CHAPTER III

RESEARCH METHODOLOGY

III.1. Research Design

The kind of this research is an experimental research. Marguerite, et al (2010) explain that the 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 controled or manipulated 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 were treated. Participants are usually assigned to different groups that receive different treatments.

The design of this study is a quasi-experimental research. It is pre-test and post-test non-equivalent control group design. Pre-test is administered before giving the treatment. In this research, three variables are used; using Directed Listening-Thinking Activity (DLTA) is an independent variable, students' listening comprehension is dependent variable 1, and students' vocabulary mastery is dependent variable 2. Two groups are involved: an experimental group and a control group.

Table III.1

Quasi-Experimental Design

Group	Pre-test	Treatment	Post-test

Experimental	O1	X	O2
Control	O3	No treatment/ Conventional treatment	O4

(Adopted from Sugiyono 2010:112)

Where:

X = Using Directed Listening-Thinking Activity

O1 = Students' ability before giving treatment on experimental group

O2 = Students' ability after giving treatment on experimental group

O3 = Students' ability before giving Conventional treatment on control group

O4 = Students' ability after giving Conventional treatment on control group

According to the design on table III.1, firstly we need to determine sample. Then, we did pre-test to see the students' ability for both groups experimental group and control group. Furthermore, treatment is given to the experimental group by using DLTA strategy. The control group is given a conventional technique or without treatment of DLTA.

III.2. Location and Time of the Research

This research was conducted at SMP IT Al-Ikhlas Pekanbaru which is located at Jl. Harapan Raya, Pekanbaru. The duration of the research was two months, (January and Febuary 2018).

III.3. Population and The Sample of the Research

Gay (2000) states that population is 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 is the second year of SMP IT Al-Ikhlas. The second year students in this school is divided into 4 classes. For more detail, see table III.2 below.

Table III.2

Total number of the second year students of SMP IT Al Ikhlas Pekanbaru

No.	Classes	Number of Students
1	VIII 1	22
2	VIII 2	30
3	VIII 3	25
4	VIII 4	31
	Total of Population	**108**

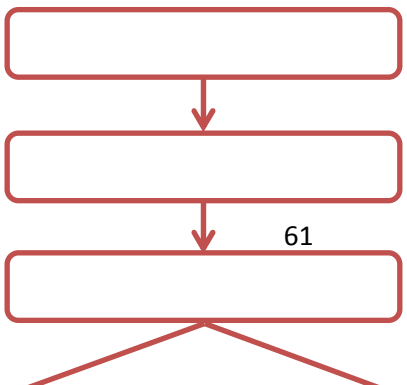
In this research, there were two groups of participants as sample namely the experimental group and the control group. They were determined by using cluster random sampling. Gay (2009) states that cluster sampling randomly select groups, not individuals. The researcher got the sample by selecting the intact group as a whole is known as a cluster sampling (Singh, 2006).

Table III.3

The Total Sample of the Research

No	Class	Male	Female	Total
1	VIII 1 (Experimental group)	12	11	22
2	VIII 3 (Control group)	11	14	25

III.4. Procedure of the Research



III.5. The Data Collection Instrument of the Research

The data of the research was collected through support this study, the technique of the data the following instrument:

III.5.1 Test

The test was administrated to find out the effect of using Directed Listening Thinking Activity (DLTA) strategy on students' listening comprehension and vocabulary mastery at the second grade of SMP IT Al-Ikhlas Pekanbaru. Test is one of the

instruments to measure the students' ability in doing something. Suharsimi Arikunto (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 listening and vocabulary test. Both of the tests were objective tests (multiple choices).

III.5.2. Observation Sheet

The observation sheet is used to observe the teacher's activities. The observation sheet is designed base on the indicator of variable X (using Directed Listening-Thinking Activity) and adapt based on the relevant situation and condition of the students.

III.6. Technique of Data Collection

To collect the data, listening and vocabulary tests were used as instrument. To measure listening comprehension and vocabulary mastery of the students, listening test was administered to them. Text comprehension was usually assessed through questions in multiple choices. Questions should focus on finding main idea, supporting detail, inference, reference and vocabulary in context. 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 answer questions about procedure text in 2x40 minutes.

The technique of collecting data uses composition test.

III.6.1 Composition Test

A composition test was used to the students find out their listening comprehension a vocabulary mastery. The test is divided into two stages:

a. Pre-Test

A pre-test is used to collect data about the students' listening comprehension and vocabulary mastery. The test will be administrated to both groups before conducting the treatment.

After computing the individual score of the students, the level of the students' ability in listening before and after using DLTA, listening comprehension and vocabulary mastery were classified. The percentage grading based on the following classification was used:

Table 5. The Classification of Students' Score in Terms of the Level of Ability

(Harris 1974)

No	Score	Level of Ability
1	81-100	Excellent
2	61-80	Good
3	49-60	Mediocre
4	21-40	Poor
5	0-20	Very Poor

b. Post-Test

A post-test is used to collect data about students' listening comprehension and vocabulary mastery. The test will be administrated to both groups after conducting the treatment.

III.6.2 Observation Sheet

Teacher's observation sheet is a sheet which used to observe teacher's activity during teaching and learning process by using DLTA strategy.

III.7. Validity and Reliability Test

III.7.1. Validity

Before collecting the data, each item of question is tested in order to be ideal to tried out. The purpose of the try out was to find out the quality of the test items. We get 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 you, as the researcher to draw good conclusions from the sample you are studying to the population. It meant that validity is the extent to which inferences make from assessment result are appropriate, meaningful, and useful in terms of the purpose of the assessment.

To analyse the validity of the data, the researcher analysed by inter item validity used SPSS 20 program. The following table is the criteria of items validity. To know whether the test valid or not, the value of $r_{counted}$ must be compared with r_{table}. For example, the number of students was 10. The degree of freedom is 25-2=23, r_{table} on df =23 are 0,3961 (5%).

If the value of $r_{counted} > r_{table}$= valid,

If the value of $r_{counted} < r_{table}$= invalid.

III.7.2. Reliability

A reliability was an important characteristic of a good test. In order to calculate the reliability of the test, the researcher founded 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 indicates the extent to which the item discriminates

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

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

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

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

Table III.6 Ccriteria 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)

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

III.8. Technique of Data Analysis

Post-test score from experimental and control classes were used in order to find out whether there was a significant effect or not of using Directed Listening-Thinking Activity (DLTA) on students' listening comprehension and students' vocabulary mastery at SMP IT Al-Ikhlas Pekanbaru. The score is analysed statistically, both descriptive and inferential statistics. In this research, the researcher used this formula:

III.8.1. Independent sample t-test

The scores would be analysed statically by using independent sample t-test and paired sample t-test. They were used in order to find out the result of the hypotheses that mentioned at chapter II. They were as follows:

a. To find out whether there was a significant difference between students' listening comprehension pre-test mean score of experimental group and students' listening comprehension pre-test mean score of control group on decriptive text by using DLTA strategy at SMP IT Al-Ikhlas Pekanbaru.
b. To find out whether there was a significant difference between students' listenimg comprehension post-test mean score of experimental group and students' listening comprehension post-test mean score of control group on procedure text by using DLTA strategy at SMP IT Al-Ikhlas Pekanbaru.
c. To find out whether there was a significant difference between students' voacabulary mastery pre-test mean score of the experimental group and students'

vocabulary mastery pre-test mean score of the control group on descriptive text by using DLTA strategy at SMP IT Al-Ikhlas Pekanbaru.

d. To find out whether there was a significant difference between students' vocabulary mastery post-test mean score of an experimental group and a control group on descriptive text by using DLTA strategy at SMP IT Al-Ikhlas Pekanbaru.

To analyse the final-test scores of the experimental group and the control group, the following formula was used:

$$t = \frac{M_X - M_Y}{\sqrt{\frac{(SD_X)^2}{N_1 - 1} - \frac{(SD_Y)^2}{N_2 - 1}}}$$

Where:

1. t = The value of comparing two means
M_X = Mean of the score in pre-test
M_Y = Mean of the score in post-test
SD_X = Standard deviation of experimental group
SD_Y = Standard deviation of control group
N_1 = Number of the sample in pre-test
N_2 = Number of the sample in post-test
1 = The constant number

The t-table has the function to see if there is a significant difference between the mean of the score of both experimental group and control group. The t-obtained value was consulted with the value of the t-table at the degree of freedom (df) by using formula:

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

Where:

df = the degree of freedom

N_1 = number of students from experimental class

N_2 = number of students from control class

nr = number of variable

The value of both; t_o and t-table statistically hypothesis:

H_α = t_o > t-table

H_o = t_o < t-table

a. H_α is accepted if t_o > t-table or there was effect after giving the treatment by using Directed Listening Activity on students' listening comprehension and students' vocabulary mastery of the second year students at SMP IT Al-Ikhlas Pekanbaru.

b. H_α is accepted if t_o < t-table or there was no an effect after giving the treatment by using Directed Listening-Thinking Activity on students' listening comprehension and students' vocabulary mastery of the second year students at SMP IT Al-Ikhlas Pekanbaru.

III.8.2. Non-independent sample t-test (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 third, fourth, seventh and eight hypotheses that was to find out whether there was significant effect of using DLTA strategy on students' listening comprehension and students' vocabulary mastery at the second year students of SMP IT Al-Ikhlas 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).

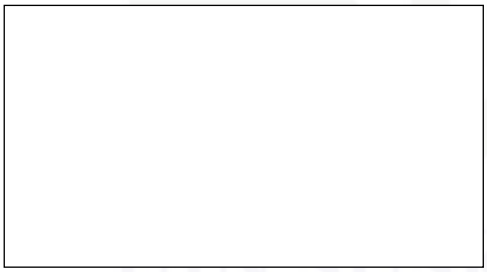
Pre-test and post-test scores were used in the experimental class in order to find the significant effect of using DLTA on students' listening comprehension and vocabulary mastery of the second year students at SMP IT Al-Ikhlas Pekanbaru. To obtain the data, SPSS 20 was used.

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:

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

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:



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}:

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

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_α = t_o > t-table

H_o = t_o < t-table

a. H_α is accepted if to > t-table or there is any significant effect after giving the treatment by using DLTA strategy on students' listening comprehension and students' vocabulary mastery of the second year students at SMP IT Al-Ikhlas Pekanbaru.
b. H_o is accepted if to< t-table or there is no significant effect after giving treatment by using DLTA strategy on students' listening comprehension and students' vocabulary mastery of the second year students at SMP IT Al-Ikhlas Pekanbaru.

III.8.2. Multivariate Analysis of Variance (MANOVA)

Multivariate analysis of variance (MANOVA) is an extension of the univariate analysis of variance (ANOVA). In an ANOVA, it examines for statistical differences on one continuous dependent variable by an independent grouping variable. The MANOVA extends this analysis by taking into account multiple continuous dependent variables, and bundles them together into a weighted linear combination or composite variable

(Tabachnick and Fidel 2012).

The MANOVA will compare whether or not the newly created combination differs by the different groups, or levels, of the independent variable. In this, the MANOVA essentially tests whether or not the independent grouping variable simultaneously explains a statistically significant amount of variance in the dependent variable.