Chapter Three

Methodology

This chapter presents research design, setting, participant of the research, research instrument, and data collection method. Moreover, data analysis is also presented in this chapter.

Reserch Design

This research used quantitative approach. It is because the researcher investigate the effect of students' critical thinking toward students' skill in writing argumentative texts in which the data are going to be analyzed quantitatively. This research also has independent and dependent variable. Then this research is suitable to use quantitative approach. According to Creswell (2014), quantitative research is an approach for testing objective theories by examining the relationship among variables. In addition, this research used ex post facto (causal-comperative) design as the method. Based on Kothari (2004), ex post facto design is one of non-experimental quantitative research types in which the researcher has no control over the variables.

Research Setting and Participants

The setting of this research was in EED UMY. There are some reasons of choosing EED as the setting. First, the problem of Interpretive Reading and Argumentative Writing Class is students' inadequate knowledge of writing. Second, the phenomenon in EED related to students' critical thinking ability in writing is the reason in conducting the research. Some students cannot think

critically to prove the evidence in writing argumentative texts. The other reason is to measure EED students' critical thinking. Moreover, the researcher is also studying at EED UMY. It is easier to gather the data. The researcher conducted the research in November 2016.

The participants of this research are the students of EED UMY Batch 2015 who take Interpretative Reading and Argumentative Writing Class. It becomes consideration because in Interpretative Reading and Argumentative Writing Class, the students need critical thinking for express their argument. The other reason is that the students batch 2015 have just finished the Interpretive Reading and Argumentative Writing Class. It ease the researcher to gather the data because batch 2015 are still take some courses.

This research used convenience sampling. Convenience sampling take total of participants in the sample based on the ease of access (Kothari, 2004). The researcher used convenience sampling to conduct this research. The participants joined this research because of their availability and willingness. It is in line with Creswell (2014) who state that the participants of convenience sampling are chosen based on their convenience and availability. The researcher chose the respondents who were accessible and available at that time.

The total of research population is 140 students. The population is all items in any field of inquiry a universe (Kothari, 2004). To know the sample size, the researcher used Slovin Formula. The percentage of the accuracy level is 10%. The reason researcher used accuracy level of 10% is because the total population less than 1000.

Slovin Formula (Kriyantono, 2008):

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

n : sample size

N: population

e : precision level (0,1)

Based on Slovin Formula computation, the sample size for this research minimum has 58 students for being participants. For the result, there were seventy students of batch 2015 from three classes (A-C) who become samples of this research based on their attendance at that time.

Research Instrument

In this quantitative research, the researcher used questionnaire to collect the data of students' critical thinking skill. This research used closed ended questionaire because the researcher provides the alternative answers. Closed ended questionnaire have the advantages of easy handling, simple to answer, quick and relatively inexpensive to analyze (Kothari, 2004). The researcher used likert scale in the questionaire. According to Kothari (2004), likert scales consist of numbers of statement which express either a favourable or unfavourable attitude towards the given object to which the participant is asked to react. In this scale, participants state what they like and dislike. The researcher decides to use 1-5 scale. They are never, rarely, sometimes, often, and always. The score of questionnaire items are as follow,

Table 3.1 *Scale item scoring*	
Scale	Description
1	Never / *tidak pernah*
2	Rarely / *jarang*
3	Sometimes / *kadang-kadang*
4	Often / *sering*
5	Always / *selalu*

The questionaire was created based on cognitive domain of critical thinking based on Bloom Taxonomy (1956). This research used questionaire adapted from Mincemoyer and Perkins (2005) to measure students' critical thinking skill. The questionnaire is to find out the EED UMY Batch 2015 students' critical thinking skill. the researcher changes the language questionnaire from English to Indonesian. It is for make clearly and understandable for the participant.

Additionally, this research used students' argumentative writing score document as the instrument to know the effect of students'critical thinking toward students' skill in argumentative writing. The students' score of argumentative writing were taken from test writing argumentative at Interpretive Reading and Writing Argumentative course.

Validity of the Instrument. Validity is indicates the degree to which an instrument measures what it is supposed to measure (Kothari, 2004). An instrument is called valid if it is able to measure the content they were intented to

measure. To know the construct validity of this instrument, the researcher did piloting the questionnaire to check wheather the instrument can be used to measure students critical thinking or not. Based on Kothari (2004), construct validity is the degree to which scores on a test can be accounted by the defining construct of a sound theory. For checking construct validity, this research used expert judgment of two lecturers of EED who master this topic. The researcher changes eight items out of nineteen items, because to make the sentences more understandable.

The researcher did piloting to twenty-two students of EED UMY Batch 2015 class D to know whether the instrument could be used to measure students critical thinking or not. The piloting used questionnaire adapted from Mincemoyer and Perkins (2005) and students' argumentative writing score document. The researcher used descriptive statistic in SPSS 16 to analyze piloting. Arikunto (2002) divided criteria of validity instrument into five levels 0,81 – 1,00 (very high) 0,61 – 0,80 (high) 0,41 – 0,60 (enough) 0,21 – 0,40 (low) 0,00 – 0,20 (very low). Then, the nineteen items were piloted.

Reliability of the Instrument. Reliability of the scores on instruments lead to meaningful interpretation of data. In this research, the reliability performed used Cronbach's Alpha Formula technique in SPSS 20.0 for windows. Sekaran (2000) divided the reliability indicator into three levels:

Table 3.2 *The Criteria of Reliability*	
The Criteria of Reliability (Alpha)	
1. 0.8-1.0	Good
2. 0.6-0.799	Moderate
3. <0.6	Not Good

The language of questionnaire this research used Indonesian. It is to make clearly and understandable for the participant. The table below is the questionnaire of critical thinking instrument construct.

Table 3.4 *Critical Thinking Instrument Construct*			
Critical Thinking Instrument Construct			
No	Indicator of critical thinking based on Bloom Taxonomy (1965) and revision by Anderson and Karthwohl (2001)	Item Number	Total
1	Remember	1, and 2	2
2	Understand	3, 4, 6, 7, 8, and 12	6
3	Apply	5, and 11	2
4	Analyze	13, and 16	2
5	Evaluate	15, 17, and 19	3
6	Create	9, 10, 14, and 18	4
Total			19

Data Collection Method

This research used questionaire to collect the data of students' critical thinking skill. The procedures in collecting the data involve some steps. The questionaire was distributed to seventy students of EED Batch 2015. The researcher asked permission to the lecturer before coming to the class. Before the students answer the questionnaire, the researcher explained how to answer the questions and asked the participants to fill out the consent form first. The participants answered the questionaire in the class around 15-20 minutes.

To get the data of students agrumentative writing skill, the researcher used score document taken from the lecturer of intepretive reading and argumentative writing class. Before that, the researcher asked permission to the lecturer of interpretive reading and argumentative writing class in taking the students' scores.

Data Analysis

This research has two variables, an independent variable and a dependent variable. The independent variable of this research is students' critical thinking skill, and students' skill in writing argumentative text is the dependent variable. The researcher identifies the frequency of questionaire using descriptive statistics in SPSS 16 to reveal students' critical thinking.

Table 3.5 *Category of Students' Critical Thinking Skill Based on Interval Formula*	
Category	Value
Very low	15-25
Low	26-36
Lower middle	37-47
Middle	48-58
Upper middle	59-69
High	70-80
Excellent	81-90

The scores of students argumentative writing text was categorized using interval formula to divide the categorize range to reveal students' skill in writing argumentative text.

Table 3.6 *Category of Students' Score of Writing Argumentative*
Category of students' score of writing argumentative
Excellent : 86-100 (A)
Good : 61-85 (B)
Satisfying : 50-60 (C)
Fair : <50 (D)

Moreover, the data was processed and analyzed to reveal the significant effect of research variables. To analyze the data, this research used simple

regression method. This method aims to find whether there is effect of students critical thinking skill toward students' skill in writing argumentative text.

To know the efffect of dependent variable toward independent variable, this research used simple regression analysis by using a tool called Statistical Package for Social Sciences (SPSS) 16 and Microsoft Excel to make easier in analyzing the data. The formula is $y = \alpha+bx$. This can be translated into English as the value of the dependent variable (y) is predicted to be a constant (a) plus a coefficient (b) times the independent variable (x). Where the symbol y denotes the estimated value of y for a given value of x. This equation is known as the regression equation of y on x which means that each unit change in x produces a change of b in y, which is positive for direct and negative for inverse relationships.