

CHAPTER III

RESEARCH METHODOLOGY

A. Form of Research

In order to achieve the main purpose of this research so that suitable method should be used. The research design that implemented in this research was an experimental. According to Singh (2006:134), “Experimental method is a scientific method. It is oriented to the future in the sense that the researcher is seeking to evaluate something new. It is a process of contribution to the already acquired fund of knowledge”. On the other word, Scott and Morrison (2006:103) stated that the experimental method requires the researcher to intervene in the natural setting and control a number of variables to determine a causal relationship between two or more properties of an individual or unit. It means that, an experimental research is to investigate the correlation between cause and effect and how far its correlation is by giving treatment to experimental group and control group as the comparison.

Based on the opinion above, it can be concluded that experimental method is the most sophisticated way of research, particularly in sciences. In this way the researcher study some variables by controlling some variables affecting the previous one. The kind of experimental research which was used by the researcher in this research was pre-experimental research by using one group pre-test and post-test design, where the researcher applied an experiment in a single group only.

Ary et al (2010:303) stated that pre-experimental because they provide little or no control of extraneous variables. Meanwhile, Creswell (2009:158) stated that with pre-experimental design, the researcher studies a single group and provides an intervention during the experiment. This design does not have a control group to compare with the experimental group.

In this research, the researcher took one class in order to know the students' speaking skill. The researcher gave pre-test before giving treatment and after that the researcher gave the treatment for the students to know the effectiveness of spontaneous argumentation debate (SPARD) technique in teaching speaking. Furthermore, the researcher gave post-test to the students in order to know the result before and after giving treatment.

Table 3.1: One group pre-test and post-test design

Pre-Test	Treatment	Post-Test
Y1	X	Y2

Source: Ary, et al (2010:304)

Based on the sign above, Y1 applied in order to know the students' mean score before giving the treatment. Meanwhile, X represents as the treatment. Y2 applied in order to measure the students' achievement after the treatment given. In this research, a pre-experimental did not have a control group. The influence of experimental treatments could be seen by seeing the mean score between the pre-test and post-test. In this research, the researcher tried to investigate the effectiveness of spontaneous argumentation debate (SPARD) technique in teaching speaking to the eleventh grade students of SMK Mandiri Pontianak.

B. Population and Sample

1. Research Population

Population is a set or collection of the subject in the research. According to Weiss (2012:4), "Population is the collection of all individuals or items under consideration in a statistical study". On the other hand, according to Singh (2006:82), "In research methodology population means the characteristics of a specific group". Meanwhile, Cresswell (2012:1422) stated "population is a group of individuals who have the same characteristic". The population in this research was all students of XI PM (Pemasaran) at SMK Mandiri Pontianak. The total populations are 27 students.

2. Research Sample

Sample is a part that can present all the population observed. According to Weiss (2012:4), "Sample is that part of the population from which information is obtained". On the other hand, according to Cresswell (2012:142), "a sample is a sub group of the population target that the researcher plans to study for generalizing about the target population". It can be said that, the sample in this research is represented of population. In this research the researcher chose the sample by using purposive sampling because there was only one class for XI PM (Pemasaran) at SMK Mandiri Pontianak. In addition, speaking skill also has crucial role for the students in marketing class because the students often use it for communication.

Therefore, the researcher used all students at XI PM as the sample of the research.

C. Technique and Tool of Data Collection

1. Technique of Data Collection

In this research, the researcher collected the data by using measurement data collection technique. “Measurement is a process that assigns a numerical descriptive to some attributes of an object, person, or event (Ross, 2005:33)”. On the other hand, Kothari (2004:69) states that measurement is a process of mapping aspects of a domain onto other aspects of a range according to some rule of correspondence. The measurement technique intended to measure the students’ knowledge before and after treatment in pre-experimental research. Therefore, the technique of data collection that applied by the researcher in this research was measurement technique.

2. Tools of Data Collection

Tool of data collection is a device which used by the researcher for collecting the data. In this research the researcher used spoken test as a tool to test students’ speaking skill. As stated by Heaton (1988:88), “Testing the ability to speak is a most important aspect of language testing. On the other hand, Ross (2005) explains that test consists of questions, known as items. According to Ary *et al* (2010:201),”A test is a set of stimuli presented to an individual in order to elicit responses on the basis of which a numerical score can be assigned”.

The test which used by the researcher in this research was spoken test in form of spontaneous argumentation debate. The test was given to know the ability of students in speaking. Pandiya (2013:44) says, “If the teacher wants to know the test takers’ ability in delivering speech, the appropriate test is speaking test or oral test. In addition, Brown (2004:172) said that there are five aspects of speaking skill that have to be assessed in teaching speaking skill, they all are vocabulary, grammar, pronunciation, fluency and comprehension. In this case, the researcher gave some topics to the students as the topics for speaking test and the students have to give their opinion based on the topic. In order to make the researcher easier to get the score of students’ spoken test so that researcher used scoring rubric of speaking assessment. Therefore, for further detail see appendix 3.

a. Readability

In this research, the researcher used spoken test. In order to know whether the students understand with the instruction of the test and what should they do in speaking test so the researcher used readability test. According to Lockyer *et all* (2009:173), “Readability is the level of easy or difficulty which a text material can be understood by a particular reader who read the text for a specific purpose”.

Therefore, it can be said that readability test is a test that used to measure the students’ comprehension about the instruction that given. The readability test was given to students in form of questionnaire. The

researcher gave the readability test to the students before giving the pre-test. The researcher used the formula as follow:

$$X \% = \frac{n}{N} \times 100 \%$$

Where :

X = the result of percentage

n = the total number of students who said yes/no

N = the total number of students in observation

The criteria:

00,00% - 33,33% = Low

33,34% - 66,67% = Middle

66,68 - 100,00% = High

(Ali, 1985:184) in Gunawan (2014)

In this part, the researcher calculated the result of students' readability test by using formula above. Based on the result, the total percentage of students who answer "Yes" was 84,45% which higher than the total percentage of students who answer "No" was 15,55%. The table can be seen in appendix 4. Therefore, it can be concluded that most of students understood the instruction of the test with total percentage was 84,45% so it was categorized "High".

b. Inter-rater Technique

Inter-rater was used to determine the students' individual score. In this case, the researcher asked the English teacher to help in scoring students' individual score. In this case, inter-rater technique was used to compare the students' individual score by comparing the score that had

been taken by the researcher and the English teacher. This technique used in order to minimize subjectivity and human error.

E. Technique of Data Analysis

Technique of data analysis comes from the interpretation of data collection. In order to find out the answer of research questions and to test the hypotheses of research so the procedures of data analysis are required. Singh (2006:223) defined that analysis of data means studying the tabulated material in order to determine inherent facts or meanings. It involves breaking down existing complex factors into simpler parts and putting the parts together in new arrangements for the purpose of interpretation. The techniques of data analysis in this research were as follow:

1. Analysis of the Students' Individual Scores in Pre-Test and Post-Test.

In order to analyze the students' individual scores, the researcher will use the formula below:

$$X = \frac{A}{N} \times 100$$

Note:

X = an individual score

A = the students' right answer

N = the number of test items

Adopted from Cohen *et al* (2007:423)

2. Analysis of the Students' Mean Score of Pre-Test and Post-Test.

In order to analyze the students' mean score, the researcher will use the formula below:

$$\bar{X} = \frac{\sum Xi}{n}$$

Note:

\bar{X} = the students' mean score

$\sum X_i$ = the total score of students

n = the total number of students

Adopted from Khotari (2007:132)

3. Analysis the Students' Difference Scores of Pre-test and Post-test.

In order to analyze the students' difference scores of pre-test and post-test, the researcher will use the formula as follow:

$$\bar{D} = \bar{X}_2 - \bar{X}_1$$

Adopted from Best and Kahn (1998:347)

Note :

\bar{D} = Interval of pretest and post test

\bar{X}_1 = The main score of pre test

\bar{X}_2 = The main score of post test

4. Analysis of the Students' Standard Deviation

In order to analyze the students' standard deviation so the researcher will use the formula as follow:

$$S = \sqrt{\frac{\sum(X_i - \bar{X})^2}{n-1}}$$

Where:

\bar{X} = the mean score

X_i = the i th values of the variable X

n = the number of items

S = Standard deviation

Adopted from Urdan (2005:16)

5. The formula of normality test

In order to decide the formula to test the hypotheses in this research, the researcher tested the normality of the data both pre-test and post-test by using Shapiro Wilk, the formula as follow:

$$T_3 = \frac{1}{D} \left[\sum_{i=1}^k a^i (X_{n-i+1} - X_i) \right]^2$$

Note:

T_3 = value of shapiro wilk

D = score of the sum of the square of different score between x and \bar{x}

a = the coefficient of shapiro wilk

X_{n-i+1} = the score in n-i+1 in the data

X_i = the score in i in the data

In this case, the criteria used to accept and refuse the normality of the data as follow:

If T_3 - value > α , the H_1 accepted

If T_3 - value < α , the H_0 accepted

Note :

H_1 = the data of population normal distributed

H_0 = the data of population not normal distributed

$\alpha = 0,05$

The formula to test the hypotheses were as follows:

The criteria is, if T_3 counted in pre-test and post-test score is more than α , the data was normal distribution and the researcher would use paired-sample t-test (two sided) with the level of confidence 95% (parametric method) that available in SPSS16 to test the hypothesis.

The formula to calculate the t-test is as followed:

$$t = \frac{\bar{D}}{\sqrt{\frac{\sum D^2 - \frac{(\sum D)^2}{N}}{N(N-1)}}$$

Note:

t = t ratio

\bar{D} = average difference

$\sum D^2$ = different scores square, then summed

$(\sum D)^2$ = different scores summed, then square

N = number of pairs

Adopted from Ary *et al* (2010:177)

On the other hand, if T_3 counted in pre-test and post-test is less than α , the data was not normal distribution and the researcher would use Wilcoxon-Mann-Whitney test or (U-test) (non-parametric method) that available in SPSS16 to test the hypothesis.

$$U = n_1 \cdot n_2 + \frac{n_1(n_1 + 1)}{2} - R_1$$

Note:

$n_1 \cdot n_2$ = the sample sizes

R_1 = the sum of ranks assigned to the values of the first sample

Adopted from Kothari (2004:294)

The researcher used SPSS 16 to test hypotheses and the result of data computation was the conclusion in applying the treatment. It was used to know if the hypotheses were accepted or refused.

6. Effect Size

In order to answer the research question number two so that the researcher used effect size formula. According to Cresswell (2012:188),

“Effect size is a means for identifying the practical strength of the conclusion about group differences or about the relationship among variables in a quantitative study”. On the other words, Cohen (2007:293) states that effect size is a measure of the degree to which a phenomenon is present or the degree to which a null hypothesis is not supported. The formula to effect size is as follows:

$$ES = \frac{\text{Mean Score of Posttest} - \text{Mean Score of Pretest}}{SD_{\text{Gain}}}$$

A Cohen’s *d* Effect Size could lie between 0 to 1 as followed:

- 0–0.20 = weak effect
- 0.21–0.50 = modest effect
- 0.51–1.00 = moderate effect
- >1.00 = strong effect

Adopted from Cohen, Manion, and Morrison (2007:521)