CHAPTER III

RESEARCH METHODOLOGY

A. Research Design

The design of this research was experimental research. According to Gay and Peter Airasian, (2000, p. 367) they state that experimental research is "the only type of the research that can test hypotheses to establish cause-and-effect relationship". The method used was quasi-experimental research. According to Muijs Daniel, (2004, p. 26) "quasi-experimental designs are meant to approximate as closely as possible the advantages of true experimental designs where the problems mentioned above occur". "The research design used in this research was Non Equivalent Experimental, which involved two groups (experimental and control groups), both of them were given a pre-test and post-test in which both groups did not have pre-experimental sampling equivalent" (Donald, 1966, p. 47). Before doing the experiment, the students were given the pre-test. The experimental group got treatment and the control group did not get the treatment. After the treatment, a post-test was given to the students. The model of research design can be illustrated as follows:

TABLE III.1
The Research Design

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

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Where:

O_1 = Pre-test for experimental and control group.

O_2 = Post-test for experimental and control class.

$O3$ = Pre-test for experimental and control group.

O_4 = Post-test for experimental and control class.

X = Treatment by using Pair Questions and Answers Strategy.

Ø = Treatment without using Pair Questions and Answers Strategy.

B. Location and the time of the Research

The research was conducted at the second year students of State Senior High School 7 Pekanbaru that was located at Pekanbaru. This research was conducted from November 2016 to Desember 2016.

C. Subject and Object of the Research

The subject of this research was the second year students of State Senior High School 7 Pekanbaru, while the object of this research was using pair questions and answers strategy on students' reading comprehension.

D. Population and Sample of the Research

1. Population

The population of this research was the second year students at State Senior High School 7 Pekanbaru. They consisted of 7 classes, the total population of the second year students at State Senior High School 7 Pekanbaru was 225 students. The detail of the population of this research was as follows:

TABLE III.2
Population of the Research

No	Class	Number of Students
1	2 IPA 1	32
2	2 IPA 2	30
3	2 IPA 3	30
4	2 IPS 1	33
5	2 IPS 2	32
6	2 IPS 3	33
7	2 IPS 4	35
Total Population		225

2. Sample

Based on the total population of the research above, the population in this school was large enough to be taken as a sample of the research. The researcher took two classes for the samples by using cluster sampling randomly to select groups, not individuals. All the members of selected groups had similar characteristics. According to Gay and Airasian, (2000) stated that random sampling is the process of selecting a sample in such a way that all individuals in the defined population have an equal and independent chance of being selected for the sample. Furthermore, Gay and Airasian, (2000) mentioned that cluster sampling is most useful when the population is very large or spread out over a wide geographic area. So, the researcher took two classes as the sample of this research. They were class 2 IPA 2 as experimental class and 2 IPA 3 for control class. Therefore the sample was 60 students.

TABLE III.3
Sample of the Research

No	Class	Student		
		Male	Female	Total
1	2 IPA 2	12	18	30
2	2 IPA 3	9	21	30
Total Sample				60

E. Technique of Collecting Data

In this research, the researcher used test to collect the data; pre-test and post-test to the students. The test which was used by the researcher was multiple choice questions. Multiple choice questions required the students to choose one the correct answer of number options. There were 25 questions that should be done by the students in 60 minutes. The test was started by giving try out in order to find validity, reliability of the test.

The test was divided into two tests:

a. Pre-test was given to the students before treatment of the strategy in both the experimental and control classes. This test was used to measure basic reading comprehension of analytical exposition texts.

b. Post-test was given after doing the treatment of the strategy to the experimental and control classes which were not given to the students whether it was made different or not in reading comprehension of analytical exposition texts.

F. The Validity and Reliability of The Test

1. Test Blueprint

For further information about the instruction of the text, the researcher shows the blueprint of both tests as follows:

TABLE III.4
Blueprint of the Test

Number	Indicator of items	Number of items	Items number
1	Identify main idea	5	1, 6, 11, 16, 21
2	Identify the meaning of vocabulary in reading texts	5	2, 7, 12, 17, 22
3	Identify generic structure	5	3, 8, 13, 18, 23
4	Identify communicative purpose	5	4, 9, 14, 19, 24
5	Identify language features	5	5, 10, 15, 20, 25

Finally, the pre-test and post-test of the experimental class were compared to the pre-test and post-test of control class. According Suharsimi Arikunto, (2009: 245) there are some categories to evaluate the students' comprehension in reading text. The students' score can be seen from the table below:

TABLE III.5
Classification of Students' Scores

The Score of Reading Comprehension Level	Categories
80 – 100	Very Good
66 – 79	Good
56 – 65	Enough
40 – 55	Less
30 – 39	Fail

2. Validity

Heaton states that (1988: 159) the validity of a test is the extent to which it measures what is supposed to measure and nothing else. Scott and Steven (2005: 279) said that the validity of an instrument determines whether the assessment is measuring the construct of interest, in the intended manner, and without unintended consequences. The instrument

can be valid if the instrument is measuring what the researcher wants to find out. The validity in this research used construct validity. According to Douglas Brown, (2003, p. 25) stated that construct validity is a major issue in validating large-scale standardized tests of proficiency. This test particularly measured the purpose of the test based on the purpose of the particular instructions.

The test given to students was considered not too difficult or too easy that often showed the low reliability. Item difficulty determined the proportion of correct responses. The formula for item difficulty is as follows:

(Heaton, (1998:178)):

$$FV = \frac{R}{N}$$

Where:

FV   : index of difficulty of facility value

R   : the number of correct answer

N   : the number of examinees or students taking the test

The difficulty level of an item shows how easy or difficult a particular item in the test. The items that do not reach the standard level of difficulty are excluding from the test and they are changed with the new items that are appropriate.

The standard level of difficulty used is > 0.30 and < 0.70, it means that the item test that is accepted if the level of difficulty is between 0.30 (difficult) and over 0.70 (easy). On the other hand, test is not too easy and

the test is not too difficult. Then, the proportion correct is represented by "p".

Based on the try out result, it was determined that there were no items of tests rejected because those items were appropriate ones. The result of try out is as follows:

TABLE III.6
The Item Difficult of Try Out

Item Number	Item Difficulty	Result
1	0.56	Accepted
2	0.47	Accepted
3	0.34	Accepted
4	0.5	Accepted
5	0.37	Accepted
6	0.40	Accepted
7	0.5	Accepted
8	0.43	Accepted
9	0.46	Accepted
10	0.40	Accepted
11	0.46	Accepted
12	0.5	Accepted
13	0.34	Accepted
14	0.5	Accepted
15	0.46	Accepted
16	0.53	Accepted
17	0.40	Accepted
18	0.59	Accepted
19	0.53	Accepted
20	0.53	Accepted
21	0.46	Accepted
22	0.37	Accepted
23	0.40	Accepted
24	0.53	Accepted
25	0.46	Accepted

3. **Reliability**

Reliability is a criterion that can judge the quality of the test. Reliability is a necessary characteristic of any good test. Heaton (1988:159) explains that reliability is primary importance in the use of

both public achievement and proficiency test and classroom test. Scott and Steven (2005: 279) said that reliability is usually measured with four techniques: (a). test – retest reliability, (b). equivalent form reliability, (c). internal consistency, and (d). interrater reliability.

There are some factors affecting the reliability of a test, they are:

a. The extent of the sample of material of material selecting for testing.

b. The administration of the test, clearly this is an important factor in deciding reliability.

According to Grand Henning (1987: 74), reliability is thus a measure of accuracy, concistency, dependability, or fairness of scores resulting from administration of a particular examination. If reliability is associated with accuracy of measurement, it follows that reliability will increase as error measurement made to diminish. We actually quantify reliability so that we can be aware of the amount of error present in our measurement and the degree of confidence possible in score obtained from the test.

Then, Arikunto (2009) he stated that the reliability for good classroom achievement tests are expected to exceed 0.0 and closed 1.00. He state that reliability of test is considered as follows:

0.00 - 0.20   : Reliability is poor

0.21- 0.40   : Reliability is satisfactory

0.41- 0.70   : Reliability is good

0.71-1.00   : Reliability is excellent

In this research, the researcher used software SPSS 16.0 version to calculate the reliability of test. The following steps were how to get the result data based on SPSS 16.0 for windows- statistical software:

1. Open the student test file.

2. From the menu of SPSS, click *Analyze* and then click sub menu *Scale*

3. From the menu click your variables, and press the narrow button.

4. From *statistics*, click item and scale, at summaries; click means, and then click *o.k* to end this process and you will see the output data of SPSS automatically.

Then, the result was shown in the output table. The output can be seen as follows:

TABLE III.7
Result of the Reliability Test

Cronbach's Alpha	N of Items
0.486	25

The realibility of the test was 0.49. it is categorized into good reliability level. It means the instrument accuracy involved in good level and this means good for a research.

G. Technique of Data Analysis

In analyzing the data, the researcher used the statistical calculation of independent sample T-test formula. The independent sample T-test was used to find out the significant difference and significant effect of students' reading comprehension of analytical exposition text between those who were taught

by using Pair Questions and Answers Strategy and taught without using Pair Questions and Answers Strategy of the second year at State Senior High School 7 Pekanbaru.

The data were analyzed by using SPSS 16. In order to find out the result of the students who were taught by using and without using Pair Questions and Answers Strategy. In order to get magnitude the effect size of the two variables (post test scores of experimental and control group). The researcher used the formula in Cohen et al, (2007:522) :

$$Eta\ Squared\ = \frac{t^2}{t^2 + (N_1 + N_2 - 2)}$$

Where:

t = the t-value (calculated by SPSS)
N_1 = the number in the sample of group one
N_2 = the number in the sample of group two

Statistically the hypothesis is:

$H_a : t_o > $ t-table

$H_o : t_o < $ t-table

a. Ho_1 : Was accepted if $t_o <$ t-table, there was no significant difference of students' reading comprehension of analytical exposition texts between taught by using Pair Questions and Answers Strategy and taught without using Pair Questions and Answers Strategy of the second year students at State Senior High School 7 Pekanbaru.

b. Ha_1 : Was accepted if $t_o >$ t-table, there was a significant difference of students' reading comprehension of analytical exposition texts between taught by using Pair Questions and Answers Strategy and taught without

using Pair Questions and Answers Strategy of the second year students at State Senior High School 7 Pekanbaru.

c. Ho_2 : Was ace pted if $t_o<$ t-table, there was no significant effect of students' reading comprehension of analytical exposition texts taught by using Pair Questions and Answers Strategy of the second year students at State Senior High School 7 Pekanbaru.

d. Ha_2 : Was accepted if $t_o>$ t-table, there was a significant effect of students' reading comprehension of analytical exposition texts taught by using Pair Questions and Answers Strategy of the second year students at State Senior High School 7 Pekanbaru.