CHAPTER III

METHODOLOGY

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

3.1 Research Methods

The purpose of this research was to find out whether teaching using reciprocal teaching strategy is effective in improving students' reading comprehension and to find out students' responses toward the advantages or disadvantages of the strategy in teaching reading comprehension. This research primarily used a quantitative method to analyze the data with quasi experimental with pre-test and post-test design chosen to get empirical data. This research used two classes: the first class was structured as an experimental class and the second class function as a control class.

3.1.1 Research Design

This research applied the pretest-posttest design which is the subset of a quasi-experimental design. Get et all (2003:402) said that pre test-post test design is often used in experiments when experimental and control

groups are such naturally assembled groups as intact classes which may be similar.

The formula is expressed as follows:

G1	T1	X	T2
G2	T1		T2

The table above illustrates the design of the study which would be administered in the research. For the design above two classes were selected for the experiment. One class was as an experimental group which was given treatment and the other class was a control group which was not given a treatment.

A Pre test was administered before the implementation of reciprocal teaching strategy as the treatment. It would be given to both groups. Pre test was administered to measures the initial ability of the sample of the subject. Later on, the post test was given to both groups. The purpose of post test was to find out whether reciprocal teaching strategy is effective or not.

3.1.2 Variables

Variables are the conditions or characteristics which the researcher can manipulate, control, or observe. There are two variables in this research. The first was an independent variable and the second was a dependent variable.

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The independent variable investigated in this research was reciprocal teaching strategy, where as the dependent variable was the achievement of students' reading comprehension.

3.2 Population and Samples

This research would be employ tenth grader students of senior high school in Subang as population. In determining the sample, purposive sampling technique was used. This technique was chosen due to the troubles which were faced in retaining the sample. Arikunto (2003) states purposive sampling can be used, if the samples have similar characteristics. Moreover, the samples selection was also based on the consideration of the suitable time in the school. Afterward, among the tenth classes, the samples selected were class X-3and X-5.

3.3 Research Instrument

The researcher used some instruments to collect data in this study. There are two kinds of instrument were used; reading comprehension test for both pre test and post test and questionnaire. The reading comprehension test as the instrument of this study aimed to measures students' reading comprehension. The reading comprehension test was used in the pre test and post test and given to both experimental group and control group.

The aim of pre test was to discover the students' previous ability in reading and then a post test was given to measure student's progress on their reading ability after they received the treatments.

A try out was conducted before the test with the purpose to investigating the reliability and validity of the test items. In formulating the items of reading test, there are some points to be considered; first, the relevance of the items to the purpose of the study, second appropriateness of the reading texts, and third the relevance of the items to the curriculum.

The questionnaire was used to investigating the students' responses toward reciprocal strategies. This questionnaire was only given to the experimental group at the end of the research. This questionnaire consisted of ten items of "yes" and "no" closed statements.

3.4 Research Procedure

In this research, four strategies of reciprocal teaching were used as the treatment for experimental group. While in the control group, conventional reading materials and teaching procedures were applied. Due to the limited the time, the research was conducted in six meetings include pre test, treatments, and post test. There are several steps employed in the research.

The first step was developing the research instrument. Before the instrument was used in this research, the researcher had administered the try out test to investigate the validity and reliability of the instrument. The try out test was administered to non sample of research. The test materials were adopted from

several textbooks used by the grade tenth grade of senior high school students. Try out test consisted of thirty texts and 100 multiple choice questions related to the text.

The second step was organizing teaching process. In preparing the teaching process, the researcher conducted two steps. The first step was organizing teaching procedures in the control and experimental group. The second step was preparing appropriate materials for teaching and learning process during the treatment.

The third step was administering pre test. To investigate the students' initial ability, a pre test was conducted. It was given to both experimental and control groups. As mentioned above, pre test was performed by using reading comprehension test. All of the students in two groups were requested read the following passages and choose the best alternative to answer the each question.

The fifth step was giving treatments. The treatment of the research was only given to the experimental group. Meanwhile the control group was taught by using conventional method that was usually applied by the English teacher. In conducting the treatments, four comprehension strategies of reciprocal teaching were used in teaching reading. The treatments were conducted in six meetings.

The process of teaching and learning in the experimental group by using reciprocal teaching strategy was started by explaining the reciprocal teaching as the new method that will be used during treatment. Then the teacher divided students into several group and gave them a reading topic that must

discussed based on the four activities of reciprocal strategy that had been explained.

In the following treatment, the teacher modeled the four activities of questioning, summarizing, predicting and clarifying. Students are asked to look at the title and pictures in the text and make prediction of what the text might be about. Next, teacher modeled question asking and invited students to ask and discuss their question. After reading the story, they are instructed to summarize the story. In addition, teacher modeled clarifying and invited students to share words and passage that need clarifying.

Arranging the general schedule of experiment was intended to make a well-established experiment. The researcher schedule is presented in the table:

Table 3.2 Schedules of the Research

No.	Experimental Group		Control Group	
	Date	Material	Date	Material
1	13th April 2011	Pre-test	13th April 2011	Pre-test
2	15th April 2011	1st treatment Four Key Strategies (Predicting)	16th April 2011	Text 1 A Bank Manager Speaks
3	27th April 2011	2nd treatment Four Key Strategies (Questioning)	27th April 2011	Text 2 Traffic Sign (Part 1)
4	29th April 2011	3rd treatment Four Key Strategies (Clarifying)	30th April 2011	Text 3 Traffic Sign (Part 2)

5	4th May 2011	4th treatment Four Key Strategies (Summarizing)	4th May 2011	Text 4 Tell Me The Way, Please (Part 1)
6	6th May 2011	5th treatment Tell Me The Way, Please	7th May 2011	Text 5 Tell Me The Way, Please (Part 2)
7	11st May 2011	6th treatment How to Make An Invitation	11st May 2011	Text 6 How To Make An Invitation
8	13hd May 2011	Post Test and Questionnaire	14th May 2011	Post Test

The sixth step was administering post test and questionnaire. To investigated the effectiveness of the reciprocal teaching strategy in teaching reading comprehension, at end of the program a post test was given to both experimental and control group. Then, the questionnaire was given to the students of experimental group to back up the research especially to investigate the students' response toward reciprocal teaching strategy.

3.5 Data Analysis

3.5.1 Scoring Technique

As mentioned before, the multiple choices were used as the research instrument. There are two types of formula that can be used in calculating the data of multiple choice items; they are the formula with punishment and the formula

with no punishment (Arikunto, 2003: 172). The formula with punishment was used in this study. The formula is showed as follow:

S=R

Note:

S refer to score

R refers to right answer

3.5.2 Data Analysis on the Try-out Test

The aim of tray out test was to investigate the validity and reliability of the test item. According to Hatch and Farhady (1982) to conduct data gathering procedure, validity and reliability of the instruments are essential. Sugiyono (2007) notes that using the valid and reliable instruments in collecting data, it is expected that the result of the research is also valid and reliable. It is important to try out the research instrument to find valid and reliable data.

3.5.2.1 Validity

It is important to find out the instruments' validity. Validity is qualities that are essential for the effectiveness of any data gathering procedures. Hatch and Farhady (1982) defines validity as a quality of data gathering instruments or produce. The Corrected Item-Total Correlation was used as the tool to analyze the validity of each item. SPSS 16.0 for windows was employed in this study

to analyze the score data. Then, the result of the calculation was compared to the r_{table}. Arikunto (2003: 72) explain that the item is valid if $r_{correlation} > r_{table}$.

The result of the calculation was interpreted with the following criteria in table below:

Table 3. 3 r Coefficient Correlation (Validity)

0.8-1.0	Very high
0.6-0.8	High
0.4-0.6	Moderate
0.2-0.6	Low
0.0-0.2	Very low

3.5.2.2 Reliability

Testing the instrument reliability is important to find out whether or not the instrument is reliable to use as the research instrument. Reliability can be defined as the consistently degree of the instrument (Hatch and Farhady, 1982).

To investigate the reliability of the research instrument, the researcher used Cronbach's Alpha formula (in SPSS 16.0 for windows). The reliability of the test was verified through the criteria of reliability. The result of the calculation was interpreted with the following criteria in table below

Table 3.4 r Coefficient Reliability

0.00 – 0.20	Almost none
0.21 – 0.40	Low
0.41 – 0.60	Moderate
0.61 – 0.80	High
0.81 – 1.00	Very High

3.5.2.3 Index of Difficulty

Heaton (1995 Cited in Firdaus, 2010) states that the index of difficulty or facility value (FV) of an items illustrates how difficult or easy the certain item established in the test. Thus, it means that a good test is a test which contains items which are not too easy and also are not too easy. The following formula is used to calculate the index of difficulty of an item:

$$FV = \frac{R}{V}$$

FV   : facility value

R   : the number of correct answers

V   : the numbers of students

Table 3.5 Index Of Difficulty

0.00 – 0.30	Difficult item
0.30 – 0.70	Moderate item
0.70 – 1.00	Easy item

3.5.2.4 Discrimination Index

According to Heaton (1995 cited in Firdaus, 2010), the discrimination index of an item indicates the extent to which the items distinguishes between the testes, separating the more able testes from the less able.

There are some procedures were used to find out the discrimination index: (1) arranging the students' total score and dividing the score into two groups; the top half and the bottom half. (2) counting the number of the students in upper group who answer each item correctly; then counting the number of lower group students who answer the item correctly. (3) subtracting the number of correct answers in the lower group from the number of correct answers in the upper group to find the differences in the proportion passing in the upper group and the proportion passing the lower group. (4) dividing the difference by total number of students in one group. The following formula is used to calculate the discrimination index of an item :

$$D = \frac{correct\ U - correct\ L}{N}$$

D : Discrimination index

U : upper half

L : lower half

N : number of students in one group

Table 3.6 Criteria of Discrimination Index

0.00 – 0.20	Poor
0.20 – 0.40	Moderate
0.40 – 0.70	Good
0.70 – 1.00	Excellent

3.5.3 Data Analysis on the Pre Test

The aim of pre tests both experimental and control group were to investigate the student initial ability and equivalence between groups. The researcher used *t-test* formula. According to Hatch and Farhady (1982), there are three assumptions underlying the *t-test*; the subject is allotted to one group in the experiment; the variances' score are equal and normally distributed; the score on the independent variable are continuous. Before calculating the data using *t-test* formula, the researcher took the normality distribution and variance homogeneity test.

3.5.3.1 Normality of Distribution Test

To analyze the normality distribution of scores, the researcher used One-Sample Kolmogorov-Smirnov formula in SPSS 16.0 for windows by following three steps below:

1) Setting the level of significance at 0.05 and establishing the hypothesis as follows:

Ho: the variances of experimental and control group are normally distributed.

2) Analyzing the normality distribution by using Kolmogrov-Smirnov formula in SPSS for windows.

3) Comparing the Asymp Sig with the level of significance for testing the hypothesis. If the asymp.sig > 0.05, the null hypothesis is accepted and the distribution of data is normal. Hence, if the asymp.sig < 0.05, the null hypothesis is not accepted and it means the data is not normally distributed.

3.5.3.2 Homogeneity of Variance

The analyzing the homogeneity of variance test, the researcher used a SPSS 16.0 for windows program namely Levene test. The steps are as follows:

1) Setting the level of significance at 0.05 and establishing the hypothesis as follows:

Ho: the variances of the experimental and the control group are homogenous.

2) Analyzing the variance homogeneity by using Levene test formula in SPSS for windows.

3) Comparing the asymp.sig with the level of significance to test the Hypothesis. If the asymp.sig $>$ 0.05, the null hypothesis is not rejected and it suggests that the variances of data are

homogenous. However, if the asymp.sig $\leq$ 0.05, the null hypothesis is rejected and it clarifies that the variances are significantly different.

3.5.3.3 Calculation of t-Test

The next step of statistical computation namely independent t-test is conducted. Independent t-test was calculated to find out the comparison of two means between the experimental group and the control group. The steps of the t-test calculation are as follows:

1) Setting the level of significance at 0.05 and establishing the null hypothesis.

Ho: The two samples are from the same population; there is no signification difference between the two samples ($Xe = Xc$).

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 calculation were performed in SPSS 16.0 for windows).

3.5.4 Data Analysis on the Post Test

Post-test was conducted to find out whether there is any difference between students' score of experimental and control group after treatments. In calculating the post-test data, the researcher used the same steps as in calculating the pre-test data. The researcher used a t-test.

3.5.5 Data Analysis on Experimental Group

3.5.5.1 Dependent t-test of Experimental Group

To investigate whether or not the difference of the pre-test and post -test means of experimental group is significance, the researcher analyzed the pre test and post test score using matched t-test (Hatch and Farhady, 1982; 114) the steps are as follow:

1) Setting the level of significance at 0.05 and establishing the null hypothesis.

   H_0: There is no significant difference between pre-test and post-test score ($X_1 = X_2$).

2) Finding the *t* value

3) Comparing the probability with the level of significance for testing the hypothesis. If the probability is more than equal to the level of significance, the null hypothesis is accepted; the two score are homogenous. (The calculated were performed in SPSS 16.0 for windows).

3.5.5.2 Students' Classification of Gain Scores in Experimental Group

After finding the pre-test and post-test score, it was important to found the gain score of each student in experimental group to know whether or not they had improvement in their reading score. Students' gain score were analyzed by following formula:

Gain Score: Post test Gain Score – Pre test Gain Score

It also necessary to found the mean of the gain score, and the following formula below is used:

$$Mgain = \frac{\sum gain}{N}$$

M = Mean

$\sum$gain = the sum of gain score

N = the number of subject

After finding the student's gain score, the researcher classified the students based on their scores before the treatment and after the treatment was given. The formula to compute the score is as follow :

$$S = \frac{R}{N} \; x \; 100$$

S = Score

R = Right answer

N = the number of the test items (questions)

The researher also computed the mean of pre test and post test to find out the mastery level of reading comprehension. The formula to compute the means is as follow:

$$Mx = \frac{\sum x}{N}$$

Mx   = mean x (before treatment)

∑x   = the sum of X score (pre test)

N   = the number of subject

$$My = \frac{\sum y}{N}$$

My   = mean y (after treatment)

∑y   = the sum of Y score (post test)

N   = the number of subject

After finding the gain score and the means, it is important to interpreted what it means. The interpretation of the result would explained to what extent the mastery of reading comprehensions before and after the treatment. Harris (1969: 134, cited in Roswita, 2011) classifies the range score with its probable students performance.

3.7 Classification of Probable Students Performance

Test Score	Probable Students Performance
80 - 100	Good to Excellent
60 – 79	Average to Good
50 – 59	Poor to Average
0 - 49	Poor

3.6 Effect Size

The coefficient correlation of effect size was calculated to determine the effect size in the independent t-test and to measure in what extend the effect of independent variable and dependent variable (Coolidge, 2000). The following formula is used to calculate the effect size of independent t-test:

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

Note:

r refers to effect size

t refers to t_{obt} or t-value from calculation of independent *t*-test

df refers to $N_1 + N_2$

After obtaining the *r* value, hence it is analyzed by using the following scale:

Table 3.8 Effect Size Scale

Effect size	*r* value
small	.001
medium	.243
Large	.371

3.7 Analyzing Questionnaire Result

Questionnaire was administered as a means of giving the students an opportunity to express their feeling, opinion, or response toward the application of reciprocal teaching. The questionnaire of Yes or No statement was used in this research. The data gained from questionnaire were classified into four categories;

students' response of using reciprocal strategy; advantages of reciprocal strategy; the disadvantages of reciprocal strategy; and the students' improvement on their reading comprehension after they received reading treatment by using reciprocal teaching strategy. The formula of percentage of Questionnaire:

$$P = \frac{F \times 100}{N}$$

Note:

P : Percentage

F : Frequency

N : The sum of sample

100 : constant

The option "Yes" was counted 1 and the option "No" was counted 0. After that, the results of the computation were interpreted to the table below:

Table 3.9 Percentage of Respondent

Percentage	Interpretation
0%	None
1%-25%	A small number
26%-49%	Nearly half
50%	Half
51%-75%	More than half
76%-99%	Most
100%	All