CHAPTER III

THE RESEARCH METHODOLOGY

A. Research Design

This research was an experimental research. According to Creswell (2012, p.295), the experimental research is conducted when the researcher intends the possible cause and effect between independent variable (variable X) and dependent variable (variable Y). It consisted of two variables; the first was the NHT as variable X and the second was the students' reading comprehension as variable Y. Because, the population of this research was large, the researcher used the quasi experimental design. Creswell (2012, p.309) also states that quasi experimental design is in which the researcher assigns participants to groups but not randomly. In this research, quasi-experimental designs had experimental group and control group. There were two kinds of test; pre-test and post-test. Pre-test was given before treatment and post-test was given in the last of treatment.

The design can be seen in the following table below (Creswell: 2012, p.310);

Table III.I
Research Design

Group	Pre-Test	Treatment	Post-Test
Experimental	O1	T	O2
Control	O3	-	O4

Where:

O1 = Pre-test of experimental group

O2 = Post-test of experimental group

O3 = Pre-test of control group

O4 = Post-Test of control group

T = Treatment

B. The Location and Time of The Research

This research was conducted at tenth grade of SMA Negeri 1 Tambang. It is located on JL. Raya Pekanbaru-Bangkinang KM.29. The time of this research was started from February to March 2017.

C. The Subject and Object of The Research

The subject of this research was the tenth grade students of SMA Negeri 1 Tambang, while the object of this research was using NHT technique in teaching students' reading comprehension at tenth grade of SMA Negeri 1 Tambang.

B. The Population and Sample of The Research

1. Population of The Research

The population of this research was the tenth grade students of SMA Negeri 1 Tambang. The specification of the population is revealed on the following table:

Table III.2
Population of the research

No	Class	Students
1	X1	30
2	X2	29
3	X3	30
4	X4	29
5	X5	29
6	X6	28
7	X7	27
Total		**203**

SMA Negeri 1 Tambang consisted of 7 (seven) classes and the total population of this research was 203 students. The total number of the tenth grade students of SMA Negeri 1 Tambang was large enough to be all taken as sample of the research. According to Arikunto (2006, p.134), the amount subject is than less 100, it is better to take all the population and if the amount of the subject is more than 100, it is better to take sample about 10% - 15% or 20% - 25% of the population.

2. Sample of The Research

Based on the total population above in this research, the researcher used cluster random sampling technique. According to Laws (2003, p.359), Cluster random sampling is instead of selecting individual sampling units, you select from clusters of units, and then choose settlements, interview all the units within that on some systematic basis. This saves travel costs and time, and you only need a sampling frame for the clusters, not for individual

units. Gay (2012, p.135) also states that in cluster sampling, intact groups, not individuals, are randomly selected. It is also convenient when the population is very large or spread over a wide geographic area.

In cluster random sampling, the researcher determined both classes to be sample of population by using lottery. The researcher gave name card to the classes based on every tenth grade class in SMA Negeri 1 Tambang; they are X1, X2, X3, X4, X5, X6, and X7. The researcher mixed these cards then took two cards randomly as the sample of the research. The chosen classes were an experimental class and a control class. So the total sample was 60 students. The specifications of the sample can be seen in the table below:

Table III.3
Sample of the research

No	Class	Students
1	X1	30
2	X3	30
Total		60

C. Technique of Collecting Data

To find out the data in this research, the researcher used test as instrument. The test was distributed to measure the students' reading comprehension of descriptive text. Then, there were two tests that the researcher gave to the students, as follows:

1. Pre-test

According to Creswell (2012, p.297), pre-test provides a measure on some attribute or characteristic that you assess for participants in an experiment before they receive a treatment.

2. Post-test

A post-test is a measure on some attribute or characteristic that is assessed for participant in an experiment after the treatment.

The kind of test that the researcher used was multiple choices. The researcher used twenty five (25) items to collect the data. Every multiple choice consisted of four answer options (a, b, c and d). The questions were based on indicators of reading descriptive text comprehension. The indicators consisted of five indicators and each had five questions. It can be seen from the blue print test below:

Table III.4
Blue Print of Test

NO	Indicators	Items of Questions
1	The students are able to identify the main idea of the descriptive text.	1, 6, 11, 16, 21,
2	The students are able to identify the generic structure of descriptive text.	2, 7, 12, 17, 22,
3	The students are able to identify the communicative purpose of descriptive text.	3, 8, 13, 18, 23,
4	The students are able to analyze the meaning of certain words of descriptive text.	4, 9, 14, 19, 24,
5	The students are able to get the detail information of descriptive text.	5, 10, 15, 20, 25.

Then, the reseacher took the total score from the result of the reading comprehension test. In SMA Negeri 1 Tambang, passing score standard for English subject is 65. Arikunto (2013, p.281) explained the classification of the students' score is shown below:

Table III.5
The Classification of Students' Score

Score	Categories
80-100	Very Good
66-79	Good
56-65	Enough
40-55	Less
30-39	Fail

D. Validity and Reliability of the Test

1. Validity

Brown (2003, p.3) states that a test is a method to measure a person's ability, knowledge, or performance in a given domain. The more explanation was also explained by Brown that one of criteria for testing a test is validity. According to Hughes (2003, p.26), a test is said to be valid if it measures accurately what it is intended to measure. While Gay and Airasian (2012, p.160) stated that validity concerned with the appropriateness of the interpretations made from tests score. In other words, validity is the core of the test and a valid test should be appropriate, meaningful, and useful in term of the purpose of the assessment.

According to Gay and Airasian (2012, p.160), there are three kinds of validity that consist of content validity, criterion validity, and construct validity. In this research, the researcher used content validity to prove the validity of the test. Kothari (2004, p.74) states that content validity refers to the extent to which a measuring instrument provides adequate coverage of the topic under study. In order to get the data for this research, researcher used test for both variables. But, before the researcher gave the test; the researcher gave try out test to the students in order to measure item difficulties. According to Arikunto (2013, p.223), the test is accepted if the level of difficulty is between 0.30-0.70. It was determined by finding the difficulty level of each item. The formula for item difficulty is as follows:

$$P = \frac{B}{JS}$$

Where:

P: Index of difficulty

B: The number of correct answer

Js: The number of students

The difficulty level of an item shows how easy or difficult a particular item in a test. The items that do not reach the standard level of difficulty are excluding from the test and they are changed with new items that are appropriate. The standard level of difficulty is <0.30 and >0.70. It means that the item test that was accepted if the level of difficulty was

between 0.30-0.70 and it was rejected if the level of difficulty was under 0.30, assumed difficult question and over 0.70, assumed as easy question. Then, the proportion correct was represented by "P", whereas the proportion incorrect is represented by "Q", it can be seen in the following tables:

Table III.6
The Students' Ability to find out the Main Idea

Variable	Finding out the Main Idea					N
Item no.	1	6	11	16	21	29
Correct	16	17	16	18	17	
P	0.55	0.59	0.55	0.62	0.59	
Q	0.45	0.41	0.45	0.38	0.41	

Based on the table III.6, the proportion of correct answer for item number 1 shows the proportion of correct 0.55, item number 6 shows the proportion of correct 0.59, item number 11 shows the proportion of correct 0.55, item number 16 shows the proportion of correct 0.62, and the item number 21 shows the proportion of correct 0.59. Based on the standard level of difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each item number for finding out the main idea are accepted.

Table III.7
The Students' Ability to Identify the Generic Structure

Variable	Identifying The Generic Structure					N
Item no.	2	7	12	17	22	29
Correct	15	16	14	14	18	
P	0.52	0.55	0.48	0.48	0.62	
Q	0.48	0.45	0.52	0.52	0.38	

Based on the table III.7, the proportion of correct answer for item number 2 shows the proportion of correct 0.52, item number 7 shows the proportion of correct 0.55, item number 12 shows the proportion of correct 0.48, item number 17 show the proportion of correct 0.48, and item number 22 shows the proportion of correct 0.62. Based on the standard level of difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each item number for identifying the generic structure are accepted.

Table III.8
The Students' Ability to Identify the Communicative Purpose

Variable	Identifying the Communicative Purpose					N
Item no.	3	8	13	18	23	29
Correct	18	13	16	17	14	
P	0.62	0.45	0.55	0.59	0.48	
Q	0.38	0.55	0.45	0.41	0.52	

Based on the table III.8, the proportion of correct answer for item number 3 shows the proportion of correct 0.62, item number 8 shows the proportion of correct 0.45, item number 13 shows the proportion of correct 0.55, item number 18 show the proportion of correct 0.59, and item number 23 shows the proportion of correct 0.48. Based on the standard level of difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each item number for identifying the communicative purpose are accepted.

Table III.9
The Students' Ability to Analyze the Meaning of Certain Words

Variable	Analyzing the Meaning of Certain Words					N
Item no.	4	9	14	19	24	29
Correct	17	14	16	16	15	
P	0.59	0.48	0.55	0.55	0.52	
Q	0.41	0.52	0.45	0.45	0.48	

Based on the table III.9, the proportion of correct answer for item number 4 shows the proportion of correct 0.59, item number 9 shows the proportion of correct 0.48, item number 14 shows the proportion of correct 0.55, item number 19 show the proportion of correct 0.55, item number 24 show the proportion of correct 0.52. Based on the standard level of difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each item number for analyzing the meaning of certain words are accepted.

Table III.10
The Students' Ability to Get the Detail Information

Variable	Getting the Detail Information					N
Item no.	5	10	15	20	25	29
Correct	14	15	16	16	18	
P	0.48	0.52	0.55	0.55	0.62	
Q	0.52	0.48	0.45	0.45	0.38	

Based on the table III.10, the proportion of correct answer for item number 5 shows the proportion of correct 0.48, item number 10 shows the proportion of correct 0.52 item number 15 shows the proportion of correct 0.55, item number 20 show the proportion of correct 0.55, and item number 25 show the proportion of correct 0.62. Based on the standard level of

difficulty "p" <0.30 and >0.70, it is pointed out that item difficulties in average of each item number for getting the detail information are accepted.

2. Reliability

According to Brown (2003, p.20), reliability has to do with accuracy of measurements. This kind of accuracy is reflected in the obtaining of similar result whe measurement is repeated on different occasions or with different instruments or by differents person. While Gay and Airasian (2012, p.165), reliability is the degree to which a test consistently measures whatever it is measuring. It means that the test is reliable when an examinee's results are consistent on repeated measurement and the key of qualification criterion of test instrument is consistent.

To obtain the reliability of the test, it must be known the total variance and the mean score of the test. According to Siregar (2013, p.111), to obtain the reliability of the test given, the researcher used the K-R 21 formula as follows:

$$rii = \left\{\frac{\mathbf{k}}{k-1}\right\}\left\{1 - \frac{X(k-X)}{k.Vt}\right\}$$

Where:

rii : reliability of the instrument

k : total of questions

V_t : total variance

X : the mean score

Firstly, the writer calculated the total variance:

$$\boldsymbol{Vt} = \sum \frac{(\boldsymbol{x1} - \boldsymbol{X})}{\boldsymbol{n} - \mathbf{1}}$$

Where:

$\boldsymbol{X}_1$: total of score

X : mean score

n : total of respondents

$$\boldsymbol{V_t} = \sum \frac{(\boldsymbol{x1} - \boldsymbol{X})}{\boldsymbol{n} - \mathbf{1}}$$

$$\boldsymbol{V_t} = \frac{(\mathbf{396} - \mathbf{13.65})}{\mathbf{30} - \mathbf{1}}$$

$$\boldsymbol{V_t} = \mathbf{13.18}$$

Total variance was 13.18, and then the researcher calculated the reliability.

$$\mathbf{r_{11}} = \left\{\frac{\mathbf{k}}{\boldsymbol{k} - \mathbf{1}}\right\}\left\{\mathbf{1} - \frac{\boldsymbol{X}(\boldsymbol{k} - \boldsymbol{X})}{\boldsymbol{k}.\boldsymbol{Vt}}\right\}$$

$$\mathbf{r_{11}} = \left\{\frac{\mathbf{25}}{\mathbf{25} - \mathbf{1}}\right\}\left\{\mathbf{1} - \frac{\mathbf{13.65}(\mathbf{25} - \mathbf{13.65})}{\mathbf{25}(\mathbf{13.18})}\right\}$$

$$\mathbf{r_{11}} = \mathbf{(1.04)\ (0.53)}$$

$$\mathbf{r_{11}} = \mathbf{0.55}$$

According to Heaton (1995, p.162), the reliability of the test was considered as follows:

Table III.11
The Classification of Realibity

No	Value	Category
1	0.0 – 0.20	reliability is low
2	0.21 – 0.40	reliability is sufficient
3	0.41 – 0.70	reliability is high
4	0.71 – 1.0	reliability is very high

In sum, the reliability of the test as calculated above (0.55) was categorized into high level.

E. The Normality and Homogenity of Test

Before doing T-test analysis, the writer analyzed and tested hypothesis pre-requisite test as the first analysis which contained normality test and homogeneity test to make sure that experimental class and control class were normal and homogeneous.

1. The Normality of the Test

In order to know whether the data have normal distribution or not, the researcher used Kolmogorof-Smirnov method as the formula to analyze the data. In this research, the researcher analyzed the data by using SPSS (Statistical Product and Service Solutions) 20 version program. The SPSS result for Kolmogorov-Smirnov Z test would be interpreted as follows:

p-value (Sig.) > 0.05 = the data are in normal distribution

p-value (Sig.) < 0.05 = the data are not in normal distribution

The results of normality of post test score in experimental and control class was computed by using SPSS version 20. It is presented in the following table:

TABLE III.12
Test of Normality

Tests of Normality

	Group	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Score	Experiment	,151	30	,079	,943	30	,107
	Control	,156	30	,062	,971	30	,555

a. Lilliefors Significance Correction

Based on the table above it showed that the significance level in Kolmogorov-Smirnov test of experimental class was 0.079; it means that 0.079 > 0.05, and significance level of control class was 0.062; it means that 0.062 > 0.05. In conclusion, the data are in normal distribution.

2. The Homogenity of The Test

According to Siregar (2013, p.167), the purpose of homogeneity test is to find out whether the object of the research has the same variance or not. The researcher assessed the homogenity of data by using SPSS 20. The result of the test can be seen as follows:

p-value (Sig.) > 0.05 = the data are homogeneous

p-value (Sig.) < 0.05 = the data are not homogeneous

The result of homogeneity test which was computed by using SPSS version 20 presented in the following table:

Table III.13
The Homogeneity of the Test

Test of Homogeneity of Variances

Reading Score

Levene Statistic	df1	df2	Sig.
2,098	1	58	,153

In line with Siregar's statement (2013, p.178), data are homogenous or variant when the value Sig. is higher than 0.05. From the table, it was known that the value of significance (sig.) was 0.153. It can be seen 0.153 > 0.05. Based on the table, it was clear that Sig. is higher than 0.05 which indicates the homogeneity of the data. It means that the data were homogeneous.

F. The Technique of Analyzing Data

In order to find out whether there is or no significant difference of using and without using Numbered Heads Together (NHT) technique on students' reading comprehension at the tenth grade of SMA Negeri 1 Tambang, the data were analyzed statistically. In analyzing the data, the researcher used post-test scores of the experimental and control classes. Those scores were analyzed by using statistical analysis. In this research, the researcher used T-tests formula (independent sample t-test) and it was calculated by using software SPSS 20 Version.

The independent samples t-test is probably the single most widely used test in statistics. Pallant (2010, p.239) stated that independent samples t-test is used to compare the mean score of two different groups of people or conditions. It means that it is used to determine whether or not there is significant difference at selected groups. T-test is obtained by considering the degree of freedom (*df*) = (N1+N2) – 2.