CHAPTER III

RESEARCH METHOD

3.1 Research Design

Quasi-experimental is the design of this study. The researcher uses quasi-experimental design because this design is more generally used appropriate with school schedules and logistical problems (Cohen, Manion, & Morrison, 2007). Besides that, the goal of quasi-experimental is to use design that provide experimental and control through the use of randomization procedures. As Trochim (2006) stated that quasi-experimental is research design that has several aspects of randomized experimental designs, such as pre-post measurement and treatment-control group comparisons. In addition, Boomsma, et al (2009) assumes the purpose of quasi-experimental design is to evaluate the change in a subject's result which is caused by receiving the treatment compared to maintenance the treatment. Because this research will use pre-post test as measurement and treatment-control group comparison that are included of quasi-experimental requirement, so this is why the researcher will use quasi-experimental as the design of this research.

This study uses quasi-experimental that is included of quantitative research design because the purpose of this study is to examine the change of students' writing procedure text after using guided writing strategy in their writing result. So, the aim of this study to examine the use of guided writing strategy toward writing procedure text in tenth grade machinery program at SMK MUHAMMADIYAH 1 GRESIK. Here, tenth grade of machinery students will

gain positive contribution in mastering writing procedure text by using guided writing strategy. The design chart can be seen in figure below:

Group	Pre-test	Treatment	Post-test
Experimental	√	√	√
Control	√	-	√

Table 3.1 Pre-test, Post-test Quasi Experiment Design

Where:

√ : With treatment of guided writing strategy

- : Without treatment of guided writing strategy

The researcher uses two groups in this quasi-experimental research. First is experimental group and the second is control group. Automatically, the experimental group uses guided writing strategy as the treatment. In this case, the researcher uses the same grade for both groups. It will make this research relate and reliable. The researcher decided to choose class X TKR 3 as the experimental group and class X TKR 1 as the control group. Pre-test is administered before the application of the experimental and control treatment, for the post-test is administered at the end of the treatment period.

3.2 Population and Sample

3.2.1 Population

According to Watt and Berg (2002) defined population is the part which consists of all the units of analysis for particular study. In short, as Hanlon and Larget (2011) assumed that population is about all individuals or units of interest. So, in this research the population is all machinery students of SMK

MUHAMMADIYAH 1 GRESIK especially in tenth grade. The total number of machinery students in tenth grade is about 60 students.

3.2.2 Sample

Sample is the small subset of the population that has been selected to be researched (Lunsford, 1995). In this research, the technique of selecting sample is cluster sampling. By cluster sampling, population is divided into units or group (strata) that the sample should be represented to the population. So, the sample should represent the heterogeneity of the population that want to be studied and also should be homogeneous among the population (Barreiro & Albandoz, 2001).

Here, the researcher will use the technique of cluster sampling because the way to collect the sample by random of the class, to get whether the class is representative as the sample or not. From the population, the researcher uses two classes of students; there are 20 students of X TKR 1 and 20 students of X TKR 3 as the subject of this study. Class X TKR 1 was taken as control group and X TKR 3 was taken as experimental group.

3.3 Data Collection

This study will use writing test to collect the data. The data will be obtained from the participants who are machinery students in tenth grade of SMK MUHAMMADIYAH 1 GRESIK.

3.3.1 Research Instrument

In this study, the researcher uses test as the instrument. There are two tests which are used by the researcher, pre-test and post-test. Pre-test and post-test

will be conducted to the experimental group and control group. Both of the tests are aimed to find out whether the learners for experimental group make progress in their writing procedure text or not. The researcher designed topics of pre-test are same with post-test. Here, the researcher designed writing test by herself after adopting material from the machinery book.

Pre-test and post-test, selecting of the tests are adapted from the syllabus of vocational high school with focusing on one skill, that is writing skill and one topic is about procedure text. The test can be elaborated as follows:

3.3.1.1 Pre-test

Pre-test will be done by the control and experimental group of X TKR 1 and X TKR 3 at SMK MUHAMMADIYAH 1 GRESIK. It is conducted for knowing the previous ability in their writing skill. The items of pre-test are focused on procedure text which is related to the materials of machinery program. They have 90 minutes to finish the test; book and dictionary are allowed. The text that will be delivered in the pre-test is aimed to measure their writing skill, so they have to know the generic structure of procedure text first, and then they have to make procedure text based on the topic that they have chosen, see Appendix A.

3.3.1.2 Post-test

As like in pre-test, post-test is also done by the experimental and control group of X TKR 1 and X TKR 3 at SMK MUHAMMADIYAH 1 GRESIK. The procedure of post-test has same procedure with pre-test, but post-test was conducted after giving all treatments to the experimental group only to measure the result of the treatment whether success or not. The items and topic of post-test

are same with the items and topic given to the experimental and control group in pre-test, see Appendix B.

A set of the test which is related to the syllabus and the curriculum that school used is created for this study to identify students' ability in mastering writing skill. The test focuses on writing procedure text that the materials are related to the machinery program and will be distributed to 40 participants of X TKR 1 and X TKR 3 at SMK MUHAMMADIYAH 1 GRESIK.

3.3.2 The Validity of Instrument

Before conducting pre test and post test as instrument of this research, the researcher will test the validity of the item. The instrument called valid if it has validity. Validity is a compatibility test with the main targets that need to be measured, as Kimberlin and Winterstein (2008) state is like degree of the measuring instrument which needs to be measured. There are three kinds of validity; those are construct, criterion, and content validity. According to Trochim (2006) in Drost (2011) construct validity is about the way to interpret or transform a concept, idea, or behaviour into an implementation reality. Besides that criterion-related validity is the degree of correlation between assessment test and one or more external criteria. For the content validity according to Yaghmaie (2003) is the essential aspect in discovering assessment concept that is used to measure the significance variable.

From those types of validity, this study will use content validity to verify the validity of pre-test and post-test that will be given to the participants. Both of the tests are applied to classify the students' achievement in writing procedure

text. For the pre-test, the researcher gives test which is involved into appropriate materials related to the machinery program, before the students get treatment. For the post-test, the researcher gives test which is same with pre-test after the students get all treatments. Here, the validity is based on the standard competence and also basic competence from the government. The researcher helped by the English teacher to check the instrument based on curriculum and syllabus. Here is the detail:

Standard Competence	Basic Competence	Test	
		Pre-test	Post-test
3. Berkomunikasi dengan Bahasa Inggris setara *Level Intermediate*	3.3 Memahami manual penggunaan peralatan	I. Classify the generic stucture of procedure text II. Analyze the sentences first, and correct by using correct grammatical structure III. Choose one of those titles and make a procedure text	I. Classify the generic stucture of procedure text II. Analyze the sentences first, and correct by using correct grammatical structure III. Choose one of those topics and make a procedure text

Table 3.2. Specification in Pre-test and Post-test achievement on writing procedure text of machinery students in tenth grade at SMK Muhammadiyah 1 Gresik

3.3.3 Procedure of Collecting Data

The data were taken from the written test on experimental group. There are some steps that the researcher used to collect the data on experimental group, those are the researcher provides the pre-test to the students, the researcher teaches writing procedure text by using guided writing strategy, the researcher provides post test to the students and the researcher collects the test. In addition, the researcher took the data in the form of the written test on the control group, those are the researcher provides pre-test to the students and the researcher provides the post test to students and then collecting the test.

Here the researcher conducts an experimental group is about four meetings. The topic of the first meeting is about component of machine connection, the second meeting is about tools of bench working, the third meeting is about the way to operate fluid pump, and the fourth is about the way to draw the component of machine. So based on the explanation, the researcher makes four lesson plans. Before and after the treatment the researcher provides pre and post test. During conducting this study, the researcher has schedule to conduct the study as follow:

No	Meeting	Class	Activity	Time
1	1st	X TKR 1 and X TKR 3	Giving Pre-test (Free writing procedure text by choosing one title that have been available)	90 minutes
2	2nd	X TKR 3	Giving first treatment (Component of machine connection)	45 minutes

3	3rd	X TKR 3	Giving second treatment (Tools of bench working)	45 minutes
4	4th	X TKR 3	Giving third treatment (The way to operate fluid pump)	45 minutes
5	5th	X TKR 3	Giving fourth treatment (The way to draw the component of machine)	45 minutes
6	6th	X TKR 1 and X TKR 3	Giving Post-test (Composing procedure text by choosing one topic of machinery program that they have been mastered)	90 minutes

Table 3.3. The Schedule of Implementation

3.4 Data Analysis

3.4.1 Analyzing Data of Test

After conducting pre and post test, the next step is analyzing the data. In conducting a research, it is necessity to analyze the data in order to interpret the data obtained from the field. The data analysis is carried out in order to answer the research problem with the data obtained through pre and post test. The researcher analyzes the data by using independent sample t-test. Since the samples are small and the groups are independent, the t-test for independent samples is carried out to determine whether there is any difference between experiment and control group.

The researcher used SPSS version 16.0 to compute statistics of writing procedure text. This study is conducted in order to find the effect of the treatment whether there is significant or not using guided writing strategy.

Assumption for the independent t-test where: (1) Independence: observation within each sample must be independent (they do not influence each other); (2) Normal distribution: the scores in each population must be normally distributed; (3) Homogeneity of variance: two populations must have equal variances (the degree which the distribution are spread out is approximately equal). Here the steps of analyze data:

3.4.1.1 Normality Distribution Test

To analyze the normal distribution, this study use Kolmogorov-Smirnov Sample Test in SPSS version 16.0. It is aimed to find whether or not the distributions of pre-test score in two groups are normally distributed.

The step in calculating normality distribution test is about tried to compare the Asymp. Sig. (probability) with the level of significance for testing the hypothesis. If the Asymp is more than the level significance (0.05), the scores were normally distributed. On the other hand, if the Asymp is less than the level of significance (0.05), the scores were not normally distributed. The procedure in analyzing normality distribution test is click analyze, click descriptive statistic, click explore and move all variable to dependent list box, click plots and tick normality plots with test then continue.

3.4.1.2 Homogeneity Test of Variance

The researcher uses Levene's Test for homogeneity test. This test is used to find out whether the variance of pre test score in experimental group and control group are homogenous. The test statistic of Levene's Test (W) is defined as follows:

$$W = \frac{(N-k)}{(k-1)} \frac{\sum_{i}^{k} = 1 \, Ni \, (Zi - Z)^2}{\sum_{i}^{k} = 1 \sum_{j}^{Ni} = 1 \, (Zij - Zi)^2}$$

Where:

W : The result of the test

K : The number of different groups to which the sampled cases belong

N : The total number of cases in all groups

Ni : The number of cases in the i group

Y_{ij} : The value of the measured variable for the jth case from i[th] group

$$Z_{ij} = \begin{cases} |Y_{ij} - \acute{Y}_i|, \acute{Y}_i \text{ is a mean of } i-th \text{ group} \\ |Y_{ij} - \acute{Y}_i|, \acute{Y}_i \text{ is a median of } i-th \text{ group} \end{cases}$$

The significance of W is tested against F (α, K- 1, N-K) where F is a quintile of F test distribution, with K – 1 and N – K its degrees of freedom, and α is the chosen level of significance (usually 0.05 or 0.01).

Here the following procedures in analyzing the homogeneity by using SPSS version 16.0: first, make two columns. The first column is a group and the second column is a score after pre test data from both experimental and control group are input, then click analyze, compare means, and then independent sample t-test, input the score into test variable and the grouping variable, then click define

groups to determine group 1 (for experimental) and group 2 (for control) click continue and the last click OK.

3.4.1.3 Hypothesis Testing

Independent t-test was used to know the significant difference between experimental group and control group had to be accepted or rejected. The first step is about stating hypothesis and setting alpha level at 0.05 (two tailed test). In this research, the hypothesis used alternative hypothesis that said "There is significant effect of using guided writing strategy toward writing procedure text in machinery program at the tenth grade of SMK Muhammadiyah 1 Gresik". The hypothesis can be formulated as follow:

Null hypothesis is $\mu1-\mu2=0$ ($\mu1=\mu2$)

Alternative hypothesis is $\mu1-\mu2\neq0$ ($\mu1\neq \mu2$)

Hypothesis testing in this research as follows:

H_0: There is no significant effect of using guided writing strategy toward writing procedure text in machinery program at the tenth grade of SMK Muhammadiyah 1 Gresik

H_1: There is significant effect of using guided writing strategy on Students' writing procedure text in machinery program at the tenth grade of SMK Muhammadiyah 1 Gresik

The second step was finding t-value using independent t-test formula and comparing the probability with the level of significance for testing the hypothesis. Determining t-critical in table t = (0.05) df, the researcher compared t-observed and t-critical. If t-obs < t-critical, the researcher should accept the null hypothesis

and if t-obs > t-critical, it means the researcher can accept the alternative hypothesis.

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

$$t = \frac{(x_1 - x_2) - (\mu_1 - \mu_2)}{Sx_1 - x_2}$$

Where:

t : t value

x_1 : Average group 1

x_2 : Average group 2

S : Standard error of two groups

$\mu_1 - \mu_2$: Always a default to 0

Where:

$$Sx_1 - x_2 = \sqrt{\frac{S^2 pooled}{n_1} + \frac{S^2 pooled}{n_2}}$$

$Sx_1 - x_2$: Standard error of two groups

$S^2 pooled$: Variants of two groups

n_1 : Number of sample group 1

nn_2 : Number of sample group 2

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

Formula of estimated standard error of the difference:

$$Sx_1 - x_2 = \sqrt{\left(\frac{SS^2 pooled}{n_1}\right)\left(\frac{S^2 pooled}{n_1}\right)}$$

Therefore, the results of the test were subjected for the following statistical procedures. To calculate t-test, the researcher uses SPSS (Statistical product and service solution) version 16.0 and the post test score of experimental and control group were also analyzed by using SPSS version 16.0 with the following procedures. The first procedure was inserting the post test data both experimental and control group using the data view. The second procedures were going to the analyze menu, selecting compare means, then choosing independent sample t test output, automatically it could answer to the research question about the comparison between two groups. The final result was collected by means of pre and post tests score. It is aimed to find out the significance on the effect of using guided writing strategy toward writing procedure text in machinery program at SMK Muhammadiyah 1 Gresik.