III. METHOD

This chapter discusses the research method. Everything related to the model of research, such as: design, data, data source, instruments, procedure, data analysis, and hypothesis testing will be described here.

3.1 Research Design

In this research, the researcher used ex post facto design which concerns to find a direct relationship between the independent and dependent variables. In the other words, the researcher selected the population, sample, and variables in order to find a cause-and-effect relationship between the variables. Ex post facto often used when the researcher did not has control over the selection and manipulation of the independent variables.

Throughout this research what the researcher meant by ex post facto was fieldindependent and dependent, as independent variable, which was a characteristic that a subject possesses before a study begins. Based on the questionnaire that gave to the students, the researcher classified the students into two groups. Ex post facto of dependent variables was that the result of reading comprehension test of students which made by the researcher based on the syllabus of the SMPN 21 Bandar Lampung. Ex post facto design that the researcher used in this research was called a criterion group design. In this design, two groups of students were compared on one measure.

X1 T

X2 T

- X1 : Field Independent as an independent variable
- X2 : Field Dependent as an independent variable
- T : Reading Comprehension Test as an dependent variable

By using design above, this research found whether students' cognitive styles, students' field independent and students' field dependent, had effected their reading comprehension or not.

3.2 Population and Sample

The population of this research was the second year students of SMP N 21 Bandar Lampung in academic year of 2014-2015. There were three hundreds (300) students among ten classes. According to Arikunto (2010) the sample is partly or deputy population of the research to determine if the size of the sample subject less than 100 better taken all the population to the research. If the population is larger than one hundred (100), the sample can be taken between 20-25 % from the population. Moreover,

the researcher took 20% from the populations. Based on the population above, the researcher has determined the sample by using simple random sampling where every individual in population has probability to be chosen as the sample. It meant that the sample was 60 students from the total population in this research. The students were classified into two groups.

3.3 Data Collecting Technique

The instruments of this research were questionnaire and reading test. There were two kinds of test those were questionnaire and reading test.

They are as follow:

1. Questionnaire

Questionnaire had given to second year students of SMPN 21 Bandar Lampung. The purpose was to categorize the students into two groups that were field-independent and Field-dependent personality. The questionnaire consisted of 40 questions and it allocated within 60 minutes.

2. Reading Test

Reading test administered to measure the students' reading comprehension in each group, named field-independent and field-dependent. The test consisted of 50 items and it was allocated within 80 minutes.

3.4 Variables

In this research, the researcher organized two variables; they were dependent and independent variables. The dependent variables were the variable which the researcher had observed and measured to determine the effect of independent variable. On the other hand, Hatch and Farhady (1982: 15) defines the independent variable is the major variables which the researcher hopes to investigate. It was the variable which has selected; manipulated and measured by the researcher.

From the explanation above, the researcher determined the variables as follows:

- 1. Field-independent students as independent variable.
- 2. Field-dependent students as independent variable.
- 3. Students' reading comprehension as dependent variable.

3.5 Instrument of the Research

To gain the data, the researcher employed two kinds of instrument. The instruments were questionnaire and the test of reading comprehension.

Each kind of instruments would explain as follows:

1. Questionnaire

In order to find the data accurately in dividing the class into two groups, they were field independent students and dependent students; the researcher gave questionnaire to the population. According to Singh A. K (1997), a questionnaire is used when factual information is desired. In line with it, Setiyadi (2006: 54) states that questionnaire is an instrument which is very effective to measure aspects and variables in associated with personality, psychology aspect or sociology. The researcher classified the students into two groups that were field independent and dependent based on questionnaire whose core expressed how act and attitude of the students against the specific even to find out their cognitive style.

There are some indicators in the questionnaire which can represent the characteristics of students' cognitive style. There are analytic, independent, self-confidence, consistency, less socialize, self-control, competitive, and egoistic. Based on Nasution (1987) field independent students' characteristics help us to grasp the characteristic of field-independent students. They are:

- a. Less influenced by the circumstances and the educational system in the past.
- b. Educated to be independent and to control his or her action.
- c. Does not care of the norm of society.
- d. Speaking quickly without considering comprehensive ability of others.
- e. Less socialized.
- f. Found primarily in male but can be overlapping.
- g. Faster in choosing his or her major field.
- h. Able to appreciate humanity and social science even thought there is a tendency to Mathematics and Physics.

- i. To differentiate parts from a whole.
- j. To concentrate on something (like reading a book in noisy bus station).
- k. To analyze separate variables without the contamination of neighboring variables.

In line with it, Nasution (1987) makes it in order for us to understand easier about characteristics of field dependent students. He says that field dependent students are:

- a. Much influenced by environment and educational background.
- b. Educated to be concerned to the others.
- c. Concerned with the norms of society.
- d. Speaking slowly in order to be understood by others.
- e. Having wider social relationship.
- f. Found primarily in female.
- g. Much more difficult in choosing his or her major field.
- h. Less favor in Mathematics, prefer humanity and social sciences.
- i. The general configuration of a problem, or idea, or event.

In brief, actually the students independent field and the students dependent field have the same criteria of their characteristics. The difference between them is they have the different tendency for each characteristics. For example, if the students field independent have high analytical ability, in the other side the students of field dependent have low analytical ability.

Indicator	Statements	Total Number
1. Analytical	1,2,3,4,5,37,38,39,40.	9
2. Independency	6,7,8,9.	4
3. Self Confidence	10,11,12,13,14,22,23,24,30,31,32,33.	12
4. Consistency	15,16.	2
5. Less Socialize	17,18,19,20,21.	5
6. Self Control	27,28,29.	3
7. Competitive	34,35.	2
8. Egoistic	25,26,36.	3
	Total Number	40

 Table 3.1 Table Specification of Questionnaire

2. Reading Test

In this research, the researcher tested the students by using some questions made by the researcher based on the syllabus in the SMPN 21 Bandar Lampung. The researcher did not do a try out test before administering the reading test. In order to score the result of reading test, the researcher only scored the qualified left items which got from the analysis of the difficulty level and discrimination power of reading comprehension. So, there were only 30 qualified items of questions to see the result of students' reading comprehension.

3.6 Research Procedure

The procedures in administering the research were as follow:

1. Determining the Population and Sample

The population of this research was the second year students of SMPN 21 Bandar Lampung. The sample of this research involved sixty students. The researcher gave the students some questionnaire to separate them into two groups they were students' field-independent and students' field-dependent.

2. Determining the Research Instrument

The instrument of this research was objective reading text of multiple choices test. This was supported by Henning (1987), who states that to measure reading comprehension, requesting students to write short-sentence answers to written questions is less valid a procedure than multiple-choice selection. Objective test used for measuring the students reading comprehension from two groups. The test consisted of 50 items of multiple choices of some reading texts. The questions had four alternative answers for each (A, B, C and D), one was the correct answer and the rest were the distracters.

3. Administering the Questionnaire

It was used for knowing the validity and reliability of the questionnaire. The total items in questionnaire were 40. The questionnaire covered students' field-independent and students' field-dependent characteristics.

4. Administering the Reading Test

Giving the reading test to the students for both of groups, here were field-independent and field-dependent. The test consisted of 50 items and it allocated within 80 minutes.

5. Analyzing the Data

The result of the questionnaire was analyzed by *One Way Anova* to separate students' cognitive style between students' field independent and students' field dependent. The data was collected and tabulated in order to input the data into SPSS. The result of the reading comprehension was compared between students' field-independent and students' field-dependent in order to find out whether there was a significant difference in students' reading comprehension both of the two groups. The data of the research was examined by using *One Way Anova*. The data was statistically computed through the Statistical Package for Social Science (SPSS).

3.7 Data Treatment

According to Hatch Farhady as quoted by Setiayadi (2006), using T-Test for the hypothesis testing had three underlying assumption, they were:

- 1. The data is interval ratio.
- 2. The data has been taken from random sample in population.
- 3. The data has been distributed normally.

Therefore, the researcher used normality test to treat the data treatment. Normality test used to measure whether the data in try out class and experiment class was normally distributed or not (Hatch and Farhady in Setiyadi: 2006). The score of the students both groups here means field- independent and Field-dependent was analyzed to gain the normality test. In this research, H1 is accepted if $p>\alpha$ and the researcher used of significance 0.05.

3.8 Scoring System

The scoring system of the students work, the researcher used Arikunto's formula (1989:271). The ideal highest score was 100. The score of reading test calculated by using the following formula:

$$S = \frac{R}{T} 100$$

- S : the score of the test
- R : the total of the right answer
- N : the total items

(Arikunto, 2005:236)

3.9 Criteria of Good Test

1. Validity

Validity refers to the extent to which an instrument really measures the objective to be measured and suitable with the criteria (Hatch and Farhady, 1982:250). A test can be considered to be valid if it can precisely measure the quality of the test. There are three types of validity: content validity, construct validity and criterion-related validity.

To measure whether the test had good validity, the researcher used content and construct validity since the other two are considered to be less needed. Face validity only concerns with the layout of the test. Criterion- related validity had concerned with measuring the success in the future, as in replacement test (Hatch and Farhady, 1982: 251).

a. Content Validity

According to Hatch and Farhady (1982: 251) states that content validity is the extent to which the test measures a representative sample of the subject matter content. Good test is the test which is appropriate with the material has been taught and the material has developed from the educational goal. The test instrument has designed to measure reading comprehension in line with educational goal stated on syllabus for eight grades of junior high school students. In this research, the content of the test items was presented in the table of specification below:

No	Reading skills	Items number	Percentage of
			items
1	Determining Main Idea	1,7,13,19,25,31,38,39,44,46	20%
2	Finding Specific Infor- mation	2,3,8,9,14,15,20,21,26,27	20%
3	Finding Reference	4,10,16,22,28,33,36,40,48,49	20%
4	Finding Inference	5,11,17,23,29,32,35,41,42,45,	20%
5	Understanding Vocabu- lary	6,12,18,24,30,34,37,43,47,50	20%
	TOTAL	50	100%

Table 3.2 Table Specification of Data Collecting Instrument

b. Construct Validity

Construct validity concerns with whether the text is actually in line with the theory of what it means to know the language (Shohamy, 1985:74).

2. Reliability

Reliability refers to the extent to which a test produced consistent result when administered under similar condition (Hatch and Farhady, 1982:244). In addition, Hatch and Farhady (1982: 246) also state that, there are three basic methods of estimating reliability: test- retest, parallel test, and internal consistency methods.

The first, test- retest will be administered in order to determine the stability of the test results. Reliability will be obtained by administering a form test to the same students and computing the correlation between the two administrations. The second, parallel test will be administered in order to determine the correlation between two alternate or parallel forms of tests, and called as a coefficient of equivalence. The tests has equivalent in length, difficulty, time limits, format and all other such aspects. The third, internal consistency method will be administered in order to estimate reliability from a single administration of a single test.

Based on Farady (1982: 246), split- half method can be used to calculating reliability from an examination of internal consistency of the test. The result of the calculating will make sure that the test appropriate for testing or not. To use the spilt- half method, the researcher classified the test items into two similar parts, i.e. odd and even numbered. By splitting the test into two equal parts, it was made if the whole tests have been taken twice. The correlation between those two parts encountered the reliability of half test by using Pearson product moment (Henning, 1987: 60). After researcher had obtained the reliability of half test, the researcher then used spearmen Brown's Prophecy Formula (Hatch and Farhady, 1982: 246) to determine the reliability of the whole test.

To measure the correlation coefficient of the reliability between odd and even number (reliability of half test) the researcher used Pearson Product Moment (Henning, 1987: 60) in the following formula:

$$\mathbf{r}_{Xy} = \frac{N \sum xy - (\sum x) (\sum y)}{\sqrt{[N \sum x^2 - (\sum x)^2][N \sum y^2 - (\sum y)^2]}}$$

r _{xy}	: the correlation coefficient of reliability between odd and even
Ν	: the number of students who take part in the test
x	: the total numbers of odd number items
У	: the total numbers of even number items
x^2	: square of x
y^2	: square of y
$\sum x$: total score of odd number items
$\sum y$: total score of even number items

(Henning, 1987: 60)

After getting the reliability of half test, the researcher then used Spearman Brown's Prophecy Formula (Hatch and Farhady, 1982: 246) to determine the reliability of the whole test as follows:

$$r_{k=}\frac{2 r_{xy}}{1+r_{xy}}$$

 r_k : the reliability of the whole tests

r_{xy} : the reliability of half test

(Hatch and Farhady, 1982: 247)

The criteria of reliability are:

- 0.09-1.00 : High
- 0.50-0.89 : Moderate
- -0.49 : Low
- A. Level of Difficulty

In order to see the level of difficulty, the researcher used the following formula:

$$LD = \frac{R}{N}$$

- LD : level of difficulty
- R : the number of the students who answer correctly
- N : the total number of students following the test

The criteria are:

<30 = difficult

0.30-0.70 = average

>0.70 = easy

(Shohamy, 1985:79)

3. Discrimination Power

The discrimination power was used to discriminate between weak and strong examines in the ability being tested. The students were divided into two groups, upper and lower students. The upper students meant the students who answered the questions correctly were more than the lower students who answered the questions correctly (upper students' score > lower students' score). To determine the discrimination power, the researcher used the following formula:

$$DP = \frac{U-L}{1/2^N}$$

DP : discrimination power

U : the proportion of the upper group who answer correctly

L : the proportion of the lower group who answer correctly

N : the total number of the students

The criteria:

a. If the value is positive, it means that more high level students get correct answer than low student.

b. If the value is negative, it means that more low level students get correct answer than the high level student (it can be said that the test item is bad item, should be omitted).

c. If the value is zero, it means that there is no discrimination.

d. In general, the higher the discrimination index will be the better. In classroom situation most items should be higher than 0.20 indexes.

(Shohamy, 1985: 82)

In accordance with Shohamy (1985:82), there are some criteria of discrimination power of an item. An item is excellent if the discrimination index ranges from 0.71 to 1.00. A good item ranges from 0.41 to 0.70. A satisfactory item ranges from 0.21 to 0.40. An item is poor if the discrimination index ranges from 0.00 to 0.20, and an item is bad if the discrimination index is negative.

3.10 Hypothesis Testing

In order to prove the hypothesis, the data was analyzed by using One way ANOVA of Statistic Package for Social Science (SPSS) windows version 16. The researcher used the level of significance 0.05 in which the hypothesis was approved if sign <p. It meant that if F-value was less than equal to the significant level selected, the effect

If $F_{value} < F_{table} H_0$ is accepted

If $F_{value} > F_{table} H_1$ is accepted

Thus, the hypothesis would be as follow:

- H0 : There is no significant effect of students' cognitive style on their reading comprehension.
- H1 : There is a significant effect of students' cognitive style on their reading comprehension.