

### III. METHODS OF THE RESEARCH

#### 3.1 Research Design

This research is a quantitative research. Hatch and Farhady (1982) states that quantitative is a kind of research in which the data used tend to use statistics as measurement in deciding the conclusion. The design which is used in this research is Pretest - Posttest Control Group Design, which employed two groups, one group as the experimental group, and the other group as the control group. The schematic representation of the design is:

$$\begin{array}{l} \underline{G1 = T1xT2} \\ G2 = T1xT2 \end{array}$$

Notes:

G1 = Experimental group

G2 = Control Group

T1 = Pretest

T2 = Posttest

x = Treatment

(Farhady and Hatch, 1982:25)

### 3.2. Population and Sample

The population of this research was the third graders of SDN 6 Metro Pusat. The third graders of SDN 6 Metro Pusat consisted of three classes, each class consist of 30 students. Two classes were taken randomly sample of this research.

One class was the experimental class and the other the control class. In determining the experimental class and the control class simple probability sampling was used by flipping a coin. One other class was also used as the try out class.

After conducting the pretest for both classes; (experimental class and control class), it was necessary to measure whether they had the same basic ability or in other word whether they had equal knowledge. The homogeneity of the scores between the two classes was measured by using T-test, in which the hypothesis for homogeneity of variance test is:

Ho : there is no significant improvement (equal)

Ha : There is significant improvement (not equal)

The criterion for the hypothesis was:

Ho is accepted if  $Sign > \alpha$ . In this case, level of significance 0, 05 was used.( See Appendix 17).

### **3.3. Data Collecting Technique**

The data were collected from the pretest and posttest

#### **A. Pretest**

The researcher gave the pretest to the students. It was necessary to know the students' ability about vocabulary related to noun before giving treatment, because the researcher would see whether there was significant improvement after teaching vocabulary by using Logico. The researcher compared the pretest scores and the posttest scores.

#### **B. Conducting the Treatments**

The treatment using Logico was conducted three times. It was necessary to ensure whether the increase would be caused by Logico application. The material taught was concerned with "food". For the first meeting, it was related to 'fruits' (mango, orange, apple), the second meeting to 'vegetables' (spinach, cucumber, carrot) and the third meeting to 'food' (bread, noodles, beef).

#### **C. Posttest**

Researcher gave the posttest to the students after conducting treatment for three times. It was necessary to get information whether Logico can increase students' vocabulary mastery, we can measure it by seeing the result of the posttest. The

forms of the pretest and posttest were twenty items. The test items were multiple choices.

### **3.4. Test Instrument**

The researcher conducts the three treatments in the class. The researcher gave two tests; pretest and posttest. The researcher tried out the pretest and posttest tests to know whether the test items of the pretest and posttest are good or not.

The pretest is given to know the students' abilities about vocabulary related to food before the treatments. The researcher gave the posttest to the students to know the students' vocabulary achievement after the treatments.

The total number of Pretest and Posttest was 20 items. And test items were multiple choices.

### **3.5. Criteria of a Good Test**

The test is said to have a good quality if it has a good validity.

In this research, the researcher administered the try out test in order to know whether the test has a good quality. Some aspect to consider concerning the quality of the test are reliability, level of difficulty, and discrimination power. Reliability is a kind of calculation to see whether the test give consistent result when administered under similar condition. Level of difficulty is a kind of calculation to judge whether the test are easy or difficult. Discrimination power is a kind of calculation to see whether the items can discriminate between the testees, separating the upper group from the lower.

## 1. Validity

To judge the validity of the test, the researcher judges it from construct and content validity. Heaton (1991: 159) says that the validity of the test is the extent to which it measures what it is supposed to measure and nothing else. It means that the test must measure certain skills that the students have already learnt in their learning activity that is vocabulary that related to Food.

Content validity depends on a careful analysis of the language being tested and of the particular objective. The test should be constructed as to contain a representative sample of the course. In the content validity the material given were suitable with the curriculum. In this case, the researcher used vocabulary that supposes to be comprehended by the third year students.

**Table of Specification (pretest)**

No	Vocabulary target	Items numbers	percentage
1	Fruits	1, 3, 8, 16, 19	25%
2	Foods	2, 4, 6, 12, 13, 14,	30%
3	Vegetables	5, 7, 9, 10, 11, 15, 17, 18, 20	45%
20			100%

**Table of Specification (posttest)**

No	Vocabulary target	Items numbers	percentage
1	Fruits	3, 5, 10, 15, 17	25%
2	Foods	2, 4, 6, 13, 14, 19	30%
3	Vegetables	1, 7, 8, 9, 11, 12, 16, 18, 20	45%
20			100%

Construct validity concerns with the correlation of the theory of testing certain language skill. As a result, the test should measure the students' achievement of vocabulary of kinds of food (fruits, vegetables, food).

## 2 Reliability of the test.

The reliability of a test is the consistency with which a test measures the same thing all the time. The test should not be elastic in their measurement; if a student takes a test at the beginning of the course and again at the end, any improvement in his score should be the result of the differences in his skill and not inaccuracies in the test.

To know the coefficient of reliability between the odd and even numbers, the writer used statistical formula, namely Product Moment Correlation (Pearson Method).

The formula is :

$$r = \frac{XY - (\sum X)(\sum Y)}{N \sqrt{X^2 - \frac{(\sum X)^2}{N}} \left( Y^2 - \frac{(\sum Y)^2}{N} \right)}$$

(Arikunto, 1992)

r = Coefficient reliability between the odd numbers and even numbers

N = Number of students

X = Total score of odd numbers

$Y$  = Total score of even numbers

$X^2$  = Square of  $X$

$Y^2$  = Square of  $Y$

To transform the split half correlation into an appropriate reliability estimate for the entire test. The Spearman Brown prophecy formula is employed:

$$r_{11} = \frac{2 \left( r_{1/2 \ 1/2} \right)}{1 + \left( r_{1/2 \ 1/2} \right)}$$

Notes:

$r_{1/2}$  = Coefficient reliability between odd items and even items

$r_{11}$  = Coefficient reliability for all items.

The criteria of reliability are:

0,90 – 1,00 = High

0,50 – 0,89 = Moderate

0,00 – 0,49 = Low

(Hatch and Farhady, 1982: 286)

The result of reliability was 0,53. Based on the criteria of reliability, the result in range 0,50 – 0,89 has moderate reliability. It indicated that this instrument would produce consistent result when administered under similar condition, to the same participant and in the different time. It can be concluded that the test has fulfilled the criteria of reliability. It means that the test reliable.

### 3. Difficulty Level

A good test is the one which is not too easy or too difficult. To find out the level of difficulty, this research used the following formula:

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

Where:

LD : level of difficulty

R : the number of students who answer correctly

N : the total number of students following the test

The criteria are:

< 0.30 = difficult

0.30 – 0.70 = average or appropriate

> 0.70 = easy

(Shohamy, 1985: 79)

Based on the criteria above there were 2 easy items (9, 11). It was because the distracters in the test were not balance. Most of the students already knew the meaning. There were 2 difficult items (29, 30) and there were twenty six average items (1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28). The items which were easy and difficult were dropped, meanwhile for the average items were used in the pretest and posttest ( See Appendix 7).

#### 4. Discrimination Power

Discrimination power is used to indicate the discrimination of the fail and the success of the students. To find out the discrimination power, this research used the following formula:

$$DP = \frac{U - L}{\frac{1}{2} N}$$

Where:

- DP : discrimination power
- U : the proportion of upper group students
- L : the proportion of lower group students
- N : total number of students

The criteria are:

1. If the value is positive discrimination a larger number of more knowledgeable students than poor students got the item correct. If the value is zero, no discrimination.
2. If the value is negative, means that more low students than high level students got the items correct.
3. In general, the higher the discrimination index, the better. In the classroom situation most items should be higher than 0, 20 indexes.

(Shohamy, 1985:81)

Based on the try out test result related to those criteria there are 3 items (1, 7, 9) were poor, 4 items (11, 14, 22, 29) were bad, and 23 items (2, 3, 4, 5, 6, 8, 10, 12, 13, 15, 16, 17, 18, 19, 20, 21, 23, 24, 25, 26, 27, 28, 30) were satisfactory. The items which had bad discrimination power were dropped. Meanwhile, the items

which had average difficulty level and satisfactory discrimination index were administered. The Discrimination power of try out test is shown on Appendix 7.

## 5. Scoring System

In scoring system the students' on the test, the writer used Arikunto's formula.

The highest score will be 100. the formula is :

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

Notes:

S = Score

R = The right answer

N = number of items

(Arikunto, 1993:240)

## 3.6 Research Procedure

The research procedures are:

1. Determining the population and sample

The first step was selecting the class sample. The researcher took two classes as the sample of this research. They were experimental class and control class.

In determining the experimental class, the researcher used simple probability sampling, using coin.

2. Administering the try out test

The researcher gave the try out to the students. The try out test consist of 30 items multiple choice. The maximal score was 100. it took 60 minutes. The

test is given to find the quality of the test before it is used. The researcher gave the try out test to find out whether the test items are good or not in level of difficulty, reliability, and the discrimination power.

### 3. Administering the pretest

The researcher gave the pretest to the students. The pretest consist of 20 items multiple choice and it took 45 minutes with total score 100.

### 4. Conducting treatments by using *Logico* and Translation

The researcher applied *logico* in the experimental class and Translation in the control class.

### 5. Administering the post test

The researcher gave the post test to the students. The post test consist of 20 items multiple choice. Total score 100.and it took 45 minutes.

### 6. Analyzing the result of the test

The researcher analyzed the data using T-Test. The data computed through the Statistical Package for Social Science (SPSS) version 16.

## **3. 7. Data Analysis**

In order to see whether there is significant difference of students' vocabulary achievement in terms of noun between the students who are taught through *Logico* and those taught through translation, the researcher analyzed the students' score by using these steps:

1. Scoring pre test and post test.
2. Tabulating the result of the test and calculating the score of pre test and post test.

3. Drawing conclusion from the tabulated result of pre test and post test that is statistically analyzed using Independent group T-Test computed through the Statistical Package for Social Science (SPSS) version 16.0.

### **3. 8. Data Treatment**

According to Setiyadi (2006:168-169), using t-test for hypothesis testing has three basic assumption, they are:

- The data is interval ratio
- The data is taken from random sample in population
- The data is distributed normally

The researcher used these following procedures in the data treatment:

#### **1. Random Test**

Random test was used to make sure whether the data was random or not.

SPSS version 16.00 was used by the researcher to calculate it. In this case, the researcher used mean as critical point run test. The hypothesis for the random test was formulated as follow:

$H_0$  : the data is random

$H_1$  : the data is not random

In this research report, the criteria are

$H_0$  is accepted if  $\text{Sig.} > \alpha$ . The researcher used the level of significant 0.05.

From the result of ( see appendixes 18), it can be determined that  $\text{sig.} > \alpha$  in pretest and posttest of both of control class and experimental class. It proves

that  $H_0$  was accepted. In other words, the data were random.

## 2. Normality Test

The researcher used normality test to know whether the data in the experimental class and the control class are distributed normally. The hypothesis for the normality test as follow:

$H_0$  : the data is distributed normally

$H_1$  : the data is not distributed normally

$H_0$  is accepted if  $\text{Sig.} < \alpha$ . The researcher used the level of significant 0.05.

Based on the result (see appendix 19), we can see that  $\text{sign} > \alpha$  in all test (Pretest and Post test) of both experimental and control class. It means that  $H_0$  was accepted. In other words, all data were distributed normally.

## 3.9. Hypothesis Testing

$H_0$  There is no significant difference of students' vocabulary achievement between the students who are taught through *Logico* and those taught through translation.

$H_1$  There is a significant difference of students' vocabulary achievement between the students who are taught through *Logico* and those taught through translation.

### **3. 10 Statistical Testing**

#### T- Test

The hypothesis analyzed at the level of significant 0.05 in which the hypothesis is approved if  $\text{Sig} < \alpha$ . It means that the probability of error in the hypothesis is only about 5 %.