

Chapter Three

Methodology

In this chapter, the delineation of methodology used in this study is presented. This chapter consists of research design, research population and sample, data collection instrument, data collection procedure, and the last is data analysis.

Research Design

To investigate the correlation between physical learning environment and students' critical thinking at English Education Department the researcher used quantitative method, specifically survey design. Quantitative research, which describes phenomena by collecting numerical data before later the data will be analyzed using mathematically based methods (Aliaga & Gunderson, 2000), positive principles are more relied on along with the use of variable and hypothesis language (Lawrence, 2011). By using quantitative research, the finding was resulted in precise numbers to show the correlation between the two variables.

A survey, common measurement tool in behavioral science, is a series of questions or statements delivered to the participants to gain responses (Privitera, 2013). In Creswell (2013), survey design mirrors post-positive philosophical assumptions, for example, determinism argues that the central way to answering questions and hypotheses through survey is by examining the connection between and among variables (p.155). The two variables in this study are learning

environment as the independent variable and students' critical thinking as the dependent variable.

Research Population and Sample

This study was conducted at Universitas Muhammadiyah Yogyakarta. The population of this research was 100 students of English Education Department batch 2012. The reason why the populations of this study taken from batch 2012 was based on the researcher's assumption that students batch 2012 were more familiar with the situation and condition of learning environment at English Education Department and that their critical thinking skills had been developed since they were on their third year as college students. It was also easier for the researcher to deliver the questionnaire in class since they still have classes in this semester.

Subsequently, the researcher used simple random sampling to determine the participants required, which was 79 students from batch 2012 taken from 100 of the whole students batch 2012 at English Education Department Universitas Muhammadiyah Yogyakarta. With the demand of 95% confidence interval and 5% sampling error (α), the researcher only used 79 students out of the whole students. The researcher decided to use simple random sampling because this sampling gave each member of the population an equal chance of being selected (Cohen, Manion, & Morrison, 2011).

Data Collection Instrument

To investigate the correlation between physical learning environment and students' critical thinking at EED UMY, the researcher collected the data using questionnaire, where later the questionnaire items were distributed to the participants. Questionnaire is an indirect data collection method because the researcher do not need to directly asking questions to the respondent (Sudaryono, Margono, & Rahayu, 2013).

According to Wilson & McLean (1994) questionnaire is used widely and suitable instrument for gathering survey information, providing structured numerical data, often being comparatively analyzed straightforward and can be administered without the presence of the researcher. Hence, questionnaire is apt to be used in this research to collect the data.

The total questionnaires consisted of 29 statements with arrangement 15 statements to measure learning environment and 14 statements to measure students' critical thinking. Fifteen statements to measure learning environment are adapted from Gibson "Affordance for students" (1997) and elements of physical learning environment proposed by Mokhtari, Amini, & Mottaghi (2014). To measure students' critical thinking, the researcher adapted seven dispositions of critical thinking proposed by CCTDI. These seven dispositions are truth-seeking, open-mindedness, inquisitiveness, analyticity, systematicity, critical thinking self-confidence, and cognitive maturity. Each disposition is made into two statements. The questionnaire can be seen in appendix one.

To avoid any misunderstanding, the questionnaires were delivered in Bahasa Indonesia, the mother tongue of the participants. The participants responded using a four-point Likert-type scale as the following:

Table 3.1 Scale of Questionnaire

No.	Scale	Score
1.	Strongly Disagree	1
2.	Disagree	2
3.	Agree	3
4.	Strongly Agree	4

In this instrument, neutral option was not included because it does not give a distinct answer as what the researcher expected. In this study, validity, reliability and normality of the instrument were also measured and presented in the form of tables in order to support the verity of the data.

Data Collection Procedure

The procedure to collect the data was divided into several steps. Firstly, the researcher determined the participant of the research. The next step is the researcher asked for permission to the lecturer after decided which classes will be used to deliver the questionnaire. After selecting date and time, the researcher joined the class for approximately the last thirty minutes before the class ended.

Subsequently, the researcher distributed the questionnaire to the participants while giving brief explanation about the procedure of how to fill out the questionnaire items. Then, the participants were given ten to fifteen minutes time to fill out the questionnaire items while the researcher waited inside the classroom

in case the participants would ask questions. Lastly, the researcher collected the questionnaire and thanked the participant for the help.

Data Analysis

The collected data in this study is used to investigate how learning environment and students' critical thinking taking place, and the correlation between physical learning environment and students' critical thinking at English Education Department, Universitas Muhammadiyah Yogyakarta. To answer the first and the second research questions, the researcher used the mean value. Mean of the data is included in descriptive statistics. The data was tabulated in form of tables to show descriptive statistics measurement.

Descriptive statistics is used widely to describe and present data for the researcher to further analyze and interpret what the description mean (Cohen, Manion, & Morrison, 2011). Descriptive statistics used in this study consists of frequencies, measure of central tendency (mean, mode, median), standard deviations, and crosstabulations. Based on the mean value, the researcher made two different ranges of score for learning environment and students' critical thinking.

Table 3.2 The Range Score of Learning Environment

Value	Category
0 – 1.9	Poor
2 – 2.9	Sufficient
3 – 4	Good

Table 3.2 is the range of score for learning environment variable. The score is divided into three categories. Score 0 to 1.9 is included into poor category, 2 to 2.9 is in sufficient category, meanwhile 3 to 4 is in good category.

Table 3.3 The Range Score of Students' Critical Thinking

Value	Category
0 – 0.9	Low
1 – 1.9	Fair
2 – 2.9	Moderate
3 – 4	High

In table 3.3, the researcher distributes the range score into four categories for students' critical thinking variable. Score 1 to 0.9 is low category, 1 to 1.9 is fair category, 2 to 2.9 is moderate category, and 3 to 4 is high category.

The correlation test was used to find out the correlation between the two quantitative variables. The measurement of correlation is also known as Pearson product-moment correlation coefficient (r). In analyzing the data, the researcher used analysis of Bivariate correlation to determine the correlation between the two variables. Further, the data in correlational research has degree of association (Cresswell, 2012), meaning that the association between two variables is a correlation coefficient of -1.00 to +1.00

Table 3.4 The Range Score of Correlation Coefficient

Coefficient (r)	Correlation
0.0 - < 0.20	Very Weak
> 0.21 - < 0.40	Weak
> 0.41 - < 0.60	Moderate
> 0.61 - < 0.80	Strong
> 0.81 - < 1.00	Perfect

Table 3.4 presents the range score of correlation coefficient. The range score is divided into five categories. Score 0.0 to 0.20 means very weak correlation, 0.21 to 0.40 is weak correlation, 0.41 to 0.60 is moderate correlation, 0.61 to 0.80 is strong correlation, and 0.81 to 1.00 is perfect correlation.