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CHAPTER III

RESEARCH METHODOLOGY

III.1 Research Design

The design of this research was an experimental research that focused on quantitative research. According to L.R Gay (2000, p.349), the experimental method is a method of research that can truly test hypothesis concerning with cause and effect relationship in the experimental research. Gay and Airasian (2000:367) argue that experimental research is the type of research that can test hypotheses to establish cause-and effect relationships.

The design of this research was a quasi-experimental design which focused on the equivalent group design which was an appropriate one to this research in order to find out the significant effect of using PQ4R and Graphic Organizers strategies on students' reading comprehension. The groups may differ in a number of ways. One group may possess a characteristic that the other does not, one group may possess more of a characteristic than the other, or the two groups may have different kind of experiences. In this research, there are three variables; PQ4R Strategy (X_1) and Graphic Organizers Strategy (X_2) are independent variables, while the students' reading comprehension (Y) is dependent variable. This research was aimed to find out the effect of PQ4R and Graphic Organizers strategy toward students' reading comprehension in the experimental group. Creswell (2009, p.160) explains both groups take a pre-test and post- test. Only the experimental group receives the treatment. The research design can be seen as follows:

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Table III.1
Research Design

Group	Pre-test	Treatment	Post test
EG 1	O1	X1	O2
EG 2	O1	X2	O2

Figure Creswell (2009, p.160)

EG 1 : Experimental Group 1

EG 2 : Experimental Group 2

O1 : Pre - test

O2 : Post - test

X1 : Independent variable (PQ4R Strategy)

X2 : Independent variable (Graphic Organizers Strategy)

Gay (2000, p.392) states that this design requires at least two groups, each of which is formed by random assignment. Both groups are administered a pre-test and each group receives a different treatment. Both groups are post-tested at the end of the study. The Posttest scores are compared to determine the effectiveness of the treatments. The pretest-posttest control group design may also be expanded to include any number of treatment groups.

III.2 Location and Time of the Research

The location of this research was SMP YPPI Tualang. It is located in Perawang Tualang of Siak Regency. The duration of time to conduct of this research was within two months starting from March to April 2017.

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III.3 Subject and Object of the Research

The subject of the research was the eight grade students of SMP YPPI Tualang, and the object of this study was the effect between students' PQ4R and Graphic Organizers strategy toward students' reading comprehension.

III.4 The Population and the Sample

III.4.1. Population

The population of this research was eight grade students of SMP YPPI Tualang in 2016-2017 academic years. There were eight classes. The total number of the eight grade students were 256 students. The following table is the details

Table III.4.1
The Total Population of the Eight Grade Students at
Junior High School YPPI Tualang 2016/2017

No	Class	Number of Students
1	VIII 1	33
2	VIII 2	31
3	VIII 3	31
4	VIII 4	33
5	VIII 5	32
6	VIII 6	33
7	VIII 7	30
8	VIII 8	33
Total		256

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III.4.2 Sample

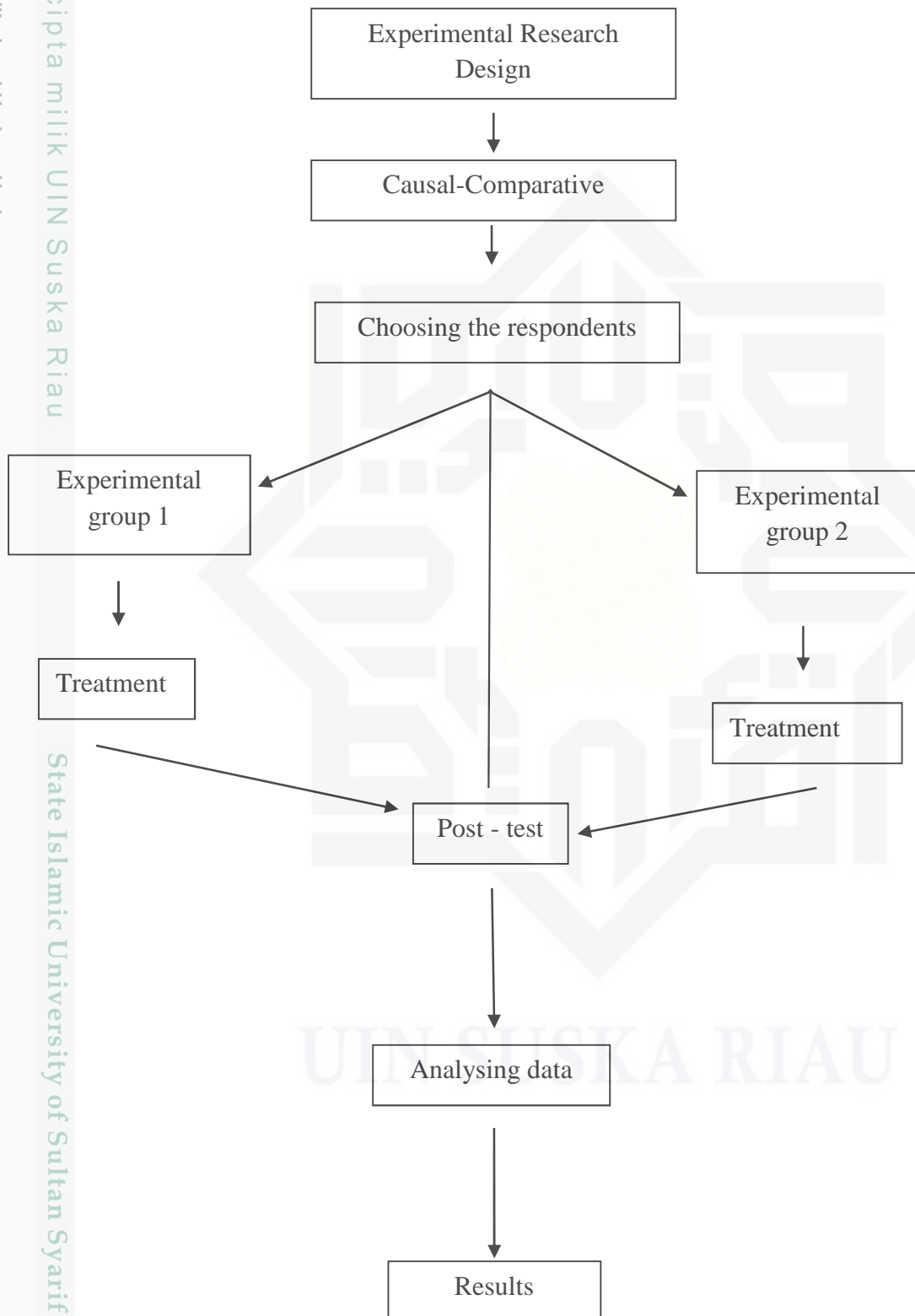
The sample of this research used cluster sampling, Gay (2000:12) states that cluster sampling randomly selects groups, not individual. All the members of selected groups have similar characteristics. The homogenous characteristics are the consideration. Because all classes were homogenous, the samples were chosen randomly, VIII 1 as an Experimental class 1 by using PQ4R strategy, VIII 6 as an Experimental class 2 by using Graphic Organizers strategy. Two classes were taken as the sample of this research as follows:

Table III.4.2

The Total Sample of the Research

No	Class	Male	Female	Total number of Students
1	VIII 1	11	22	33
2	VIII 6	19	14	33
	Total	30	36	66

III.5 Research Procedure



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III.6 Research Instruments

To collect the data, reading test was administered as the instrument of this study. The pre-test and post- test were administered to two classes which consisted of VIII 1 and VIII 6. The pre-test was administered before the treatment and the post-test aims at finding out the students' reading comprehension after treatment. The treatments were given by teaching PQ4R and Graphic Organizers Strategies. This activity also intended to find out whether the students' skills keep hold of the material after doing the treatment.

III.7 Data Collection Technique

In this research, the data were collected by distributing the test to the students and observation checklist to the teacher. Hughes (2003, p.43) says that there are many techniques than can assess the students' reading comprehension; one of them is multiple choice techniques. In line with this statement, multiple choices were used and it was designed by using four choices and the student choose one of the correct answers. The test consisted of five passages where each of the passages consisted of five questions related to the passages of reading comprehension test. The duration of time in teaching learning process was 40 minutes. The tests were taken from the students' textbook and internet materials.

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III.8 Validity and Reliability Test

III.8.1 The validity of instrument

Before collecting the data, each item in 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. Brown (2000, p.22) states that the 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.

To find out the validity of the items of test, it was used Split-Half formula by using SPSS 20 version by looking at the corrected item - total correlation (correlation between score item and score total item = r_{counted}) in table Item-Total Statistics.

To know whether the test valid or not, the value of r_{counted} must be compared with r_{table} . The degree of freedom is $32-2=30$, r_{table} on $df=30$ are 0,349 (5%).

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

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

The result, as below:

Table III.8.1 Instrument Validity Before Try Out

	Corrected Item-Total Correlation	R Table = 0,05 ; n= 30	Categories
ITEM1	,849	< 0,349	Valid
ITEM2	,849	> 0,349	Valid
ITEM3	,854	> 0,349	Valid
ITEM4	,502	> 0,349	Valid
ITEM5	,341	> 0,349	Invalid
ITEM6	,854	> 0,349	Valid
ITEM7	,791	> 0,349	Valid
ITEM8	,854	> 0,349	Valid
ITEM9	,474	> 0,349	Valid
ITEM10	,318	< 0,349	Invalid
ITEM11	,854	< 0,349	Valid
ITEM12	-,052	< 0,349	Invalid
ITEM13	,456	< 0,349	Valid
ITEM14	-,052	< 0,349	Invalid
ITEM15	,854	< 0,349	Valid
ITEM16	,854	> 0,349	Valid
ITEM17	,849	< 0,349	Valid
ITEM18	,849	< 0,349	Valid
ITEM19	,849	> 0,349	Valid
ITEM20	,849	< 0,349	Valid
ITEM21	,854	< 0,349	Valid

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ITEM22

,854

> 0,349

Valid

Table III.8.1 Instrument Validity Before Try Out (Continued)

	Corrected Item-Total Correlation	R Table = 0,05 ; n= 30	Categories
ITEM24	,854	> 0,349	Valid
ITEM25	,849	> 0,349	Valid
ITEM26	,849	< 0,349	Valid
ITEM27	,854	> 0,349	Valid
ITEM28	,849	< 0,349	Valid
ITEM29	,854	> 0,349	Valid
ITEM30	,849	> 0,349	Valid

From the result calculated by using SPSS, it is clear and concluded that 21 items are valid; item 1, item 2, item 3, item 4, item 6, item 7, item 8, item 9, item 11, item 13, item 15, item 16, item 17, item 18, item 19, item 20, item 21, item 22, item 23, item 24, item 25, item 26, item 27, item 28, item 29, item 30 and 4 items are invalid ; item 5, item 10, item 12, and item 14. So, the invalid items were removed and the result validity after the invalid items were changed that can be appeared below:

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Table III.8.2 Instrument Validity after Try Out

	Corrected Item- Total Correlation	R Table = 0,05 ; n= 25	Categories
ITEM1	,849	< 0,349	Valid
ITEM2	,849	> 0,349	Valid
ITEM3	,854	> 0,349	Valid
ITEM4	,502	> 0,349	Valid
ITEM5	,854	> 0,349	Valid
ITEM6	,791	> 0,349	Valid
ITEM7	,854	> 0,349	Valid
ITEM8	,474	> 0,349	Valid
ITEM9	,854	< 0,349	Valid
ITEM10	,456	< 0,349	Valid
ITEM11	,854	< 0,349	Valid
ITEM12	,854	> 0,349	Valid
ITEM13	,849	< 0,349	Valid
ITEM14	,849	< 0,349	Valid
ITEM15	,849	> 0,349	Valid
ITEM16	,849	< 0,349	Valid
ITEM17	,854	< 0,349	Valid
ITEM18	,854	> 0,349	Valid
ITEM19	,849	< 0,349	Valid
ITEM20	,854	> 0,349	Valid
ITEM21	,849	> 0,349	Valid
ITEM22	,849	< 0,349	Valid
ITEM23	,854	> 0,349	Valid
ITEM24	,849	< 0,349	Valid
ITEM25	,849	> 0,349	Valid

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Table III.8.1 describes that there are four items are invalid and cannot use in measuring the students' reading comprehension. While there are 25 items are valid and able to use in measuring the students' reading comprehension. The conclusion is in this research the researcher use 25 items to measure the students' reading comprehension.

III. 9 The reliability of Instrument

Reliability is an important characteristics of a good test. In order to calculate the reliability of the test, the mean of the students' scores the standard deviation was sought. In finding reliability of instruments, there are several formulas were used such as Split-Half formula, Spearmen-Brown formula, Flanagan formula, Rulon formula, Hoyt formula, Alpha formula, Kuder-Richardson 20 (K-R 20) formula and Kuder- Richardson 21 (K-R 21) formula (Arikunto, 2006, p.223). From these formulas, the writer used Slit-Half formula by using SPSS and result of reliability can be seen through Guttman Split-Half Coefficient in reliability statistics on the output of SPSS.

TableIII.9.1 CriteriaCoefisien of Reliability

CoefisienReliability	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

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$0,20 \leq r_{11} \leq 0,39$

Low reliability

$0,00 \leq r_{11} \leq 0,19$

Lowest reliability

(Arikunto, 2006, p.223)

The result of test reliability can be shown as follows:

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,972	,972	25

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 0,972. So, $0,80 < 0,972 < 1,00$. It means that the instrument are highest realibility.

III.10 Data Analysis Technique

The scoring guide is chosen as the criteria of scoring representing the basic aspects of reading. The reading results were evaluated by considering five aspects and each aspect has a score or a level. The specifications of the aspects are; main idea, factual information, textual reference, generic structure and word meaning.

In analyzing the data, the researcher used the scores on the pre-test and the post-test of experimental groups. Those scores are analyzed statistically for both descriptive and inferential statistic using SPSS 20. This study used SPSS 20 to analyze the scores and the analyses were presented in the next chapter.

III. 11. Independent sample t-test

To find out whether there is a significant difference or there is no significant difference between two or more variables, the data can be analyzed by

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using Independent Sample t_{test} . Gay (2000) added that the t-test for independent sample is use to determine whether there is probably 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 fourth hypotheses. They are as follows:

- a. To find out a significant difference of students' reading comprehension before being given the treatment by using PQ4R strategy and Graphic Organizers strategy for experimental class 1 and experimental class 2
- b. To find out a significant difference of students' reading comprehension after being given the treatment by using PQ4R strategy and Graphic Organizers strategy for an experimental class 1 and an experimental class 2

To analyze the final-test scores of the experimental group 1 and the experimental group 2, the researcher used SPSS 20.

III.12 Dependent Sample t-test

Dependent sample t-test is known also as Paired-Sample t-test. The researcher used this formula to obtain the result of the second and third hypotheses that was to find out whether there is a significant effect of using PQ4R Strategy and Graphic Organizers Strategy on students' reading comprehension at Junior High School YPPI Tualang. L.R.Gay (2000:488) states that t-test for non-independent samples are used to compare groups that are formed by some types of matching or to compare a single group's performance on a pre- and post-test or on two different treatments.

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At this time, the researchers used the pre-test and the post-test scores of the experimental class in order to find the significant effect of using PQ4R Strategy and Graphic Organizers Strategy on students' reading comprehension at Junior High School YPPI Tualang.

To obtain the data, the writer used SPSS 20 and to find out the percentage of significant effect between the pre-test and the post-test of experimental class by looking for the effect size or eta-squared as follows:

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

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

Where;

$$\tilde{\eta}^2 = \text{eta squared}$$

$$t^2 = \text{t-test result}$$

$$n = \text{students number}$$