CHAPTER III

RESEARCH METHOD

A. Design of the Research

This research design is a correlational research. The researcher used correlational research which is a quantitative method. Correlational research was applied since the researcher mainly intend to find out the correlation among variables. Creswell (2005, p. 325) states that a correlation is a statistical test to determine the tendency or pattern for two (or more) variables or two sets of data to vary consistently. This kind of correlation is *Pearson Correlation* because the kind of data correlation is ordinal and interval. In this research, the researcher found out whether or not there was correlation between variables; critical thinking and reading comprehension. This research covered one independent variable, critical thinking and one dependent variable, reading comprehension. The paradigm of this research was illustrated in the following figures.

$$X \longrightarrow Y$$

X = Students' Critical Thinking

Y = Students' Reading Comprehension

B. Time and Location of the Research

This research was conducted in MAN 2 Gresik located at Jl. Raya Metatu No.07, Benjeng, Gresik, East Java. This study is conducted outside the classroom.

C. Subject and Objective of the Research

The subjects of this research were the students of MAN 2 Gresik who joined in English club which was one of the main extracurricular in MAN 2 Gresik and the students joined English olympiad practice. As the

researcher knew English Olympiad practice's goal was to participate English Olympiad competition.

1. Population

According to Sugiyono (2012, p. 80) states that the population is a generalization area consisting of objects or subjects that have certain quality and characteristics set by the researchers to be studied and then drawn conclusions. The population of this research was the students who joined English club in MAN 2 Gresik even grade of 10 A, B, C, D and also grade of 11 A, B, and C. with totally number of 135 students.

Table 4

Population

No.	Classes	Population
1.	10 A	30
2.	10 B	15
3.	10 C	15
4.	10 D	15
5.	11 A	30
6.	11 B	15
7.	11 C	15

2. Sample

According to Arikunto (2013, p. 174) discussed that sample is part or representative of the population being studied. The research sample were the students of 10 & 11 grade in MAN 2 Gresik. In this research, the researcher took a sample of 10% and determined the error rate of 10% or the level of confidence or (significant) of 90%. The number of samples to be taken in this research, the researcher used the formula from Slovin.

Slovin's formula was used to choose as the participant. Slovin's formula is a formula or formula to calculate the minimum sample size if the behavior of a population is not known with certainty.

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This formula was first introduced by Slovin in 1960. This Slovin formula is commonly used in survey research where the number of samples is usually very large, so the formula is needed to get a small sample but can represent the entire population. One of the methods used to determine the number of samples is using the Slovin's formula in Ridwan (2010, p.71) as follows:

$$n = \frac{N}{1 + Ne^2}$$

Where :

n   = Number of Samples,

N   = Total Population and

e   = Error tolerance (0,1)

Based on the formula above, the number of samples is obtained as follows:

$$n = \frac{135}{1 + 135\,(0,1)^2} = \frac{135}{2,35} = 57,44$$

$$n = 58$$

Sampling technique in this research used *Simple Random Sampling* is an appropriate technique in this research because it is an unbiased survey technique, the average size of the sample can accurately represent the population, free from classification error, easy to conduct and suitable for situations where limited information is available about population. Moreover, cost and convenience of obtaining the desired sample size were also considered.

D. Research Instrument Analysis

The researcher used two kinds of instruments to collect the data; the first was distributing the critical thinking test and the second was giving reading comprehension test.

1. Critical Thinking Test

To measure the students' critical thinking, the researcher used the Cornell Critical Thinking Test (CCTT). The CCTT is a standardized test developed by R. Ennis, Millman, and Tomko (2000). This test was

considered suitable to be used in the present research because it was claimed by its developers to be a general critical thinking test which attempts to measure the critical thinking skills as a whole and it is best used for grade 9 to 12, and college students. Moreover, the test had been widely used throughout the world more than twenty years to measure critical thinking skill. The test was developed based on a sound rationale and that the test x items were intensively discussed by the test developers who were scholars involved in the Illinois Critical Thinking Project. For CCTT, the items are in the form of "Yes, No, Maybe" questions. The specifications of critical thinking test were as follows:

Table 5

The Specification of CCTT

No	Content	Indicator
1	Induction	The students are able to generalize and explain the arguments
2	Deduction	The students are able to make decision and conclusion about the arguments
3	Credibility	The students are able to assess the credibility of sources of information and claims the students make
4	Assumption Identification	The students are able to identify assumptions, reason, examine the arguments

2. Reading Test

To measure the dependent variable, students' reading comprehension, the researcher used reading comprehension test which is taken from Cliff's TOEFL Preparation consisted of 5 passages with 50 questions. Each types of question will be given a practice example questions. The students is given 30 minutes to do the test as much as they can. In addition, the reading test used in this research has already to be tested in the term of validity and the reliability of each question.

The type of the question was multiple choice. The result of students' reading comprehension achievement were classified based on the following table:

Table 6

The Classification of Reading Comprehension

Range	Qualification
80 – 100	Excellent
70 – 79	Good
60 – 69	Average
50 – 59	Poor
0 – 49	Very poor

E. Data Collection

Before collecting the data, the researcher rechecked to make sure that the students were ready to do the test. The first test that was being administered was critical thinking test and continued by reading test.

1. The Steps of Critical Thinking Test
   a) Firstly, the participants were asked to fill out the name, date of birth, grade and students' number in the answer sheet.
   b) The participants were asked to read the direction of the test
   c) The researcher explained the direction of the test and how to answer the test. After the participants were ready, the test was started and the researcher supervised the test took place.
   d) The participants had to finish the questions of critical thinking test in 50 minutes.
   e) After the participants completed the test, the participants' answers were scored and the results were analyzed.

2. The Steps of Reading Test
   a) The reading test was conducted in the same day directly after the participants finished the critical thinking test.
   b) Firstly, the participants were asked to fill out the name, date of birth, grade and students' number in the answer sheet.

c) The participants were asked to read the direction and the scoring criteria of the test.

d) The reading test consists of 50 questions and the students are given 30 minutes to do the test.

e) After the participants finished the reading test, their answers were scored and the results were analyzed.

F. Data Analysis

After the data of students' critical thinking skill and reading skill had been collected, the scores of the two tests were analyzed to determine whether there was correlation or not between two variables covered in this study. At the end, this analysis could be useful to examine the truth or false of this study hypotheses. In this research, the parameter statistic was used to calculate the data. Therefore, as the requirement in the parameter statistic in correlation research, the linearity and normality distribution of the data had to be examined first.

1. **Test of Normality Data**

Testing normality was employed to check whether the population had normal distribution or not. The value of normality table was sought with significance of 5%. After the value of normality table was found, it had to be compared with the value of the normality test result to find whether the data had a normal distribution or not.

2. **Test of Linearity Data**

Linearity test aimed to determine whether the two variables significantly had a linear relationship or not. This test was used as a prerequisite in the analysis of correlation. Moreover, to find out the regression line, the variance analysis table (ANOVA) was used in this study.

3. **Test of Pearson Product Moment Correlation Coefficient**

To find out the correlation between two variables, Pearson Product Moment correlation was employed. In addition, the computer

software such as Microsoft Office Excel 2010 and SPSS version 25.0 were used to assist the writer in analyzing the data of this study. Here, is the formula to find the Pearson Product Moment correlation coefficient value:

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

The descriptions of the formula above are explained as follow:

= Correlation coefficient value

N = Number or sum of the participants

= Sum of X score

= Sum of Y score

Y = Sum of the products paired scores

Meanwhile, the hypotheses were analyzed using t-test. The t-test was used to see the score difference between the two variables: the student's critical thinking skill and the student's reading comprehension skill. After getting the result of t-value, then the t-value was consulted to the t-table to be interpreted. The t-value was tested using this formula:

$$t = \frac{r_{xy}\sqrt{n-2}}{\sqrt{1-r_{xy}^z}}$$

The descriptions of the formula above are as follow:

t : the t- value

r : Correlation coefficient value

n : Number or sum of the participants

Then, to know the level of correlation of two variables covered (critical thinking and reading comprehension skill), the can also be interpreted with the table of *r* score interpretation as presented in the following table:

Table 7

Table r Score Interpretation

No.	The "r" score	Interpretation
1.	0.90 – 1.00	Very High
2.	0.70 – 0.89	High
3.	0.40 – 0.69	Moderate
4.	0.20 – 0.39	Low
5.	0.00 – 0.19	Very Low

Table above represents the interpretation of correlation coefficient value (). If the value of is between 0.90—1.00, it means that the both of the variables analyzed have very high correlation; while if the score gained ranges between 0.00—0.19, it can be interpreted that the relationship between two variables analyzed is very low.

Meanwhile, The product moment correlation coefficient was obtained by considering the degree of freedom (df) = N-nr; (N=number of sample, nr=number of variable.)

Statistically, the Hypotheses are:

H_a: $> r$ $_{table}$

H_o: $r_o < r$ $_{table}$

H_a is accepted if $r_o >$ r $table$ or there is a significant correlation between the students' critical thinking and reading comprehension.

H_o is accepted if $r_o >$ r $table$ or there is a significant correlation between the students' critical thinking and reading comprehension.