

## **CHAPTER III**

### **RESEARCH METHOD**

In this chapter, the researcher describes about the research method used in this study, such as research design, population and sample, data collection which consists of instrument and the procedure of collecting data, validity of the test and data analysis which consists of normality test, homogeneity test, and hypothesis testing.

#### **3.1. Research Design**

In this study, the researcher uses quantitative method, especially experimental design to investigate the effect of flipped learning through graphic organizers toward writing skill. An experimental design was chosen for this research because experiments provide answers for cause-effect relations (Abbott & McKinney, 2013). According to Ary (1990:336), the goal of the researcher is to use designs that provide full experimental control through the use of randomization procedures but there are many situations that impossible for the researcher to do true experiment design because the researcher may not possible to random the students in the class. For the example, when the research is conducted in the classroom, the researcher cannot change the classroom setting.

In this research there are two variables, they are independent variable (X) and dependent variable (Y). Independent variable of this study is the implementation of flipped learning through graphic organizers and dependent variable is toward writing skill at MAN 2 Gresik. The researcher wants to know the relationship between dependent variable and independent variable before and after the treatment and also to gets the result of the data. The researcher tries to

find out the result between pre-test and post-test of the students after the treatment.

The researcher divides this research into two groups, they are experimental group and control group. Both of them will give pre-test and post-test. The treatment will administrate to the experimental group. In this study, the design chart can be seen the figure below:

<b>Group</b>	<b>Pre-test</b>	<b>Treatment</b>	<b>Post-test</b>
Experimental	+	+	+
Control	+	-	+

Where:

+ : with treatment

- : without treatment

From the table above, it can be seen that both of the group which given pre-test in the beginning of the research and experimental group will give the treatment by applying flipped learning through graphic organizers. After giving the treatment, the researcher will give post-test to both of groups.

## **3.2. Population and Sample**

### **3.2.1. Population**

Population is a set of all elements processing one or more attribute of interested. Sekaran (2000) states population refers the entire group of people, events, or things of interest will be investigated. The population of this study is social students of 11<sup>th</sup> grade at MAN 2 Gresik which consist of 4 classes. The total number of the students in social studies program is 157 students.

### **3.2.2. Sample**

Sample is a part of number and characteristic which belong to the population. According to Ary (2007), sample is a smaller number of observations taken from the total number making up a given population. The researcher collects the sample of 11<sup>th</sup> grade at MAN 2 Gresik. The sample was taken by cluster sampling where among four classes the researcher only chooses two classes become the sample because two classes have the same characteristics, in term of affective factor. They were XI.IPS-1 which consisted of 38 students as experimental group and XI.IPS-2 which consisted of 39 as control group.

### **3.3. Data Collection**

#### **3.3.1. Instrument**

Research instrument is an important role in doing a research. Instruments are all the things or the activities to get the data. Instruments that used by the researcher is a test. Test is the most important activity in a research which used to collect the data. Arikunto (2004) states test is a set of question or exercise or other means used to measure skill, knowledge, intelligence, ability, or talent of an individual or group of people. In this study, the researcher uses pre-test and post-test. By conducting the writing pre-test and post-test, the researcher wants to get the information about the students' writing scores. To get the score, the researcher uses the scoring guide chosen as the scoring criteria of the aspects writing skill.

##### **3.3.1.1. Pre-Test**

The researcher will give pre-test which is conducting before the treatment. The aim of pre-test is to find the information about the students' writing scores before the treatment. The researcher makes pre-test based on the

material of 11<sup>th</sup> grade. The topic is about procedure text. The researcher gives pre-test to the students by rearrange the sentences into correct order and the total item of pre-test is 10 items. The pre-test can be seen at appendix 1.

#### **3.3.1.2. Post-Test**

The researcher will give post-test which is conducting after the treatment. The aim of pre-test is to find the information about the students' writing scores after the treatment. The researcher makes post-test with the same topic in pre-test. It is about procedure text. The researcher gives post-test to the students by preparing some topics and asks to the students to choose one of the topics then compose the procedure text based on the topic was chosen. The post-test can be seen at appendix 2.

#### **3.3.1.3. Treatment**

Before conducting the treatment, the researcher will prepare and arrange the teaching design. The design will used to facilitate the researcher in doing research by applying flipped learning through graphic organizers. The researcher will apply flipped learning through graphic organizers in teaching writing for experimental group.

### **3.4. The Procedure of Collecting Data**

In this study, the researcher uses quantitative method by giving a test. There are some procedures to collect the data:

1. Giving pre-test to the subjects to measure students' writing skill before the treatment.

2. Giving the treatment to the subjects by applying flipped learning through graphic organizers.
3. Giving post-test to the subjects to measure students' writing skill after giving the treatment.
4. Finding the differences between the result of pre-test and post-test.
5. Analyzing the data using independent sample t-test to prove the hypothesis.

### **3.5. Validity of the Test**

According to Brown (2004) stated that a test is valid. It is appropriate, meaningful and useful in term of purpose of the test. In this study, the researcher uses content validity to analyse the test. According to Ary (1990) content validity is not always in numeric form but it can be determine whether the test's items reflect the course and objectives in the curriculum guides, syllabus and course book.

In the present study, the validity of the test is based on core competency and basic competency because MAN 2 Gresik used Curriculum 2013. The topics of 11<sup>th</sup> grade are invitation letter, personal letter, report text, and procedure text. The researcher also gives a test based on the syllabus and makes the scoring criteria table. The table is used to analyze the students' score in writing assessment, in terms of content, vocabulary, grammar, and spelling. The scoring criteria table can be seen at appendix 5.

Here is the detail:

<b>Core Competency</b>	<b>Basic Competence</b>	<b>Learning Material</b>	<b>Time Allotment</b>
4. Mengolah, menalar, dan menyaji dalam ranah konkret dan ranah abstrak terkait dengan pengembangan dari yang dipelajarinya di sekolah secara mandiri, bertindak secara efektif dan kreatif, serta mampu menggunakan metoda sesuai kaidah keilmuan	4.2. Menyusun teks undangan resmi, dengan memperhatikan fungsi sosial, struktur teks, dan unsur kebahasaan, secara benar dan sesuai dengan konteks.	Invitation Letter	2 x 45 menit
	4.3. Menyusun teks surat pribadi, dengan memperhatikan fungsi sosial, struktur teks, dan unsur kebahasaan, secara benar dan sesuai dengan konteks.	Personal Letter	2 x 45 menit
	4.4. Menyusun teks ilmiah faktual (factual report), sederhana, tentang benda, binatang dan gejala/peristiwa alam, terkait dengan mata pelajaran lain di Kelas XI dengan memperhatikan tujuan, struktur teks, dan unsur kebahasaan, secara benar dan sesuai dengan konteks.	Report Text	2 x 45 menit
	4.5. Menyusun teks prosedur berbentuk manual dan kiat-kiat (tips), dengan memperhatikan tujuan, struktur teks, dan unsur kebahasaan, secara benar dan sesuai dengan konteks.	Procedure Text	2 x 45 menit

**Table 3.5. Validity of Writing Test**

### **3.6. Data Analysis**

After conducting the classroom experiment research, the researcher needs to analyze the result. In this study, writing test will analyzed quantitatively. The accuracy from the aspects of writing skill is content, vocabulary, grammar, and spelling. The researcher analyse the quantitative data to know the tendency of the students' writing scores. She identifies the progress of the students' writing skill due to the actions. Furthermore, the instrument that analyzed quantitatively is the results of pre-test and the post-test.

In this study, the researcher will use SPSS 16.0 especially independent sample t-test to analyzing the data. Independent sample t-test is used to find out the results of the first and second hypothesis. They are to find out significant difference of students' writing skill who are taught by applying flipped learning through graphic organizers (experimental group) and the students' writing skill who are taught by applying think talk write method (control group). Here are the steps of analyze the data:

#### **3.6.1. Normality Distribution Test**

Normality distribution test is used to find out whether or not the data between two groups are normally distributed. The researcher uses normality distribution test because she wants to know the data between experimental group and control group toward writing skill are in normal distribution or not. To analyze it, this researcher uses Kolmogorov-Smirnov test in SPSS. The procedure to analyze the normal distribution is selecting Analyze, choose Descriptive Statistics, then Explore, input the variable score to Dependent List, group variable

to Factor List, click Plots and give  $\sqrt{\quad}$  Normality plots with test, click Continue, and then click OK.

### 3.6.2. Homogeneity Test

Homogeneity test is used to find out whether the research population has the same variance or not. The researcher also uses homogeneity test because she wants to know the variance between experimental group and control group toward writing skill are homogeneous or not. To analyze it, the researcher uses Lavene's test. The test statistic of Lavene's test ( $W$ ) is defined as follows:

$$W = \frac{(N - k) \sum_{i=1}^k \frac{1}{n_i} (Z_{i.} - Z_{..})^2}{(k - 1) \sum_{i=1}^k \sum_{j=1}^{n_i} \frac{1}{n_i} (Z_{ij.} - Z_{i.})^2}$$

Where:

$W$  : The result of the test

$K$  : The number of different groups to which the samples belong

$N$  : The total number of samples

$N_{ij}$  : The number of sample in the  $i^{th}$  group

$Y^{ij}$  : The value of  $J^{th}$  sample from the  $i^{th}$  group

$$Z_{ij} = |Y_{ij} - \gamma_{i.}|, \gamma_{i.} \text{ is mean of } i - \text{th group}$$

$$Z_{ij} = |Y_{ij} - \gamma_{i.}|, \gamma_{i.} \text{ is median of } i - \text{th group}$$

The significance of  $W$  is tested against  $F(\alpha, K-1, N-K)$  where  $F$  is a quintile of  $F$  test distribution, with  $K-1$  and  $N-K$  its degree of freedom, and  $\alpha$  is the chosen level of significance (usually 0,05 or 0,01).

The procedure to analyze the homogeneity test is inserting the pre-test data both experimental and control group, click Analyse, then Compare Means, choose Independent Sample T-Test and then click OK. The output automatically shows the result of Lavene's test.

### 3.6.3. Hypothesis Testing

In this study, the researcher uses independent t-test to know the significant difference between experimental group and control group is accepted or rejected. There are two steps of hypothesis testing. The first step is starting the hypothesis and setting the alpha level at 0.05 (2-tailed). The hypothesis can be formulated as follow:

Null hypothesis is  $\mu_1 - \mu_2 = 0$  ( $\mu_1 = \mu_2$ )

Alternative hypothesis is  $\mu_1 - \mu_2 \neq 0$  ( $\mu_1 \neq \mu_2$ )

Hypothesis testing in this study is:

$H_0$ : There is no significant effect of flipped learning through graphic organizers toward writing skill at MAN 2 Gresik

$H_1$ : There is a significant effect of flipped learning through graphic organizers toward writing skill at MAN 2 Gresik

The second step is finding t-value using independent t-test formula and comparing the probability with the level of significance for testing the hypothesis. After the scores were computed in SPSS 16.0, see the output of independent t-test and interpreted the output that if sig (2-tailed) > (0.05), the researcher should accept the  $H_0$  but if sig (2-tailed) < (0.05), the researcher can reject  $H_0$ , it means  $H_1$  is accepted.

T-test was calculated to find out the comparison of two means between experimental and control group pre-test and post-test. In analyzing the data, the researcher uses independent t-test formula. The formula is:

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - (\mu_1 - \mu_2)}{S_{\bar{x}_1 - \bar{x}_2}}$$

Where:

$t$  : t value

$\bar{x}_1$  : Average group 1

$\bar{x}_2$  : Average group 2

$S$  : Standard error of the two groups

$\mu_1 - \mu_2$  : Always defaults to 0

Where:

$$S_{\bar{x}_1 - \bar{x}_2} = \frac{\sqrt{S^2_{\text{pooled}} + S^2_{\text{pooled}}}}{n_1 + n_2}$$

$S_{\bar{x}_1 - \bar{x}_2}$  : Standard error of two groups

$S^2_{\text{pooled}}$  : Variants of the two groups

$n_1$  : Number of sample group 1

$n_2$  : Number of sample group 2

Pooled variance: the average of two sample variances, allowing the larger sample to weight more heavily.

Formula:

Estimated standard error of the difference

$$S_{\bar{x}_1 - \bar{x}_2} = \frac{\sqrt{(SS_1 + SS_2)(1 + 1)}}{(n_1 + n_2)(n_1 + n_2)}$$

To calculate t-test, the researcher uses SPSS (Statistical Product and Service Solution). It aims to find out the significance effect of flipped learning through graphic organizers toward writing skill. The post-test score both experimental group and control group will analyzed by using SPSS 16.0 with some procedures. The first procedure is inserting the post-test data both experimental group and control group using the data view. The second procedures is selecting Analyse, then Compare Means, and choose Independent Sample T-Test output, automatically it could answer to the research question about the comparison between two groups. The final result is collecting by means of pre-test and post-test score.