalam konteks kelas</i>	<i>3.2 memahami kalimat dan pesan tertulis sangat sederhana</i>	<i>Mengidentifikasi makna kata dalam kalimat.</i>	3,9,11, 12, 13, 14, 15,16,19,20.	50%
		<i>Mengidentifikasi waktu kejadian yang ada dalam kalimat.</i>	4,5,8,10.	20%
		<i>Mengidentifikasi tujuan komunikasi dalam teks.</i>	1,2,17,18.	20%

		<i>berbentuk percakapan</i>		
		<i>Mengidentifikasi informasi dalam suatu teks.</i>	6,7.	10%

3.3.1.2 Interview

The data collection type that was chosen in this study is interview. The interview was chosen because of three advantages. First, it is useful when informants cannot be directly observed. Second, informants can provide historical information. Third, interview allows researcher control over the line of questioning. The option of interview used in this study is face-to-face – one on one, in-person interview. The interview was carried out to find out students' perception towards the use of TPR method in learning English.

3.3.2 Pilot-testing the data collection instruments

The main instrument in this study is vocabulary achievement test. The test was pilot tested to 28 students of SDN Cidadap on March 19, 2009. The purpose of pilot testing the instrument is to find out the validity and reliability of the test by analyzing the individual items of the test. The items of the try out test consist of 44 multiple-choice items.

The individual items of the test were analyzed through two procedures. The first procedure was calculating the facility or difficulty index. The second procedure was calculating the discrimination index (Baker, 1989).

3.3.2.1 Validity

The test of validity is used to determine how well test score represents course objective. The test is said to have validity if it measures something that is supposed to be measured.

This vocabulary achievement test has content validity because the individual items of the test are developed based on the representative sample of language skills that are stated in SK-KD of English as a local content of elementary school.

Besides content validity, the item validity is crucial to be known because the validity informs how item score influences total score. An item is considered valid if it has parallelism with total score.

The item validity is calculated by using Pearson's Product Moment Correlation. Read (2000) stated:

Two or more vocabulary tests were administered to a group of students and then comparing the result by means of correlation. One of the tests was judge to be valid according to how highly the test correlated with the criterion.

Correlation test is used to compare the score in pilot test to the criterion of validity. The researcher used SPSS 16.0 to calculate the correlation.

Table 3.2

Category of Coefficient Correlation of Validity

$r_{xy} < 0.20$	The validity of item is very low
$0.20 \leq r_{xy} < 0.40$	The validity of item is low
$0.40 \leq r_{xy} < 0.60$	The validity of item is moderate
$0.60 \leq r_{xy} < 0.80$	The validity of item is high
$r_{xy} \geq 0.80$	The validity of item is very high

The following is the result of validity calculation of the try out test. It was found that out of 44 items, only 20 items are valid and could be used in the pretest.

3.3.2.2 Reliability

Reliability is the extent to which a test produces consistent result when administered under similar condition (Hatch and Farhady, 1982:244). Split-half method was used to measure reliability of the test. The process in the split –half method is by first splitting the test into two parts. All odd-numbered items become one part and all even-numbered become the other part. Then calculating the correlation coefficient by using Pearson’s Product Moment formula to obtain the half-part reliability of the test. Last, finding out the reliability of the whole test by using Spearman-Brown formula.

Having conducted the data of the try out using SPSS version 16.0, it was found that the coefficient correlation of reliability of the test is 0.78. It can be concluded that the test will produce similar result if it is tested to the similar subject.

Table 3.3

Category of Coefficient Correlation of Reliability

$0.80 < r_{11} \leq 1.00$	Very high reliability
$0.60 < r_{11} \leq 0.80$	High reliability
$0.40 < r_{11} \leq 0.60$	Moderate reliability
$0.20 < r_{11} \leq 0.40$	Low reliability
$0.00 < r_{11} \leq 0.20$	Very low reliability

3.3.2.3 Index of Difficulty

Difficulty or facility index of an item illustrates how easy or difficult the certain item constructing the test. This is calculated by counting how many of testee responded correctly to the item and dividing by the total number of candidates (Baker, 1982).

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

FV = facility value/ index of difficulty

R = the number of correct answer

N = the number of students taking the test

Table 3.4

Criteria of Difficulty Index

FV 0.00 – 0.30	Difficulty items
FV 0.30 – 0.70	Moderate items
FV 0.70 – 1.00	Easy items

For example, here is item No 5

$$FV = \frac{R}{N} = \frac{20}{28} = 0.71$$

The calculation above shows that difficulty index of No. 5 is 0.71. Based on the criteria of difficulty index, this item is considered easy. The result of the difficulty index of the try out's total items was presented in appendices. Based on the result of calculation, it was found that out of 44 items, 1 item is easy, 29 items are moderate, and 14 items are difficult.

3.3.2.4 Discrimination Index

The discrimination index of an item indicates the extent to which the items discriminate between good and poor students (Heaton, 1995:179). If good students answer correctly, whereas, the poor students answer incorrectly on the same item, then the item is good because it is successful to distinguish between good and bad students in the same way as the total test score.

The formula and the criteria of the discrimination index can be depicted as follow.

$$D = \frac{\text{Correct } U - \text{Correct } L}{n}$$

D = discrimination index

U = upper half

L = lower half

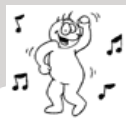
N = number of students in one group; $n = \frac{1}{2} N$

Table 3.5

Criteria of Discrimination Index

D 0.00 – 0.20	Poor
D 0.20 – 0.40	Moderate
D 0.40 – 0.70	Good
D 0.70 – 1.00	Excellent

The following item, taken from the try out test that was administered to 28 students, produced the following result:



12. The boy is...

- a. jumping b. singing c. eating **d. dancing**

$$D = \frac{13 - 4}{14} = 0.64$$

From the computation above, it can be seen that the item with discrimination index of 0.64 is good because the item is successful to discriminate between good and the poor students. The rest of the items were calculated in the same way. It was found that out

of 44 items; 4 items are excellent, 4 items are good, 12 items are moderate, 19 items are poor, and 5 items are bad.

3.4 Data collecting procedure

The data of this study were collected through several steps. The first step was preparing and organizing the teaching procedure to the experimental group. The experimental group was given teaching procedure consisting of TPR techniques with various activities applied in the classroom. The second step was making and organizing the research instrument. The instruments that were used in this study are vocabulary achievement test and interview. Then the first instrument was pilot-tested to find out validity, reliability, difficulty index and discrimination index. The third step was administering pre-test to experimental group and control group to find out their initial vocabulary knowledge. The fourth step was organizing lesson plan and conducting teaching experiment by using TPR method to the experimental group. The fifth step was administering posttest to the experimental group and the control group to find out the effect of treatment that has been undertaken to the experimental group. Then interview was administered only to the experimental group to find out their perception towards the use of TPR method in learning English. The sixth step was analyzing the data. All of data obtained from pretest, posttest, and interview were analyzed based on the data analysis procedure. The seventh step was drawing conclusion and suggestion.

3.5 The experiment

The study was carried out for about two months. In this study, the researcher acted as substitute teacher who taught the experimental group in six sessions. One topic with various interrelated activities was discussed in every session. The topics for the treatment were taken from the classroom textbook that is based on *standar kompetensi dan kompetensi dasar* ((SK-KD) competency standard and basic competency). The following table presents the topic of the treatment and the schedule of the study.

Table 3.6
The schedule of the study

No.	Date	Event	Participant
1	March 19, 2009	Pre-test	Experimental and Control group
2	April 23, 2009	1 st treatment: In the classroom	Experimental group
3	April 25, 2009	2 nd treatment: Making instruction machine *1	Experimental group
4	April 30, 2009	3 rd treatment: Making instruction machine *2	Experimental group
5	May 2, 2009	4 th treatment: Part of body and face	Experimental group

6	May 7, 2009	5 th treatment: In the playground – a picture dictation	Experimental group
7	May 14, 2009	6 th treatment: My daily activities	Experimental group
8	May 16,2009	Post-test	Experimental and Control group

3.6 Data analysis

Independent sample t-test was used to analyze the obtained data. The results of posttest and pretest of both groups were compared and calculated to see whether there is a significant difference between those groups or not. Then this test revealed whether TPR is effective in improving vocabulary focusing on verbs of fourth graders in SDN Harapan. Meanwhile, the students' perception towards the use of TPR in learning English was revealed by writing narrative as interpretation result of the pie charts displayed.

3.6.1 Technique for analyzing the Data

3.6.1.1 Pretest data analysis

The following are procedures to analyze pretest data:

3.6.1.1.1 Normality Test

Normality test has function to examine the hypothesis of this study. The criteria that the data population normally distributed are (1) the mean, mode, and

median are all the same, (2) it does not have a zero score; the tails never meet the straight line, (3) the shape of normal distribution is bell-shaped and symmetric (Hatch and Farhady: 64, 1982).

The normality test was executed by using *Kolmogorov-Smirnov* test in SPSS

16.0. The hypotheses used are as follows:

H_0 : sample is from the population with normal distribution

H_1 : sample is from the population with not normal distribution

By using 5% level of significance (α), the criteria of normality test is H_0 is rejected if the significance value (Sig.) < 0.05 , meanwhile, if significance value (Sig.) > 0.05 , H_0 is accepted.

3.6.1.1.2 Variance Homogeneity Test

After the result of normality test was found, the researcher executes variance homogeneity test. Variance homogeneity test is used to find out whether or not some population variance is the same. The hypotheses used are as follows:

H_0 : the variance of pre-test of experimental and control group are homogenous.

H_1 : the variance of pre-test of experimental and control group are not homogenous.

The variance of homogeneity test used is *Levene Test* at 5% level of significance (α). The criteria of the test is H_0 is rejected if the significance value (Sig.) < 0.05 , meanwhile, if significance value (Sig.) > 0.05 , H_0 is accepted.

3.6.1.1.3 The calculation of t-test

Independent t-test was used when the variance is homogenous and the data population is normally distributed. According to Popham and Sirotnik (1967:139), the selection of t model depends upon whether the variance is homogenous and whether the variances of two groups are equal.

To reduce the effect of heterogeneity of variances, the larger sample size ($N > 15$ or 20 in each group) and an equal number of participant in each group were used in this study (Coolidge, 2000:143).

The computation of independent t-test was executed by using SPSS version 16.0.

3.6.1.2 Post-test analysis

Post-test was conducted to find out whether there is different score result between experimental group's students and control group's students. The procedures of data analysis in post-test are same as the pre-test data analysis. Besides calculating independent *t*-test, paired sample *t*-test in SPSS 16.0 was also calculated. It was aimed to find out the differences between the pre-test and post test scores in each group.

In addition, the coefficient correlation of effect size was calculated to determine the effect size in the independent *t*-test and to know the influence of independent variable upon the dependent variable. (Coolidge, 2000:151).

The following formula is used to calculate the effect size of independent *t*-test.

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$

After obtaining the correlation of effect size, the following scale is used to interpret the magnitude of effect size.

Table 3.7
The Scale of Effect Size

Effect size	<i>r</i> value
Small	.100
Medium	.243
Large	.371

3.6.1.3 Interview analysis

The interview was analyzed through several steps. The first is collecting the information of the field. The information was collected by conducting the interview to 26 students in experimental group. Second is sorting the information obtained into categories. There are two categories of the questions that exist in the interview: feeling and experience. Third is formatting the information into picture. Pie chart was chosen to format the information in order to make them easier to be understood. Fourth is writing the interpretation result of the pie chart.