

## CHAPTER III

### RESEARCH METHODOLOGY

This chapter provides a discussion on the methodological aspects of the research covering statements of problems, research design, hypothesis, data collection, procedures of study, and data analysis.

#### 3.1 Statement of Problems

As it is stated in previous chapter, the problems to be examined in the study are formulated as follows.

1. Is Collaborative Strategic Reading effective in improving students' reading comprehension?
2. What are students' perceptions toward the use of Collaborative Strategic Reading?

#### 3.2 Research design

The research employed quasi-experimental with one group pretest-posttest design. This design allows the researcher to take only one group without the existence of control group. Moreover, this design is measured by using pretest which is done before the treatment and posttest which is done after the treatment.

There was one class involved in this study. This group received CSR as a treatment. The one group pretest-posttest design of the research is described in the following table.

**Table 3.1 One Group Pretest-Posttest Design**

Group	Pretest	Treatment	Posttest
Experimental	$T_1$	X	$T_2$

Note:

- $T_1$  is pretest
- $T_2$  is posttest

- X indicates a treatment by using Collaborative Strategic Reading (CSR)

Nunan (1992: 25) stated that in experimental study, there are two variables: independent variable and dependent variable. Independent variable is the label that is given to the variable that the experimenter expects to influence the other. In addition, Wiersma & Jurs (2009: 34) define independent variable as the variable that the researcher is trying to determine whether there is a cause-and-effect relationship to the dependent variable. Dependent variable is the outcome variable to be calculated statistically. The values of this variable in some way depend on independent variable. In this case, the independent variable of this study was the Collaborative Strategic Reading (CSR), while the dependent variable was the students' score in reading comprehension.

### 3.3 Research Hypothesis

To provide specificity and direction, hypotheses were developed. A hypothesis is a guess at the solution to a problem (Wiersma & Jurs, 2009: 37). McMillan & Schumacher (1989: 349) defines hypothesis as a research prediction that is tested. There are two types of hypothesis, namely null hypothesis and alternative hypothesis. Null hypothesis ( $H_0$ ) is an error probability in terms of sampling and measurement which state that there is no difference between the population means of the group. The researcher employed descriptive statistic to determine the probability that the null hypothesis is untrue. The descriptive statistic used is one sample t-test. On the other hand, alternative hypothesis ( $H_a$ ) is a difference between experimental treatments that the researcher expects to emerge (Borg & Gall, 1983: 89). Hence, the hypotheses of the study are as follow:

$H_0$ : There is no significant difference in mean of pretest and posttest

$H_a$ : There is significant difference in mean of pretest and posttest

### 3.4 Data Collection

#### 3.4.1 Population and Sample

Population, according to McMillan & Schumacher (1989: 161), is the sample consists of individuals selected from a larger group of person, while sample is selected from the larger group to provide subject. The population involved in this study was eighth grade students from SMPN 15 Bandung. In this study, the sampling technique used was purposive sampling where one class was chosen as an experimental group based on some consideration such as the students were active in the class and they was better than the other classes. The class taken was 8 A consist of 35 students. Two students did not follow the whole activities, thus, only 33 students was taken as participants in this study.

### **3.4.2 Research instruments**

The data needed to be collected is the score of the students before and after the CSR is implemented. Those data will be analyzed to find out the effectiveness of the treatment. There are three research instruments used to collect the data, namely pretest, posttest, and questionnaire.

To measure students' reading comprehension, reading comprehension test was conducted by using multiple choice. In collecting the data, firstly, the writer administered pilot test in higher class to examine the validity, reliability, and difficulty of the items of test that would be administered in the group.

The pretest was conducted to the group before giving the treatment in order to measure the preliminary ability of the students. On the other hand, posttest was employed in the last meeting after giving CSR treatment. It was used to find out whether or not there is significant improvement in reading comprehension.

To collect students' response toward the implementation of CSR in the classroom, questionnaire was given after the treatment. The questionnaire contained some closed question related to students' opinion toward the strategy used in teaching and learning process.

### **3.5 Procedures of study**

In collecting the data, some procedures were employed in this study which covered in the following steps: preparing the lesson plan, preparing the teaching

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material, administering pilot test, administering pretest, applying the CSR to the experimental group, administering posttest, and administering questionnaires.

### **3.5.1 Organizing the Teaching Procedure**

There were two steps in teaching procedures. Firstly, researcher was preparing the lesson plan and appropriate materials. In the preparing the lesson plan, the researcher focused on reading skill. The lesson plan was designed for four meeting out of six meeting. The first meeting was used for pretest. The last meetings were used for posttest. The rest meetings were allocated for teaching reading. The text for teaching material was taken from textbooks and internet that appropriate with the syllabus. Secondly, the researcher was organizing teaching procedure that was Collaborative Strategic Reading.

### **3.5.2 Administering Pilot Test**

The pilot test is to examine the validity and reliability of the test that will be given in pretest and posttest. It was administered before the pretest to the higher class from the samples, since the higher class had learnt narrative text. The pilot test was administered in the same school where the research was done. The test consists of 50 items of narrative text. All of the questions are multiple choices.

After computing the result score using AnatesV4, the writer made an analysis to find out the validity, reliability, level of difficulty, and discrimination index of the test item. The valid and reliable item used in designing instrument for pretest and posttest.

### **3.5.3 Pretest**

After analyzing the data of pilot test, the researcher employed pretest to measure students' reading comprehension ability by using multiple choices. The test is administered during school hours.

### **3.5.4 Conducting the Treatment**

The treatment used in this study was Collaborative Strategic Reading to enhance students' reading comprehension. The group received the reading treatment for four days where the students take the main role in the learning process, and the teacher role is as a prompter. In the last meeting, students were given posttest to measure their reading comprehension after teaching and learning process.

### **3.5.5 Posttest**

The posttest was given to find out the students' reading comprehension after received treatment. At the end of the meeting, the group was given questionnaire to find out students' response toward the implementation of CSR in teaching and learning process.

### **3.5.6 Administering questionnaire**

The questionnaire was administered after the experimental group finished the posttest. It was aimed to find out students' opinion toward the implementation of the treatment. The writer used closed questionnaire consists of 10 items which give students chance to write down their reason. There were 7 items to find out students' experience in using CSR as their reading strategy. The rest of the items were developed to find out their motivation when CSR was implemented.

## **3.6 Data Analysis**

After collecting the data, the next step was analyzing the data. The following steps are how the data are analyzed.

### **3.6.1 Scoring**

There are two types of formula in the process of scoring the multiple choice test. The formulas are formula with punishment and formula with no punishment. The writer uses formula with no punishment in order to avoid negative score. The formula is proposed as follows:

$$S = R$$

S = Obtain score  
R = Right Answer

### 3.6.2 Pilot Test Analysis

#### 3.6.2.1 Validity

Validity refers to the interpretation and the generalizability of results (Wiersama & Jurs, 2009: 296). The purpose of conducting validity test is to find out whether or not the test is valid to be used in pretest and posttest. The instrument of test or evaluation tools is valid if it evaluates things that must be evaluated. There are two kinds of validity namely content validity and construct validity. The test has content validity “if the content of the text constitutes a representative sample of the language skills, structure, etc.” (Hughes, 2003). It means the test includes material that has been taught to the students. Miller (1984) believe that the test needs construct validity which involves the judgement of validity of measure on the basis of interrelated experimental findings in order to be valid. To find out the validity of the test, Pearson’s Product-Moment ( $r$ ) formula was applied. To help the process of calculation, the data calculated using AnatesV4 program. The data obtained is interpreted based on the category below.

**Table 3.2 Category of Coefficient Correlation of Validity**

<b>Coefficient correlation</b>	<b>interpretation</b>
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, 2013: 89)

The formula of validity in pilot-test is shown below.

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

- $r$  = correlation coefficient  
 $X$  = item score  
 $Y$  = total score  
 $N$  = number of subject

(Kranzler, 1999)

### 3.6.2.2 Level of Difficulty Test

Index difficulty shows how easy or difficult the item is. This test was done to measure the relevancy of the items to the participant's ability, whether the test items were too easy or too difficult. The formula below is the formula of difficulty index:

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

- $P$  = index of difficulty  
 $B$  = the number of students who answer the item correctly  
 $JS$  = the number of students

(Arikunto, 2012: 223)

The score of index difficulty obtained after the calculation is interpreted based on the criteria below.

**Table 3.3 Level of difficulty index**

Facility Value	Interpretation
0.00 – 0.30	Difficult
0.31 – 0.70	Moderate
0.71 – 1.00	Easy

(Arikunto, 2012: 225)

### 3.6.2.3 Discrimination index

Discrimination index is an ability of test item to differentiate the upper group from the lower group in answering a single item of the test (Arikunto, 2012: 226). The higher discrimination index value is the higher discrimination between upper group and lower group. In this research which multiple choices was used as a test instrument, the formula of discrimination index is:

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B} = P_A - P_B$$

D = The discrimination index

$B_A$  = Number of upper group who answered the item correctly

$B_B$  = Number of lower group who answered

$J_A$  = Number of upper group

$J_B$  = Number of lower group

$P_A$  = Proportion of upper group who answered the item correctly

$$(P_A = \frac{B_A}{J_A})$$

$P_B$  = Proportion of lower group who answered the item correctly

$$(P_B = \frac{B_B}{J_B})$$

(Arikunto, 2012: 228-231)

After the discrimination index is obtained from, then it is interpreted based on the following categorization:

**Table 3.4 The criteria of discrimination index**

Coefficient interval	Interpretation
< 0.00	Discrimination index is very poor
0.00 – 0.20	Discrimination index is poor
0.21 – 0.40	Discrimination index is satisfactory
0.41 – 0.7	Discrimination index is good
0.71 – 1.00	Discrimination index is excellent

(Arikunto, 2013: 232)



### 3.6.2.4 Reliability

Based on Punch (2009: 244), reliability refers to consistency. Consistency is divided into consistency overtime and internal consistency. He further described that consistency over time means stability of measurement over time, while internal consistency refers to whether or not the items are consistent with each other or all working in the same direction. The values of reliability coefficients can take on values of 0 to 0.99 which described below.

The table below displays the result of reliability in reading items:

**Table 3.5 The reliability test of the reading comprehension**

Coefficient of reliability	Interpretation
0.0 – 0.7	Lowly reliable
0.7 – 0.9	Highly reliable

(McMillan & Schumacher, 1989)

Spearman-Brown formula is used to find the reliability of the test. The formula is stated as follows.

$$r_{11} = \frac{2r_{1/2}1/2}{(1 + r_{1/2}1/2)}$$

$r_{11}$  = instrument reliability

$r_{1/2}1/2 = r_{XY}$  which mentioned as correlation index between two instrument

(Arikunto, 2010: 223)

Based on the calculation by using AnatestV4, the result of reliability of test items was 0.9. It means that it was categorized as highly reliable.

### 3.6.3 Pretest Data analysis

#### 3.6.3.1 Testing the Normal Distribution

Normal distribution test administered to see whether or not the distribution of data is normal. The writer used Kolmogorov-Smirnov to investigate the normal distribution by using SPSS 20.0 for windows to analyze the students' score in pretest. There are three steps in conducting Kolmogorov-Smirnov test:

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1. Stating the hypothesis

$H_0$  : the distribution score of experimental group in pretest is normally distributed

$H_a$  : the distribution score of experimental group in pretest is not normally distributed

2. Analyzing the normality distribution of test using the Kolmogorov-Smirnov formula in SPSS 20.0 for windows.

3. Comparing  $D_{obt}$  (absolute value of Kolmogorov Smirnov) with  $D_{tab}$  of Kolmogorov-Smirnov to test hypotheses. The formula of  $D_{tab}$  is stated as follows:

$$D_{tab} = \frac{1.36}{\sqrt{n}}$$

Note:

$D_{tab}$  is the critical value of Kolmogorov-Smirnov

$N$  is the number of sample

(Santoso, 2015, p. 86)

$$D_{tab} = \frac{1.36}{\sqrt{33}} = 0.24$$

If the absolute value of Kolmogorov Smirnov more than  $D_{tab}$  ( $D_{obt} > 0.24$ ), the null hypotheses ( $H_0$ ) is rejected. Meanwhile, if the result less than the  $D_{tab}$  ( $D_{obt} < 0.24$ ), the null hypotheses ( $H_0$ ) is accepted and the alternative hypotheses is rejected.

4. If the pretest data is normally distributed, the computation is continued by using one sample t-test.

### 3.6.4 Posttest Data Analysis

#### 3.6.4.1 Testing the Normal Distribution

Normal distribution test administered to see whether or not the distribution of posttest data is normal. The writer used Kolmogorov-Smirnov to investigate the normal distribution by using SPSS 20.0 for windows to analyze the students' score in posttest. There are three steps in conducting Kolmogorov-Smirnov test:

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1. Stating the hypothesis

$H_0$ : the distribution score of experimental group in pretest is normally distributed

$H_a$ : the distribution score of experimental group in pretest is not normally distributed

2. Analyzing the normality distribution of test using the Kolmogorov-Smirnov formula in SPSS 20.0 for windows.

3. Comparing  $D_{obt}$  (absolute value of Kolmogorov Smirnov) with  $D_{tab}$  of Kolmogorov-Smirnov to test hypotheses. The formula of  $D_{tab}$  is stated as follows:

$$D_{tab} = \frac{1.36}{\sqrt{n}}$$

Note:

$D_{tab}$  is the critical value of Kolmogorov-Smirnov

$N$  is the number of sample

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$$D_{tab} = \frac{1.36}{\sqrt{33}} = 0.24$$

If the absolute value of Kolmogorov Smirnov more than  $D_{tab}$  ( $D_{obt} > 0.24$ ), the null hypotheses ( $H_0$ ) is rejected. Meanwhile, if the result less than the  $D_{tab}$  ( $D_{obt} < 0.24$ ), the null hypotheses ( $H_0$ ) is accepted and the alternative hypotheses is rejected.

4. If the posttest data is normally distributed, the computation is continued by using paired sample t-test or dependent t-test.

### 3.6.5 Testing Paired Sample T-Test

Paired sample t-test is employed to compare the pretest and posttest score. Pretest data was students score before the treatment was implemented, while posttest data was students score after the treatment was implemented. There are some steps in conducting paired sample t-test: (1) stating the hypotheses and select significance level ( $\alpha$ ); (2) computing  $t_{obt}$  obtained from analyzing the group's score using the paired sample t-test in SPSS 20.0 for Windows; (3)

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comparing  $t_{obt}$  with the level of significance for testing hypothesis. The first step is setting the level significance at 0.05 and the hypotheses are stated as follows:

$H_0$ : there is no significance difference in mean of pretest and posttest score of experimental group

$H_a$ : there is significance difference in mean of pretest and posttest score of experimental group

After calculating paired sample t-test, the result of  $t_{obt}$  is compared to the significance level. If  $t_{obt}$  is more than significance level ( $t_{obt} > 0.05$ ), the null hypothesis ( $H_0$ ) is accepted which means there is no significance difference in mean of pretest and posttest score of experimental group. In contrast, if  $t_{obt}$  is less than 0.05 ( $t_{obt} < 0.05$ ), the null hypothesis ( $H_0$ ) is rejected which means that there is significant difference in mean of pretest and posttest score of experimental group.

### 3.6.6 Students' Classification of Gain Score in Experimental Group

After finding the pretest and posttest score, it is important to find the gain score of each student in experimental group. Gain index will be used if the mean score of pretest are different to posttest. This is also to determine students' achievement of cognitive quality improvement. Therefore, it examines whether or not they had improvement in their reading score. The improvement was calculated by the following formula (Hake, 1999):

Gain Score: Posttest score – Pretest score
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$$\langle g \rangle = \frac{\% \text{ posttest score} - \% \text{ pretest score}}{\% \text{ maximum ideal score} - \% \text{ pretest score}}$$

The quality of students' reading comprehension in experimental group will be interpreted from the following gain index:

**Table 3.6 Interpretation of Gain Index**

Gain	Interpretation
$g \leq 0.30$	Low

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$0.30 < g \leq 0.70$	Medium
$g > 0.70$	High

(Hake, 1999)

### 3.6.7 Data Analysis of Questionnaires

The writer uses questionnaire in order to collect the data to find out students' responses toward the use of CSR in reading. There were 10 items in the questionnaire which was developed based on previous similar study. Seven items out of 10 items were made to explore students' experience while reading using CSR. The rest of items were made to find out their motivation toward CSR. The questionnaire items can be seen on Appendix B. The questionnaire is assessed by using likert scale. In likert scale, the statement includes a value or positive or negative direction and the subject indicates agreement or disagreement (McMillan, 2012:157). The data from questionnaire is computed by the following formula:

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

$P$  = percentage of samples' answer

$F_o$  = frequency of samples' answer

$n$  = number of samples

The interpretation of the result can be seen in the following tables.

**Table 3.7 Interpretation of Questionnaire Percentage**

Percentage	Interpretation
0%	None
$0 \% < p \leq 25 \%$	Small number / few
$25 \% < p < 50 \%$	Almost half
$p = 50 \%$	Half / some
$50 \% < p \leq 75 \%$	Large number / mostly

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$75\% < p < 100\%$	Commonly / mostly
$p = 100\%$	All of them / the whole

(Aisyah, 2011, as cited in Rohmah, 2014)