

## CHAPTER III

### RESEARCH METHOD

#### 3.1 The design of the research

This research is a correlational research where the researcher investigates whether there is a correlation between students' critical thinking and their ability in writing analytical exposition and how strong the relationship is. Correlation analysis is used to describe the strength and direction of the linear relationship between two variables (Pallant, 2005).

According to Creswell, correlation is a statistical test to determine the tendency or pattern for two (or more) variables or two sets of data to vary consistently. In the case of only two variables, this means that two variables share common variance, or they co-vary together (2008). The researcher looks at things that already exist and determines if and in what way those things are related to each other (Subrata, 2009). This is a kind of method that serial the condition through the collection of the data.

There are two variables investigated in this study. First, independent variable is the students' critical thinking which is symbolized by "X". Second, the dependent variable is the students' ability in writing analytical exposition which is symbolized by "Y".



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### 3.4.2 The Sample of The Research

In order to have a well representing sample, the researcher used cluster random sampling technique. This sampling technique was used because the population consists of homogenous classes and heterogeneous members that might have differences individually. The clusters or classes picked as sample were chosen randomly since the researcher had the entire eleventh year student that have the same syllabus and learning materials as the subject of the research, they can be assumed homogenous. There were two classes as the sample of this research:

**Table III.2**  
**Sample of The Research**

| No.   | Class       | Number of Sample |
|-------|-------------|------------------|
| 1     | XI Social 2 | 28*              |
| 2     | XI Social 3 | 28               |
| Total |             | 55*              |

\*one student were absent at the time of the research conducted.

According to Arikunto, if the population is more than 100 persons, the sample is taken between 10-15% (2006). It means that the total number is between 29-44 respondents. Yet, the sample of this study was 55 respondents. It is supported by Margono (2010) in his book that oversampling is always better than under sampling.



### 3.5 The Data Collection Techniques

To collect the data for this research, the researcher used two kinds of instruments as follows:

#### 3.5.1 Questionnaire

The questionnaire was used to find out how the critical thinking of the eleventh grade students of State Islamic Senior High School 2 Model Pekanbaru is. Cohen (2007) says that the questionnaire is a widely used and useful instrument for collecting survey information, providing structured, often numeric data, being able to be administered without the presence of the researcher, and often being comparatively straightforward to analyze.

According to Tishman and Andrade (1996) in Connie's journal (2006) the category of assessment method for evaluating critical thinking dispositions are those based on self-report or self-assessment by learners themselves. The example of self-assessment instrument is questionnaire. Self-assessment instruments such as surveys or questionnaires usually consist of a statement followed by a response continuum such as strongly agree, agree, disagree and strongly disagreed. The subject selects the response that best describes his reaction to the statement.

This questionnaire consists of 30 questions describing seven indicators of critical thinking disposition that can be mapped as follows:

**Table III.3**  
**Blue Print of Critical Thinkng Disposition**

| No | Indicators     | Item Number       |
|----|----------------|-------------------|
| 1  | Truth-seeking  | 1, 7, 11, 26      |
| 2  | Open-minded    | 2, 12, 21, 27     |
| 3  | Analytic       | 3, 8, 13, 16, 28  |
| 4  | Self-confident | 4, 17, 22, 29     |
| 5  | Systematic     | 9, 14, 18, 23, 30 |
| 6  | Inquisitive    | 5, 15, 19, 24     |
| 7  | Mature         | 6, 10, 20, 25     |

### 3.5.2 Test

The data for students' ability in writing analytical exposition was obtained by a test of writing. According to Cohen et al (2007), test is subject to item analysis. The test is used to measure all kinds of abilities, interests, attitudes, and works. In this case, the students will be instructed to write an analytical exposition text in English about certain topic that was given by the researcher.

The following table shows the scoring rubrics of writing according to Jacobs et al in Weigle (2002) used to measure the students writing:

**Table III.4**  
**Writing Assessment Rubric (Jacobs et al, 2002)**

| Aspects      | Level                  | Score | Criteria   |
|--------------|------------------------|-------|--|
| Content      | Excellent to very good | 4     | Knowledgeable, substantive, through development of thesis, relevant to assigned topic.                               |
|              | Good to Average        | 3     | Some knowledge of subject, adequate range, limited development of thesis, mostly relevant to topic but lacks detail. |
|              | Fair to poor           | 2     | Limited knowledge of the subject, little substance, inadequate development of topic.                                 |
|              | Very poor              | 1     | Does not show knowledge of subject, non-substantive, not enough to evaluate.   |
| Organization | Excellent to very good | 4     | Fluent expression, ideas clearly stated/ supported, well organized, logical sequencing, cohesive.                    |
|              | Good to Average        | 3     | Loosely organized, limited support, logical but incomplete sequencing.   |
|              | Fair to poor           | 2     | Non-fluent, ideas confused or disconnected, lack logical development and sequencing.                                 |

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|                     |                        |    |   |
|---------------------|------------------------|----|---|
|                     | Very poor              | 1  | Does not communicate, no organization, not enough to evaluate.  |
| Vocabulary          | Excellent to very good | 4  | Sophisticated range, effective word usage, word from mastery.   |
|                     | Good to Average        | 3  | Adequate range, occasional errors of word usage but meaning not obscured  |
|                     | Fair to poor           | 2  | Limited range, frequent errors of word usage, meaning confused.   |
|                     | Very poor              | 1  | Essentially translation, little knowledge of English.   |
| Language use        | Excellent to very good | 4  | Effective constructions, few errors of agreement, tense, number, word order, article, pronouns, and preposition.  |
|                     | Good to average        | 3  | Effective but simple constructions, minor problems in complex constructions, several errors of agreement, tense, number, word order, article, pronouns, Preposition |
|                     | Fair to poor           | 2  | Major problem in simple construction, frequent errors of negation, tense, number, word order, article, pronouns, preposition  |
|                     | Very poor              | 1  | No mastery of sentence construction rules, dominated by errors, does not communicate or not enough to evaluate  |
| Mechanics           | Excellent to very good | 4  | Demonstrates mastery of conventions, few errors of spelling, punctuation, capitalization, paragraphing  |
|                     | Good to average        | 3  | Occasional errors of spelling, punctuation, capitalization, paragraphing but meaning not obscured   |
|                     | Fair to poor           | 2  | Frequent errors of spelling, punctuation, capitalization, paragraphing, poor handwriting, meaning confused or obscured  |
|                     | Very poor              | 1  | No mastery of conventions, dominated by errors of spelling, punctuation, capitalization, paragraphing, handwriting illegible, or not enough to evaluate             |
| Maximum total score |                        | 20 |   |
| Minimum total score |                        | 5  |   |

$$\text{final score} = \frac{\text{total score}}{\text{maximum score}} \times 100$$



## 3.6 Validity and Reliability

### 3.6.1 Validity

Creswell (2008) stated that validity is the individual's scores from an instrument that makes sense, meaningful; enable you, as the researcher, to draw good conclusions from the sample you are studying to the population. It means that validity is the extent to which inferences made from assessment results are appropriate, meaningful, and useful in terms of the purpose of the assessment.

According to Gay, there are three kinds of Validity. They are content validity, criterion-related validity, and construct validity (2000). In this research, the researcher used constructed validity. Siregar (2013) described that construct validity means the validity that relates to the ability of instrument to measure the concept being measured; it is a non-test instrument which is used to measure psychological construct such us itelligence, motivation, anxiety, and critical thinking as in this research.

To analyze the validity of the questionnaire, the researcher conducted two try outs to the 40 items by handing them to 30 students who were not included in the research sample. Then, the researcher used SPSS 16.0 program for Windows to analyze the data. The researcher compared  $r$  value to  $r_t$ . the  $r_t$  at the significant level of 5% is 0.3061 ( $d = N - 2 = 28$ ). The  $r$  value of each item should be higher than the  $r_t$  to be considered as a valid question. If the value of  $r$  on the analysis of less than  $r$  table, it can be concluded that these items are not significantly correlated with the total score (declared invalid) and must be removed or corrected.

Based on the result of the first try out of the instrument to the 40 items, there were 28 items were obtained as valid questions. However those items did not represent all of the indicators of the research. Thus, the researcher revised the instrument and gave it as the second try out. Finally, there were 30 valid items that well represent all indicators of the research. It means that the instrument could be used in this research. In the following table is the result of the instrument validity:

**Table III.5**  
**The Validity Analysis of Critical Thinking Questionnaire**

| Item No. | R    | Status  | Item No. | R     | Status  |
|----------|------|---------|----------|-------|---------|
| 1        | .541 | Valid   | 21       | -.043 | Invalid |
| 2        | .376 | Valid   | 22       | .233  | Invalid |
| 3        | .368 | Valid   | 23       | .277  | Invalid |
| 4        | .486 | Valid   | 24       | .349  | Valid   |
| 5        | .286 | invalid | 25       | .460  | Valid   |
| 6        | .336 | Valid   | 26       | .491  | Valid   |
| 7        | .344 | Valid   | 27       | .389  | Valid   |
| 8        | .380 | valid   | 28       | .541  | Valid   |
| 9        | .266 | Invalid | 29       | .251  | Invalid |
| 10       | .424 | Valid   | 30       | .541  | Valid   |
| 11       | .271 | Invalid | 31       | .167  | Invalid |
| 12       | .472 | Valid   | 32       | .368  | Valid   |
| 13       | .239 | Invalid | 33       | .435  | Valid   |
| 14       | .357 | Valid   | 34       | .374  | Valid   |
| 15       | .326 | Valid   | 35       | .262  | Valid   |
| 16       | .474 | Valid   | 36       | .186  | Valid   |
| 17       | .312 | Valid   | 37       | .402  | Valid   |
| 18       | .239 | Invalid | 38       | .302  | Valid   |
| 19       | .395 | Valid   | 39       | .408  | Valid   |
| 20       | .411 | Valid   | 40       | .395  | Valid   |

### 3.6.2 Reliability

Reliability has to do with accuracy of measurement. This kind of accuracy was reflected in obtaining the similar results when measurement was repeated on



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different occasion or with different instruments or by different person. The characteristic of reliability is sometimes termed consistency (Brown, 2003:20). And this research is internal consistency reliability. According to Creswell (2012:160), internal consistency reliability is the instrument administered once; using one version of the instrument and each participant in the study completes the instrument. The table below is the categories of reliability test used in determining the level of reliability of the tests.

**Table III.6**  
**The Level of Acceptable Reliability**

| No | Reliability | Level of Reliability |
|----|-------------|----------------------|
| 1  | >0.90       | Very High            |
| 2  | 0.80-0.90   | High                 |
| 3  | 0.70-0.79   | Reliable             |
| 4  | 0.60-0.69   | Marginally/Minimally |
| 5  | <0.60       | Unacceptably Low     |

(Cohen, Manion, & Morrison, 2007)

a. Questionnaire

To obtain the reliability of the questionnaire given, the researcher used SPSS 16.0 program to find out whether the questionnaire was reliable or not.

**Table III.7**  
**The Reliability Level of the Critical Thinking Questionnaire**

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .869             | 30         |

From the table above, it can be seen that the value of cronbach's alpha is 0.869. The value is higher than the standard cronbach's alpha which is 0.60. Therefore, it can be concluded the questionnaire is reliable, and the level of reliability is high.

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### b. Writing Analytical Exposition Test

Borrowing the rubric of writing from Jacobs (et al, 2002), inter-rater reliability formula was used because the researcher used two raters in assessing the writing of the students. According to Creswell (2012), the researcher compared scores from the two raters (rater 1 and rater 2) in order to find out if the scores were similar or not.

In order to find out the correlation between the scores given by rater 1 and 2, the researcher used the F-test inter-correlation analysis by SPSS 16.0 version. below is the result:

**Table III.8**  
**Reliability Statistics of The Writing Test**

| Cronbach's Alpha | N of Items |
|------------------|------------|
| .723             | 2          |

The result shows the value of Cronbach's alpha for the writing scores assed by the two raters is 0.723. It can be concluded that the writing rubric is reliable.

### 3.7 Technique of Data Analysis

For the technique of data analysis, the researcher applied a quantitative analysis. According to David Nunan (2002), quantitative research describes a research problem through a description of trends or a need for an explanation of the relationship among variables by collecting numeric data from a large number of people using instruments with preset questions and responses.

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In order to find out whether there is a significant correlation between students' critical thinking and their writing ability in analytical exposition, the data was analyzed by using statistical formula. The researcher used the score of test of variable X and the score of test of variable Y.

To analyze the data of the students' critical thinking, the researcher used the following formula (Anas Sudijono, 2011):

$$P = \frac{f}{N} \times 100\%$$

Where:

P = Number of percentage

F = Frequency

N = Number of sample

Then, to analyze the correlation between students' critical thinking and their writing ability in analytical exposition, the researcher used Pearson product-moment correlation coefficient (r) technique by SPSS 16.0 program for Windows. The conclusion of the analysis was obtained by looking at the *sig.t* value. Statistically, the Hypotheses are:

$$H_a: sig.t < 0.05$$

$$H_o: sig.t \geq 0.05$$

$H_a$  is accepted if  $sig.t < 0.05$  or there is a significant correlation between the students' critical thinking and their writing ability in analytical exposition.

$H_o$  is accepted if  $sig.t \geq 0.05$  or there is no significant correlation between the students' critical thinking and their writing ability in analytical exposition.