

CHAPTER III

METHODOLOGY OF THE RESEARCH

A. The Design of the Research

The design of this research was an experimental research. Donald ary explained:

Experimental research involves a study of the effect of the systematic manipulation of one variable(s) on another variable. The manipulated variable is called the experimental treatment or the independent variable. The observed and measured variable is called the dependent variable. The goal of experimental research is to determine whether a causal relationship exists between two or more variables. Because the experiment involves control and careful observation and measurement, this research method provides the most convincing evidence of the effect that one variable has on another¹.

The experiment is the best way to establish cause and effect relationships among variables². Experimental research is the researcher controls or manipulates how groups of participants are treated and then measures how the treatment affects each group. In technical terms, the researcher controls or manipulates one or more independent variables and examines the effect that the experimental manipulation has on the dependent variable or the outcome of the study. The independent variable is the variable that refers to how participants are treated. Participants are usually assigned to different groups that receive different treatments³.

¹ Donal Ary. *Introduction To Research in Education* (8th edition), p. 26 & 265

² Jack R Fraenkel, et al. *How to Design and Evaluate Research in Education* (sixth edition). (New York: Avenue of the Americas, 1932)

³ Marguerite.G. Iodico, et al, *methods in educational research*, (Jossey-bass: a willay imprint, 2010), p. 178

The design of this research was quasi-experimental design. The writer used non equivalent group design; both experimental and control group given a pretest and a posttest. There were two variables in this research. Using tree diagram technique was an independent variable which is symbolized as (X), and students' writing ability in descriptive text was dependent variable which is symbolized as (Y), two groups involved; an experimental group and control group.

**The Research Design:
Table III.1**

Group	Pre-test	Treatment	Post-test
Experimental	O_1	X	O_2
Control	O_3	-	O_4

Where:

X : Treatment

O_1 : Pretest of experimental group

O_2 : Posttest of experimental group

O_3 : Pretest of control group

O_4 : Posttest of control group

B. The Time and Location of the Research

The location and time of the research was at SMK Telkom Pekanbaru, This research had been conducted from 16 August–30 September 2013.

C. The Subject and Object of the Research

The subject of this research was all of the first grade students of SMK Telkom Pekanbaru. The object of this research was the students' ability in writing descriptive text by using Tree Diagram technique.

D. The Population and Sample of the Research

1. The Population of the Research

The population of the research was all of the students at the first grade of SMK Telkom Pekanbaru. There were 6 classes for the first grade students in which 3 classes for MO (otomotive machine), 2 classes for TI (informative technic), and one class for Telkom in which the total number of students was 129 students.

2. The Sample of the Research

Jack R. Fraenkel stated that sampling refers to the process of selecting these individuals. The technique used to determine the sample was cluster random sampling⁴, it was done by selecting the group not individual because all the

⁴ Jack R Fraenkel, et al. *How to Design and Evaluate Research in Education (sixth edition)*. (New York: Avenue of the Americas, 1932), p. 97-98

members of selected group have similar characteristic. It means that the subjects of this research have the same background of knowledge, the same ability and the same teacher that teaches them. After doing the cluster random sampling, Telkom was as an experimental class and MO1 was as a control class. The experimental class consisted of 20 students and the control class consisted of 20 students. The total number of sample was 40 students.

E. The Technique of Collecting Data

In this research, the writer collected the data by using observation and test as the instrument. Bandura et al in Marguerite stated that observation as a tool of research requires systematic and careful examination of the phenomena being studied. Specifically, researchers who choose to use observation must conduct their observations in a way that results in accurate, unbiased, and richly detailed⁵.

Brown stated that a test in simple terms is a method of measuring a person's ability, knowledge, or performance in a given domain⁶. The test was pretest and posttest. Pre-test was given before treatment and it was done once which was conducted at the beginning process of implementing method. Post-test was given after treatment and it was done two times which was conducted to get the data at the end of process of implementing the method. The writer used pre-test and posttest to experimental class and control class in order to know the effect

⁵ Marguerite.G. Iodico, et al, *Op.cit.*, P. 117

⁶ H. Douglas Brown, *Language Assessment: Principles and Classroom Practices*, (New York: Pearson Education, 2007), p. 3

of using Tree Diagram technique towards students' ability in writing descriptive text of the first grade at SMK Telkom Pekanbaru.

1. Observation

Table III.2
The Items Observed in Teaching Learning English
by Using Tree Diagram Technique

No	Items	Yes		No	
		F	P	F	P
1	Teacher shows Tree Diagram to students and explain about tree diagram	4	9.5%	2	4.8%
2	Teacher gives example to students in using Tree Diagram in learning English	2	4.8%	4	9.5%
3	Teacher gives chance to students to make questions about Tree Diagram	2	4.8%	4	9.5%
4	Teacher gives students various Tree Diagram and asks them to choose one of tree diagram they like	5	12%	1	2.4%
5	Teacher asks students to describe in detail what they can catch in Tree Diagram	6	14.3%	0	0%
6	Teacher gives students opportunity to express their ideas/opinion by using Tree Diagram on piece of paper	6	14.3%	0	0%
7	Teacher and students discuss the error in students' writing	2	4.8%	4	9.5%
Total		27	64.5%	15	35.7%

The table above shows that there were 27 activities that were well done during the class, and 15 activities were not well done. The percentage result of information is further computed as follows:

$$P = \frac{F}{N} \times 100\%$$

$$P = \frac{27}{42} \times 100\%$$

$$P = 64.3\%$$

$$P = \frac{F}{N} \times 100\%$$

$$P = \frac{15}{42} \times 100\%$$

$$P = 35.7\%$$

Furthermore, from the observation result percentage above, the researcher made the percentage recapitulation in order to know the use of Tree Diagram in the classroom. The table above showed that there were some highest aspects that were implemented by the teacher and also showed that there were some aspects that were well implemented. Such as:

- 1) Teacher shows and explains to students about Tree Diagram Technique.
- 2) Teacher gives students various Tree Diagram and asks them to choose one of Tree Diagram they like.
- 3) Teacher asks students to describe in detail what they get in Tree Diagram.
- 4) Teacher gives students opportunity to express their ideas/opinion by using Tree Diagram on piece of paper.

Then, the table above also showed that there were some aspects that were not well implemented. Such as:

- 1) Teacher gives example to students in using tree diagram in learning English.
- 2) Teacher and students discuss the error in students' writing.

At the last, the table above also showed that aspect that was rarely implemented, that is the teacher gives chance to students to make questions about tree diagram.

2. Test

a. Data Collection for Experimental Class

1) Pre-Test

Pre-test was a test that was done at the beginning of the research in order to know the students' ability before the treatment. The researcher asked students to write a descriptive text based on the topic that was given.

2) Treatment

The treatment was conducted for experimental class only. The form of treatment was using Tree Diagram Technique. The treatment was done by the researcher as the teacher. In this technique, the researcher introduced the concept of Tree Diagram Technique in teaching writing especially descriptive text and involved students in teaching learning process. The students' involvement such as: take simple topic that they want to be described then write topic at the top of tree, mention something related to the topic as many as possible, write all possible ideas at the line below of Tree Diagram. This treatment was given for six meetings.

3) Post-Test

After giving the treatment for six meetings, in which the researcher taught by using Tree Diagram Technique, then the researcher asked the students to write a descriptive text based on the topic that was given.

b. Data Collection for Control Class

1) Pre-Test

The type of test and procedure of giving the test was the same as the experimental class.

2) Simple Picture Technique

Control class was taught without using Tree Diagram Technique. The researcher has taught writing through the types of text available in student's textbook (Get Along With English). At the first activity the researcher asked the students to review all aspect in text, especially descriptive text (consist of its purposes, organization and linguistic features). Teacher explain related vocabularies to the simple picture and the last the teacher asks students to write descriptive text based on the simple picture on the blank piece of paper

3) Post-Test

Post-test was given at the end of meeting. To get the data about the students' writing ability in descriptive text, the writer used the assessment of writing.

The test had been done to find out the ability of students in writing descriptive text. In this research, the result of pretest and posttest either experimental group or control group were assessed by two raters. The ability of students in writing descriptive text was measured by the teacher of English of SMK Telkom Pekanbaru by using the assessment aspects of writing.

Table III.3
The Assessment of Writing Descriptive Text

No	Aspect Assessed	Score			
		1	2	3	4
1	Content				
2	Organization a. Identification b. Description				
3	Vocabulary				
4	Grammatical Features a. Adjectives and compound adjectives b. Attribute have and has c. Linking verbs d. Simple present tense				
5	Spelling and Punctuation				
	Total				
	Maximum Score	20			

Score Explanation:

1 = Incompetent

2 = Competent enough

3 = Competent

4 = Very competent

Final score: $\frac{\text{TotalScore}}{\text{MaximumScore}} \times 80$

3. Validity and Reliability

Donald Ary explained:

Validity is defined as the extent to which scores on a test enable one to make meaningful and appropriate interpretations. Reliability indicates how consistently a test measures whatever it does measure. Researchers must be concerned about the validity and reliability of the scores derived from instruments used in a study and must include this information in the research report. If a researcher's data are not obtained with instruments that allow valid and reliable interpretations, one can have little faith in the results obtained or in the conclusions based on the results⁷.

Reliability indicates how consistently a test measures whatever it does measure. The table below is the categories of reliability test used in determining the level of reliability of the test.

Table III.4
The Level of Reliability⁸

No	Reliability	Level of Reliability
1	0.0 -20	Very Low
2	0.21 - 0.40	Low
3	0.41 - 0.60	Enough
4	0.61 - 0.80	High
5	0.81-1	Very High

In this research, to know the reliability of the writing test the researcher used inter rater reliability, because the researcher used two raters in order to score the students' writing ability. Gay said that inter judge reliability can be obtained by

⁷ Donald Ary, *Op.Cit*, p. 224

⁸ Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan*. (Jakarta: Bumi Aksara, 2009), P. 75

having two or more judges independently score to be compared to the score of both judges. Then, the scores of the rater 1 correlated with the scores of the rater 2. The higher correlation, the higher the inter judge reliability. The researcher used SPSS.16 version to see the score correlation between the raters.

r product moment can be obtained by considering the degree of freedom (df) as below:

$$df = N - nr$$

N = Number of cases

nr = the total variable correlated

Statistically the hypotheses are:

$$H_0 : r_0 < r_t$$

$$H_a : r_0 \geq r_t$$

H_0 was accepted if $r_0 < r_t$ there was no significant correlation between score from rater 1 and rater 2.

H_a was accepted if $r_0 \geq r_t$ or there was a significant correlation between score from rater 1 and rater 2.

The following table describes you the correlation between score of raters. The researcher used SPSS.16 version.

Table III.5
Pearson Correlation

	Rater1	Rater2
Rater1 pearson correlation	1	.542*
Sig. (2-tailed)		.013
N	20	20
Rater2 pearson correlation	.542*	1
Sig. (2-tailed)	.013	
N	20	20

*. Correlation is significant at the 0.05 level (2-tailed).

From the output above, the r calculation is 0.542 that would be calculated to r table, $df = 38$ to be correlated either at level of 5% or 1%. At level of 5% r table is 0.320, while at level of 1% r table is 0.413. Thus, the r observation was obtained higher than r table, either at level of 5% or 1%. The researcher concluded that there is a significant correlation between score of rater 1 and rater 2. The writing test was reliable.

To know the validity of the test, the writer used content validity. Donald said that content validity is receiving renewed attention. It means if a measurement is as the representative of the ideas or the appropriate material that will be measured called content validity. The test had fulfilled the validity of the content. The material of the test had been taught to the first grade students at SMK Telkom Pekanbaru.

Then, the writer used the *spearman-brown prophecy formula* to find the reliability obtained between two raters. The following is the formula:

$$r_{tt} = \frac{nr_{A,B}}{1+(n-1)r_{A,B}}$$

Where:

r_{tt} = inter-rater reliability

n = the number of raters whose combined estimates from the final mark for the examinees

$r_{A,B}$ = the correlation between raters or the average correlation among all raters if there are more than two

$$\begin{aligned} r_{tt} &= \frac{nr_{A,B}}{1+(n-1)r_{A,B}} \\ &= \frac{2 (0.542)}{1+ 2-1 (0.542)} \\ &= \frac{1.084}{1+0.542} \\ &= \frac{1.084}{1.542} \\ &= 0.702 \end{aligned}$$

Based on the calculation above, the writer obtained inter-rater reliability was 0.702, it can be concluded that the reliability of writing test included into high level.

F. The Technique of Data Analysis

In this research, to analyze the student's ability in descriptive writing the writer used passing score (*KKM*) of SMK Telkom Pekanbaru that is 60. It does mean for those who get score < 60 they do not pass the passing score, while for those who get score ≥ 60 they pass the passing score.

the writer used post-test score from experimental and control class in order to find out whether there is a significant effect or not of using Tree Diagram Technique towards students' ability in writing descriptive text. These scores were analyzed statistically by using independent sample T-Test from SPSS 16.0 version. The t_{table} was employed to see whether there was a significant difference between the mean score both, experimental and control group. The $t_{obtained}$ value was consulted with the value of t_{table} at the degree of freedom (df) by using formula:

$$df = (N_1 + N_2) - nr$$

Where:

df = the degree of freedom

N1 = number of students from experimental class

N2 = number of students from control class

nr = number of variable

1. H_0 is accepted if $t_0 < t\text{-table}$ or there is no significant effect of using Tree Diagram Technique towards students' writing ability in descriptive text of the first grade at SMK Telkom Pekanbaru.
2. H_a is accepted if $t_0 > t\text{-table}$ or there is any significant effect of using Tree Diagram Technique towards students' writing ability in descriptive text of the first grade at SMK Telkom Pekanbaru.