CHAPTER III

METHODOLOGY OF RESEARCH

This chapter explains about research design, population, sampling technique, sample, research instrument, validity and reliability testing, normality and homogeneity testing, data collecting method and data analysis.

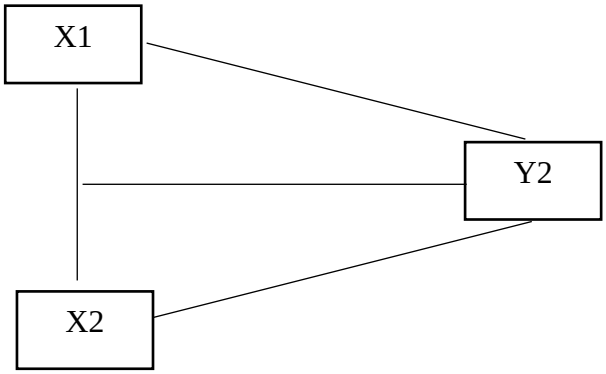
A. Research Design

In this research, the researcher used correlational research especially Path Analysis. According to Pedhazur in Ary *et al* (2010:364) defines path analysis as a method for studying direct and indirect effects of variables hypothesized as causes of variables treated as effects. It means that the explanation above can support this research, because this research using three variables and the goal is to know the correlation among variables.

Path model presents the simultaneous relations between the endogenous variables (variables whose variation is explained by one or more variables within the model) and exogenous variables (variables whose variation is explained by factors outside the model and which also explains other variables within the model) so that the further analysis is done to examine the comparative strength of the direct and indirect relationships among variables (Lleras, 2005). It means that the variable effected by another variable. In this research the familiarity of topic (X1) give effect to argumentative writing (X2) and critical thinking (Y1), and also the argumentative writing (X2) can effect to critical thinking (Y1). The pattern is as illustrated in Table 3.1

Table 3.1

Model Path Analysis



Notes:
X1 = Familiarity of Topic
X2 = Argumentative Writing
Y1 = Critical Thinking

The Table 1 show that the direction of relationships is symbolized by the arrow. It means that the variable of critical thinking skills (Y1) is related with familiarity of topic (X1) and argumentative writing (X2), and argumentative writing (X2) give effect to critical thinking (Y1).

The variabeles clasify into dependen and independent variable, the dependent variable are Argumentative writing and Familiarity of topic. The independent variable is Critical Thinking.

B. Population, Sample and Sampling

According to Ary et al (2010:148) a population is defined as all members of any well-defined class of people, events, or objects. In this research, the target population is English Department students IAIN Tulungagung in 6th semester. The total number of students are 200 students.

A sample is a portion of a population (Ary:2010). The number of the sample for this research would automatically be less than the population. There were 36 students picked as the sample.

Two major types of sampling procedures are available to researchers are probability and nonprobability sampling (Ary:2010:149). The main characteristic of probability sampling is that every member or element of the population has a known probability of being chosen in the sample. In other hand, Nonprobability sampling includes methods of selection in which elements are not chosen by chance procedures. Its success depends on the knowledge, expertise, and judgment of the researcher. In this research, the researcher impossible to choose probability sampling such as randomize sampling technique because the schedule of subject can't be rearranged. So, the researcher chose nonprobability sampling, especially purposive sampling.

Purposive sampling also referred to as judgment sampling-sample elements judged to be typical, or representative, are chosen from the population (Ary et al, 2010:156). In this research the researcher chose B class of English Department in IAIN Tulungagung because the B class has been passed the Argumentative Writing class also the schedule of B class is appropriated with the researcher.

C. Research Instrument

Research instrument is defined as tool(s) to measure the nature or social phenomena being observed (Sugiyono, 2009:102). They are 4 kinds of research instrument that used in this research. The first is writing prompt. It used to elicit data on students argumentative writing. The prompt is the instruction on writing a composition of at least 300 words presenting students' argument on free topic.

Second, rubric for assessing familiarity of topic through mind map. The prompts also require mind map writing related to the given topic. Accordingly, the writing prompts were used to measure the three variables at the same time, namely familiarity of topic, writing performance and critical thinking skills. The rubric is adopted from Indah (2013) to identify the students' familiarity on certain topic seen from the arrangement of concepts, links and linking lines, content, and text. The arrangement of concept identified through the division of the main idea and sub concepts. The links used clarify the connection among the concept presented. The content and the text deal with the logical clarity and the readability of the information given. Each category is rated as follows: 5 representing unsatisfactory, 10 representing proficient, and 15 representing exemplary. The total score is categorized into very good (60-53); good (52-45); fair (44-37); poor (36-29) and very poor (28-20). (see appendix 3)

Third, rubric for assessing writing performance. The rubric for assessing writing performance is taken from the result of considerable and careful

research conducted on ESL Composition Profile (Jacobs et al., 1981; Hartfiel et. al, 1985) It assesses the content, organization, vocabulary, language use and mechanics. The content is assessed through some descriptors such as knowledgeable, substantive, thorough development of thesis and relevant to assigned topic. The organization refers to the fluent expression, ideas supported, logical sequencing and other descriptors such as brief, well organized and cohesive. The vocabulary is examined in terms of the sophisticated range, effective word choice, word form mastery and appropriate register. The language use concerns with the use of effective complex construction, agreement, tense, number, and word order. The mechanics deals with the attention on the use of spelling, punctuation, capitalization, and paragraphing. The total score of writing performance is interpreted into some categories such as excellent to very good (100-88); good to average (87-75); fair (74-64); poor (63-49) and very poor (48-34). (appendix 4)

Fourth, rubric for assessing critical thinking skills. The rubric is adapted from Stapleton (2001) and used to enable the raters to assess the students‘ essay more effectively (Rezaei & Lovorn, 2010). The rubric for assessing critical thinking skills assesses the five elements: arguments, evidence, recognition of opposition, refutation, and conclusion. Based on the quality of each of the critical thinking skill, the scale given is from 1 to 5. Score 1 means that the elements of critical thinking is not existing, score 2 means the elements are reflected implicitly, score 3 means the elements are identifiable; score 4 means the elements are reflected explicitly and adequately, and score 5 means

the elements are reflected and developed well. The total score is categorized as very good (25-21); good (20-17); fair (16-13); poor (12-9) and very poor (8-5) in reflecting the elements of critical thinking. By employing the rubric the focus of the assessment concerns the rhetorical strategies employed in presenting the argument. (see appendix 5)

D. Validity and Reliability

1. Validity Testing

Validity is defined as the extent to which scores on a test enable one to make meaningful and appropriate interpretations (Ary, 2010:224). It means that validity is the used of instrument to measure everything should be measure in the research. There are so many ways to reach the validity of the instrument used to gather the data. There are face validity and construct validity.

a. Face Validity

Mousavi in Brown (2004:26) stated that face validity refers to which a test *looks* right and *appears* to measure the knowledge or abilities it claims to measure, based on the subjective judgement of the examinees who take it, the administrative personnel who decide on its use and other psychometrically unsophisticated observers. In this research, the researcher used face validity by consulting with the expert as a validator. The result of the validator, there are some correction in the instrument like correction of mistyping and spelling. Over-all the instruction was very clear. (see appendix 2)

b. Construct Validity

Construct validity is a slightly more complex issue relating to the internal structure of an instrument and the concept it is measuring (Muijs, 2004: 68). The researcher asked the students to write about mind map and argumentative writing. The students should know about the structure of mind map and argumentative writing, that include many specific aspect, there are:

a. Mind map: Arrangement of concept, Links and Linking lines, Content, Text. All of those aspect based on (franker, 2011)
b. Argumentative Writing: Content, Organization, Vocabulary, Language use, Mechanics. This aspect based on (Jacob, 1981)
c. Critical thinking: Argument, Evidence, Recognition of opposite, Refutation, Conclusion. This aspect based on (Stapelton, 2001)

Based on explanation above the researcher use the argumentative writing to measure the students critical thinking so that's why the instrument consist of two instructions, there are instruction to write mind map and the instruction to write an argumentative writing. (see appendix 2)

2. Reliability

Reliability testing is the next way to measure the test or instrument. The reliability of a measuring instrument is the degree of consistency with which it measures whatever it is measuring (Ary,

2010:236). It means that the reliability is very important to measure the instrument. To measure the reliability of the test, researcher used SPSS. 16 with Cronbach's Alpha. The reliability is based on the following roles:

1. If α score > rtabel in score signification 5% so, the test items are reliable.
2. If α score< rtabel in score signification 5% so, the test items are not reliable

To find r_{table}, the researcher should know the standard deviation of the instrument with formula:

$$Df = N-2$$

In which;

Df = standard deviation

N = the number of students participating in the test,

In this research, standard deviation of the test is 8, with N = 10 and α = 5%. It means that r_{table} of this test is 0,632.

Table 3.2
Result of Cronbach's Alpha

Cronbach's Alpha	N of Items
.740	3

The result show that the score of Cronbach's Alpha is 0,740. It means that Cronbach's Alpha higher than $r_{table.}$ So, the test is reliable and it can be as research instrument.

E. Try Out

The researcher conducted try out to measure whether the instrument appropriate to measure students' critical thinking, students' argumentative writing and students' familiarity of topics. The researcher conducted in English Department of IAIN Tulungagung. The researcher selecting random students at 6th semester to conduct try out. The researcher explains about main map to students, and create main map based on topic that familiar for them. The researcher asked the students to create argumentative writing based on their main map. the scores of the try out showed in appendix 6.

F. Data Collecting Method

In this research, the researcher collects the data on 11th and 12th March 2018. The data consists of familiarity of topic and argumentative writing. Familiarity of topic written in mind map models. The procedure for collecting data consist of students are assigned to write an argumentative essay in English based on the topic they chose. They can develop their claim by using analytical exposition (using reiteration after presenting the thesis and argument), hortatory (giving recommendation after presenting the thesis and argument), discussion or any possible type of generic structure of composition since there is no limitation given. Prior

to writing the essay, they are assigned to draw a mind map on a topic of his/her interest or the topic they develop in their argumentation. Each essay is assessed by involving the researcher and the teacher as the raters using the assessment rubrics. While the mind map is assessed using the rubric familiarity of topic. the summary of the data collection procedure is presented in Table 3.3.

Table 3.3
Blueprint of Collecting Data

No	Data	Collection method	Instrument	Procedures to collecting data
1.	Set of scores of familiarity of topic	Mind map assessment	• Prompt of mind map • Rubric of assessing familiarity of topic	• Students are asked to write a mind map on a topic before writing their essays based on the prompts. • Student's mind map are scored based on the rubric
2.	Set of scores of writing performance	Essay assessment	• Writing prompts • Rubric for assessing writing performance	• Students are asked to write argumentative essay based on the writing prompts • Students' essay are scored based on the rubric
3.	Set of scores of critical thinking skills	Essay assessment	• Writing prompts • Rubric for assessing critical thinking skills	• Students are asked to write argumentative essay based on the writing prompts. • Students' essays are scored based on the rubric

The data were collected by administering the tests to gain the scores on familiarity of topic, writing performance and critical thinking skills. However, the prompts were informed earlier to the students as students need to have the opportunity to prepare the content in advance of the writing because of the difficulties to manage the linguistic demands as second language writers (Weigle, 2002) and to allow students to demonstrate their best writing (Kreth et al., 2010). So, the researcher asked the students to used hand writing in the mind map and argumentative essay.

G. Data Analysis

The next step of analyzing the data is standardizing the variables. This step is taken as each of the variables on familiarity of topic, writing performance and critical thinking skills has different range of scores. The most general method used to transform the data into standardized one is used correlational testing in SPSS 16. The hypothesis testing is done in line with the objective of the study. The testing of the hypothesized model is done using the statistical analysis of multiple correlation.