CHAPTER 3
RESEARCH METHOD

In this chapter, the method of the research is discussed. The parts of methodology such as: setting of the research, research design, population and sample, data collecting techniques, research procedure, data analysis, and hypothesis testing are explained further.

3.1. Setting of the Research

The researcher chose SMA Negeri 1 Purbolinggo as the research place because this was one of the developing schools in East Lampung district that could be reached easily by the researcher. He analyzed the final semester test which had been conducted by the students at the second grade of the third semester. And for the time of research, he prepared for the proposal, determined the object of the research, determined the subject, approached the school and the teachers, sought for permission from the headmaster and teachers of English to carry out the research in that school for one specific time.

3.2. Research Design

This research used quantitative and qualitative approaches. It is obviously true that quantitative study carries out an attitude survey of students and also collect
information from computer records about the frequency of ‘hits’ in the use of web-based course materials (Robinson, Spratt & Walker, 2004:6). Meanwhile, qualitative research focuses on the process of research involves questions and procedures, data typically collected in the participant’s setting, data analysis inductively building from particulars to general themes, and the researcher makes interpretations of the meaning of the data (Creswell, 2009:70). The writer chose this research design because he tried to investigate whether the final semester test had fulfilled the criteria of a good test or not. So, every question in the multiple choice tests was evaluated quantitatively and qualitatively.

From the observation that was done among the items, the use of ITEMAN program for assessing the final semester test would be elicited. The design of this research was descriptive and evaluative. This means that the researcher described the result of an evaluation on an object which was based on the standard criteria.

From the explanations above, this study was planned and done as quantitative and qualitative study that aimed at finding the use of ITEMAN software program and the assessment of the final semester test.

The researcher used one class. The class comprised of students with different ability in English. The students had already been given the test by the school. The result of the test was only taken in the school which means that the researcher had got the data. Subsequently, after the result of the test had been obtained, the researcher analyzed the test.
3.3. Population and Sample

Population is all cases, situations or individuals who share one or more characteristics (Nunan, 1992:231). The population of this research was the second grade students of SMA Negeri 1 Purbolinggo. There were 252 students for the second grade in SMA Negeri 1 Purbolinggo.

After determining the population, the researcher had to pick out the sample of this research. The sample is XI IPA 2. There were 30 students in XI IPA 2. This class was taken by using *purposive sample*. Purposive sampling, also known as judgmental, selective or subjective sampling, is a type of non-probability sampling technique. Non-probability sampling focuses on sampling techniques where the units that are investigated are based on the judgment of the researcher (Patton, 2002:230). The researcher needed to get a group of students who had the lowest score among others as the sample. The purpose was to determine the quality of the final semester test more accurately. Since the final semester test made by MGMP has been used for years by the school, it means that the test is considered good. The researcher needed to know if the group of the lowest students had really bad scores due to the test, to their ability, or to the learning process. Consequently, the researcher chose XI IPA 2 as the sample of this research.

3.4. Data Collecting Technique

The data were collected from the final semester test created by MGMP in 2013/2014 academic year. The researcher took the students’ answers and the test from the school. Then, ITEMAN software program got its turn to analyze the test.
3.5. Research Procedures

The researcher checked the quality of the final semester test after the students’ answers and question sheets had been obtained. The instrument was the final semester test; each item had five options A., B., C., D., and E. Then, the researcher analyzed the test.

There were several procedures to make the research run well. The procedure of this research was as follows:

1. Determining the problems
   The problems were formulated to be a foundation of this research.

2. Determining and selecting the population and the sample
   The population of this research was the second grade of SMA Negeri 1 Purbolinggo. The researcher took one class that contained 30 students. The sample of this research was XI Science 2 class at the third semester.

3. Determining the test
   The test was from the final examination of semester three made by MGMP- SMA LAMPUUNG TIMUR 2013/2014 academic year.

4. Assessing the test
   Before the final semester test was examined quantitatively, the test was analyzed by using qualitative approach to find out the construct validity, content validity, and face validity. Then, this research touched the final semester test by counting on ITEMAN software.
program. The test consisted of 35 multiple choice items, and the students were given 60 minutes to answer.

3.6. Data Analysis

Data analysis is the process of data organization in order to achieve the necessity of the research. The purpose of data analysis is to determine the quality of the final semester test at the second year of SMAN 1 Purbolinggo in 2013/2014 academic year. The data of the research was examined by using quantitative and qualitative approaches.

In order to know the quality of the final semester test at the second year of SMAN 1 Purbolinggo in 2013/2014 academic year, the researcher analyzed the test using traits of language skills and aspects of language, KTSP (School-Based Curriculum), Guidelines for Constructing Multiple Choice Test, and ITEMAN software program.

Before being analyzed by using ITEMAN software program, the researcher evaluated the test by utilizing traits of language skills and aspects of language, KTSP, and Guidelines for Constructing Multiple Choice Test.

Traits of language skills and aspects of language were applied to find out the construct validity of the test. This concerned whether the tests were true reflection of the theory of the trait, in this case, language which was being measured. For content validity, KTSP got its turn to analyze the final semester test. So, the relationship between the test items and the course objectives were mainly focused on. In
analyzing face validity, Guidelines for Constructing Multiple Choice Test helped the researcher determine the validity which was very important for holistic scores.

After analyzing the final semester test using the three items, the researcher conducted the analysis of the data by using the steps of ITEMAN program. The following are the steps to enter the data using a new file (Suparman, 2011):

1. Click *Start*
2. Select *Program*
3. Select *Accessories*
4. Choose and click *Notepad*
5. Save/click *File*
6. Select and click *Save as*, then name the data file, for example: MIDTEST (make sure the file name must not exceed 8 letters/numbers)
7. Start data entry
8. The data appear like shown on the example of the data in the input (Figure 1).

ITEMAN requires that the input data file be formatted in ASCII (text-only) files. Most data files produced by optical scanning devices are very close to the format that ITEMAN requires, with the exception of the 5 lines that must be added at the beginning. These lines (fig. 3.1) contain the control line, the key, number of alternatives, and students’ answers.
After all the data have been put in Notepad and saved, the data are analyzed using ITEMAN program. The following are the steps of utilizing the program (Suparman, 2011):

1. Open ITEMAN Program, by clicking *Start*

2. Select *program/click* ITEMAN and the program shows this appearance.
3. Type the name of your data file (input) on *Enter the name of the input file*. For example, F:\MIDTEST.txt, then *Enter*.

4. Enter the name of the output file on *Enter the name of the output file*. For example, F:\MIDTEST.output, then click *Enter*.

5. A question appears *Do you want the scores written to a file? (Y/N)*, then type *Y* and click *Enter*.

6. Enter the name of your score file on *Enter the name of the score file*: For example, F:\MIDTEST.scr, then click *Enter, Finish*.

Then, there are some steps to open the results of item analysis on MS WORDS program (Suparman, 2011):

1. Click *Start*.

2. Select *Program/click Microsoft Word*.

3. Click *File/click Open*, then look for the results on, for example, *Drive F* (depends on which one you choose).

4. The result appears in output data (Fig. 3.2).
ITEMAN produces an output file, score file (if desired) and statistics file (if desired). The output file contains the statistical measures, and displays them not only for each question, but for each alternative as well. Here is a sample from the output file:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1</td>
<td>0-1</td>
<td>.40</td>
<td>.39</td>
<td>.28</td>
<td>A .10</td>
<td>.09 -.15</td>
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<td></td>
<td></td>
<td></td>
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<td></td>
<td>B .40 .50 .18 .24</td>
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<td>C .40 .25 .64</td>
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<td>Other .00 .00</td>
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</tr>
</tbody>
</table>

And so on

Scale Statistics

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Scale: 0

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N of Items 30
N of Examinees      32
Mean            21.906
Variance         6.085
Std. Dev.        2.467
Skew             -1.504
Kurtosis         3.420
Minimum          13.000
Maximum          25.000
Median           22.000
Alpha            0.476
SEM              1.786
Mean P            0.730
Mean Item-Tot.   0.294
Mean Biserial    0.445
Max Score (Low)  21
N (Low Group)     12
Min Score (High) 24
N (High Group)    10

**Figure 3.2. The Output Data from Final Examination of SMK YADIKA NATAR 2013/2014**

This output lists the proportions of 1) the total number of students selecting, 2) the bottom 27% of the group selecting, and 3) the top 27% of the group selecting for each alternative (ASC, 1989-2006). The output also lists the Biserial Coefficients for each alternative. The asterisk denotes which alternative is the correct answer. This format allows the user to examine alternatives by comparing the high scoring students versus the low scoring students. This easily allows the user to identify alternatives
that are attracting to many high scoring students, indicating the alternative may need revision.

The statistic in output data of ITEMAN is used when the rater identifies a mastery criterion group within the group of students being tested. The upper scoring group is usually the group that passes the test; whereas the lower scoring group is usually the group that fails the test. To find out the proportion correct, the statistic is calculated by taking the number of master students answering the item correctly, subtracting the number of non-master students answering the item correctly and then dividing by the total number of students (Crocker & Algina, 1986). It is calculated by the following formula (Backhoff, Larrazolo, & Rosas, 2000):

\[
p_i = \frac{A_i}{N_i}
\]

where:

\( p_i \) = Difficulty index of item \( i \)

\( A_i \) = Number of correct answers to item \( i \)

\( N_i \) = Number of correct answers plus number of incorrect answers to item \( i \)

The program can process up to a 750-item test with unlimited number of students (ASC, 1989-2006). The user can also manually create a data file using the edit menu in ITEMAN, which is similar to Windows Notepad program. ITEMAN’s controls are few in number and very simple to use. The program offers five pull down menus and five buttons. The user first selects the configure menu or button to identify
the file and select the options desired for analysis. The user then selects the analyze menu or button. The user can view or print the output file by clicking on the view button or print button. These buttons appear after the analysis is complete.

3.7. Hypothesis Testing

The research was intended to find out whether the final semester test in 2013/2014 academic year had fulfilled the criteria of a good test or not. The researcher used the final semester test created by MGMP because the test had been distributed to the students in SMAN 1 Purbolinggo for years. It means that the test was always relied on by the teachers to evaluate the students. So, the probability is that the final semester test has fulfilled the criteria of a good test, that is, has good validity, high reliability, average level of difficulty, high discriminating power, and functional alternatives.