

CHAPTER III

METHODOLOGY

This chapter describes the procedures of the study in order to find out the answers of the two questions previously stated in chapter one. The chapter covers: statements of the problem, research methods, the instrument, population and sample, and data analysis.

3.1 Statements of the Problem

The study is conducted to answer the following questions:

1. Is the implementation of Student Teams-Achievement Divisions (STAD) effective in teaching reading comprehension using descriptive text?
2. What are students' opinions toward the implementation of Student Teams-Achievement Divisions (STAD) in teaching reading comprehension using descriptive text?

3.2 Research Methods

This research was conducted based on quasi-experimental research. Hatch and Farhady (1982) state that quasi experimental method is practical compromises between true experimentation and the nature of human language behavior which we wish to investigate. This research took two classes; the first class is served as control class and the second class is served as experimental class.

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3.2.1 Research Design

In this research, particular treatment was given to the experimental group in teaching reading descriptive text. The aim of this study is to find out whether or not the implementation of STAD technique is effective in teaching reading descriptive text. Thus, the study used experimental design with the pre-test and post-test control group design. Time constraint is the main reason why the researcher used this design.

Schematically, this quasi experimental study was described as follows:

Table 3.1
Quasi Experimental Design

Groups	Pretest	Treatment	Posttest
Experimental	T1E	X	T2E
Control	T1C	-	T2C

(Hatch, E and Farhady H, 1982:21)

Notes

T1E = Pre-test for experimental group

T2E = Post-test for experimental group

X = Treatments (implementing STAD)

T1C = Pre-test for control group

T2C = Post-test for control group

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From the table above, it can be seen that both of the classes were given pre-test in the beginning of the study. Afterwards, the experimental group was given the treatment for five times. After the treatment, post-test was given to both groups. This is to find out whether the students who were treated by using STAD technique could achieve higher scores than those who were taught using the conventional technique.

3.2.2 Variables

Hatch and Farhady (1982) define variable as a certain attribute of a person or an object that differs each other. It has two diverse sorts of variable; they are independent variable and dependent variable. In addition, Vockell (1983) describes independent variable as the treatment employed which is intended to produce particular outcome and dependent variable as the outcome that is looked ahead to appear after getting the treatment.

This study had two variables as well; the implementation of Student Teams-Achievement Division (STAD) as the independent variable and teaching reading descriptive text as the dependent variable. The intervening variable is any factor whose effects has not been measured but theoretically may or may not be part of that process.

3.3 Hypothesis

Hypothesis is a tentative statement about the outcome of the study (Hatch and Farhady, 1982). This study begins with Null Hypothesis (H_0) where both classes

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conducted; experimental and control classes are similar. The hypothesis in this study is formulated in the null hypothesis (H_0) as follows:

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

H_0 = there is no difference between experimental class and control class in the mean adjustment level (Gerald Kranzler and Janet Moursund; 1999). By using null hypothesis of this study is there is no difference in mean adjustment level of test score between students who are taught about teaching reading by implementing STAD with those who are not. If the hypothesis is rejected, it can be concluded that experiment works. While, if the hypothesis is accepted, the experiment does not work.

3.4 Subjects

3.4.1 Population

According to Hatch and Farhady (1982) population is any group of individuals that have one or more characteristics in common that attract the researcher. The population of this study was the first grade students in one of junior high schools in Bandung.

3.4.2 Sample

Vockell (1983) states that sample is a smaller group to be analyzed which is drawn from the population. The samples of this study were two diverse classes; they were class VII-C as the experimental group and class VII-A as the control group. Each class consists of 35 students. However, to anticipate the absence of the sample

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of the study, the study only took 30 students from each class as the sample. As a result, the total fixed numbers of the sample was 60 students. During the experiment, the experimental group was given several treatments in period of five meetings.

3.5 Research Instruments

Reading comprehension test which has aim to measure students' reading ability was used as the instrument of this research. This reading test comprises 15 multiple choice items which were tested to the experimental and control classes. The reading comprehension test was used in pre-test and post-test and given to the experimental and the control group. The aim of pre-test was to discover the student's previous ability in reading and then post-test was conducted to assess students' reading ability after having treatment.

However, before applying the instrument to control and experimental group, the value of its validity and reliability was sought. So that 30 items of multiple choice items were tested to another class in order to gain 15 question items which are valid and reliable. In formulating the items of the test, there were some points to be considered; first the relevance of the items to the purpose of the study, second appropriateness of the reading passages, third the relevance of the items to the curriculum.

Table 3.2
The Competences and Indicators

Aspect	Standard Competence	Basic competence	Indicator
Reading	11. understanding the meaning of functional written	11.2 responding the meaning and the rhetorical stages accurately, fluently,	Identifying the detail information in descriptive text

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	text and very simple short essay in descriptive and procedure forms related to the surrounding	and acceptably related to the surrounding in descriptive and procedure forms	Identifying the meaning of words or phrases in descriptive text
			Identifying the function of descriptive text

3.5.1 Teaching Material

The teaching material given to students was taken from several English textbooks; *English in Focus for Grade VII Junior High School*, and *Scaffolding English for Junior High School Students*. It is in line with the competence standard of VII grade junior high school in number 11 that students must be able to comprehend simple written short essay and functional text in descriptive and procedure forms closely to their environment. The material included some descriptive texts. In detail, those texts involved several terms; describing animal, describing people and describing place. The material was taught to both of the experiment and the control groups as well with different techniques.

3.6 Research Procedure

3.6.1 Organizing Teaching Procedure

Generally, the procedure used in the study could be explained as follows:

- Organizing the material of instructions that would be taught in both experimental and control groups;
- Organizing the instrument of the research, a multiple-choice test, and teaching procedure in which STAD technique applied;

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- Administering pilot test as the instrument of the research, a multiple-choice test;
- Analyzing the data from the pilot test to ensure its validity, reliability, and difficulty;
- Administering pre-test for both groups to obtain the equal abilities between those two;
- Giving the treatment of STAD technique to the experimental group;
- Administering post-test for both groups to obtain the result of the treatment;
- Distributing questionnaire and conducting interview to experimental group to know students' opinions toward the implementation of STAD technique in teaching reading comprehension;
- Analyzing the data collected from pre-test, post-test, questionnaire, and interview;
- Deriving the interpretation based on the result of the collected data analysis; and
- Drawing the conclusion of the result of the study and recommending some constructive suggestion for further research.

3.6.2 Administering Pilot Test

Before the instrument used in the study, the researcher tested pilot test to investigate the validity and reliability of the instrument. Pilot test consisted of thirty

multiple choice questions related to texts with one genre, that is descriptive text. The test materials were adapted from several textbooks used by the first grade of junior high school students and also articles from the internet. The pilot test was conducted in class VII F on January 30, 2012 before the experimental teaching began.

3.6.3 Treatment

Two second grade classes in one of junior high schools in Bandung, which were VII C as the experimental group and VII A as the control group, were selected to the experiment. The experimental group was exposed to STAD technique to read while the control group was taught by using conventional technique.

3.6.3.1 Implementation of Experiment

Arranging general schedule of experiment was intended to make well-establish experiment. The table below is the general schedule of the experiment.

Table 3.3
General Schedule of the Study

No	Experiment Group		Control Group	
	Date	Material/Theme	Date	Material/Theme
1	February 1, 2012	Pre-test	February 1, 2012	Pre-test
2	February 3, 2012	Describing Animal	February 6, 2012	Describing Animal
3	February 8, 2012	Describing Animal	February 8, 2012	Describing Animal
4	February 10, 2012	Describing People	February 13, 2012	Describing People
5	February 15, 2012	Describing Place	February 15, 2012	Describing Place
6	February	Describing Place	February 20,	Describing Place

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	17, 2012		2012	
7	February 22, 2012	Post-test	February 22, 2012	Post-test

3.6.3.2 Classroom Activities of Experimental Group

After the pre-test, the teaching and learning process was conducted to both groups. This was handled by the researcher herself. The procedure that was applied in the experimental group as follows:

The STAD was used to teach Class VII C the experimental group. The treatment had been conducted for four weeks in which the teacher presented some reading comprehension assignments. The topics were chosen based on the curriculum. Due to limited time, there were two meetings in a week. Every meeting took 45 minutes. Overall, the treatment was only conducted in five meetings.

There are four steps in STAD technique. The first is *Teacher Presentation*. In every meeting, the teacher presented and explained the material, assessed students' understanding by giving them some questions and preparing answers and explanations to students' problems, then distributing assignment for each group.

The second step is *Team Study*. After explaining the material, the teacher explained the rules of discussion and allowed the students to work with their teams cooperatively about the material that was previously taught by the teacher. Most often, this involved students discussing problems together, comparing answers, and correcting any misconception if teammates made mistakes. During the process, the

teacher observed groups, started discussion or checked students' comprehension by asking them random question.

The third step is *Individual Quiz*. After finishing the group discussion, teacher gave a task for each student. Students were not permitted to help one another during the quiz. This individual quiz was given soon after teacher presentation and team study.

The final step is *Team Recognition*. Each group got a team score. Any group which gained the highest team score was awarded a kind of reward. This was done on the following meeting.

3.6.3.3 Classroom Activities of Control Group

The procedure that was applied in the control group as follows:

First, *Teacher Presentation*. The teacher explained the topic and material to the students. The Teacher gave the handouts to the students and they were asked to answer several questions based on the texts provided.

The last, *Individual Work*. The student answered the questions based on the text and then asked to write the main idea of the text in a piece of paper.

3.6.4 Administering Pre-test and Post-test

Post-test was administered to both of the experimental and control groups with similar test. In this study, the test administered was in a multiple choice form. To conduct pre-test was important for getting data about students' capability before receiving the treatment. Meanwhile, post-test was administered to obtain data of

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students' reading skill after receiving the treatment. Those data were beneficial for knowing the implementation of Student Teams-Achievement Divisions (STAD) in teaching reading descriptive text.

3.7 Data Analysis

The data of this study were 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.

3.7.1 Scoring Technique

This study applied multiple choice tests as an instrument in pilot test, pre-test and post-test. According to Arikunto (2003), there are two types of formulas that can be used to process the multiple choice item; formula with punishment and formula with no punishment. This study used the formula with no punishment. The formula is stated in the following:

$$S = R$$

In which S is score and R is right.

On the other hand, for calculating students' quiz score, it can be seen in Appendix A.

3.7.2 Data Analysis on Pilot Test

The obtained data from the pilot test were analyzed to investigate the validity and reliability of the test items. Furthermore, the valid and reliable items were used as the research instrument. According to Hatch and Farhady (1982) to carry out data

gathering procedure, validity and reliability of the instrument are essential.

3.7.2.1 Instrument Validity and Reliability

Validity and reliability are qualities that are essential to the effectiveness of any data-gathering procedures, Hatch and Farhady (1982). Definition of validity and reliability based on Hatch and Farhady (1982) is as follows:

“Validity is that quality of data-gathering instruments or procedure that enables it to determine what it is designed to determine. Reliability is the quality of a consistency that the instrument or procedure demonstrates over a period of time”.

3.7.2.2 Instrument Validity

Before conducting pre-test and post-test, the test items should be tried out in terms of its validity and reliability (Hatch and Farhady, 1982). In order to make the validity of the test, the researcher used the assistance of SPSS Version 19 and also Anates.

The instrument validity was examined by item analysis; therefore the process of the calculation was named as validity index. The index validity of each item was interpreted, to determine whether the test was good or not. The researcher used Anates with correlation product moment formula. The formula used in testing the validity is:

$$r_{xy} = \frac{N \sum XY - (\sum X)(\sum Y)}{\sqrt{\{N \sum X^2 - (\sum X)^2\} \{N \sum Y^2 - (\sum Y)^2\}}}$$

(Arikunto, 2003)

Note:

r_{xy} : coefficient correlation between variable X and Y

X : item which its validity is assessed

Y : total score gained by the sample

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 – 1.000	Very High

(Arikunto, 2003)

3.7.2.3 Instrument Reliability

Reliability is the extent to which a test produces consistent result when administered under similar condition (Hatch and Farhady, 1982). The data were calculated by Anates. The result was interpreted with the following criteria in table 3.5.

Table 3.5
The Criteria of Reliability Test

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

(Sugiono, 2001: 149)

3.7.2.4 Difficulty

Another requirement that needs to be considered as excellent instrument is difficulty test. Arikunto (2003) argued that difficulty test aims at getting the level of difficulty for each item of the instrument. The formula employed to measure difficulty as follows:

$$P = \frac{B}{JB}$$

Note:

P = index of difficulty

B = the number of students who can answer the item correctly

JB = the number of students

The following criteria are used to interpret the index of difficulty:

Table 3.6
The Criteria of Difficulty

Facility Value	Interpretation
0.000 – 0.300	Difficult

0.300 – 0.700	Moderate
0.700 – 1.000	Easy

(Arikunto, 2003)

3.7.2.5 Discrimination Index

Arikunto (2003) states that discrimination index is used to indicate how far a single test item can distinguish the upper group from the lower group of the class. In addition, according to Heaton (1978), the discrimination index of an item indicates the extent to which the item distinguishes between the testees, separating the more able testees from the less able. The index of discrimination (D) tells us whether students who do well on the entire test tend to do well or badly on each item of the test.

To find out the discrimination index, some procedures were used are as follows: arranging the students' total scores and dividing the scores into two groups of equal size (the top half and the bottom half), counting the number of the students in the upper group who answer each item correctly, then counting the number of lower group students who answer the item correctly, subtracting the number of correct answer in the upper group to find the difference in the proportion passing in the upper group and the proportion passing the lower group, and dividing the difference by the total number of students in one group proposed by Heaton (1978). The formula discrimination index is:

$$D = \frac{\text{Correct U} - \text{Correct L}}{n}$$

Where:

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

Table 3.7
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

(Arikunto, 2003)

3.7.3 Data Analysis on the Pre-test

The aims of pre-test are both to investigate the students' equal ability and to investigate the equal equivalence between the groups. The researcher used *t*-test formula, Case II studies or independent sample test (Hatch and Farhady, 1982). Hatch and Farhady (1982: 114) state three assumptions underlying the *t*-test as follow:

1. The subject is allotted to one group in experiment
2. The variances' scores are equal and normally distributed
3. The scores on the independent variable are continuous

For that reason, the researcher did the normality distribution and variance homogeneity test before calculated the data using *t*-test formula.

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3.7.3.1 Normality of Distribution Test

In this study, the researcher used the SPSS 19.0 to analyze the normality distribution of the scores with the steps as follows:

1. Stating the hypothesis and setting the alpha level at 0.05 (two tailed test)

H_0 = The score of the experimental and the control group are normally distributed.

H_1 = The score of the experimental and the control group are not normally distributed.

2. Analyzing the normality distribution using Kolmogrov-Smirnov formula in SPSS 19.
3. Comparing the Asymp. Sig with The level of significance to test the hypothesis. If the Asymp. Sig > level of significance (0.05) the null hypothesis is accepted: the scores are normally distributed.

3.7.3.2 The Homogeneity of Variance Test

In analyzing the variance homogeneity of the scores, the researcher used the Levene Test formula in SPSS 19.0. The analyzing of variance homogeneity follows the steps below:

1. Stating the hypothesis and setting the alpha level at 0.05

H_0 = The variance of the experimental and control group are homogenous.

H_1 = The variance of the experimental and control group are not homogenous.

2. Analyzing the variance homogeneity using Levene Test formula in SPSS.

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3. Comparing the probability with the level significance for testing the hypothesis. If the probability $>$ the level of significance (0.05) the null hypothesis is accepted; variance of the experimental and control group are homogenous.

3.7.3.3 The Calculation of Independent *t*-test

The steps of the independent *t*-test calculation are as follows:

1. Stating the hypothesis and setting the alpha level at 0.05 (two tailed test)

H_0 = The two samples are from the same population; there is no significant difference between the two sample ($X_e = X_c$)

H_1 = The two samples are from the same population; there is a significant difference between the two sample ($X_e \neq X_c$)

2. Finding the *t* value
3. Comparing the probability with the level of significance for testing the hypothesis. If the probability is more than or equal to the level of significance, the null hypothesis is accepted; the two groups are equivalent (The calculations were performed in SPSS 19.0).

3.7.4 Data Analysis on the Post-test

In calculating the post-test data, the researcher used the same steps as in calculating the pre-test data. The researcher used *t*-test formula, Case II studies or independent sample test (Hatch and Farhady, 1982).

Post-test was conducted to find out whether there is any difference between

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students' score of experimental and control group after the treatments. The procedures of data analysis in post-test were exactly same as pretest data analysis. Besides, calculating independent *t*-test, paired sample *t*-test in SPSS 19.0 was also calculated. It was aimed to find out the differences between the pretest and posttest scores in each group.

In addition, the coefficient correlation of effect size was calculated to determine the effect size in the independent *t*-test and to know the influence of independent variable upon the dependent variable (Coolidge, 2000). The formula of effect size is:

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

Note:

r = effect size

t = *t* obt or *t* value from the calculation of independent *t* test

df = *N* 1 + *N*2 – 2 (degree of freedom)

Value of effect size was interpreted by the following scale:

Table 3.8
The Scale of Effect Size

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

(Coolidge, 2000)

3.7.5 Questionnaire and Interview

Questionnaires were distributed to the experimental class in the end of the treatment to find out students opinions about the implementation of Student Teams-Achievement Divisions (STAD) which in turn will show the technique's strength and weaknesses. Afterwards, an interview was given to experimental group as well in order to get additional information and to clarify information contained in questionnaires.

The questionnaire consisted of 10 statements. Each statement had five various alternatives options that should be chosen by the students. The researcher used *Likert scale* by Rensist Likert in 1932 (Edmondson, 2005) with typical five-level Likert item format as follows:

1. Strongly disagree (STS: *Sangat Tidak Setuju*)
2. Disagree (TS: *Tidak Setuju*)
3. Undecided (TT: *Tidak Tahu*)
4. Agree (S: *Setuju*)
5. Strongly agree (SS: *Sangat Setuju*)

The result of questionnaires was put in percentage below.

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

Note:

P = Percentage of each question

o = Frequency of answer (total respondent who answer the item)

n = Total Respondents

The criteria of percentage categories are described as follow:

Table 3.9
Criteria of Percentage of Respondent

Percentage of Respondent	Criteria
1- 25%	Small number of students
26-49%	Nearly half of students
50%	Half of students
51-75%	More than half of students
76-99%	Almost all of students
100%	All of students

(Sudjana, 1984)

After the questionnaire was given, the interview was used to collect additional information from the students to support the questionnaire that students had answered. The questions were in Indonesian in order to help students express their feeling more easily. The researcher pointed out the important parts which were related to statements of the problem. Furthermore, to justify the answer, related literature were presented.