CHAPTER III
RESEARCH METHODOLOGY

This chapter explains the procedures of the study in order to answer the questions stated in the previous chapter. The discussion includes formulation of the problems, research method, hypothesis, data collection, research procedure, and data analysis.

3.1 Formulation of the Problems

This study mainly focuses on the use of PQ4R in teaching students’ reading comprehension of narrative text. Thus, two questions were formulated in this research, they are:

1. Is PQ4R strategy effective to improve the students’ reading comprehension of narrative text?
2. What are the students’ responses toward PQ4R strategy in reading comprehension of narrative text?

3.2 Hypothesis

Hypothesis is a tentative statement about the outcome of the research (Hatch and Farhady, 1982). The null hypothesis (H₀) and alternative hypothesis (H₁) of the research are stated as follows:

\[
H₀ : \text{There is no difference in student reading comprehension of narrative text between control group and experimental group for students who used PQ4R strategy and those who did not. They belong to the same population}
\]

\[
H₁ : \text{There is a difference in student reading comprehension of narrative text between control and experimental group for students who used PQ4R strategy and those who did not. They belong to different population.}
\]
However, this study works on null hypothesis ($H_0$) meaning PQ4R strategy is not effective in improving students’ reading comprehension of narrative text.

3.2 Research Method

The research method used in this research was quasi-experimental method. Zainal (2011) states that quasi-experimental is aimed at analyzing the achievement of two groups with different treatment. Thus, this research was conducted by giving different treatments to two groups to gain the objective of the research. The aim of the research was to find out whether or not using PQ4R in teaching is effective to improve the students’ reading comprehension. Therefore, pre test and post test were given to experimental and control group.

This study tried to reveal the use of PQ4R strategy in improving students’ reading comprehension of narrative text. The strategy was implemented to the students in the experimental group in order to find out the effectiveness of the strategy and it was compared to the students in control group who were given conventional strategy. The experimental design in this study is described as follows:

\[ O_1 \times O_2 \]
\[ O_1 - O_2 \]

(Sugiyono, 2012: 116)

Notes:

$O_1$ : Pre test

$O_2$ : Post test

$X$ : Treatment for the experimental group (Using PQ4R strategy)

- : Treatment for the control group (Using conventional strategy)

From the description above, it can be seen that both of the groups were given pre-test in the beginning of the research. Then, the treatments were given for four meetings before implementing the post test. This is to find out whether the students
who were treated by using PQ4R could achieve greater score than those who were treated by using conventional method.

3.2.1 Variable

In this research, there are three variables exist. The first is independent variable, the second is dependent variable and the last is the intervening variable.

Hatch and Farhady (1982: 15) state that an independent variable is the main variable which is investigated, a dependent variable is the variable which is observed and measured to determine the effect of the independent variable and an intervening variable is a number of variables which cannot be measured or manipulated.

In this research, the dependent variable is the students’ reading score or achievement in the test. The independent variable is the effect of using PQ4R strategy in improving students’ reading comprehension. The intervening variable is any factors in which the effects they have not been measured but theoretically may or may not be part of that process.

3.2.2 Population and Sample

The population of the research was the tenth grade students of one public high school in Cianjur. Class X.1 was taken as the experimental group and class X.2 was chosen as the control group. They were taken to this research based on purposive sampling method, considering that both of the classes are regular class. The choice of the sample is also affected by their English teacher who recommended them to be involved in the research. The number of the sample was 76 students. It consists of 38 students for each class.
3.4 Data Collection

In this section, several instruments used in this research are elaborated, such as test, questionnaire and interview.

3.4.1 Research Instrument

According to Sugiyono (2012: 148) research instrument is the tool used to measure what we observe. The instruments used will be in test (Pre test and Post test) and non test form (Questionnaire and interview). Pre test and post test were used to answer the research question about the improvement in using PQ4R strategy in teaching reading comprehension of narrative text. While the questionnaire and interview was used to know the students’ responses toward the use of PQ4R strategy in reading comprehension of narrative text.

3.4.1.1 Test

The pre test was conducted in the first meeting in control and experimental group for 80 minutes. This test was aimed at discovering the students’ previous ability in reading narrative text. The post test was also conducted in 80 minutes at the end of the meetings. The post test was conducted after the students received treatments for four meetings. The aim of the post test was to reveal the differences between two groups after the treatments were given. The test items of the post test were not the same as the pre test. Thus, the students would not remember the answer of the pre test when the post test conducted but the difficulty level of the items were similar.

3.4.1.2 Questionnaire and Interview

The questionnaires and interview were used to find out the students’ perceptions toward PQ4R strategy in reading comprehension. The questionnaire and interview were conducted in the last meeting after the students finished their post test.
There were 12 questions in the questionnaire and four questions in the interview. The questionnaires and interview were also used to know the benefits of using PQ4R strategy and identify students’ difficulties in implementing the strategy.

3.5 Research Procedure

In this research, there were several steps conducted to collect the data required. The steps consisted of:

1. Preparing the lesson plan
2. Preparing the teaching material
3. Administering pilot test
4. Administering pre-test
5. Implementing the treatment by using PQ4R strategy in experimental group and using conventional method for control group
6. Administering post-test
7. Administering questionnaires
8. Administering interview

3.5.1 Preparing the Lesson Plans

There were three lesson plans used to implement for four meetings in the treatment sessions. The first and last meetings were allocated for pre-test and post-test, while the rest four meetings were allocated for treatment sessions.

The lesson plan arranged for this research would be based on the syllabus below:
Table 3.1

Syllabus for 1st Grade Senior High School

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Competence Standard</th>
<th>Basic Competence</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading</td>
<td>Understanding the meaning of short functional text and simple essay in the form of report, narrative and analytical exposition in the context of daily situation and also to access knowledge</td>
<td>Responding the meaning of formal and informal short functional text (banner, poster, pamphlet, etc) by using various written language in the context of daily situation to access knowledge</td>
<td>1. Identifying elements of narrative text such as theme, character, setting and plot</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2. Identifying generic structure of narrative text</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3. Identifying vocabulary used in narrative text</td>
</tr>
</tbody>
</table>

Source: Standar Isi SMA/MA

3.5.2 Teaching Materials

There were three texts that were employed in this study taken from Look Ahead: An English Course for Senior High School Students Year X. The texts were “Indian’s Fish”, “The Great Fortune Teller” and “Batara Kala”

3.5.3 Administering Pilot Test

To investigate the feasibility of reading comprehension test used, the test items were tried out to reveal their validity and reliability. Try out also functioned to investigate the items in terms out the difficulty level and discrimination index. Try-
out was implemented to 38 non samples students from X.4 of one public senior high school in Cianjur. However, the class was still in the same level and population as the experimental and control group. The test consisted of forty eight questions. The result of the tried out is presented in Appendix B.

3.5.4 Pre Test

After the test items had been analyzed in terms of validity and reliability the pre-test would be conducted. Pre-test was conducted before the treatment given, precisely on the 31st of August for experimental and control group.

3.5.5 Treatment

When the pre-test had been conducted, the treatment was implemented to control group and experimental group and it was handled by the researcher himself. The treatment was conducted based on the schedule presented below

**Table 3.2**

<table>
<thead>
<tr>
<th>Topic List of Each Meeting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meetings</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>1st meeting</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>2nd meeting</td>
</tr>
<tr>
<td>3rd meeting</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>4th meeting</td>
</tr>
</tbody>
</table>
The PQ4R strategy was used to teach class X1 as the experimental group. The treatments would be conducted for four meetings. Every meeting consisted of 2 X 45 minutes (2 hour lesson). The first and second meeting had the same topic while the third and last meeting presented different topics.

In the first meeting, the teacher gave a brief explanation about narrative text. Then, the teacher introduced the students PQ4R strategy. In this session, the teacher delivered what PQ4R was and how to implement PQ4R in reading comprehension of narrative text. Every student was given PQ4R worksheet. In the first meeting, the students applied preview and question, then read, reflect, recite and review were implemented in the second meeting. In the end of the meeting, the students were given some question about the text they had learned. The students were able to see at their worksheet but they were not permitted to see on their friends’ work.

In the third meeting, the teacher gave different story. In contrast, PQ4R strategy was implemented in one meeting. Thus, every student applied the steps in PQ4R strategy in one meeting, they filled PQ4R worksheet in a day, and then they answered some questions in the end of the meeting. The fourth meeting was the same as the third meeting. The only different was on the story/sub topic.

As comparison, in the control group, lecturing strategy was applied. Teacher explained the materials to the students. The students were given some stories and they could open their dictionary. Finally, the students answered some questions individually.

3.5.6 Post test

Post-test was given to investigate the effect of the treatments. It would be given to both experimental and control group. The test was conducted on August 17th, 2013 to 38 students of the control group and 38 students of the experimental group.
3.5.7 Questionnaire

Questionnaires were only distributed to the experimental group. It was given after the students had finished their post test. The questionnaires were used to find out the students responses toward the use of PQ4R strategy.

3.5.8 Interview

Interview was also given to the students in the experimental group after they had finished their post test. Their opinions were gathered to find more additional information and to clarify information in the questionnaires.

The strength and weaknesses of the strategy based on the students’ perceptions would be revealed through the questionnaires and interview.

3.6 Data Analysis

In this section, the analysis of the data gathered from the try-out, pre-test and post-test are presented.

3.6.1 Data Analysis on Pilot Test

The data from the pilot test would be collected and they were analyzed in terms of the validity, reliability, level of difficulty and discrimination index.

3.6.1.1 Analyzing Validity

Sugiyono (2012:182) states validity instrument could be determined in relating score items and total score. To calculate the validity of each item, Anates V4 was used.

Validity test used was conducted used the formula as presented below:

\[ r = \frac{N\sum XY - (\sum X)(\sum Y)}{\sqrt{(N\sum X^2 - (\sum X)^2)(N\sum Y^2 - (\sum Y)^2)}} \]  

(Arikunto, 2012: 87)

Note:
r = Pearson product-moment correlation
x = score item which its validity is answered
y = total score gained by the sample
N = number of respondent

The index validity of each item was interpreted with the following criteria

<table>
<thead>
<tr>
<th>Raw Score</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.8 – 1.0</td>
<td>Very high</td>
</tr>
<tr>
<td>0.6 – 0.8</td>
<td>High</td>
</tr>
<tr>
<td>0.4 – 0.6</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.2 – 0.4</td>
<td>Low</td>
</tr>
<tr>
<td>0.0 – 0.2</td>
<td>Very low</td>
</tr>
</tbody>
</table>

(Arikunto, 2012:89)

3.6.1.2 Analyzing Reliability

Arikunto (2012: 100) states “A test could be claimed as a reliable test if it shows a constant result”. Anates V4 was also used to measure the reliability of the pilot test.

K-R 20 formula was used to check the reliability of multiple choice items. The formula is presented below:

\[ r_i = \frac{k}{k-1} \left\{ \frac{s_i^2 - \sum p_i q_i}{s_k^2} \right\} \]

(Sugiyono, 2012: 359)

Note:

- \( p_i \) = proportion of students passing the item
- \( q_i \) = proportion of students failing the item (\( q = 1-p \))
- \( \sum p_i q_i \) = sum the product of \( p_i q_i \) for all items
- \( k \) = number of items
- \( s_k^2 \) = variance of the whole test (standard deviation squared)

The reliability of the test could be classified with the following criteria:
Table 3.4
Reliability Classification

<table>
<thead>
<tr>
<th>Coefficient Correlation</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0 – 0.20</td>
<td>Low</td>
</tr>
<tr>
<td>0.20 – 0.40</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.40 – 0.70</td>
<td>High</td>
</tr>
<tr>
<td>0.70 – 1.00</td>
<td>Very High</td>
</tr>
</tbody>
</table>

(Arikunto, 2012:89)

3.6.1.3 Analyzing Difficulty Level

Difficulty level functioned to measure how far the test items were relevant to the participants’ ability. Arikunto (2012: 222) states “A good test was not too easy or too difficult”. A too easy test would not stimulate the students to improve their ability in solving a problem while a too difficult test would cause the students desperate because the test was not on their range.

The formula used to measure the difficulty level of each item is presented below:

\[
P = \frac{B}{JS} \quad (3.8)
\]

(Arikunto, 2012: 223)

Note:

\[P\] = difficulty index items (index kesukaran butir soal)
\[B\] = number of students passing the item
\[JS\] = number of students

The following table showed the difficulty level of a test
### Table 3.5
Index of Difficulty Level

<table>
<thead>
<tr>
<th>Index of Difficulty</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 – 0.30</td>
<td>Difficult</td>
</tr>
<tr>
<td>0.30 – 0.70</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.70 – 1.00</td>
<td>Easy</td>
</tr>
</tbody>
</table>

(Arikunto, 2012: 225)

#### 3.6.1.4 Analyzing Discrimination Index

Discrimination index is measured based on the answer of high achiever students and low achiever students (Arikunto, 2012: 226). When an item can be answered more by low achiever students than the high achiever students, it means that the item can be solved by guessing (Arikunto, 2012: 232), therefore measuring the discrimination index of items is important to do.

The formula to find the discrimination index is presented below:

\[
D = \frac{BA}{JA} \times \frac{BB}{JB} = \frac{PA}{JA} - \frac{PB}{JB}
\]

(Arikunto, 2012: 228)

**Note:**

- \( J \) = number of students
- \( JA \) = number of high achiever students
- \( JB \) = number of low achiever students
- \( BA \) = number of high achiever students passing the item
- \( BB \) = number of low achiever students passing the item
- \( PA \) = proportion of high achiever students passing the item
- \( PB \) = proportion of low achiever students passing the item

The following table showed the discrimination index and its interpretation.
<table>
<thead>
<tr>
<th>Discrimination Index (D)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 – 0.20</td>
<td>Poor</td>
</tr>
<tr>
<td>0.21 – 0.40</td>
<td>Satisfactory</td>
</tr>
<tr>
<td>0.41 – 0.70</td>
<td>Good</td>
</tr>
<tr>
<td>0.71 – 1.00</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

(Arikunto, 2012:232)

3.6.2 Data Analysis on Pre-test

The pre-test and post-test were given to both experimental and control group. The pre-test and post-test were computed by using SPSS statistics 16.0 for Windows. The steps applied in analyzing pre-test and post were scoring, normal distribution test, homogeneity variance, if the data is normally distributed and homogenous, independent t-test was conducted (Uyanto: 161).

3.6.2.1 Scoring

Scoring for multiple choices were decided by rights only method, therefore one point (1) was given to a correct answer, the wrong answer was given zero (0) and a question which is not answered was given zero (0). Students’ score was based on their right answers. Here is the formula in deciding students’ score:

\[ S = R \]

(Arikunto, 2012: 188)

*S* = Students’ score  
*R* = Right answer

3.6.3.2 Normal Distribution Test

Normal distribution test was aimed at measuring whether or not the distribution of pre-test and post-test were normally distributed. The statistical calculation of normality test used Kolmogorov-Smirnov by following three steps:

1. Setting the hypothesis,
The hypothesis used is $H_0$ (the sores between experimental and control groups are normally distributed)

2. Analyzing the normal distribution using Kolmogorov-Smirnov formula in SPSS 16.0 for Windows.

3. Setting the level of significance ($p$) at 0.05

4. Comparing the significance value to the level of significance. If significance value is greater than the level of significance, the null hypothesis is not rejected and the scores are normally distributed. (Uyanto, 2009: 54)

### 3.6.3.3 Homogeneity of Variance

The homogeneity of variance test used Levene test in SPSS statistics 16.0 for windows. The steps were as follows:

1. Setting the hypothesis.
   
   The hypothesis used is $H_0$ (data between two groups are homogenous)

2. Analyzing the variance of homogeneity using SPSS 16.0 for Windows.

3. Setting the level of significance ($p$) at 0.05

4. Comparing the significance value with the level of significance.
   
   If:
   
   1. Significance value $< 0.05$, the null hypothesis is rejected, it means that the two groups were not equal.
   2. Significance $> 0.05$, the null hypothesis is accepted, it means that the variance data of the two groups were equal; the data were homogenous.

### 3.6.3.4 Independent t-test

The independent t-test was used to analyze the differences between two groups’ means. In this study the independent sample test was calculated by the computation of SPSS 16.0 for Windows. The steps were as follows:

1. Setting the hypothesis
The hypothesis used is $H_0$ (there is no significant difference between the students’ reading comprehension of narrative text scores in experimental and control groups).

2. Setting the level of significance (p) at 0.05 with two tailed of significance.

3. Calculating t-test scores using SPSS Statistics 16.0 for windows.

4. Comparing significance value and level of significance, if significance value > than the level of significance (Sig value > 0.05), the null hypothesis is rejected, then if significance value < level of significance, the null hypothesis is accepted. Then, the value of $t$-obtained and $t$-critical should be compared. If $t$-obtained > $t$-critical, there is a significant difference between two groups, it means that the null hypothesis is rejected. Meanwhile, if $t$-obtained < $t$-critical, there is no significant difference between groups. It means that the null hypothesis is not rejected. (Uyanto, 2009: 160-161)

3.6.3 Data Analysis on Post-test

The data collected from post test of experimental and control group were analyzed by using the same procedure as pre test involved normal distribution test, variance homogeneity, then when the result of normal distribution test and variance homogeneity test shows that the data were normally distributed and homogenous, then independent t-test conducted (Uyanto: 161). The analysis conducted to reveal whether or not there was a difference between the reading scores of experimental and control group which used different treatment.

In addition, the effect size conducted to check the level of effect of the treatments after t-test was done. The effect size was used to determine how significant the impact of the treatments was to the experimental groups’ scores. Effect size has positive correlation to its value. The larger effect size value is the larger of treatment will be (Coolidge, 2000). The formula of effect size is described as follow:

$$r = \sqrt{\frac{t^2}{t^2 + df}}$$
Note:

\[ r = \text{effect size} \]

\[ t = t \text{ obt or t value from the calculation of independent t test} \]

\[ \text{df} = N_1 + N_2 - 2 \]

Value of effect size is described in the table below:

| Table 3.7 |
| Scale of Effect Size |
|---|---|
| **Effect Size** | **r value** |
| Small | .100 |
| Medium | .243 |
| Large | .371 |

(Coolidge, 2000:151)

### 3.6.4 Data Analysis on Questionnaires and Interview

The Questionnaire consisted of 12 statements. Each statement had five options. The students had to choose one out of five options based on their perception. The analysis would be based on likert scale. Bertram (2006) states that “likert scale primarily used in questionnaire to obtain participant’s preferences or degree of agreement of a statement”. There are five level likert scale. They are:

1. Strongly disagree (STS: Sangat Tidak Setuju)
2. Disagree (TS: Tidak Setuju)
3. Undecided/Neither agree nor disagree (TT: Tidak Tahu)
4. Agree (S: Setuju)
5. Strongly Agree (SS: Sangat Setuju)

The result of questionnaires was put in percentage. The formula is presented below:

\[ p = \frac{f}{n} \times 100\% \]
Note:
P = Percentage
f = Frequency
n = Response
100 = Constant

When the questionnaires had been given, the interview was implemented to gather more information from the students to support the students’ opinion in their questionnaires. The analysis of interview used the descriptive analysis procedure. Sugiyono (2008) gives some examples of descriptive analysis procedure such as transcribing, interpreting, and concluding students’ responses on the interview based on the theme of each item proposed.

The questionnaire and interview were in Bahasa Indonesia to help students express their feeling easily. The findings and discussions of the present study are elaborated in the following chapter.

3.7 Concluding Remark
The research method of study has presented in this chapter. This study was aimed at finding out the effectiveness of PQ4R strategy and to investigate the students’ responses toward the strategy. Quasi experimental method was used as the research design, therefore it involved one public senior high school in Cianjur. To obtain the data, this study involved pre test, post test, questionnaire and interview. The results of the study will be presented in the following chapter.