

## **CHAPTER III**

### **RESEARCH METHODOLOGY**

In this chapter the researcher describes the research method. It consists of research design, population and sample, data collection, research instrument, the procedure of collecting data, the validity of the instrument, reliability, and data analysis.

#### **3.1 Research Design**

Researchers conducted a study of the comparison between performance based assessment and multiple option assessment of English at the eleventh grade of Muhammadiyah 8 senior high school of Cerme as one of the high education institutions that use two types of assessment formats namely performance based assessment and multiple option assessment in assessing the students in English learning . The eleventh grade students in that school get a lesson with assessing that using two assessment formats. However, the use of a performance based assessment is still a bit dominating over that time period.

This study uses comparative design which is part of quantitative research. This research is aimed to know the significant comparison differences between performance based assessment and multiple option assessment of English at the eleventh grade students. In the other hand, factors affecting students in favoring certain assessment formats are also analyzed to deepen this research. To get the

data the researcher used the standardized test to analyze the result from collecting the score of performance based assessment and multiple option assessment of English.

## **3.2 Population and sample**

### **3.2.1 Population**

This research will conduct in one of the private school located in Morowudi street. The school is selected to be a research population of several higher education level in Cerme district because it meets the criteria required by the researcher. Researchers focused on high-level education that uses learning English with two assessment formats namely performance based assessment and multiple option assessment. The population of this research is about 90 students.

### **3.2.2 Sample**

In this study, researcher took samples from science majors of the eleventh grade students because they are deemed to have experience in receiving learning with two types of assessment formats. This school, performance based assessment format is slightly dominant used in assessing the students. There are 2 of 6 classes that used performance based assessment and 4 of 6 classes that used multiple option assessment. This data taken from the class of science major at the eleventh grade students. There are 50 students of A and B science class of the

eleventh grade students of Muhammadiyah 8 Senior High School of Cerme in the academic year 2017- 2018 which became the sample of this research. The number consists of 25 students of A science class and 25 students of B science class.

### **3.3 Data Collection**

#### **3.3.1 Research Instrument (Standardized Test)**

Instruments used in this study to identify the subjects. Test were conducted to find out the score of students' assessment from two kinds of assessment format those are performance based assessment and multiple option assessment. This research was conducted with the help of standardized test distributed to the students so that they get two assessment formats during English test in Muhammadiyah 8 Senior High School of Cerme.

The English test consists of several questions about some topics in their book. The types of questions is close questions of multiple option assessment to measure the students' understanding about the content of every topic. The second types of the questions is performance based assessment which the students have to practice their ability by speech or oral presentation. The instrument included 40 questions of multiple option assessment of speaking and for the instrument of performance based assessment included some criteria of the activity that students must do. The rubric assessment already given by the teacher for both assessment. Every rubric assessment has different format and the content.

### **3.3.2 Procedure of Collecting Data**

The procedures used in this study begin by giving self report measure interview and surveys to the teacher who use both assessment namely performance based assessment and multiple option assessment. After finding the school with the criteria, the researcher takes the sample of the research which one of the class uses two assessment formats. The sample was previously taken by using purposive sampling. The researcher collects the score from the teacher who uses both assessment. There are two kinds of the test, first by using multiple option assessment and the second by using performance based assessment which both of the assessment have different format. In the other hand, the validity and reliability of self-reports needs to be measured to ensure the instruments are used well.

### **3.3.3 Validity**

Validity refers to whether a study measures or examines what it claims to measure or examine. Instrument validity test is conducted to measure how the accuracy of a measuring instrument in performing the measuring function. Calculation of validity test in this study is used SPSS 16.0 program. Instrument validity was tested using correlation technique. The instrument is said to be valid if the value of significance  $<0.05$  (Sugiyono,2008). Testing the validity of data performed on each indicator of the variables to be studied.

In this research, the researcher uses content validity and construct validity. To determine the content validity, the researcher asked to the English teacher and checked the instrument validity as syllabus, lesson plan, and score criteria. Whereas to determine the construct validity, the researcher uses the assistance of SPSS version 16.0 programs to compute descriptive statistics. The instrument validity was examined by analyzing item is good or not. The researcher uses:

$$r_{xy} = \frac{n\sum xy - (\sum x)(\sum y)}{\sqrt{\{n\sum x^2 - (\sum x)^2\}\{n\sum y^2 - (\sum y)^2\}}}$$

Which:

$r$  : the coefficient of correlation x and y variable or validity of each item.

$n$  : the number of students/subject participating test.

$x$  : the sum of x scores

$y$  : the sum of y scores

$\sum y$  : the sum of total score for each student

$\sum x$  : the sum of total score in each item

$\sum xy$  : the sum of multiple score from each student with the total score in each item

$\Sigma x^2$  : the sum of the square from each item

$\Sigma y^2$  : the sum of th total score from each student

According to Andresen (2000), the validity criteria are as follows:

**Excellent** : correlation coefficient  $> 0.6$

**Adequate** : correlation coefficient  $0.31 - 0.59$

**Poor** : correlation coefficient  $< 0.30$

### 3.3.4 Reliability

Reliability refers to how consistent the measuring tool is. A measurement is said to be reliable or consistent if the measurement can produce similar results if reused in the same situation. For example, if the speedometer gives the same reading at the same speed it will be reliable. Otherwise it will be very useless and unreliable. Importantly, the reliability of the standardized test, can be assess t-test method.

A reliability leads to the consistency of a measuring instrument, where the degree of reliability will show how the reliable the measurement results are consistent even if done several times against the same measuring instrument.

### **3.4 Data Analysis**

#### **3.4.1 Technique of Analyzing Data**

In conducting a research, it is a requirement to analyze the data in order to interpret the data obtained from the field. The data analysis is carrying out in order to answer the research problems with the data obtained after collecting the students' scores in both assessments. The researcher analyzes the data by using Independent t - Test in SPSS 16,0. The researcher used Independent t - Test because the sample was small and the groups were independent. It was carried out to decide whether there was significant comparison differences between performance based assessment and multiple option assessment.

Assumption for the independent t – test : a) Independence: Observations within each sample must be independent, they do not influence each other, b) amount of subject in every group are same or neared and, c) Normal distribution: The score in each population must be normally distributed and, d) Homogeneity of variance: Two populations must have equal variance (the degree to which the distribution are spread out is approximately equal). The data in this study is include in ratio. The result of the data in ratio is definite homogeny and normal distribution.

### 3.4.2 Homogeneity Test of Variance

For homogeneity test, the researcher used one Levene's test of homogeneity test in SPSS 16,0 version. The purpose of this test was to analysis the variances of the observation between performance based assessment and multiple option assessment were equal. Because the researcher could not random the students so, homogeneity test was necessary to make sure the students in both of the class had the same ability in critical thinking or not. The test of Levene's test ( $W$ ) was defined as follows :

The test statistic,  $W$ , is defined as follows:

$$W = \frac{(N - k) \sum_{i=1}^k N_i (Z_{i.} - Z_{..})^2}{(k - 1) \sum_{i=1}^k \sum_{j=1}^{N_i} (Z_{ij} - Z_{i.})^2},$$

where

- $k$  is the number of different groups to which the sampled cases belong,
- $N_i$  is the number of cases in the  $i$ th group,
- $N$  is the total number of cases in all groups,
- $Y_{ij}$  is the value of the measured variable for the  $j$ th case from the  $i$ th group,
- $Z_{ij} = \begin{cases} |Y_{ij} - \bar{Y}_i|, & \bar{Y}_i \text{ is a mean of the } i\text{-th group,} \\ |Y_{ij} - \tilde{Y}_i|, & \tilde{Y}_i \text{ is a median of the } i\text{-th group.} \end{cases}$

Table : 02 (The formula of Levene's test for testing the homogeneity test)

[https://en.wikipedia.org/wiki/Levene%27s\\_test](https://en.wikipedia.org/wiki/Levene%27s_test)



The significance of  $W$  was tested against  $F(\alpha, k - 1, N - k)$  where  $F$  was a quintile of the  $F$  – test distribution, with  $k-1$  and  $N - k$  its degrees of freedom, and  $\alpha$  was the chosen level of significance (0.05 or 0.01).

The procedures in analyzing the homogeneity by using SPSS VERSION 16.0 were as follows: after the scores were input, then clicked Analyze - Compare - Means Independent Sample t – Test, in Independent Sample t – Test menu, input the score variable into Test Variable column and the group variables, then defined groups, put code 2 for performance based assessment in group 1 and code 5 for multiple option assessment of speaking in group 2 Continue then click OK.

### 3.4.3 Hypothesis Testing

Independent t-test uses to find out the significant comparison differences between performance based assessment and multiple option assessment at the eleventh grade of Muhammadiyah 8 Senior High School of Cerme. The steps of t-test calculation are:

1. Test the hypothesis of the research and the setting  $\alpha$  (alpha) level at 0.05 (two-tailed test). The hypothesis in this research could be formulated as follow:

Null hypothesis is  $\mu_1 - \mu_2 = 0$  ( $\mu_1 = \mu_2$ )

Alternative hypothesis is  $\mu_1 - \mu_2 \neq 0$  ( $\mu_1 \neq \mu_2$ )

H<sub>0</sub>: There is no significant difference between performance based assessment and multiple option assessment at the eleventh grade

H<sub>1</sub>: There is significant difference between performance based assessment and multiple option assessment at the eleventh grade

Finding t-value using Independent - Sample T-Test and comparing the probability with the level of significance for testing the hypothesis. After the scores compute in SPSS 16.00 version, then see the output of Independent-Sample T-Test and interpret the output that if sig. (2-tailed) >  $\alpha$  (0.05), the researcher should accept the H<sub>0</sub>, but if sig. (2-tailed) <  $\alpha$  (0.05), the researcher can be rejected the H<sub>0</sub>, it means H<sub>1</sub> is accepted. T-test calculates to find out the comparison of two means between performance based assessment and multiple option assessment score. In analyzing the data, the researcher uses independent t-test formula. The formula for calculating t-test is:

$$t = \frac{(x_1 - x_2) - (\mu_1 - \mu_2)}{Sx_1 - x_2}$$

Where

$t$  : t value

$x_1$  : Average group 1

$x_2$  : Average group 2

$S$  : Standard error of two groups

$\mu_1 - \mu_2$  : Always defaults to 0

$$S_{x_1 - x_2} = \frac{\sqrt{S^2_{\text{pooled}} + S^2_{\text{pooled}}}}{n_1 + n_2}$$

Where

$S_{x_1 - x_2}$  : Standard error of two groups

$S^2_{\text{pooled}}$  : Variants of two groups

$n_1$  : Number of sample group 1

$n_2$  : Number of sample group 2

Pooled variance : The average of two sample variances, allowing the larger sample to weight more heavily.

Formula:

Estimated standard error of the difference

$$S_{x_1 - x_2} = \frac{\sqrt{(SS_1 + SS_2)(1 + 1)}}{(n_1 + n_2)(n_1 + n_2)}$$

In calculating t-test, the researcher uses SPSS 16.0 version. The first steps, input the data of the scores in SPSS program between performance based assessment and multiple option assessment, then click Analyze then Compare Mean Then Independent Sample T-Test. In Independent Sample T- Test, input the score variable into Test Variable column, and group variable Grouping Variable column, then clicks Define Group, Choose group 1 (for performance based assessment) and group 2 (for multiple option assessment), then click OK.