III. RESEARCH METHODS

This chapter discusses the methods of research that used in this study, such as research design, data source, research instruments, research procedure, data analysis, and hypothesis testing.

3.1 Research Design

This research used a quantitative. Setiyadi (2006:5) says that quantitative design aims to investigate a theory that has been existed and the data in order to support or reject it. In this research, the researcher used One Group Pre-test and Post-test Design (Hatch and Farhady, 1982:20) in which to investigate whether there was any increasing of students’ reading comprehension achievement through RAPQ technique.

The researcher used simple random probability sampling to determine one experimental class. There was one experimental class that had both pre-test and post-test also treatments.

The design of the research is presented as follow:

\[
T1 \quad X \quad T2
\]
Note:

T1 : Pre-test

X : Treatment

T2 : Post-test

This research conducted in five meetings. The activity was began for try-out test. The first meeting was pre-test. The second, third, and fourth meetings were treatment. The fifth meeting was post-test.

3.2 Data Source

The population of the research was the second grade of students of SMP Kartika Jaya II-2 Bandar Lampung. There were six classes in the second grade of SMP Kartika Jaya II-2 Bandar Lampung and consisted of 30 students in each class (VIIIA-VIII.F). The researcher took two classes: one class as an experimental class, the second class as try-out class. The classes were selected randomly because there was no priority class of the second grade in SMP Kartika Jaya II-2 Bandar Lampung. It was applied based on the consideration that every student in the population had the same chance to be chosen and in order to avoid the subjectivity in the research (Setiyadi, 2006:39).

3.3 Research Instrument

The data of this research were collected by means of reading tests. The reading tests were focusing on examining students’ reading skill that was RAPQ
technique. In gathering the data the researcher used try-out test, pre-test, treatments, and post-test.

1. **Try-out**

The researcher conducted try-out test to measure that the research instrument was good for testing students’ reading comprehension. The quality measurement was based on the calculation of its reliability, level of difficulty and discrimination power. In the reliability of the try-out, the Split-Half Method was used in order to analyze the odd (x) and even (y) of the test items. To measure the coefficient of the reliability between odd and even group, the researcher used Spearman-Brown formula. Based on the research results that had been conducted, some items were dropped and administered to both pretest and posttest.

After doing the try-out test, the researcher found that some questions have good validity and could be used to test the students’ reading comprehension and the others did not have good validity and had to be dropped. That was why the researcher chose 40 questions which had good validity.

2. **Pre-test**

The pre-test was administered once only. This pre-test was done to know the basic of students’ reading ability in comprehending texts before getting treatments. The test consists of 40 items in multiple choice forms with four options a, b, c, d. Each correct answer had 4 points so that the highest score was 100.

3. **Treatment**
In the treatment, the researcher taught reading comprehension by using RAPQ technique. The materials would be given three times in three meetings in which one meeting had 2x45’.

4. Post-test

The post-test was also administered once. It was given to measure students’ reading ability in comprehending text and also to know the effectiveness of RAPQ technique. The items were approximately same as pre-test that consists of 40 items in multiple choice forms. Each correct answer had 4 points so that the highest score was 100.

The researcher gave try-out test to measure that the research instruments was good for testing students’ reading comprehension in terms of validity, reliability, level of difficulty and discrimination power. Here were some elements tested as follows:

1. The Validity

Validity is a matter of relevance; it means that the test measures what is claimed to measure. To measure whether the test has a good validity, it can be analyzed from its face validity, content validity and construct validity. Face validity concerns with how the test looks. Content validity is concerned whether the test is sufficiently representative for the rest of test or not. While construct validity focuses on the relationship between indicators within the test. In getting face validity, the instructions and the directions of the reading skills test is examined by advisors and English teachers until the test looks right and is understandable.
According to Heaton, (1975:160) the content validity is intended to know whether the test items are good reflection of what will be covered. The test took from the material that have been taught to the students and to know whether the test have a good content validity, the items of the test is discussed with the experts (lecture or advisor) to measure the degree of agreement.

Meanwhile, construct validity measures whether the construction has already referred to the theory, meaning that the test construction had already in line with the objective of learning (Hatch and Farhady, 1982). Construct validity concerns whether the tests are true reflection of the theory of the trait – in our case – language which is being measured. If a test has construct validity, it is capable of measuring certain specific characteristic in accordance with a theory of language behaviour and learning.

To determine whether the test has a good construct validity, the test is guessed to the expert to be evaluated whether it has fulfill the construct validity, that is whether the text really measures the reading skill. By giving try-out test to the students, the researcher took 40 questions which had good validity.

**Table 3.1 Specification of the Try Out Test**

<table>
<thead>
<tr>
<th>No</th>
<th>Reading Skills</th>
<th>Items Numbers</th>
<th>Percentage of Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Determining main Idea</td>
<td>1, 16, 21, 26, 41, 46, 61,</td>
<td>17.5%</td>
</tr>
<tr>
<td>2.</td>
<td>Finding Specific Information</td>
<td>2, 22, 27, 32, 37, 42, 67</td>
<td>17.5%</td>
</tr>
<tr>
<td>3.</td>
<td>Inference</td>
<td>8, 18, 23, 28, 33, 38, 48, 58, 63,</td>
<td>22.5%</td>
</tr>
<tr>
<td>4.</td>
<td>Reference</td>
<td>4, 9, 19, 34, 44, 59, 69</td>
<td>17.5%</td>
</tr>
<tr>
<td>5.</td>
<td>Vocabulary</td>
<td>5, 10, 25, 30, 35, 40, 45, 50, 55, 65</td>
<td>25%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>40 items</td>
<td>100%</td>
</tr>
</tbody>
</table>
2. The Reliability

According to Hatch and Farhady (1982:243), the reliability of a test can be defined as the extent to which a test procedures consistent result when administered under similar conditions. To estimate the reliability of the test, the Split-Half Method is used in order to analyze the odd (x) and even (y) of the test items. To measure the coefficient of the reliability between odd and even group, the researcher was used Spearman-Brown formula, that is:

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

Notes:

- \( R \): coefficient of reliability between odd and even numbers
- \( N \): number of the students
- \( X \): square of X
- \( Y \): square of Y
- \( \sum X \): total score off odd number
- \( \sum Y \): total score of even number

(Hatch and Farhady, 1982:198)
First, using Pearson Product Moment Correlation, the coefficient correlation between odd and even number of the items was counted.

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

\[ = \frac{30.4601 - 362(338)}{\sqrt{30.5012 - (362)^2}(30.4436 - (338)^2)} \]

\[ = \frac{138030 - 122356}{\sqrt{150360 - 131044)(133080 - 114244)}} \]

\[ = \frac{15674}{\sqrt{19316)(18836)}} \]

\[ = \frac{15674}{\sqrt{363836176}} \]

\[ = \frac{13095}{19074.49} \]

\[ = 0.68 \]

After getting the reliability of half test, the researcher used Spearman Brown to determine the reliability of the whole tests, as followed:

\[ \Gamma_k = \frac{2 r_{xy}}{1+ r_{xy}} \]
Where:

\[ r_k : \text{the reliability of the whole tests} \]

\[ r_{xy} : \text{the reliability of half test} \]

\[ r_k = \frac{2r_{xy}}{1 + r_{xy}} \]

\[ r_k = \frac{2 \cdot 0.68}{1 + 0.68} \]

\[ r_k = \frac{1.36}{1.68} \]

\[ r_k = 0.80 \]

Based on the criteria of reliability, it was found that the test items had high reliability that was 0.80.

3. **The Level of Difficulty**

The difficulty level of an item shows how easy or difficult that particular item done by the participants, (Heaton, 1975:182). Level of difficulty is generally expressed the percentage of the students who answer the item correctly. It is calculated by the following formula:

\[ LD = \frac{U + L}{N} \]
Notes:

LD : the level of difficulty

U : the number of upper group who answer correctly

L : the number of lower group who answer correctly

N : the total number of students in upper and lower groups

(Arikunto, 1993:221)

The criteria of the difficulty level are:

< 0.30 = difficult

0.30-0.70 = average

> 0.70 = easy

4. The Discrimination Power

Discrimination power is the ability of the item to differentiate between the students who have high ability and those who have low ability. To determine the discrimination power, the researcher was used the following formula. The formula of the discrimination power is:

\[ D = \frac{U - L}{\frac{1}{2}N} \]
Notes:

\[ D \] : discrimination power  \\
\[ U \] : the number of students from the upper who answer correctly  \\
\[ L \] : the number of students from the lower who answer correctly  \\
\[ N \] : the number of the students

The criteria are:

\[ DP = 0.00 - 0.19 \] = poor  \\
\[ DP = 0.20 - 0.39 \] = satisfactory  \\
\[ DP = 0.40 - 0.69 \] = good  \\
\[ DP = 0.70 - 1.00 \] = excellent  \\
\[ DP = \text{negative/minus (-)}, \text{all is poor} \]

(Arikunto, 1993:221)

After doing the test, it was found that most of the questions have average level of difficulty. There was one question which has excellent criteria of discrimination power, there were 24 questions which have good criteria of discrimination power, there were 15 questions which have satisfactory criteria of discrimination power.
5. **Scoring System**

In scoring the result of students’ test, the researcher used Percentage Correct (Lyman, 1971:95). The percentage correct score is used in reporting the result of achievement test. The researcher calculated the average of the pre-test and post-test by using this formula:

\[
S = 100 \times \frac{R}{N}
\]

Where:
- \( S \) = the score of test
- \( R \) = number of right answers
- \( N \) = total number of items on test

3.4 **Research Procedure**

In research procedures, there were nine major types that should be concerned, there were:

1. **Determining the problem**

   The first step in conducting the research was determining the problem. The researcher got the problem based on the rule of curriculum that had not been achieved through what happened in the real situation of teaching reading process. It could be seen from a class observation that was hold by researcher.
2. Finding the population and determining the sample
The researcher selected simple random probably sampling, in assumption that every class had the same ability.

3. Determining the research instrument
The materials were taken from the students’ textbook and authentic materials (i.e. taken from the internet). The test in multiple choice tests which consisted of 40 items. In giving treatments, the researcher used reading text which was taken from English textbook for second year students of SMP and authentic materials.

4. Administering the try-out test
The researcher conducted try-out test in order to find out whether the test items that was used in the research were good or not considering from the validity, reliability, level of difficulty, and discriminating power.

5. Administering pre-test.
The researcher administered the pre-test before treatments.

6. Conducting treatments.
The researcher taught reading comprehension in reading a text by using RAPQ technique in SMP Kartika Jaya II-2 Bandar Lampung for five times.

7. Administering the post-test.
The researcher administered the post-test after the treatments were done.

8. Analyzing the data
This step was to find out the students’ reading comprehension achievement using RAPQ technique. The data would be computed through the statistical package for social sciences (SPSS) version 17.0.
9. Testing hypothesis

The hypothesis test would be taken from the comparison mean of the pre-test and post-test.

3.5 Data Analysis

Analyzing data was very important part of the research process that helped a researcher to identify findings from the study. By analyzing the data throughout the collection period, the researcher was able to begin and to interpret what occurred in classroom and the truth of students’ activities and the effects of RAPQ teaching technique were implemented. After the data had been collected from reading test, the scoring test was done.

In analyzing the data, the researcher scored pre-test and post-test and drew conclusion into the tabulated result of the pre-test and post-test that used statistical computerization i.e. *Repeated Measure T-Test of Statistical Package for Social Science (SPSS) 17.00 for windows* to test whether progress of students’ gain is significant or not, in which the significant is determining by $p < 0.05$ (Hatch and Farhady, 1982: 114).

3.6 Hypothesis Testing

$H_0$: There is no significant difference of students’ reading comprehension before and after being taught by using RAPQ technique.

$H_1$: There is a significant difference of students’ reading comprehension before and after being taught by using RAPQ technique.
The criteria for accepting the hypothesis were as follows:

1. \( H_0 \) is accepted if the T-value is lower than T-table. It means that there is no significant difference of students’ reading after and before being taught by using RAPQ technique.

2. \( H_1 \) is accepted if the T-value is higher than T-table. It means that there is a significant difference of students’ reading after and before being taught by using RAPQ technique.

Those were the methods of research that were used in this study, such as research design, data source, research instruments, research procedures, data analysis, and hypothesis testing.