CHAPTER III
RESEARCH METHODOLOGY

A. Form of Research

The form of research that was implemented in this research was experimental research. Singh (2006:135) stated that experimental method is a scientific method, it is oriented to the future in the sense that the researcher is seeking to evaluate something new. Another expert, Ary*et al* (2010: 265) states, the goal of experimental research is to determine whether a casual relationship exist between two or more variables. An experimental research is used to establish possible cause and effect between the independent and dependent variables.

The kind of experimental research which is used by the researcher in this research is pre-experimental research by using one group pre-test and post-test design. A pre-test is a test given before the experimental treatment in order to see if the groups are equal, the groups are then post-test with an alternate form of the same test, while a post-test is a test given after the experimental treatment (Lodico, Spaulding, and Voegtle, 2010:228).

In this research the researcher was going to take one offour classes to know the students' reading comprehension. The researcher gave the pre-test before giving the treatment and after that the researcher gave the treatment for students to know the effectiveness of PQ4R Strategy in TeachingReading Comprehension. Afterward, the researcher gave post-test to the students in order to know the result before and after giving the treatment.

The reason of choosing this strategy was to find out whether the strategy that was going to use in this research effective or not.Ary*et al* (2010:303) mentioned that, the one group pre-test and post-test design usually involves three steps ((1) administering a pre-test measuring the dependent variable (2) applying the experimental treatment *X* to the subject and (3) administering a post-test, again measuring the dependent

variable.Furthermore, to explain about how the design works the researcher adopted the experimental design by Ary*et al* (2010:304), as follow:

Table 3.1: One group pre-test and post-test

Pre-Test	Treatment	Post-Test
Y_1	X	Y_2

Taken from Ary et al (2010:304)

Where:

*Y*1 : Pre-test

X : Treatment

Y2 : Post-test

Y_1 was applying in order to know the students' mean score before giving the treatment. Then, X represents as the treatment. Y_2 was applying in order to measure the students' achievement after the treatment given. A pre-experimental does not have a control group. The influence of experimental treatments can be seen by seeing the mean score between the pre-test and post-test. In this research, the researcher tried to investigate the effectiveness of reading comprehension by PQ4R Strategy to the seventh grade students of SMPN1Kuala Mandor B.

B. Population, Sample, and Sampling

1. Research Population

Population is a group of individuals that share one or more characteristics from which data can be gather and analysis. According to Singh (2007:88), a population is a group of individuals, objects, or items from among which samples are taken for measurement. The population in this research was all of the seventh grade students of SMPN 1Kuala Mandor B. The total populations are 91 students that divided into three classes. The classes are VII A, VIIB, and VII C.

Table 3.2: Population Table

NO	Seventh Grade students of SMPN 1 Kuala Mandor B	
1.	VII A	30 students
2.	VII B	31 students
3.	VII C	30 students
Total		91 students

Taken from: Administration of SMPN 1 Kuala MandorB

2. Research Sample and Sampling

Sample is the part of the population that indicates all the population. As stated by Ary (2010:148) the small group that is observed is called a sample. Supported by Webster (1985) A sample can be defined as a finite part of a statistical population whose properties are used to make estimates about the population as a whole. Thus, the researcher concludes that sample is a representative of the population that will be involved in the research.

The sampling is the fundamental to all the statistical techniques and statistical analysis. The quality of a piece of research stands or falls not only by the appropriateness of methodology and instrumentation but also by the suitability of the sampling strategy that has been adopted Cohen (2007:100). This research, the researcher will take simple random sampling where the researcher will choose only one class randomly to make limitation of population. Simple random sampling is type of sampling where each and every items in the population has an equal change of inclusion in the sample and each one of the possible samples, in case of finite universe, has the same probability of being selected (Kothari 2004:15).In this technique, the number of students should not less than 30 participants Cohen et al (2007:101) mentions a sample size of thirty is held by many to be minimum number of cases if researcher

plan to use some form of statistical analysis on their data, though is a very small number and we would advise very considerably more. The researcher would prepared a piece of paper and divide the paper in two pieces, then write each of paper with codes namely,. Afterwards, the researcher will shake and take one of the paper from a container as a lottery. The class that will be chosen is the class which written in the paper to present the population.

C. Technique and Tool of Data Collecting

1. Technique of Collecting Data

In this research, the researcher used measurement data collection technique. Measurement is a process of mapping aspects of a domain into other aspects of a range according to some rule of correspondence (Kothari, 2004:69). At the same concern, Creswell (2012:623) states that measurement means that the researcher observes and records the score on an instrument. This measurement technique intended to measure the change students' reading comprehension before and after PQ4R Strategy treatment.

2. Tool of Collecting Data

The data needed for this research was collected using a wrriten test in form multiple choices question. Ary et al, (2010 : 201), explains that "A test is a set of stimuli presented to an individual in order to elicit responses on the basis of which a numerical score can be assigned". It means the test is a way to meansure student's bility to complete the task mastery or knowledge of the material that has been learn to produce a value. In this research, the reseacher used objective test as a tool to collect the data for the pre test 25 items and post test 25 items with five possible answers (A, B, C, or D). Before researcher give the instrument used as the tool of collecting the data, the instrument of the research is already read by one of lecturers of English Education in IKIP PGRI

Pontianak. To ensure that the instruments are already suitable with the curricullum of school, syllabus and learning objective.

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D. Technique of Analysing Data

This research used statistical analysis in order to find out of the answer of research questions and to test the hypotheses of the research procedures of data analysis were required. The numerical dataanalysed using windows-based program, Statistical Package for the Social Sciences (SPSS) statistic 16.

Cresswell (2012:183) states that descriptive statistics will help you summarize the overall trends or tendencies in your data, provide an understanding of how varied your scores might be, and provide insight into where one score stands in comparison with others. Therefore, the technique of data analysis in this research was descriptive statistic. In analyzing the data, the researcher firstly analysed students' individual score, then students' mean score, students' standard deviation, normality test and testing the hypotheses to answer the first question. And the last, the researcher analyzed the effect size to answer the second question: The technique of data analysis in this research as follow:

1. Students' Individual Scores of Pre-Test and Post- Test.

In order to analyse the students' individual scores, the researcher woulduse the formula below:

$$X1 = \frac{A1}{N1} \times 100 \qquad X2 = \frac{A2}{N2} \times 100$$

Where:

X1 : an individual student's score Pretest

X2 : an individual student's score Posttest

A1 : the students' right answer of Pretest

A2 : the students' right answer of Posttest

N1 : the number of test items of Pretest

N2 : the number of test items of Posttest

Taken from (Cohen and Manion, 2007:423)

To calculate the students' individual score, from a test result, the number of students' correct answer was multiplied by 100 and then divided by the total number of test items. After finding the individual score the researcher continued to analyse the means score.

2. Students' Mean Score of Pre-Test and Post-Test.

A mean is an average score that the students get from the test. In order to analyse the students' mean scores, the researcher used the formula below:

$$\overline{X1} = \frac{\sum X1}{N1} \qquad \overline{X2} = \frac{\sum X2}{N2}$$

Where:

$\bar{X}1$: the students' mean scores of Pretest

$\Sigma X1$: the totalscore of students Pretest

$\bar{X}2$: the students' mean score of Posttest

$\Sigma X2$: the total score of students Posttest

N1: the total number of students Pretest

N2: the total number of studentsPosttest

Taken from Khotari (2004:132)

To find the mean score, the researcher has to sum all the students' individual score and divide it with the number of participants of the study. The mean score is used to find the difference score of students in pre-test and post-test

Table 3.3

Mean Score Classifications

Test Score	Classification
80-100	Good to Excellent
60-79	Average to Good
50-59	Poor to Average
0-49	Poor

Taken fromBrown(2003:287)

3. Standard Deviation.

Standard deviation is a measure of variability indicating the average amount that scores vary from the mean. In order to analyse the students' standard deviation, the researcherused the formula below:

$$\text{SD} = \sqrt{\frac{\sum X^2 \frac{(\sum X)^2}{N}}{N-1}}$$

Where :

SD = Standard deviation

$\sum X^2$ = Sum of the squares of each score

$(\sum X^2)$ = Sum of the scores squared

N = The number of elements in a sample

Taken fromAry et al (2010: 177)

4. Normality Test

After the researcher calculate the Individual score along with mean and the standard deviation from the individual score; then the researcher need to find out whether the data that acquired during the process is in normal state or not. This is recognized to be the preliminary step before the researcher test the hypothesis of this research and answering the research question by seeing the statistical significance from pretest and post-test. To

test the normality of the data, Pearson index formula utilized to check the shape of the value distribution. The formula is as follows**:**

$$\text{Pearson's index} = \frac{3(\bar{x} - \text{median})}{s}$$

Taken from BraseandBrase (2012:284)

Where:

$\overline{x}$ = *x* bar or Mean Score

Median = The middle value of the data

S = Standard Deviation of the data

Taking a note, that if the index value is greater than 1 or less than -1 it indicates skewness. If the distribution of the value is in skewed form it means that the data is not normal. (Brase and Brase 2012:284). When the data is in normal state it means that the researcher must use parametric test (t-test); however when the data is not in normal state it means that the researcher must use non-parametric test (wilcoxon tests).

5. Testing Hypotheses

If the result from the Kolgomorov-Smirnov test is normal the researcher continues to t-test for a dependent sample. t-test for a dependent sample is a test used to compare sample's means before and after treatment. Ary*et al* (2010:176) said in a t-test for dependent sample "The measure to be analysed by the dependent *t* test is the mean difference between the paired scores. Pre-test and post-test scores of the same individuals are an example of paired scores". The formula for the t-test for dependent sample:

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

Where:

t = t ratio

$\overline{D}$ = average difference

$\sum D^2$ = different scores squared, then summed

$(\sum D)^2$ = different scores summed, then square

N = the number of elements in a sample

Taken fromAryet al (2010:177)

The result of data computation would be the conclusion for deciding the hypothesis. To answer the first question, whether PQ4R strategy was effective or not, the researcher would use the p-value of t-test. If the value of (p) < α (0,05) it means that PQ4R strategywas effective and Ho is rejected. If the value of (p) > α (0,05) it means that PQ4R strategywas not effective and Ha is fail to be rejected.

In simply way:

a) If p – value < α, the Alternative Hypothesis accepted

b) If p – value >α, the Null Hypothesis accepted

6. The Effect size

The second research question related to the strength of the effect of PQ4R strategyin TeachingReading Comprehension. The formula to find effect size is as follow:

$$ES = \frac{\overline{X}2 - \overline{X}2}{SD}$$

Where:

ES = Effect size

$\overline{X}2$= the students' mean score of post-test

$\overline{X}1$= the students' mean score of pre-test

SD = the average standard deviation of both test

Taken from Creswell (2012:195)

Table 3.4

Effect Size

A Cohen's Effect Size could be listed between 0 to1 as followed:

Effect Size	Qualification
0 – 0.20	weak effect
0.21 – 0.50	modest effect
0.51 – 1.00	moderate effect
>1.00	strong effect

Taken from Cohen and Manion(2007:521)

E. The Implementation of Research

There were some procedure that researcher did while conducting this research. The procedure can be explained as bellow:

1. Administration

   At this stage the researcher firstly asked permission to Headmaster of SMPN1Kuala Mandor B to conduct the research. After gaining the permission, the researcher selected the sample from the seventh grade class and contacting the teacher in charge of the class.

2. Pre-test

   The second stage the researcher gave pre-test where the researchertry to find out the samples real condition before implementing the treatment of PQ4R.The pre-test was held on 8 February 2021.

3. Giving Treatment

   Next stage was implementing the treatment to the sample class by using PQ4R Strategy. The treatment of PQ4R Strategy was conductedfour times. There were on9 February to 22 february2021.

4. Post- Test

   The researcher conducted a post-test to know the result of implementing of PQ4R strategytoward the samples' reading comprehension. The post-test was held on 23 Februay 2021.

5. Analysing the Test Result

Last stage of the research was analysing the data collected from both pre-test and post-test using formulas in this chapter III.