CHAPTER III

METHODOLOGY

This chapter describes the procedures of the research in order to find out the answer of the question previously stated in chapter one. The chapter comprises research method, the instrument, population and sample and data analysis.

3.1   Research Method

Nazir (2005:13) stated that research is a systematic way of investigation. This research uses quantitative method where experimental is needed to gather the data. Therefore, two classes were chosen for the experiment; first class served as control class and the second class served as experimental class.

3.1.1   Research Design

Quasi-experimental with non equivalent control group design was used as the design of the research. Ruseffendi (1994, cited in Anggarini 2008) said that quasi-experimental with non equivalent control group design is used in classroom experiment when the sample for experimental group and control group are naturally assembled groups as intact classes which may be similar.

The formula is showed as follows:

$$\left(\frac{G_1(Experiment\ class)}{G_2(Control\ class)} \middle| \frac{T_1 \times T_2}{T_1 \quad T_2} \right)$$

As the formula shows there are two classes, Experimental class (G_1) and Control class (G_2). The treatment (X) was only given to the experimental class.

Pre-test (T_1) was given to both class before the implementation of the treatment. Furthermore, the Post-test (T_2) was held to find out the students' reading achievement.

3.1.2 Variables

Variable is attribute of a certain object which differs it with other object. Nazir (2005: 123) said that variable is a concept which has many values. There are two variables in this research, independent variable and dependent variable.

Coolidge (2000: 24) called independent variable as the variable that the experimenter manipulates. In this study, PC game entitled *Nancy Drew* was act as the independent variable. On the other hand, dependent variable, in an experiment, is variable which is measured to determine the effect of the independent variable (Coolidge, 2000: 25). Dependent variable in this study was students' reading achievement.

3.1.3 Hypothesis

This research use Null Hypothesis (H_0) as its foundations. Null Hypothesis means that there is no relationship between the independent variable and the dependent variable (Coolidge, 2000: 95).

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

It means that there is no difference between the two classes' means, experimental class and control class (Coolidge, 2000: 98). It believed that control group and experimental group are similar.

Coolidge (2000: 102) stated that if a research using Null Hypothesis, two possibility of the research can be shown as follows: (1) if the hypothesis is rejected, it means that the experiment works, (2) if the hypothesis is accepted, then the experiment does not work.

Therefore, the null hypothesis for this research is PC Game is not effective in improving reading achievement of eighth grade of junior high school students.

3.2 Subjects

3.2.1 Population

Arikunto (2006: 130) stated that population is the whole subject of the research. She also said that each population member possesses one or more attributes of interest. Hence, the population member of this research was the eighth grade of junior high school students in SLTPN 4 Serang which is grouped into 7 classes. Each class consist about 45 students, so the total population is 315 students.

3.2.2 Sample

Sample is a part of the population that is being observed in an experiment (Arikunto, 2006: 131). Based on Ruseffendy statement (1994, cited in Anggarini 2008), sample for quasi experimental with non equivalent control group design were taken from naturally assembled groups as intact class. it means the sample were drawn not randomly, but from purposive sampling which is from students who have the same level of English proficiency and never been thought using PC game. Therefore, this research took two classes (VIII C and VIII D), Class VIII D will serve as experimental class and class VIII C will serve as control class. In anticipating the absence of some students during the research, this research was only took 38 students from each class as the sample. So, the number of the sample will be 76 students.

During the experiment, the experimental class (class VIII D) was given the treatment in periods of four meeting.

3.3 Research Instrument

Instrument is a device to measure in certain method when conducting research (Arikunto, 2006: 149). In this research, reading comprehension test is used as an instrument to measure the students' reading achievement. This reading test consists of 25 items of multiple choices which are given to each class, experimental class and control class. Furthermore, in order to know the students' prior reading achievement this reading comprehension test was use in pre-test. After the treatment given, reading comprehension test also being conducted as post-test to identify the students' reading achievement.

Yet, before applying the instrument to experimental class and control class, the value of its validity and reliability should be measured. Therefore, in order to get 25 questions items which are valid and reliable, 30 items of multiple choices were tested to another class.

Still, in developing the question items there were several points should be considered. First is the relevancy of the question item with the purpose of the research, second is the appropriateness of the reading passage, and third is the appropriateness with the curriculum of the school. The following are table of specified which shows the test items qualification.

Table 3.1

Table of Specified

Aspect	Standard Competence	Basic competence	Indicator	Number of test items
Reading	Understanding the meaning of simple essay in the form of recount, and narrative to interact with every day situation.	Reading aloud of short functional text and simple essay in the form of recount and narrative in the context of every day situation.	1 Identifying key words in narrative / recount texts? 2 Identifying set detailed information in narrative / recount texts 3 inferring generic structure of narrative text	☐ There are 8 numbers of Items from Indicator number 1 ☐ There are 13 numbers from indicator number 2 ☐ There are 4 numbers from indicator number 3

From table 3.1 the indicator number 2 was the main focus, therefore the number of items were the highest. It had 13 numbers of items. There were only 4 numbers of items derived from indicator number 3. Moreover, there are

8 items come from indicator number 1. Furthermore, the research instrument that was used in pre-test and post-test was provides an easy difficulty items and medium difficulty items level (based on Bloom taksonomi cited in Arikunto, 2008: 121).

3.4   Research Procedures

3.4.1   Organizing Teaching Procedure

Two steps were highlighted when organizing the teaching process. First is preparing the appropriate material for the teaching and learning process during the treatment. Second is organizing the teaching procedures in control and experimental class.

While conventional reading materials and teaching procedures were conducted in the control class, experimental class mostly use PC game as reading materials and teaching procedures. Furthermore, the researcher was acted as teacher and facilitator in both experimental class and control class.

3.4.2   Conducting Try-out Test

In order to investigate the validity and reliability of the instrument, a try-out test was held before implementing it to the research. There were 30 questions of multiple choices related to the text which vary across different genre of reading texts. The materials were taken from several examination test of eighth grade of junior high school students. The try-out test was conducted on November 15, 2008 in class VIII B of SLTPN 4 Serang before the

treatment began.

3.4.3 Treatment

There were two eighth grade classes of SLTPN 4 Serang student selected to the experiments, class VIII D as the experimental class and class VIII C as the control class. The experimental class was had PC game as their basic reading materials and teaching process, while conventional reading materials and teaching was used as the basic of the control class.

3.4.3.1 Implementation of the Experiment

In order to make a well establish experiment, arranging the schedule of the treatment is needed. The following table is the schedule of the experiment.

Table 3.2

Schedule of the Study

No	Experiment Group		Control Group	
	Date	Material	Date	Material/Theme
1	November 17, 2008	Pretest	November 21, 2008	Pretest
2	November 22, 2008	Nancy Drew	November 22, 2008	LOVE story
3	November 24, 2008	Nancy Drew	November 28, 2008	LOVE story
4	November 29, 2008	Nancy Drew	November 29, 2008	Cinderella
5	December 1, 2008	Nancy Drew	November 5, 2008	Cinderella
6	December 6, 2008	Posttest	November 6, 2008	Posttest

3.4.3.2 Classroom activities of experimental class

Experimental class activities are shown as follow:

1. Pre-reading activity

   At the first meeting teacher were try to explore the prior knowledge of the students to see how far the students know about the environment of the game, how to explore the game, and what kind of text and question will appear in the game.

   Afterward, the teacher was explaining what the students should do with the game. For example, every beginning of the lesson the teacher will always state the objective of the game that the students have to finish for today lesson. Moreover, the teacher was also state the information that the students need to write, the character, the objective, or the storyline of the game.

2. In whilst activity, the students' were explore the game and try to find the clues to finish the objective given. Meanwhile, the teacher was acted as the facilitator to provide the students knowledge to infer the meaning of some mysteries or some riddles. In short, while the students try to figure out the mystery in the game the teacher was try to observe whether the students understand the text or not by answering the question of students or by giving some question to students.

3. In order to know the students understanding about the game, Post-reading activity were conducted. It tried to explore how far the

students could engage with the game by asking the name of the character they met in the game, the objective that character gives, and the storyline of the game that the students go through.

3.4.3.3 Classroom activities of control Class

Control class activities are shown as follow:

1.   Pre-reading activity

Teacher was tried to explore the students knowledge of the material given. After that, teacher gave the text that was given by the schoolbook.

2.   In whilst activity, teacher was tried to explain the topic of the text and the story of the text. Then, teacher asked the students to answer several question based on the schoolbook given.

3).   In order to know the students understanding about the text, teacher, In post reading activity, asked the students to retell the text based on their understanding.

3.4.4   Administering Pre-test and Post-test

To know the students' prior reading achievement pre-test was held. It was given to each class, experimental class and control class. Afterward, at the end of the treatment post-test was given to both classes experiment class and control class in order to investigate the effectiveness of PC game in teaching

reading.

3.5 Data Analysis

3.5.1 Scoring Technique

There are two types of formula in processing the score for multiple choice tests: with punishment and without punishment (Arikunto, 2008: 172). To avoid the negative score, this research uses the formula without punishment. Here is the formula:

$$S=R$$

(S stands for Score; R stands for the right answer)

3.5.2 Data Analysis for Try-out Test

In order to get the valid and reliable test items that will be used as the instruments research, the obtained data from try-out test were analyzed. Moreover, a valid test is when the test can measure the purpose of the research or study (Anderson, et. al cited in Arikunto, 2008: 65). Therefore, instrument validity and reliability is very essential in a research.

3.5.2.1 Instrument Validity

Validity is measurement which shows the validity levels or quality levels of an instrument (Arikunto, 2006: 168). Still according to Arikunto (2008: 70) Pearson product moment correlation can be used to determine the validity of each instrument items.

The data will be interpreted using the following criteria:

Table 3.3

Interpretation table of r Coefficient

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, 2008:75)

3.5.2.2 Instrument Reliability

Nazir (2005: 134) stated that reliability is the precise levels of an instrument. In other words, reliability provides the consistent and stable indication of a research instrument (Arikunto, 2008: 87). There are several formulas to measure the reliability of an instrument; one of the formulas is Spearman – Brown formula.

This research was used Spearman – Brown formula to investigate the reliability of the instrument and afterward the data will be interpreted using the following criteria:

Table 3.4

r Coefficient Correlation

r Coefficient	Correlation
0.800 - 1.000	Very High
0.600 - 0.800	High
0.300 - 0.600	Moderate
0.000 - 0.300	Low

(Arikunto, 2008: 75)

3.5.3 Data Analysis on Pre-test

Pre-test which means to know the initial ability of the students and the initial equality between the groups was measured using Independent t-test. Coolidge (2000: 143) assumes that there are three points should be considered in using t-test:

1. The participant must be different in each group.

2. The normality of the dependent variable and homogeneity of the variance.

3. The scores on the independent variable are continuous.

Consequently, normality distribution test will be conducted before calculated the data using t-test formula.

3.5.3.1 The Normality of the Dependent Variable

Kolmogorov Smirnov formula was used to investigate the normality of the dependent variable, 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_a = the score of the experimental and the control group are not normally distributed

2. Analyzing the normality of the dependent variable using the Kolmogorov Smirnov formula.

3. Comparing the result (D) with the level of significance to test the hypothesis. If the result (D) < level of significance (0.05) the null hypothesis is accepted. Therefore, the score are normally distributed.

3.5.3.2 Homogeneity of the Variance

Coolidge (2000:143) in his book stated that in order to minimize unequal variance large sample sizes, N > 15 or 20 in each group, is needed. Moreover, using equal number of participants in each group will also reduce the unequal variance (Coolidge, 2000:143).

3.5.3.3 Calculation of the t-test

Here are the steps of the t-test calculation:

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

H_0 = there is no significant difference between the two samples mean

(Xe = Xc)

H_a = there is a significant difference between the two samples mean (Xe

$\neq$ Xc)

2. Finding t value using independent t-test formula.

3. Comparing the t value with the level of significance for testing the hypothesis. If the t value does not exceed the level of significance, the null hypothesis is retained. Therefore, the two groups mean are equivalent.

3.5.4   Data Analysis on Post-test

3.5.4.1 Data Analysis on the Experimental and the Control Group Scores

Matched t-test formula was used to investigate the significance of the mean difference between pretest and posttest means (Coolidge, 2000:156). Here are the steps:

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

   H_0 = there is no significant difference between the pre-test and post-test means.

   H_a = there is significant difference between the pre-test and post-test means.

2. Finding t value using matched t-test formula.

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3. Comparing the t value with the level of significance for testing the hypothesis. If the t value ≥ level of significance, the null hypothesis is rejected. Therefore, there is there is significant difference between the pre – test and post-test means.

3.5.4.2 Determination of the Effect Size

Effect size evaluation was used to determine the strength of independent variable (Coolidge, 2000: 151). The formula would be:

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

The following scale is used to interpret the effect size:

Table 3.5

The Correlation Coefficient of Effect Size Scale

Effect size	r value
Small	0.100
Medium	0.243
Large	0.371