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CHAPTER III

RESEARCH METHODOLOGY

III.1. Research Design

This research is an experimental research. Marguerite, et al (2010) explain that an experimental research is the researcher control or manipulates how group of participants are treated and then measures how the treatment affects each group. In technical term, the researcher controls or manipulates one or more independent variable and examines the effect that 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 treatments.

In this research, there were two classes, one class was an experimental group which was treated by CTL and another one was a control group taught by using non CTL. For both experimental and control groups, a pre-test and a post-test were administered to the students. The pre- test was given at the beginning of the teaching learning in order to identify the students' English reading comprehension and writing ability. Then, the experimental group was given a treatment by using CTL and the control group non CTL. During the treatment, the writer accompany by an observer, and at last, both groups were given a post-test at the end of the teaching and learning processes in order to determine the effect of using CTL on students' reading comprehension and writing ability.

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Table III.1

The Research Design

Group	Pre-test	Treatment	Post-test
X1	Y1	X	Y2
X2	Y1	-	Y 2

John W. Creswell (2008:314)

Where : X1 = Experimental group

X2 = Control Group

Y1 = The pre-test both of two groups

Y2 = The post-test both of two groups

X = Treatment (Thematic Progression)

\- = Teaching reading and writing without treatment (Thematic Progression)

According to the design on the table III.1, firstly the researcher needed to determine a sample, then, gave a pre-test to see the students' ability for both experimental group and control group. Furthermore, treatment was given to the experimental group by using CTL. The control group was given a conventional technique or without treatment of CTL.

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III.2. Location and Time of the Research

This research was conducted at MAN 2 Pekanbaru, which is located at Jl. Diponegoro No.55, Cinta Raja, Pekanbaru City, Riau from May 17, 2018 up to April 7, 2018 in the academic year 2017-2018.

III.3. Population and Sample

Gay (2000) states that population is a group interest that the evaluation of the result to be generalizable. It involves object or subject that has certain quality and characteristics. The population of this research was the first year of MAN 2 Pekanbaru. The first year students of in this school were divided into 6 classes. For more detail, see table III.2 below.

Table III.2

Total number of the first year students of MAN 2 Pekanbaru

No.	Classes	Number of Students
1	X IPA 1	25
2	X IPA 2	25
3	X IPA 3	24
4	X IPA 4	24
5	X IPS 1	27

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6	X IPS 2	27
	Total of Population	**162**

In this research, there were two groups of participants as sample namely the experimental group and the control group. They were determined by using cluster random sampling. Gay (2009) states that cluster sampling randomly select groups, not individuals. The researcher got the sample by selecting the intact group as a whole is known as a cluster sampling (Singh, 2006). So, in taking sample, this research used cluster random sampling technique by considering the number of population. There are 162 students consisting 6 classes in MAN 2 Model Pekanbaru. Because of the number of population, taking sample by applying cluster sampling was better to be used in selecting the sample as participants. So the students selected based on group not individuals.

Table III.3

The Total Sample of the Research

No	Class	Male	Female	Total
1	X IPA 1 (Experimental group)	8	17	25
2	X IPA 2 (Control group)	10	15	25

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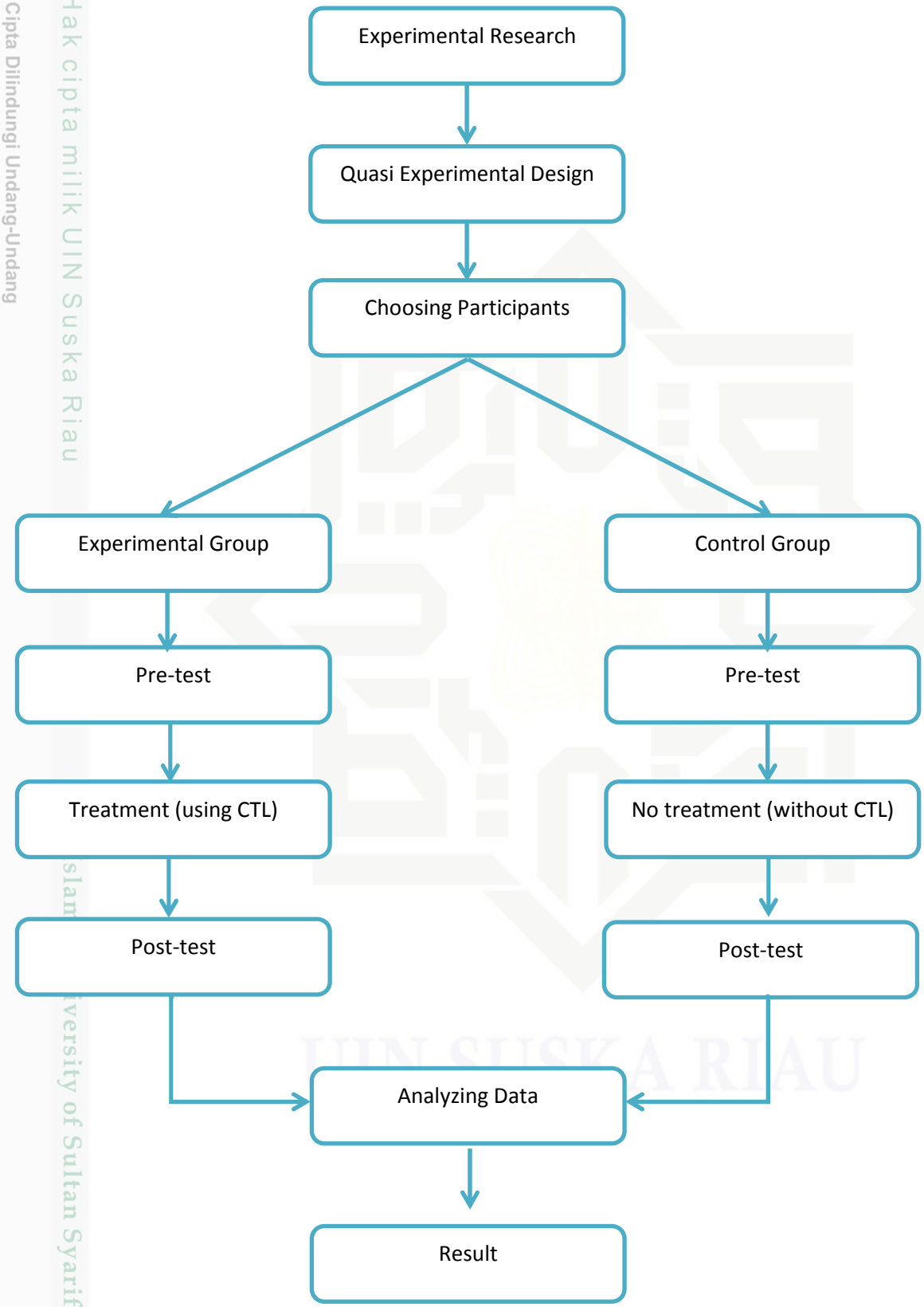
III.4. Procedure of the Research



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III.5. Instrument of the Research

a. Test

Test is one of the instruments to measure the students' ability in doing something. SuharsimiArikunto (2006:150) states that test is a series of question or exercises which is used to measure skill, intelligent knowledge, aptitude of individual or groups. In this study, the researcher prepared reading and writing test of recount text.

In reading test, the test was multiple choice test consisting 20 question based on 5 indicators of reading comprehension. The indicators are Literal comprehension, reorganization, inference, evaluation, appreciation (Barrett:1968). Further, for writing test, the students wrote about recount text then the students' writing were scored based on the writing rubric adopted from Hughes and the school rubric.

III.5.2. Observation

Observation was used to observe directly the students which use CTL in reading and writing recount text and to observe the influence of CTL on students' reading comprehension and writing ability of recount text. In observation technique, the researcher had a list of observational items to be observed in the class during teaching and learning process by using CTL.

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III.6. Technique of Data Collection

To collect the data, reading and writing tests were used as instrument. To measure reading comprehension of students' in this study, reading test was administered to them. Text comprehension was assessed through questions in multiple choices. Questions should focus on finding main idea, supporting detail, inference, reference and vocabulary in context. Elizabeth (2011) states that material used for assessing reading should ideally be authentic. They should reflect the type of reading normally encountered in daily life. Clay (2001) remarks that multiple choice questions can be used to test factual recall as well as levels of understanding and ability to apply learning. In doing the test the students were instructed to write and answer questions about recount text in 2x40 minutes.

On the other hand, writing ability of the students, writing test was administered to them. The students chose and wrote one topic of recount texts based on topics given. The test had some considerations such as; how to make a short story based on students' experiences, use correct grammar (simple past tense, chronological connection; then, first, etc, using linking verb; was, were, saw, heard, etc, using action verb), use appropriate vocabulary, use mechanic (spelling, punctuation, capitalization) and lastly use fluency (using simple sentence and flowing style).

The researcher measured the total score from the results of the students' English reading comprehension and writing ability test. The classification of the students' scores is shown below.

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Table III.4

The Classification of Students' Score

Score Range	Categories
80 – 100	Good to excellent
60 – 79	Average to good
50 – 59	Poor to average
0 – 49	Poor

(Harris at al, 1986)

If the students were able to achieve the goal, this meant that assessment of students ability need to be correlated with purpose of achievement.

III.7. Validity and Reliability Test

III.7.1. Validity

Before collecting the data, each item of question was tested in order to be ideal to try out. The purpose of the try out was to find out the quality of the test items. The main point from Brown (2003:3) that a test is method of a measuring a person's ability, knowledge, or performance in a given domain. In line with that, Creswell (2008) states that validity is the individual's scores from an instrument make sense, meaningful, enable researchers to draw good conclusions from the sample you are studying to the population. It means that validity is the extent to which inferences made from assessment result are appropriate, meaningful, and useful in terms of the purpose of the assessment.

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To analyze the validity of data, the researcher analyzed by inter item validity used SPSS 20 program. The following table is the criteria of items validity.

Table III. 5

The criteria of items validity

R	Interpretation
0,80 < r ≤1,00	Very High
0,60 < r ≤ 0,79	High
0,40 < r ≤ 0,59	Average
0,20 < r ≤ 0,39	Low
0,00 < r ≤ 0,19	Very Low

Table III.6

Instrument Validity

	Corrected Item-Total Correlation	R Table α = 0, 05 ; n= 20	Categories
ITEM1	,969	> 0,396	Valid
ITEM2	,969	> 0,396	Valid
ITEM3	,851	> 0,396	Valid
ITEM4	,851	> 0,396	Valid
ITEM5	,851	> 0,396	Valid
ITEM6	,851	> 0,396	Valid

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ITEM7	,756	> 0,396	Valid
ITEM8	,932	> 0,396	Valid
ITEM9	,932	> 0,396	Valid
ITEM10	,932	> 0,396	Valid
ITEM11	,932	> 0,396	Valid
ITEM12	,932	> 0,396	Valid
ITEM13	,969	> 0,396	Valid
ITEM14	,969	> 0,396	Valid
ITEM15	,932	> 0,396	Valid
ITEM16	,969	> 0,396	Valid
ITEM17	,969	> 0,396	Valid
ITEM18	,874	> 0,396	Valid
ITEM19	,969	> 0,396	Valid
ITEM20	,969	> 0,396	Valid

It is apparent that all items were valid, the result of all items' calculation were valid can be seen based on the table above. So, in this research, the item for the test was 20 questions.

III.7.2. Reliability

A reliability is an importantcharacteristic of a good test. In order to calculate the reliability of the test, the researcher found out the mean of the students' scores the standard deviation.

To find out the reliability of the test the following formula was used the discrimination index of an item indicated the extent to which the item discriminated

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between the students, separating the more able students from the less able. The following formula was taken from Heaton (1975: 164) as follow :

$$r_{ii} = \frac{N}{N-1}(1 - \frac{m(N-m)}{N(X)^2}$$

Where : $M = \frac{\sum x}{N}$ and $S^2 = \frac{\sum x^2 - \frac{(\sum x_i)^2}{N}}{N}$

r_{ii} :Reliability of the test

N : The number of item in the test

M : The mean score of all the test

S^2 : The standard deviation of all the test score

TableIII.7

Criteria Coefisien of Reliability

Coefisien Reliability	Criteria
$0,80 \leq r_{11} \leq 1,00$	Highest reliability
$0,60 \leq r_{11} \leq 0,79$	High reliability
$0,40 \leq r_{11} \leq 0,59$	Middle reliability
$0,20 \leq r_{11} \leq 0,39$	Low reliability
$0,00 \leq r_{11} \leq 0,19$	Lowest reliability

(Arikunto, 2006, p.223)

The results of test realiblity can be showed as follow:

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Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,993	,993	20

From the results of calculation by using SPSS 20, it is obvious that the value of Cronbach's Alpha Based on Standardized Items (r_{11}) for test is 0,993. So, 0,80 ≤ 0,993 ≤ 1,00. It means that the instrument is highest realibility.

III.8. Technique of Data Analysis

To know the effect of using CTL on students' reading comprehension and writing skill was used some techniques as follows:

a. MANOVA

To know the homogeneity of this research, the analysis technique used MANOVA because there are two dependent variables (reading comprehension and writing ability. Manova is a generalized form of univariate analysis of variance (ANOVA), although, unlike univariate ANOVA, it uses the covariance between outcome variables in testing the statistical significance of the mean differences. Where sums of squares appear in univariate analysis of variance, in multivariate analysis of variance certain positive-definite matrices appear.. MANOVA is based on the product of model variance matrix, and inverse of the

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error variance matrix, . The hypothesis that implies that the product . Invariance considerations imply the MANOVA statistic should be a measure of magnitude of the singular value decomposition of this matrix product, but there is no unique choice owing to the multi-dimensional nature of the alternative hypothesis.

MANOVA's power is affected by the correlations of the dependent variables and by the effect sizes associated with those variables (Carey 2011). For example, when there are two groups and two dependent variables, MANOVA's power is lowest when the correlation equals the ratio of the smaller to the larger standardized effect size.

b. Paired Sample T-test

Non-independent sample t- t_{test} is known also as Paired-Sample t_{test}. The researcher used this formula to obtain the result of the first, second, third, fourth hypotheses that were to find out whether there was significant effect of using CTL and conventional teaching strategy on students' reading comprehension and students' writing ability at MAN 2 Pekanbaru. L.R Gay (2000) states that t-test for non-independent sample is used to compare groups that are formed by some types of matching or to compare a single group's performance on a pre-test and post-test or on two different treatments. (L.R Gay, 2000). As for the effect size of the independent sample t-test, the eta squared is commonly used (Pallant: 2001). Eta squared ranges from 0 to 1 and represents the proportion of variance in the dependent variables that was explained the independent variables. The formula is as follow:

$$\text{eta squared} = \frac{t_2}{t_2 - (N_1 + N_2 - 1)}$$

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The effect size can assist between 0 to 1, according to Cohen (Cohen, Manion, and Morrison :2007 p.521) the category of effect size is as follow:

0– 0.20	*= Weak effect*
0.21 – 0.50	= Modest Effect
0.51 – 1.00	= Moderate effect
> 1.00	= Strong effect

Paired sample t-test was used in this research to obtain the result of hypothesises. Gay (2000:163-167) contends that t-test for non-independent variable sample is used to compare groups that are formed by some types of matching or to compare a single group's performance on pre-test and post-test.

The formula of paired-sample t_{test}:

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

D : Gain Score (D=X_2-X_1)

The t-table has the function to see if there is a significant improvement among the mean of the score of both pretest and posttest. The t-obtained value is consulted with the value of t-table at the degree of freedom (df) = N-1 which is statistically hypothesis:

$H_\alpha = t_o >$ t-table

$H_o = t_o <$ t-table