# CHAPTER III

# RESEARCH METHOD

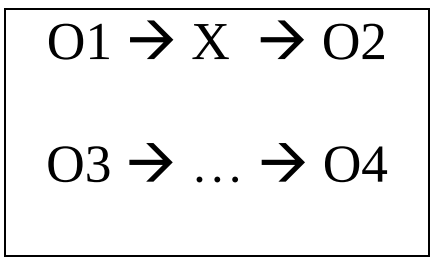
In this chapter, the researcher presents the research method including research design, population, sample, sampling, variable, data and data source, research instrument, validity and reliability testing, normality and homogeneity testing, data collecting method, and data analysis.

## A. Research Design

In this research, the researcher used Quasi experimental design to find out the effectiveness of the implementation of IGT activity toward students's vocabulary mastery. As Ary (2010:640) states Quasi-Experimental is in which the investigator can control the treatment and the measurement of the dependent variable but cannot control assignment of the subjects to treatment.

In this experimental design, the researcher evaluated the experimental group before and after given a treatment. Meanwhile, the other class stand as control group and isolated from the treatment. In other word, control group is not given the treatment except conventional teaching. Finally, the researcher compared the influence of the treatment toward an experimental class. The research design in this research can be seen in the diagram below:

**Figure 3.1 Pretest and Posttest diagram**



O1 : Pre-test for experimental group before being given the treatment

O2 : Post-test for experimental group after being given the treatment

O3 : Pre-test for control group

O4 : Post-test for control group

X : Treatment for experimental group; vocabulary mastery through IGT strategy.

## B. Population, Sampling, and Sample

The population of this research were all of the second grade students at SMAN Campurdarat – Tulungagung which consist of four natural science classes and four social science classes. The researcher choosed purposive sampling technique to determine the sample. Therefore, in this study the researcher choosed the XI IPA 1 class as the experimental group which consist of 10 boys and 24 girls. Meanwhile, the XI IPA 3 class which consist of 8 boys and 25 girls will be chosen as the control group. The XI IPA 1 class is taken because among other classes the students of XI IPA 1 class has average proficiency. To determine the proficiency level, the researcher has checked the sample's score from the teacher and the students' transcript.

## C. Variable

In this study, there were two kind of variables that were independent variable and dependent variable. Both of the variables were selected by the researcher. The independent variable in this study is IGT strategy, the variable was manipulated by the researcher according to the real teaching situation. Meanwhile, dependent variable is a variable that is a consequence of or dependent on an

antecedent (independent) variable. Thus, the dependent variable in this study is the student's vocabulary mastery.

## D. Data and Data Source

The data in this research is quantitative data with numeric form. The kind of data in this study was interval data because the data will be taken from the students score from the result of the student's pre-test and post-test. Thus, the data can be ranked with precise different. In order to know whether there are significant differences between students who are taught by using IGT and those who are not, the researcher used the data sources from primary data that are collected directly from the sample. In conclusion**,** the primary data sources of this research are taken from students test during pre-test and post-test both from experimental and control group.

## E. Research Instrument

Research instrument is a tool to help collecting the data. In this study, the researcher used a teacher-made test as the research instrument. The test was constructed by the teacher itself to assess the students' vocabulary skill in overall. The test was a multiple choices test type which consist of 25 test items. The test can be seen on appendix 1. Meanwhile, the scoring rule of the test, the researcher used the common manual computation:

*Correct answers x 4 points = Rounded into 100 points.*
*25 x 4= 100*

The reason why the researcher constructs a teacher-made test because the researcher wanted to test the overall ability of the second grade students in mastering the vocabularies through IGT strategy. This kind of test is also easier for the researcher in collecting the student's score. This kind of test used to measure the student's vocabulary mastery by using IGT strategy. The test would be administrated during pretest and posttest section.

## F. Validity and Reliability Testing

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. The focus of recent views of validity is not on the instrument itself but on the interpretation and meaning of the scores derived from the instrument (Ary, 2010:225). In conclusion, validity simply means that a test or instrument is accurately measuring what it's supposed to.

In this study, the researcher constructed the test form based on the student's vocabulary skill in overall. Thus, the researcher used content validity and face validity to measure whether the test is valid.

a. Content validity

According to Ary (2010:226) Evidence based on test content involves the test's content and its relationship to the construct it is intended to measure. Content validity is when you create a test or questionnaire for a particular subject, you want the test to actually measure what you want them to. It means that the test form was measured based on the content involved. The content validity in this research can be seen in the table below:

**Table 3.1. Content Validity**

**Content Validity**

| No | Material | Indicators | Test item |
|---|---|---|---|
| 1 | Noun | • The students are able to answer the missing words (gap filling) | 1,2,3,4, |
| | | • The students are able to answer the questions by matching the words | 5,6,7, 8 |
| 2 | Verb | • The students are able to answer the missing words (gap filling) | 9,10,11 |
| | | • The students are able to answer the questions by matching the words | 12,13,14 |
| 3 | Adjective | • The students are able to answer the missing words (gap filling) | 15,16,17,18 |
| | | • The students are able to answer the questions by matching the words | 19,20,21,22, 23, 24, 25 |
| | | | Total 25 Items |

b. Face Validity

Face validity occurs where something appears to be valid. This depends very much on the judgment of the validator/ the expert. In this study, the researcher use the face validity from an expert that is a teacher from the school where the research will be held. The researcher use the test-blueprint to get the validation judgments. If the test there is a mistake, the researcher revise it until the test is valid based on the expert's assessment. The evidence of the validation is shown in appendixs 9.

Reliability is a measuring instrument is the degree of consistency with which it measures whatever it is measuring. This quality is essential in any kind of measurement (Ary, 2003:236). In this study, the researcher conduct try out before pretest and posttest then use the SPSS.13 for windows to calculate the score during try out session. The researcher conducted a tryout to ten students of second grade

science class at SMAN Campurdarat on 20th April 2018. The result can be seen in the table 1.2 below:

**Table 3.2. The student's Pretest and Posttest Tryout Score**

| No | Subject | Pretest | Posttest |
|---|---|---|---|
| 1 | SRJ | 68 | 72 |
| 2 | KP | 72 | 76 |
| 3 | WE | 72 | 68 |
| 4 | SCP | 64 | 80 |
| 5 | MS | 68 | 76 |
| 6 | NLJ | 72 | 76 |
| 7 | NY | 68 | 72 |
| 8 | AT | 76 | 80 |
| 9 | DVA | 80 | 80 |
| 10 | NDP | 64 | 64 |

After knowing the tryout session result, the researcher can find the mean and standard deviation to know the reliability of the test. The researcher used SPSP 13 program to calculate it. The result can be seen below:

**Table 3.3. Descriptive Statistics**

**Descriptive Statistics**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| PRE | 10 | 64 | 80 | 71,20 | 5,266 |
| POST | 10 | 64 | 80 | 74,00 | 5,735 |
| Valid N (listwise) | 10 | | | | |

Meanwhile, to find out the reliability, the researcher used *Pearson Product Moment* formula to calculate the reliability level (Isnawati, 2011:20). The researcher used the SPSS program to help in calculating the level. The result can be seen below:

**Table 3.4. Correlation**

**Correlations**

| | | PRE | POST |
|---|---|---|---|
| PRE | Pearson Correlation | 1 | ,765** |
| | Sig. (2-tailed) | | ,010 |
| | N | 10 | 10 |
| POST | Pearson Correlation | ,765** | 1 |
| | Sig. (2-tailed) | ,010 | |
| | N | 10 | 10 |

**. Correlation is significant at the 0.01 level

From the correlation analyzing, the result shows the correlation between posttest score and pretest score was 0,765 while the ideal reliability coefficient is 1. It can be concluded that the test is reliable.

## G. Normality and Homogeneity Testing

### 1. Normality

Normality testing is the way to see that the test has a normal distribution. The researcher used *One-sample Kolmogorov-Smirnov Test* to analyze the normality from the students' score of experimental group and control group (Both pretest and posttest). The normality interpretation can be seen from the result of Asymp. Sig (2-tailde). If Sig (2-tailde) > significant 0.05 in consequence the test has a normal distribution. The computation result can be seen on the table below:

**Table 3.5 Normality Testing**

**One-Sample Kolmogorov-Smirnov Test**

| | | Pretest Exp | Posttest Exp | Pretest Con | Posttest Con |
|---|---|---|---|---|---|
| N | | 34 | 34 | 33 | 33 |
| Normal Parameters(a,b) | Mean | 72,71 | 80,35 | 69,45 | 69,09 |
| | Std. Deviation | 4,455 | 4,444 | 6,150 | 7,568 |
| Most Extreme Differences | Absolute | ,181 | ,238 | ,225 | ,200 |
| | Positive | ,181 | ,238 | ,127 | ,120 |

| | | | | |
|---|---|---|---|---|
| Negative | -,172 | -,174 | -,225 | -,200 |
| Kolmogorov-Smirnov Z | 1,053 | 1,385 | 1,291 | 1,150 |
| Asymp. Sig. (2-tailed) | ,217 | ,043 | ,071 | ,142 |

a Test distribution is Normal.
b Calculated from data.

According to the table, it showed that for the pretest of experimental group is 0,217, the posttest of experimental group is 0.043. While, the pretest of control group is 0.071 and the posttest of control group is 0.142. All the Sig (2-tailed) result were bigger than significant 0.05. Therefore, the distribution test is normal.

**2. Homogeneity**

Homogeneity testing is used to know the variance of the both groups are equal. To analyze if the two samples has an equal variance or not, the researcher used *One Way Anova* in SPSS. 13. Version for windows. As a test criteria, if the Sig bigger than significant 0.05, in consequence the variance of experimental and control group are equal. The computation result can be seen on the table below:

**Table 3.6. Homogeneity Testing**

**Test of Homogeneity of Variances**

Nilai Ujian

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| 2,292 | 1 | 65 | ,135 |

**ANOVA**

Score

| | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|
| Between Groups | 1571,200 | 1 | 1571,200 | 51,447 | ,010 |
| Within Groups | 1985,098 | 65 | 30,540 | | |
| Total | 3556,299 | 66 | | | |

According to the table above, it show that the significant is 0.135. Thus, Sig 0.135 > 0.05. Because the Sig is bigger than significant 0.05, it can be concluded that the variance of experimental group and the variance of control group are equal.

## H. Data Collecting Method

Method of collecting data refers to how the way the researcher collects the data. Therefore, the researcher conducts pre-test and post-test. The descriptions are clarify as follows:

### a. Pre-test

Pre-test is a test which is conducted before being given a treatment to the students. It is given to both experimental group and control group. Pre-test is administrated to know the student's vocabulary mastery overall.

### b. Post-test

After the treatment, the researcher conduct the post-test in order to know or to measure the student's vocabulary mastery after the treatment. Post-test is administrated to know whether there is significant difference before and after the treatment.

The schedule of the data collected can be seen in the table 1.1 below:

**Table 3.7. Table of schedule**

| Sample | Date | Activity |
|---|---|---|
| Experimental group | 23 April 2018 | Pretest |
| | 26 April 2018 | Treatment |
| | 30 April 2018 | Treatment |

| | | |
|---|---|---|
| | 3 May 2018 | Posttest |
| Control group | 24 April 2018 | Pretest |
| | 1 May 2018 | Posttest |

## I. Technique of Data Analysis

Data analysis is a review of a series activities, grouping, systematization, interpretation, and verification of the data so that a phenomenon has social value, academic, and scientific (Suprayoga in Tanzeh 2009:69). The data was obtained from the student's score that will be analyzed quantitatively. Quantitative analysis was done by using statistical computation that is SPSS 13 version program for windows. This technique was to find out the significant difference on the students vocabulary mastery after being taught using IGT.

After getting the data from both pretest and posttest sections, the researcher would analyze the data by using *independent-sample t-test* formula on SPSS 13 program. After the researcher knows the computation result, then the next step would be interpreting the result.