CHAPTER III

RESEARCH METHODOLOGY

This chapter elaborates the methodology applied in the study. The discussion of this chapter includes research design, population and sample of the research, data collection, research procedures, and data analysis.

3.1 Research Design

This study uses quasi-experimental design. Jackson (2009, p.318) states that it was taken because the participants of this study were not chosen randomly, but they were already part of the groups. In this case, the groups were class VIII-A and VIII-B. Furthermore, this study provided pre-test - post-test to both experimental and control group.

According to (Hatch and Farhady 1982:21) two classes were taken as the sample classes; those were labeled as the experimental group and control group. The first group (e1) as the experimental group was given a pre-test (X1), treated by using comic strip (T), and then provided a post-test (X2). The second group (c1) as the control group was given a pre-test (X1), treated by using conventional teaching (O) and a post-test (X2). Here is the representation of the design:
Table 3.1

The Quasi-Experimental Design

<table>
<thead>
<tr>
<th>Group</th>
<th>Pre-test</th>
<th>Treatment</th>
<th>Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experimental</td>
<td>Xe 1</td>
<td>T</td>
<td>Xe 2</td>
</tr>
<tr>
<td>Control</td>
<td>Xc 1</td>
<td>O</td>
<td>Xc 2</td>
</tr>
</tbody>
</table>

Xe 1 : Students’ reading scores of experimental group on pre-test
Xc 1 : Students’ reading scores of control group on pre-test
T : Comic Strips treatment
O : Non-Comic Strips treatment
Xe 2 : Students’ reading scores of experimental group on post-test
Xc 2 : Students’ reading scores of control group on post-test

(Hatch and Farhady, 1982:21)

The table shows that both classes were given pre-test and post-test, but the difference is in giving treatment. In experimental group, comic strip was given as a treatment to the students in the teaching learning process. And control group, conventional teaching (Three-phases-steps) was given as a treatment in teaching learning process. After treatments have been given to experimental group, both experimental and control group were given the post-test in order to find out the result of using comic strip that could achieve a higher score than conventional teaching (Three-phases-steps).
3.2 Population and Sample

The population of this study was all students of second grade in one junior high school in Bandung; consist of 60 students of second grade. To determine the sample of this study, the sampling technique used was purposive sampling. Purposive sampling is a sampling technique with particular consideration (Sugiyono, 2010: 85). This study took two classes as the sample of the study. They were class VIII-A and VIII-B. However, only 30 students from each class were taken to be the sample of this study. The first 30 students from class VIII-A participated as experimental group and other 30 students taken from class VIII-B participated as control group. The focus of this study was on improving students’ reading comprehension of narrative texts. Based on that condition, the chosen subjects were eighth-grade students as they were studied.

3.3 Data Collection

3.3.1 Research Instrument

In this study, pre-test and observation were to gain the information about the prior reading proficiency of the students from both groups. Then a post-test, interview and a set of questionnaire were distributed to obtain more information about the way comic strip in improving students’ reading comprehension. The entire study instrument used to investigate the effectiveness of comic strips in reading comprehension.
3.3.1.1 Pre-test

Pre-test was given to both experimental and control group in the beginning. It was aimed to find out the initial differences between experimental and control groups as they have similar level in reading skill before receiving the treatment.

3.3.1.2 Post-test

A post-test was conducted to find out the students’ progress in reading comprehension. The post-test procedure was similar to the pre-test procedure. The post-test was held in both control and experimental classes.

3.3.1.3 Questionnaire

Questionnaire was given only to the experimental group who has experienced the treatment of the use of comic strips during their learning process. The questionnaire given was aimed to find out the way of using comic strips in improving students’ reading comprehension of narrative texts in their teaching learning process. The questionnaire consisted of 10 closed-ended questions. According to Beins (2012:264) Closed-ended question is a question that contains a set of answer that a respondent chooses.

3.3.1.4 Interview

Interview is a technique of verbal communication. It is a communication for getting the information. According to Knupfer and McLellan (cited in Grace, 2001), interviews provide an opportunity to follow a line of questioning to obtain
more in-depth information. Interview was given only to the experimental group who has experienced the treatment. The interview in this study is addressed to find out the use of comic strips in improving students’ reading comprehension of narrative texts.

### 3.4 Research Procedures

#### 3.4.1 Preparation

This study was planned for eight meetings. The first meeting was used to conduct a tryout of the instruments of this study. The next meeting was used to conduct the pre-test and the third to seventh meetings were allocated to implement the lesson in the classroom. The post-test and interview were administered in the rest two meetings.

A preparation in doing the research in this study involved designing lesson plan and preparing materials. There were four lesson plans design to be implemented in the treatment of the use of comic strip for experimental group. The lesson plans were designed based on 2006 English School-Based Curriculum for eighth grade students. The four lesson plans were all based on the standard competence and competence of descriptive text learning. In addition, for the control group, the lesson plans were designed similar to the experimental one. The differences were on the learning media and materials used.

Learning materials in teaching learning process of the experimental group included narrative texts, comic strips handout and the limited authentic materials available in the classroom that were related to the topic. On the other side, the
learning materials used in the teaching learning process in the control group included narrative texts and handout that were related to the topic.

3.4.2 Instrument of Try Out

In the very beginning, the instrument test was administered to students outside the experimental and control group in order to measure the validity, reliability, difficulty level, and discrimination level of the instruments employed. The try out was administered in another class which was not involved during the research process.

3.4.3 Pre-test

Pre-test was administered to both experimental and control group in the first meeting. It was aimed to find out the initial ability of students’ reading comprehension of narrative texts. 60 students from the experimental and control group took the test.

3.4.4 Treatment

The treatment program was done in four meetings in the experimental group. The use of comic strips in improving students’ reading comprehension of narrative texts was provided as the treatment to the experimental group. It was aimed to improve students’ reading comprehension. The treatment program in the control group was done in four meetings. Four meetings in the control group showed the same pattern of teaching.

3.4.5 Post-test
Post-test was administered to 60 students of both experimental and control group in the last two meetings. It was held at the end of treatment, because it was aimed to find out the students’ progress in term of their reading comprehension after getting the treatment. In other word, the post-test could be the data to help this study in finding out whether there are any differences between the experimental group who was treated with the use of comic strips and the control group who was treated with the text alone.

3.4.6 Questionnaire

In the last meeting from the whole eight meetings, the chance was used to administer the questionnaire to students. The questionnaire discussed about reading comprehension and the use of comic strips in the teaching learning process. So, the questionnaire was administered to the experimental group only who had experienced the treatment of the use of comic strips in their learning process.

3.4.7 Interview

In the last meeting, the interview was administered to find out the advantages and disadvantages about using comic strips in improving students’ reading comprehension of narrative texts.

3.5 Data Analysis

The data analysis included the scoring technique, data analysis on instrument tryout, data analysis on pre-test and post-test results, and data analysis on the results of the interview.
3.5.1 Scoring on instruments try out, pre-test and post-test

According to Arikunto (2003) there are two types of formulas that can be used in the process of scoring and data. They are punishment and formula with no punishment. This study used the formula with no punishment.

\[ S = R \]

Where:
- \( S \) = Score
- \( R \) = Right Answer

(Arikunto, 2003)

3.5.2 Data Analysis on Instrument Try Out

The aim of analyzing the instrument of try out was to investigate its validity, reliability, difficulty level, and discrimination level. It was uses since good instrument test was required to measure the proficiency level of English language learners.

3.5.2.1 Validity

To find out the validity of instrument items, this study conducted Pearson’ Product Moment Correlation. The calculation process used SPSS v.17.0. Correlation technique is one of the techniques that are mostly used by researchers to find out the validity of instrument items (Masrun, 1979 cited in Sugiyono 2010:
Therefore, the process of calculation follows SPSS 17.00 for windows. The criteria of validity were shown in the table 3.6.2.1:

Table 3.2

<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, 2002)

Table 3.3

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Validity Score</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40</td>
<td>Correlation coefficient &gt; 0.3</td>
<td>Valid</td>
</tr>
<tr>
<td>18</td>
<td>Correlation coefficient &lt; 0.3</td>
<td>Not Valid</td>
</tr>
</tbody>
</table>
Based on the table above, 39 items were valid and 1 item was stated not valid. The valid items could be used as research instrument. So, the total items that could be used as the instrument in this study were 39 items.

3.5.2.2 Reliability

According to Arikunto (2003: 86) a good instrument is instruments which consistently can give data that matched with the reality. Therefore, a reliability test was required to find out whether the instrument test of this study could provide consistent result of the data or not.

To find out the reliability of the instrument test, this study uses two kinds of method. This study has two kinds of questions type. It was objective and subjective questions (essay). To test the reliability of subjective questions (essay) could not use the same way as objective questions in reliability test (Arikunto, 2003: 109). Therefore, Spearman-Brown formula was used to test the reliability of objective questions, number 1 to 20 and Cronbach’s Alpha was used for subjective questions from number 21 to 40. In calculating the data, SPSS v.17.0 was used in this study. Furthermore, in interpreting the result, the criteria of correlation coefficient interpretation by Sugiyono (2010) was used in this study.

The result of reliability test for objective questions by conducting Spearman-Brown formula in SPSS v.17.0 showed that the instrument has moderate level of reliability. The score was at 0.532. While, the result of reliability test for subjective questions by using Cronbach’s Alpha in SPSS v.17.0
showed that the instrument had very high level of reliability. The score was at 0.967.

3.5.2.3 Difficulty Index

In order to give an appropriate and acceptable test for students, analyzing the level of difficulty test items was required to be done in this study. The computation of difficulty index test on instrument try out employed Anates v.4. In interpreting the result, the criteria of difficulty index interpretation by Arikunto (2009) was used in this study. In addition, the following formula is used to calculate the index of difficulty of an item.

\[ FV = \frac{R}{N} \]

- \( FV \) = Facility/ Index of difficulty
- \( R \) = The number of correct answers
- \( N \) = The number of students taking the test

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

3.5.2.4 Discrimination Index
The discrimination index was used to measure the extent of which items that differentiate the students who gained higher scores and those who gained lower scores. To find out the discrimination index of the instrument in this study, Anates v.4 was used to calculate it. Furthermore, in interpreting the result, the criteria of discrimination index interpretation by Arikunto (2009) was used in this study. Heaton (1995: p. 179) states that the discrimination index of an item indicates the extent to which the item distinguishes between the tests, separating the more able tests from the less able. The following formula is used to calculate the discrimination index of an item:

\[ D = \frac{\text{Correct}_U - \text{Correct}_L}{n} \]

Where:

- \( D \) = Discrimination Index
- \( U \) = Upper half
- \( L \) = Lower half
- \( n \) = Number of students in one group; \( n = \frac{1}{2} N \)

(Heaton, 1995: p. 179)

<table>
<thead>
<tr>
<th>Discrimination Index</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.00 – 0.20</td>
<td>Poor</td>
</tr>
<tr>
<td>0.20 – 0.40</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.40 – 0.70</td>
<td>Good</td>
</tr>
<tr>
<td>0.70 – 1.00</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Table 3.5
Criteria of discrimination index

Table 3.6
The Result of Discrimination Index Test

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Raw Score</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>0.00 &lt; D ≤ 0.20</td>
<td>Poor</td>
</tr>
<tr>
<td>5,7,12,13,14,15,16.</td>
<td>0.20 &lt; D ≤ 0.40</td>
<td>Moderate</td>
</tr>
<tr>
<td>1,3,4,9,19,20</td>
<td>0.40 &lt; D ≤ 0.70</td>
<td>Good</td>
</tr>
<tr>
<td>2,6,8,10,11,17,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40.</td>
<td>0.70 &lt; D ≤ 1.00</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Based on the table above, there was no item that was marked “poor”. While, 7 items were marked “moderate” in discrimination index test, 6 items were stated “good” in discrimination index test, and 26 items were stated “excellent” in discrimination index test. In sum, the most items on the instrument of this study were stated “excellent” in discrimination index based on the criteria of Arikunto (2009).

3.5.3 Data Analysis on Pre-test and Post-test

In order to find out whether there was significant different between the experimental and control group, the data of pre-test – post-test from both groups have to be analyzed. The analyzing processes in this study intended to use t-test formula. However, before performing the t-test formula, the data were ensured to meet the conditions required. The requirements of using t-test are as follow: the data are interval-ratio scale, the underlying distributions are bell-shaped (normally distributed), the observations are independent, and the variance of the two groups must be homogenous (Jackson, 2009: 234). In addition, the conditions required of
using dependent t-test were actually similar to the independent t-test, except the requirement that the observations are independent. The assumption for dependent t-test was the observations were not independent, but the observations were correlated or dependent (Jackson, 2009: 239).

3.5.3.1 Normality Distribution Test

In the aim to find out if the data were normally distributed, Kolmogrov - Smirnov’s formula in SPSS v.17.0 was used. In addition, the hypotheses to test are as follow:

Hypothesis in experimental group:
Ho = The scores of experimental group are normally distributed.
H1 = The scores of experimental group are not normally distributed.

Hypothesis in control group:
Ho = The scores of control group are normally distributed.
H1 = The scores of control group are not normally distributed.

The interpretation of the result was based on the level of significant 0.05. If the result is higher than 0.05, then H0 is not rejected or in the other word that the data are normally distributed. Whereas, if the result is lower than 0.05, H0 is rejected (Priyatno, 2010: 71).

3.5.3.2 Variance Homogeneity Test
The next step to meet the requirement of using t-test formula was to find out whether the data were homogenous or not. Levene’s test in SPSS v.17.0 was used to find it out. In addition, the hypothesis to test is as follow:

Ho = The scores of both experimental and control group are homogenous.

H<sub>1</sub> = The scores of both experimental and control group are not homogenous.

The interpretation of the result to find out whether the data were homogenous or not were based on the level of significant 0.05. If the result is higher than significant level 0.05, then H<sub>0</sub> is not rejected. Meanwhile, if the result is lower than 0.05, then H<sub>0</sub> is rejected or in the other word that the data are not homogenous (Priyatno, 2010: 76).

3.5.3.3 t-test Computation

This study uses some statistical process of t-test to analyze the data, such as: independent t-test for pre-test, independent t-test for post-test, dependent t-test for experimental group, and dependent t-test for control group. This t-test is a parametric inferential statistical test of the null hypothesis (Jackson, 2009: 184). In addition, null hypothesis or H<sub>0</sub> is the hypothesis that predicting no difference exists between the groups being compared (Jackson, 2009: 166).

3.5.3.3.1 Independent t-test Computation on Pre-test

Independent t-test uses to calculate the data from pre-test of both experimental and control group. In detail, the independent t-test was used to compare means of pre-test scores of both experimental and control group.
Independent t-test is a parametric statistical test that compares the means of two different samples of participants (Jackson, 2009: 227). It was aimed to find out whether there was significant different or not between both groups’ initial ability before the groups were given the treatments.

In this study, the independent t-test was analyzed by using SPSS v.17.0. The significance level used in independent t-test was 0.05 (two-tailed test of significance). In addition, the hypothesis to test is as follow:

\[ H_0 = \text{There is no significant different between the means of pre-test scores of both experimental and control group.} \]

\[ H_a = \text{There is significant different between the means of pre-test scores of both experimental and control group.} \]

The testing criterions are as follow:

- Ho is not rejected if \(-t_{crit} \leq -t_{obt}\) or \(t_{crit} \geq t_{obt}\)
- Ho is rejected if \(-t_{obt} < -t_{crit}\) or \(t_{obt} > t_{crit}\)
- And
- Ho is not rejected if significant > 0.05
- Ho is rejected if significant < 0.05

(Priyatno, 2010: 36)

3.5.3.3.2 Independent t-test Computation on Post-test

The use of independent t-test in post-test was to compare means of post-test scores of both experimental and control group. It was aimed to find out
whether there was significant difference or not between both groups’ ability after the groups experienced the treatments in their learning process.

As in the pre-test analysis, SPSS v.17.0 was also used this computation to analyze the independent t-test. The significance level used was at 0,05 (two-tailed test of significance). The hypothesis to test is as follow:

\[ H_0 = \text{There is no significant different between the means of post-test scores of both experimental and control group.} \]
\[ H_a = \text{There is significant different between the means of post-test scores of both experimental and control group.} \]

The testing criterions are as follow:

Ho is not rejected if \(-t_{\text{crit}} \leq -t_{\text{obt}}\) or \(t_{\text{crit}} \geq t_{\text{obt}}\)

Ho is rejected if \(-t_{\text{obt}} < -t_{\text{crit}}\) or \(t_{\text{obt}} > t_{\text{crit}}\)

And

Ho is not rejected if significant > 0,05

Ho is rejected if significant < 0,05

(Priyatno, 2010: 36)

3.5.3.3.3 Dependent t-test

The dependent t-test was used to find out whether there was significance different or not between pre-test and post-test. Dependent t-test is a parametric statistical test that compares the means of two related (within or matched-participants) samples (Jackson, 2009: 234).
3.5.3.3.3.1 Dependent t-test on the Experimental Group Score

The dependent t-test on the experimental group was used to find out whether there was significance different or not between pre-test and post-test after the group had experienced the treatment of the use of comic strip in this study.

The dependent t-test computation used SPSS v.17.0 in calculated the data. The significance level used was at 0.05 (two-tailed test of significance). In addition, the hypothesis to test is as follow:

Ho = There is no significant different between pre-test and post-test after treatment.
Hₐ = There is significant different between pre-test and post-test after treatment.

The testing criterions are as follow:

Ho is not rejected if \(-t_{crit} ≤ -t_{obt}\) or \(t_{crit} ≥ t_{obt}\)
Ho is rejected if \(-t_{obt} < -t_{crit}\) or \(t_{obt} > t_{crit}\) and,
Ho is not rejected if significant > 0.05
Ho is rejected if significant < 0.05

(Priyatno, 2010: 41)

3.5.3.3.3.2 Dependent t-test on the Control Group Score

The dependent t-test on the control group was used to find out whether there was significance difference or not between pre-test and post-test after the group had experienced the treatment of the use of text alone in this study.

As in the experimental group, the dependent t-test computation on control group was used SPSS v.17.0 too in calculated the data. The significance level
used was at 0,05 (two-tailed test of significance). Moreover, the hypothesis to test is as follow:

$H_0$ = There is no significant different between pre-test and post-test after treatment.

$H_a$ = There is significant different between pre-test and post-test after treatment.

The testing criterions are as follow:

Ho is not rejected if $-t_{crit} \leq t_{obt}$ or $t_{crit} \geq t_{obt}$

Ho is rejected if $-t_{obt} < -t_{crit}$ or $t_{obt} > t_{crit}$ And

Ho is not rejected if significant > 0,05

Ho is rejected if significant < 0,05

(Priyatno, 2010: 41)

3.5.3.4 Calculation of the Effect Size

In order to measure how well the treatment worked in this study, calculation of the effect size was employed. In order to determine the effect size in the independent t-test, a correlation coefficient of effect size can be derived as presented below:

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

Where:

$r$ = effect size

$t$ = $t_{obt}$ or t value from the calculation of independent t-test

$df$ = N1+N2-2
After obtaining the value of $r$, the score was matched with the following scale to interpret the effect size. According to Coolidge (2000) the effect size has positive correlation to its value, the larger effect size value, the larger impact of treatment.

<table>
<thead>
<tr>
<th>Effect size</th>
<th>$r$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>0.100</td>
</tr>
<tr>
<td>Medium</td>
<td>0.243</td>
</tr>
<tr>
<td>Large</td>
<td>0.371</td>
</tr>
</tbody>
</table>

(Coolidge, 2000; p. 151)

3.5.3.4.1 Calculation of the Effect Size on the Dependent t-test

Jackson (2009: 238) states that the computation of effect size should be conducted for the dependent t-test. Cohen’s $d$ formula was used to calculate the effect size on dependent t-test. The Cohen’s $d$ formula for dependent t-test is as follow:

$$d = \frac{\bar{D}}{S_D}$$
Where:  

\[ \bar{D} = \text{The mean of the difference scores} \]

\[ S_{D} = \text{The standard deviation of the difference scores} \]

(Jackson, 2009: 238)

In interpreting the result, the criteria of effect size by Cohen (1992) was adopted. The criteria are as follow: a small effect size is one of at least 0.20, a medium effect size is at least 0.50, and a large effect size is at least 0.80 (Cohen, 1992 cited in Jackson, 2009: 238).

### 3.5.4 Data Analysis on Questionnaire

In analyzing the students’ responses about the vocabulary learning and the use of audio visual aids in their English learning process, the questionnaire was analyzed by using this below percentage formula:

\[ P = \frac{f_o}{n} \times 100\% \]

Where:  

- \( P \) = Percentage
- \( f_o \) = Frequency observed
- \( n \) = Number of sample

(Riduwan, 2009)

In interpreting the result of percentage computation above, the classification percentage by Rahmawati (2011) was used to classify it.

### 3.5.5 Data Analysis on Interview
In analyzing the data of interview, the interview data were transcribe to obtain the information about the way of using comic strips in improving students’ reading comprehension of narrative texts. This was aimed to find out the advantages and disadvantages of using comic strips which had been used in learning reading comprehension of narrative texts.