

CHAPTER III

METHODS OF INVESTIGATION

In this chapter presents Method of the Study, Population and Sample, Instrument of the Study, Technique of Data Collecting, and Technique of Data Analysis.

A. Method of the study

Research is a process of steps used to collect and analyze information to increase our understanding of a topic or issue⁶⁸. Based on the categorization of research design from David Nunan, this study is a case study which is an empirical inquiry that investigates a contemporary phenomenon and context are not clearly evident⁶⁹.

Here, the phenomena is found from the result of the students in doing summative test. Almost all of students got low score. Then, the researcher tries to investigate whether the test is really good in term of a good test or not by documenting and analyzing the students' answer sheet and English Summative test question paper.

This research is categorized as a descriptive analysis because it is intended to describe the items test on the English Summative test of MA Uswatun Hasanah Semarang made by MGMP LP Ma'arif NU of Semarang district for the second grade students at odd semester 2013/2014 by analyzing the validity reliability and practicality of the test and analyzing their item analysis which consists of difficulty level, discriminating power and their distractor analysis.

This study also applied a quantitative research because the writer used some numerical data which is analyzed statistically. As John W. Creswell stated that,

⁶⁸ Creswell, John W., *Educational Research, Planning, Conducting, and Evaluating Quantitative and Qualitative Research Fourth Edition*, (Boston. Pearson: 2002), p. 3

⁶⁹ Nunan, David, *Research Methods in Language Learning*, New York: Cambridge University Press. 1992), p. 76

quantitative data analysis is analyze the data using mathematical procedures, called statistics.⁷⁰

B. Population and Sample

An entire group of people or elements that have at least one characteristic in common is called a population. Examples would include all the residents of a particular suburb, all high school mathematics teachers in a district, or all the states in the United States.⁷¹ Population of this research is the second grade of MA Uswatun Hasanah Semarang in the academic year 2013/2014.

A sample, then, is a small group of observations selected from the total population.⁷² A sample should be representative of the population, because information gained from the sample is used to estimate and predict the population characteristics that are of interest. The researcher will take all of classes in the second grade of MA Uswatun Hasanah as a sample, which is divided into two classes; natural and social science program. The total number of students here are 39. According to Suharsimi Arikunto, when subject less than 100, it will be better to take all of subjects to be analyzed, so the research is the study population.⁷³ Then, the writer will take all of the students' answer sheets to be analyzed because the population is less than 100 subjects.

C. Instrument of the Study

The researcher used four instruments, which are:

1. Students' answer sheets in English summative test for second grade of MA Uswatun Hasanah made by MGMP LP Ma'arif NU of Semarang district in the academic year 2013/2014.

⁷⁰ Creswell, John W., *Educational Research; Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, (USA: Pearson Education, Inc., 2012), 4th edition, p.15

⁷¹ David, Ruth, *Practical Statistic for Educators*, (UK: Rowman & Littlefield Publishers, Inc., 2011), 4th edition, p.24

⁷² David, Ruth, *Practical Statistic for Educators*, (UK: Rowman & Littlefield Publishers, Inc., 2011), 4th edition, p.24

⁷³ Arikunto, Suharsimi, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: Rineka Cipta, 2006), p.116

2. English Summative Test question paper for the second grade of MA Uswatun Hasanah Semarang made by MGMP LP Ma'arif NU of Semarang district at odd semester in the academic year 2013/2014. The researcher used English Summative Test which was conducted on Saturday, December 7th 2013, from 07.30 to 09.00 a.m. The test consists of 55 items, 50 multiple choice items and 5 essay items.
3. English syllabus, it was used to analyze content validity of the test by comparing the contents of the test and the indicators which included on the English syllabus.
4. The result of interview to the teacher, it was used to know the practicality of the test.

D. Technique of Collecting Data

In this research, the researcher used two techniques:

1. Documentary study

The researcher collected English Summative Test question paper for the second grade of MA Uswatun Hasanah Semarang made by MGMP LP Ma'arif NU of Semarang district at odd semester in the academic year 2013/2014, the students' answer sheets and the English syllabus to be analyzed.

2. Interview

Interview is a means of collecting information by asking a number of questions to be answered orally. The main characteristics of the interview are face-to-face contact between the interviewer and interviewee.⁷⁴ In this research, the writer also used interview technique. The researcher interviewed the teacher to get the information about the practicality of the test.

⁷⁴ Margono, S., *Metodologi Penelitian Pendidikan*, (Jakarta: Rineka Cipta, 2010), p.165

E. Technique of Data Analysis

For analyzing the data, the researcher used the techniques as follow:

1. Analysis of content validity

To analyze content validity of summative test the researcher did by comparing between the contents of the test and the indicator that included on the syllabus. Whether the contents have been included on the syllabus or have not.⁷⁵ To analyze content validity of summative test, Suharsimi Arikunto states the formula as follows:

$$C = \frac{A}{B} \times 100 \%$$

In which:

C: Conformity level

a: The indicators indicates which are found in the items of English summative test.

b: The indicators which are recommended in the syllabus.

Then, content validity must be interpreted in the rank scale of content validity, as follow:

Table 3

The rank scale of content validity⁷⁶

Interpretation	P
<i>Good</i>	76 – 100%
<i>Adequate</i>	56 – 75%
<i>Poor</i>	40 – 55%
<i>Bad</i>	> 40%

⁷⁵ Sudjijono, Anas, *Pengantar Evaluasi Pendidikan*, (Jakarta: PT Raja Grafindo Persada, 2008), p.165

⁷⁶ Arikunto, Suharsimi, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: Rhineka Cipta, 2002), p.313

2. Analysis of reliability

To analyze the reliability, the researcher used *K-R 20* formula. The steps are :

- a) Preparing calculation tables in order to test the reliability of the test by displaying multiple choice items.
- b) Finding S_t^2 variants using the formula:

$$S_t^2 = \frac{\sum X_t^2 - \left(\frac{\sum X_t}{N} \right)^2}{N}$$

- c) Establishing the calculation to determine the reliability of the test by formula: *KR 20*

$$r_{11} = \frac{n}{n-1} \left(\frac{S_t^2 - \sum p_i q_i}{S_t^2} \right)$$

Explanation :

r_{11} : coefficient of reliability tests

n : the number of testee who joined in test

1 : constant number

S_t : total variance

p_i : proportion of the testee who answered the items correctly

q_i : proportion of the testee who answered the items incorrectly

$p_i q_i$: the result number of multiplication $p_i q_i$ ⁷⁷

To evaluate the reliability of essay test, the researcher did with the formula *alpha*:⁷⁸

⁷⁷ Purwanto, *Evaluasi Hasil Belajar*, (Yogyakarta: Pustaka Pelajar, 2009), p. 170-171

⁷⁸ Sudijono, Anas, *Pengantar Evaluasi Pendidikan*, (Jakarta: PT Raja Grafindo Persada, 2008), p.208

$$r_{11} = \frac{k}{k-1} \left(1 - \frac{\sum Si^2}{St^2} \right)$$

Explanation:

r_{11} : coefisien reliability of the test

k : total item

1 : constant's number

Si : varians score of each item

St : varians total

Next, according to Anas Sudijono, there are two kinds for interpreting the coefficient reliability of the test:

- a. If r_{11} is equal or more than 0.70, it means that the test results of the study have high reliabillity.
- b. if r_{11} is smaller than 0.70, it means that the test does not have high reliability yet.⁷⁹

3. Analysis of practicality

To analyze practicality of the test, the researcher used interview technique. She interviewed the teacher in order to get information about the practicality of the test. Then, she analyzed the result of interview and made conclusion about it.

4. Analysis of difficulty level

The researcher evaluated an item test by using all the students' answer sheets. The formula is:

$$P = \frac{B}{JS}$$

In which :

⁷⁹ Sudijono, Anas, *Pengantar Evaluasi Pendidikan*, (Jakarta: PT Raja Grafindo Persada, 2008), p.209

P : Index of difficulty

B : The total number of students who got the item correct

JS : The number of students who took a test⁸⁰

The formula above is commonly used for multiple choice item. For the essay items, Zainal Arifin states as follows:⁸¹

$$\text{Mean} = \frac{\text{The total of Students score for each item}}{\text{The number of Students}}$$

$$\text{Index of Difficulty} = \frac{\text{Mean}}{\text{Maximum score of each item}}$$

Then, level of difficulty must be interpreted in the rank scale of difficulty level as mentioned in chapter II.

5. Analysis of discriminating power

To analyze the index discriminating power of multiple choice items, Anas Sudijono states the formula as follows:⁸²

$$D = PA - PB$$

We can analyze the PA and PB by using the formula:

$$PA = \frac{BA}{JA}$$

$$PB = \frac{BB}{JB}$$

⁸⁰ Arikunto, Suharsimi, *Dasar-dasar Evaluasi Pendidikan*, (Jakarta: PT. Bumi Aksara, 2005), edisi revisi, p. 208

⁸¹ Arifin, Zainal, *Evaluasi Pembelajaran*, (Bandung: Remadja Rosdakarya, 2009), p.135

⁸² Sudijono, Anas, *Pengantar Evaluasi Pendidikan*, (Jakarta: PT Raja Grafindo Persada, 2008), p. 389

Explanation:

D : Discriminating power

PA : Proportion of high group who answered the item correctly

PB : Proportion of lower group who answered the item correctly

BA : Total students in high group who answered the item correctly

JA : Total students in high group

BB : Total students in lower group who answered the item correctly

JB : Total students in lower group.

For essay items, the reseracher used the technique to analyze by using the formula:⁸³

$$DP = \frac{\bar{x} ka - \bar{x} kb}{Max\ score}$$

Explanation :

DP : Discriminating power

$\bar{x} ka$: Average of upper group

$\bar{x} kb$: Average of lower group

$Max\ score$: Maximum score

Then, the discriminating power must be interpreted in the rank scale of difficulty level. It has been explained in chapter II.

6. Analysis of distractor

To analyze the effectiveness of distractor the researcher used the following formula:

⁸³ Arifin, Zainal, *Evaluasi Pembelajaran*, (Bandung: PT Remaja Rosdakarya, 2011), p.133

$$\frac{\text{Total testee who answered the question}}{\text{Total testee who joined in tes}} \times 100\%$$

To determine whether a distractor was able to work effectively if the distractors have been choosen at least by 5% of all test participants.⁸⁴

⁸⁴ Sudjijono, Anas, *Pengantar Evaluasi Pendidikan*, (Jakarta: PT Raja Grafindo Persada, 2008), p.411