

CHAPTER III

METHODOLOGY

This chapter describes the procedures of the study in order to find out the research questions which are (1) Is STAD technique effective in improving junior high school students' reading comprehension? (2) What are the students' responses toward STAD in teaching reading comprehension? This chapter consists of research design, variables, research hypothesis, research site and participant, research instrument, research procedures, data collection, and data analysis.

3.1 Research Design

This research was conducted based on quasi-experimental research. According to Creswell (2005, cited in Chavez, 2008) quasi-experimental research is designed to describe a relationship between variables or to predict an outcome. This research investigates the improvement of students' reading comprehension using STAD technique. There were two classes taken as the subjects groups in this research. The first group was an experimental group, which was given the treatment of the research, while the second group was a control group, which was taught using the conventional teaching method in which the teacher lectured the students in three phases (pre-, while-, post-). Thus, the research used an experimental design with the pre-test and post-test control group design.

Schematically, this quasi experimental research was described as follows.

Table 3.1
Quasi Experimental Design

Groups	Pretest	Treatment	Posttest
Experimental	O ₁	X	O ₂
Control	O ₃	-	O ₄

(Cohen et al, 2007, p. 283)

Notes

X : the exposure of a group to an experimental variable

O : the process of observation measurement

From the table above, both classes were given the same test; pre-test and post-test but they got different treatments. After the pre-test, the experimental group was given STAD technique as the treatment for four times, while the control group was given conventional teaching method. After the treatment, post-test was given to both groups. The aim of this research is to find out whether the students who were taught by using STAD technique could get higher score than those who were taught using the conventional technique or not.

Variable is defined as an attribute of a person or an object which differs from person to person, text to text, object to object, or time to time (Hatch and Lazaraton, 1991, p. 63). There are two variables which were investigated in this research; they are independent variable and dependent variable. Independent variable is the variable which influences dependent variable, while dependent variable is the variable that will be affected by independent variable (Coolidge, 2000, p. 15).

For this research, the implementation of STAD was chosen as the independent variable because this technique is the major variable to be investigated. Teaching reading comprehension was chosen as the dependent variable.

3.1.1 Research Hypothesis

Hypothesis is one of the important aspects in this research because it can predict or temporarily answer the research problems. Hypothesis can be described as a statement about the possible outcome of the research (Hatch & Lazaraton, 1991, p. 24). For this research, there are two hypothesis taken which are null hypothesis and alternative hypothesis.

Null hypothesis of this study is when there is no significant difference between the post-test means of control after applying the treatments. Whereas, the alternative hypothesis is when there is significant difference between the post-test means of control and experimental group after applying the treatments. The hypothesis in this study is formulated as follows.

$$H_0 : \mu \text{ control} = \mu \text{ experimental}$$

$$H_a : \mu \text{ control} \neq \mu \text{ experimental}$$

3.2 Data Collection

3.2.1 Population and Sample

The population of this research was the second grade students in one of the junior high school in Bandung. The population taken was due to these considerations: 1) the students had learned basic English; 2) due to the limitation of time, costs, and energy of the researcher, so the research population was only second graders in the related school in Bandung where the researcher had an experience in doing internship in the school before; 3) because the researcher had an experience in teaching in the school before, the characteristics of population has been identified, for example the similarity of students' English ability. The last consideration was in line with Sugiyono (2010) which states that population is a group of object/subject which has similar quality and characteristics to be learnt and drawn a conclusion then by the researcher.

The sample of this research were two diverse classes; they were VIII-A as the experimental group and class VIII-C as the control group. Each class consisted of 35 students. However to anticipate the absence of the sample of the research, this research only took 25 students from each class as the sample. As a result, the total fixed numbers of the sample was 50 students. Both groups had similar characteristic, such as ability in reading comprehension. During the execution of the research, students of VIII-A as the experimental group was taught by STAD technique as the treatment for four meetings.

3.2.2 Research Instruments

In this study, two kinds of research instruments were employed. They were test (pre-test and post-test) and questionnaire. The research instruments are explained below.

3.2.2.1 Reading Comprehension Test

Reading comprehension test was used as the instrument of this research to measure students' reading ability. This reading test comprises 20 multiple choice items which were tested to the experimental and control classes. The reading comprehension test was used as pre-test and post-test and given to the both groups. Pre-test was aimed to discover the students' previous ability in reading and post-test was done to assess students' reading ability after having the treatment.

However, before applying the instrument to control and experimental group, the value of its validity and reliability was sought through pilot test. There were 50 items of multiple choice items tested to another class in order to gain 20 questions items which were valid and reliable. The items covered 5W and 1H (what, who, when, where, why, and how) questions to identify supporting detail, main idea, and implicit information of the text. There were some points to be considered in formulating the items of the test: the relevance of the items to the purpose of the

research, appropriateness of the reading passages, and the relevance of the items to the curriculum. Reading comprehension test used was provided in the appendix B.

3.2.2.2 Questionnaire

To investigate the students' response toward the implementation of STAD technique, the questionnaire was held. It was given to the group who got the treatment. This instrument was given after the post-test. The rationale of using questionnaire is because questionnaire is suitable for obtaining more data without spending too much time

The type of questionnaire used in this study was closed-ended questionnaire. Questions and responses for this type of items used Guttman scale categories. The questionnaire was set in a form of checklist. The questions were arranged from the general to the specific. It consisted of 10 of "yes" or "no" questions in bahasa Indonesia to avoid misunderstanding from the participants. It was in line with Sugiyono (2010) who states that the use of language in the questionnaire should be easy and adjusted to the social and culture of respondent. As the scoring system of Guttman scale categories, the answer "yes" was counted 1 and the answer "no" was counted 0. The questionnaire used in this study can be seen in the appendix B.

3.3 Research Procedure

The research was conducted from March 10th to April 10th of 2014. The steps of the research procedures were as follow:

1. Preparing the Lesson Plan

The lesson plan was designed for 4 meetings. The first and the last meeting were conducted the pre-test and the post-test while the 4 meetings were held to apply the treatment for groups. The lesson plan was designed based on the National Curriculum of English for eight grade students, which consists of competence standard, basic competence, indicator, instructional objective, and lesson materials. In

addition, method/technique, steps of the activity, source lesson, and the evaluation were also involved.

2. Organizing the Research Instruments

Organizing the research instrument includes creating the test item for both pre-test and post-test, piloting the pre-test and post-test and constructing questions for questionnaire.

3. Administering Pilot Test

Pilot-test was done for testing the test whether the test was valid and reliable to be tested for eight grade students or not. Pilot test consisted of fifty multiple choice questions related to texts with one genre that was recount text. The test materials were adapted from several textbooks used by the second grade of junior high school students and also articles from the internet and national examination.

4. Administering Pretest

After conducting the pilot test and finding the validity and reliability of the result of the instrument, the pretest was held at the first meeting of the research. The pretest aimed to get the data about the previous reading ability of the students and to find out that the students from both group had same capability and same English proficiency before given the instrument.

5. Conducting Treatment

Two second grade classes in one of junior high schools in Bandung, which were VIII-A as the experimental group and VIII-C as the control group, were selected to the experiment. The treatment conducted in experimental group was STAD technique. On the other hand, control group was to give conventional technique. The time schedule can be seen in table 3.2.

Table 3.2
Time Schedule of the Research

No	Experimental Group		Control Group	
	Date	Material	Date	Material
1	March 10 th 2014	Pretest	March 10 th 2014	Pretest
2	March 13 th 2014	Personal Experience	March 11 th 2014	Personal Experience
3	March 17 th 3014	My Holiday Experience	March 17 th 2014	My Holiday Experience
4	March 18 th 2014	Health Experience	March 20 th 2014	Health Experience
5	March 25 th 2014	Share your Experience	March 27 th 2014	Share your experience
6	April 10 th 2014	Posttest & Questionnaire	April 8 th 2014	Posttest

The study used several reading activities which were spread into four meetings of classroom activities. Classroom activities in the experimental group were emphasized on group discussion which is ended by individual quiz. The group consisted of four to five students with different achievement level which was based on the students' pre-test score. On the other hand, the control group applied individual learning in the whole meeting. The classroom activities of experimental group and control group are illustrated briefly in table 3.3. Then, further information about the activities can be seen in the lesson plan presented in appendix A.

Table 3.3**Experimental Group and Control Group Classroom Activities**

Meeting	Reading Activities	Classroom Activities	
		Experimental	Control
1	Brainstorming Skimming Reading aloud Scanning Summarizing, & giving feedback	- Teacher divides students into group of four/five - Brainstorming about personal experience - Teacher reads the text followed by students - In group, students give a title of the text, and answer comprehension questions on the worksheet - Teacher observes the process and gives intervention if needed - Students take individual quiz - Teacher counts students' improvement score and gives reward - Summarizing the material and providing feedback	- Brainstorming about personal experience - Teacher reads the text followed by students - Students make a list of vocabulary - Students give a title of the text - Students answer comprehension questions on the worksheet individually - Teacher and students discuss the students' answer - Summarizing the material and providing feedback
2	Brainstorming Skimming Summarizing, & giving feedback	- Teacher divides students into group of four/five - Brainstorming about holiday activities - Teacher explains how to find mind idea briefly - In group, students arrange the paragraph, and find main idea of each paragraph on the worksheet - Teacher observes the process and gives intervention if needed - Students take individual quiz - Teacher counts students' improvement score and gives reward - Summarizing the material and providing feedback	- Brainstorming about holiday activities - Students arrange the paragraph - Students make a list of vocabulary - Teacher explains how to find mind idea - Students find main idea of each paragraph on the worksheet individually - Teacher and students discuss the students' answer - Summarizing the material and providing feedback
3	-Previewing & Predicting -Reading aloud -Scanning Summarizing, & giving feedback	- Teacher divides students into group of four/five - Predicting & Previewing the text based on some pictures - Teacher reads the text followed by students - In group, students discuss the material and answer comprehension questions on the worksheet - Teacher observes the process and gives intervention if needed - Students take individual quiz - Teacher counts students' improvement score and gives reward - Summarizing the material and providing feedback	- Predicting & Previewing the text based on some pictures - Teacher reads the text followed by students - Students make a list vocabulary - Students answer comprehension questions on the worksheet individually - Teacher and students discuss the students' answer - Summarizing the material and providing feedback
4	Brainstorming Scanning Summarizing, & giving feedback	- Teacher divides students into group of four/five - Brainstorming about experience in writing a letter - Teacher explains about verb 2 and pronoun referent briefly	- Brainstorming about experience in writing a letter - Teacher explains verb 2 and pronoun referent - Students complete the text and answer comprehension questions on

		- In group, students discuss the material, complete the text and answer comprehension questions on the worksheet - Teacher observes the process and gives intervention if needed - Students take individual quiz - Teacher counts students' improvement score and gives reward - Teacher summarizes the material and provides feedback	the worksheet individually - Teacher and students discuss the students' answer - Summarizing the material and providing feedback
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6. Administering Post-test

The last meeting of the research was post-test which was held to both experimental group and control group. The test was same with the pre-test. It was conducted to measure the students' reading comprehension ability after receiving the treatment. It also aimed to find out the difference of the students score of both groups.

7. Administering Questionnaire

The questionnaire was distributed to 35 students but the researcher only took 25 as many as the samples in experimental group. The questionnaire was given to investigate the students' perception towards the implementation of STAD in teaching reading comprehension. The questions of the questionnaire were presented in the appendix B.

3.4 Data Analysis

The data of the research was analyzed through several steps including scoring technique, data analysis on the pilot test, data analysis on pre-test and post-test, and data analysis on the questionnaire.

3.4.1 Scoring Technique

Since the pre-test and the post-test were in the form of 20 numbers multiple choices, the researcher determined test scores according to the correct numbers answered and divided by 0.2. Therefore, the maximum score that students could obtain was 100.

3.4.2 Data Analysis on the Pilot Test

Before applying the instrument to experimental and control group, the value of its validity and reliability was sought. Therefore, the pilot test was conducted. There are 50 items of multiple choice were tested to 30 students in similar level which were beyond the sample of the study.

Moreover, difficulty and discrimination test of the instrument were also analyzed to discriminate between the higher ability test takers and the lower ability test takers. The test was done to see whether the test items were relevant with the population or not.

3.4.2.1 Data Analysis on the Validity Test

Validity refers to the appropriateness of a given test to measure of what it is supposed to measure (Henning, 1987; cited in Alderson et al, 1995, p. 170). Therefore, validity test was measured to support any inferences that the writer made based on the data gained using particular instrument.

In order to make the validity of the test, the researcher used the assistance of Anates V4. The index validity of each item was interpreted with the following criteria:

Table 3.4

r Coefficient Correlation (Validity)

Raw Score	Interpretation
0.000 – 0.200	Very Low
0.200 – 0.400	Low
0.400 – 0.600	Moderate
0.600 – 0.800	High
0.800 – 1.00	Very High

(Arikunto, 2010, p. 319)

3.4.2.2 Data Analysis on the Reliability Test

The reliability test is defined as the extent to which a result can be considered stable when administered under similar condition (Brown, 1996, p. 192). To test the reliability, the Cronbach's alpha in SPSS 16 for Windows was used.

The finding was interpreted according to the following criteria:

Table 3.5

The Criteria of Reliability

Coefficient Reliability	Interpretation
0.00 – 0.19	Very Poor
0.20 – 0.39	Poor
0.40 – 0.59	Moderate
0.60 – 0.79	Good
0.80 – 1.00	Excellent

(Sugiyono, 2010, p. 184)

If the value of Cronbach's alpha of the test reaches the range 0,40 to 1,00, the test is considered to be reliable to be used. In contrast, if the value is less than 0.40, the test is considered inappropriate to be used in the study.

3.4.2.3 Difficulty

Difficulty level was defined as the proportion of the test takers who answer the correct item (Fulcher and Davidson, 2007, p. 102). This test was used to measure whether the item is relevant to the students' ability or not. In this study, the difficulty level was measured by using ANATES V4.

Furthermore, the difficulty level should not be too easy or too difficult either. The items with facility value around 0.500 were considered to be ideal, with an acceptable range being from around 0.250 to 0.750 (Fulcher and Davidson, 2007, p. 102)

3.4.2.4 Discrimination Index

It is important to know how each item discriminates and distinguishes students at different level of ability. Getting correct answer is directly related to more ability in question and getting wrong answer is directly related to less ability in question (Henning, 1987, p. 50, cited in Fulcher and Davidson, 2007, p. 102).

In this study, ANATES V4 was used in calculating the discrimination item. The result was interpreted according to the following criteria:

Table 3.6

Criteria of Discrimination Index

Discrimination Index	Interpretation
0.00 – 0.19	Very poor
0.20 – 0.39	Poor
0.40 – 0.59	Moderate
0.60 – 0.79	Good
0.80 – 1.00	Excellent

(Adapted from Arikunto, 2010, p. 319)

3.4.3 Data Analysis on the Pre-test and Post-test

3.4.3.1 Normality of Distribution Test

According to Kranzler & Moursund (1999) normality distribution is one formula used to analyze whether the data is in normal distribution or not. The data in this study are students' pre-test and post-test scores. Normal distribution test was conducted in this study to see whether the data were distributed between the highest score and the lowest score. The distribution of the data in this study was examined by using the Kolmogorov-Smirnov test that was employed through SPSS 16 for Windows. It was conducted in three steps. The first step was stating the hypothesis and setting the alpha level at 0.05 and it was two tailed test. The hypothesis was stated as the following

- H_0 = the scores of the experimental and the control group are normally distributed

- H_A = the scores of the experimental and the control are not normally distributed

The second was analyzing the data by using Kolmogorov-Smirnov formula in SPSS 16. The last step was Comparing the Asymp Sig with The Level of significance to the test hypothesis. If it is lower than the set alpha level ($p < 0.05$), the null hypothesis will not be retained, which means that distribution of the sample is probably not normal. In contrast, if the output is greater than the set alpha level ($p > 0.05$), the null hypothesis is accepted, which means the scores are normally distributed.

3.4.3.2 The Homogeneity of Variance Test

The test was conducted after doing the normality of distribution test. In this study, the test was aimed at determining whether or not the variance of the experimental and the control groups was homogeneous. It was important to be done because the scores in this study were taken from separate groups in one population. In analyzing the variance homogeneity of the scores, this study used The Levene Test Formula in SPSS 16 for Windows. This test was conducted in three steps. The first step was stating the hypothesis and setting alpha level at 0.05. The hypothesis is stated as the following:

- H_0 = the variances of the experimental and the control group are homogeneous
- H_A = the variances of the experimental and the control group are not homogeneous

The second was analyzing the variance using Levene Test formula in SPSS. After analyzing the data, the output was interpreted. Again, if the probability is greater than the level of significance ($p > 0.05$), the null hypothesis is accepted, which means variance of the experimental and control group are homogeneous.

3.4.3.3 The Independent t-test

After the data about students' reading comprehension ability had been proven as a normal distribution, the data were calculated using independent t-test. The independent t-test in this study is used to measure the effectiveness of STAD. In this study, independent t-test was analyzed using SPSS 16 by comparing the level of significance to test the hypothesis as follows.

H_0 = there are no significant differences between the pre-test/post-test mean of the experimental and the control groups.

H_a = there are significant differences between the pre-test/post-test mean of the experimental and the control groups.

If the result shows the significant value is more than or equal with the level of significance (0.05), the null hypothesis is accepted and it will be concluded that there is no significance difference between the two means. On the other hand, the null hypothesis will be rejected if the significant value is less than the level of significance (0.05). It means that the means is significantly different from the other mean.

3.4.3.4 Dependent t-test

The dependent t-test, in this case, was employed to find out the progress of the students' reading comprehension ability of the experimental group after getting STAD technique as the treatment. Dependent t-test in this study was analyzed using SPSS 16. To examine the dependent t-test, there are some steps to follow: stating alpha level ($p = .05$); stating null hypothesis; employing the dependent t-test; interpreting the result. The null hypothesis is that there is no difference between the pre-test and the post-test score which means no progress or improvement.

As the result obtained, it was compared to $t_{critical}$. If $t_{obtained}$ is equal to or greater than $t_{critical}$, the null hypothesis can be rejected, and if $t_{obtained} < t_{critical}$, the null hypothesis is accepted.

3.4.3.5 The calculation of effect size

The calculation correlation of the effect size was calculated to measure how well the treatment test worked and to know the influence of independent variable upon the dependent variable (Coolidge, 2000, p. 151). In this study, the effect size is used to measure how well STAD technique can improve the students' reading comprehension. The formula of effect size can be derived as follows:

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

Note:

r = effect size

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

df = $N_1 + N_2 - 2$

Value of effect size was interpreted by the following scale:

Table 3.7

The Scale of Effect Size

Effect Size	Value
Small	.100
Medium	.243
Large	.371

(Coolidge, 2000, p. 151)

3.4.4 Questionnaire

Questionnaire in this study was employed in order to find out the information and to elaborate the data concerning the research question about students' responses toward the use of STAD in improving reading comprehension. The questionnaires were distributed to the experimental group.

. Afterwards, the data from questionnaire were analyzed based on the frequency of students' answer. The data gained from questionnaires were calculated using the percentage scale formula. The formula is as follows:

$$P = \frac{Fo}{n} \times 100$$

P = Percentage

Fo = Frequency of Observed

N = Number of samples