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CHAPTER III

RESEARCH METHODOLOGY

III.1 RESEARCH DESIGN

The design of the research was a quasi-experimental study which focused on quantitative research. According to L. R Gay (2000: 364), the quasi-experimental design involves selecting two groups or more differing on some independent variables and comparing them to some dependent variables. The groups may differ in a number of ways. One group may possess a characteristics that the other does not, one group may possess more of a characteristics than the other, or the two groups may have had a different kind of experiences. In this research, there are three variables; Two Stay Two Stray (TSTS) Strategy and Directed Reading Activity (DRA) Strategy are independent variables, while the students' reading comprehension is dependent variable. Both classes were taught by using Two Stay Two Stray (TSTS) Strategy and Directed Reading Activity (DRA) Strategy.

Gay (2000:364) states that the major difference between experimental research and causal-comparative research is that in the experimental research of the independent variable the alleged cause, is manipulated, and in causal-comparative research it is not, because it has already occurred. In the experimental research, the researcher can randomly form groups and manipulate independent variable. In causal-comparative research the groups are already formed and already divided on the independent variable. Furthermore, causal-comparative

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studies identify relationships that may lead to experimental studies, but only relationship is established. Cause-effect relationships established through causal comparative research are at the best tenuous and tentative. Only the experimental research can truly establish cause-effect relationship. So that to investigate the students' reading comprehension is provided with post-test. They can be drawn in the following table:

Table 3.1 Research Design

E1	01	X1	02
E2	03	X2	04

Figure (Gay, 2000: 353)

E1 : Experimental Group1

E2 : Experimental Group2

X1: Independent variable 1 (DRTA)

X2 : Independent variable 2 (QAR)

01,03 : pre-test

02,04: post-test

Based on the diagram above, Gay (2000: 354) states that the definition and selection of comparison group are a very important part of the causal-comparative procedure. The independent variable differentiating the groups must be clearly and operationally defined, since each group represents a different population. The

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way in which the groups are defined will give the effect on the generalizability of the results.

III.2 LOCATION AND THE TIME OF THE RESEARCH

This research was conducted at the Vocational High School Pharmacy Ikasari Pekanbaru which is located on Bangau Sakti street, Panam sub-district Pekanbaru. The duration of the research was four months starting from January to April 2017.

III.3 POPULATION AND SAMPLE OF THE RESEARCH

III.3.1 Population

The population of this research was the second year students of Vocational High School Pharmacy Ikasari Pekanbaru in the academic year 2016 – 2017 which consisted of Five classes which had the same capability, and two classes are chosen by using cluster sampling. The population of this research was students of the second year at the Vocational High School Pharmacy Ikasari Pekanbaru in the academic year 2016 – 2017. The total number of the population was 194. The target population is students of XI. 1 Pharmacy and XI.2 Pharmacy. Based on the population of this research, the sample was selected by using cluster sampling. According to (Gay and Airasian, 2000), cluster sampling randomly selects groups not individuals. All the members of selected groups have similar characteristics, and three classes were chosen by using cluster sampling in this research.

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Table 3.2. Population of the second year students of Vocational High School**Pharmacy Ikasari Pekanbaru**

Class	Total of Students
XI. 1 Pharmacy	39
XI. 2 Pharmacy	40
XI. 3 Pharmacy	38
XI. 4 Pharmacy	39
XI. 5 Pharmacy	38
Total Population	194

III.3.2 Sample

The kind of sample of this research was cluster sampling, Gay (2000:12) states that cluster sampling randomly selects groups, not individual. All the members of selected groups have similar characteristics. The homogenous characteristics were the consideration. Because all classes were homogenous classes, the sample chosen randomly, XI. 1 Pharmacy as Experimental class 1, XI.2 Pharmacy as experimental class 2. Two classes were taken as the sample of this research as follows:

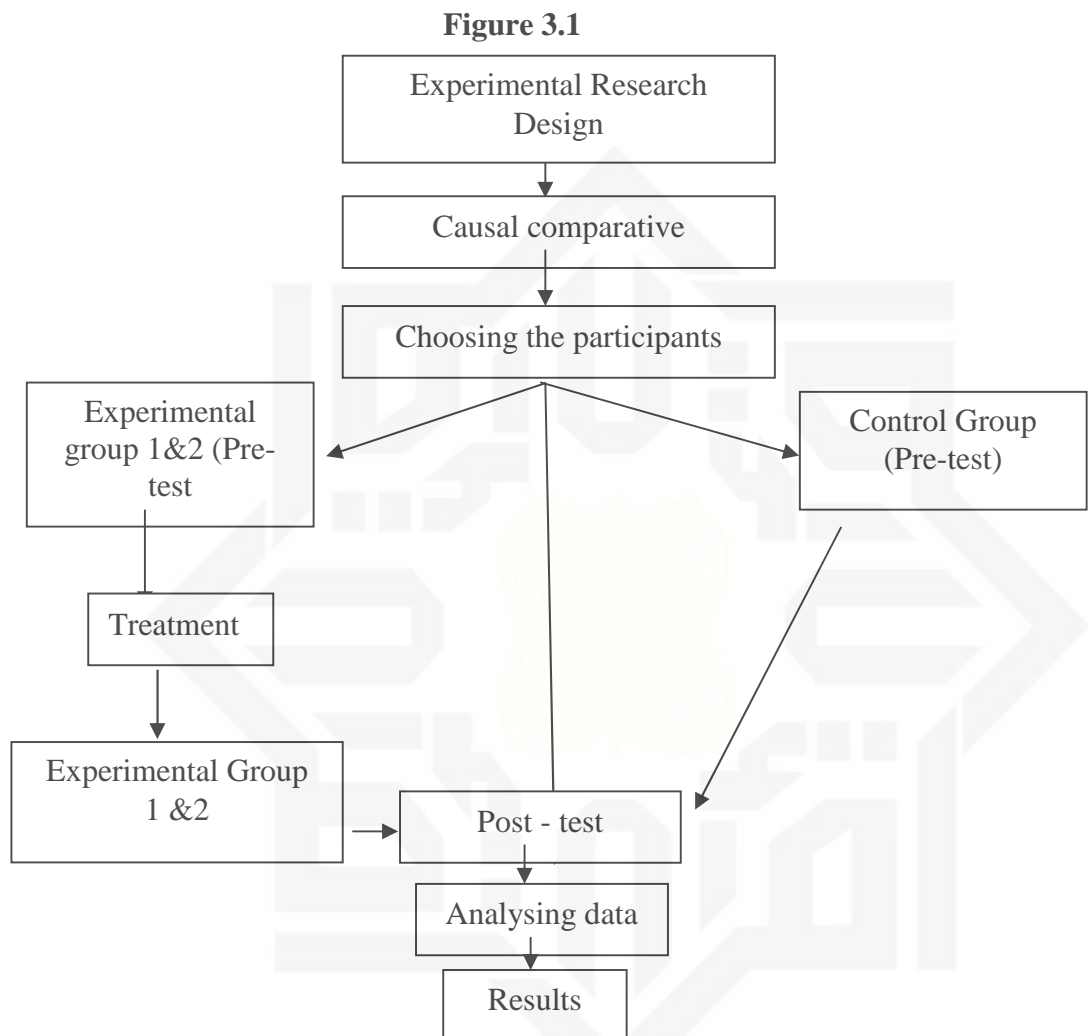
Table 3.3. Sample of the research

No	Sample	Male	Female	Total
1	XI. 1 Pharmacy	6	33	39
2	XI. 2 Pharmacy	6	34	40
	Total	12	67	79

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III.4 RESEARCH PROCEDURE



1. Procedures of collecting data of the experimental group1 and experimental group 2.

Three procedures were administered to collect the data.

a. Pre-test

Pre-test was given to the students before conducting of the teaching and learning process using TSTS and DRA strategy. It was used to measure the students' reading comprehension by using written test.

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b. Treatment

In the treatment, the students were taught by using TSTS in the experimental class 1 and DRA in the experimental class 2. The teacher taught and explained the narrative text by using the procedure of TSTS and DRA strategy with the procedure: pre activities, whilst activities and post activities as they were stated at Chapter II.

c. Post-test

Post-test was conducted to the students of the experimental group 1 and the experimental group 2 after applying the treatment by using TSTS and DRA strategy. The result of the post-test was compared with the pre-test result in order to determine the comparison of the TSTS and DRA strategies of the students' reading comprehension after conducting 4 meetings of the TSTS in the experimental group 1 and DRA in the experimental group 2.

2. Procedures of collecting data for the control group

a. Pre-test.

Pre-test was administered to the students of the control group before being taught by using conventional strategy or non-TSTS and non-DRA. The pre-test was given to the students of the control group which was similar to those of the experimental group 1 and the experimental group 2.

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b. Post-test

Post-test is administered to the students of the control group after being taught for four meetings by using conventional strategy. The result of the post-test was compared with the pre-test result in order to compare their reading comprehension

III.5 RESEARCH INSTRUMENTS

To collect the data of reading test was administered as the instrument of this study. The pre-test and post- tests were administered to two classes which consisted of XI/1, XI/2. The pre-test was administered before the treatment and the post-test aimed at finding out the students' reading comprehension after treatment. The treatment was given by teaching with TSTS Strategy and DRA Strategy. This activity also intended to find out whether the students' skill keepsholding of the material after doing the treatment.

III.6 DATA COLLECTION TECHNIQUE

In this research, the data were collected by distributing pre-test and post-test to the students. The test consisted of six passages where each of the passage consisted of five questions related to the passages of reading comprehension test. Each reading text had been considered the time and the procedures of TSTS Strategy and DRA Strategy to teach reading text. The duration of time was 90 minutes. The test was taken from the students' textbook and internet materials.

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In order to get the data to support this study, the researcher used the technique as follows :

1. Observation

Observation was used to observe directly the students using Two Stay Two Stray (TSTS) Strategy and Directed Reading Activity (DRA) Strategy in reading comprehension in narrative text and to observe the influence of TSTS and DRA strategies toward the students' ability in reading comprehension of narrative 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 TSTS and DRA strategies.

2. Test

To find out the comparison of using TSTS and DRA on the students' reading comprehension at the second grade of Vocational High School Pharmacy Pekanbaru, the researcher administered the test to assess students' English ability especially in Recount text. The test is administered into two stages. The first was pretest done before doing the treatment. The second was posttest done after doing the treatment. The researcher measured the total score from the result of the students' English reading comprehension test. The classification of the students' score is shown below.

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Table 3.4

The Classification of Students' Score

Score	Categories
80 – 100	Very good
66 – 79	Good
56 – 65	Fair
40 – 55	Poor
30 – 39	Very Poor

If the students are able to achieve to goal, this means that assessment of students' ability needs to be correlated with purposes of achieving. **Hughes (2003)**, there are many techniques that can be assessed to the students' English reading comprehension but in this case, it uses written test.

III.7 VALIDITY AND RELIABILITY TEST

III.7.1 The validity of instrument

Before collecting the data, each item in question is 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. **Brown (2000:22)** states that a test is a method of a measuring a person's ability, knowledge, or performance in a given domain. Validity is the extent to which inferences make from assessment results which are appropriate, meaningful, and useful in terms of the purpose of the assessment.

The points of difficulty level and discrimination index are analyzed by using a formula (Heaton, 1975 : 178).

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$$FV = \frac{R}{N} \times 100\%$$

Where :

FV : The index of difficulty

R: The number of correct answers

N : The number of respondents

III.7.2 The reliability of Instrument

A reliability is an important characteristic of a good test. In order to calculate the reliability of the test, the mean of the students' scores and the standard deviation are sought. To find out the reliability of the test, the following formula is 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 :

$$r_{ii} = \frac{N}{N-1} \left(1 - \frac{m(N-m)}{N \sum x^2} \right)$$

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

r_{ii} : Reliability of the test

N: The number of items in the test

M: The mean score of all the tests

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

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Table 3.5 Criteria Coefficient of Reliability

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

III.8 DATA ANALYSIS TECHNIQUE

The scoring guide is chosen as the criteria of scoring representing the basic aspects of reading. The reading results are evaluated by considering five aspects and each aspect has a score or a level. The specification of the aspects is the topic, main idea, specific idea, textual reference, and word meaning.

In analyzing the data, the researcher used scores of pre-test and post-test of the experimental and control groups. This scores were analyzed statistically for both descriptive and inferential statistics. In this research, the researcher used the following formulas:

1 Independent sample t-test

To find out whether there is a significant difference or there is no significant difference between two or more variables can be analyzed by using an Independent Sample t test. Gay adds that the t-test for independent sample is used to determine whether there is probable a significant difference between the means

of two independent samples. Independent sample t-test is used to find out the results of the first and second hypotheses. They are as follows:

1. To find out whether there was a significant difference of students reading comprehension before being given the treatment by using TSTS Strategy and DRA Strategy for the experimental class 1 and experimental class 2

2. To find out whether there was a significant difference of reading comprehension after being given the treatment by using TSTS Strategy and DRA Strategy between the experimental class 1 and experimental class 2

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

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

Where:

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

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The t-table has the function to see if there is a significant difference between the mean of the score of both experimental and control groups. The t-obtained value is consulted with the value of the t - table at the degree of freedom (df) = (N1+N2)-2 which is hypothesized

Ha: $t_o > t\text{-table}$

Ho: $t_o < t\text{-table}$

Ha is accepted if $t_o > t\text{-table}$ or there is effective after giving the treatment of TSTS Strategy and DRA Strategy on students' reading comprehension.

Ho is accepted if $t_o < t\text{-table}$ or there is no effect after giving the treatment of TSTS Strategy and DRA Strategy on reading comprehension.

2. Paired sample t-test or Non-independent Sample t- 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 seventh, eleventh and ninth hypotheses that was to find out whether there was a significant effect of using TSTS, DRA and conventional teaching technique on students' reading comprehension at the eleventh grade students of Vocational High School Pharmacy Ikasari Pekanbaru. L.R Gay 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: 488).

Pre-test and post-test scores were used of the experimental class in order to find the significant effect of using TSTS and DRA on students'

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reading comprehension at the eleventh grade students of Vocational High School Pharmacy Pekanbaru. To obtain the data, SPSS20 was used.

The formula of paired-sample t_{test} :

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

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_a : $t_o > t\text{-table}$

H_o : $t_o < t\text{-table}$

H_a is accepted if $t_o > t\text{-table}$ or there is a significant effect after giving the treatment TSTS and DRA toward students' reading comprehension at the eleventh grade students of Vocational High School Pharmacy Ikasari Pekanbaru

H_o is accepted if $t_o < t\text{-table}$ or there is no significant effect after giving treatment TSTS and DRA toward students' reading comprehension at the eleventh grade students of Vocational High School Pharmacy Ikasari Pekanbaru.

Afterward, it is better to find the effect size of T-test by following a formula:

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$$\tilde{\eta}^2 = \frac{t^2}{t^2+n-1}$$

$$eta\ squared = \tilde{\eta}^2 \times 100\%$$

Where:

eta squared : Coefficient effect

$\tilde{\eta}^2$: Coefficient

$$\tilde{\eta}^2 = \frac{t^2}{t^2+n-1}$$

$$kp = \tilde{\eta}^2 \times 100\%$$

Where:

kp : Coefficient effect

$\tilde{\eta}^2$: Coefficient