III. METHODS

This chapter discussed about research methods which consist of research design, population and sample, data collecting technique, validity and reliability, research procedure, data analysis, and hypothesis testing which were elaborated in the following section.

3.1. Research Design

This research was conducted to find out whether any significant effect of learning styles on students' reading comprehension achievement. The design of this research was an inferential statistical analysis, a quantitative study. In collecting the data, the researcher did not carry out a treatment or an experiment of any kind of subjects. Here, ex post the facto non correlational was used by the researcher for collecting the data.

Thus, the design of this research is as follows:

X   Y

In which:

X   = Learning style as the independent variable

Y   = Reading comprehension as the dependent variable

Whereby, in collecting the data, the researcher gave a reading test (Y) to see the students' reading achievement.

Prior to that, the researcher distributed a questionnaire (X) in order to know the learning style employed by the students in comprehending the reading text. Then, the score from questionnaire (X) was compared with the score of reading test (Y).

3.2. Population and Sample

3.2.1. Population

A research population is generally a large collection of individuals or objects that is the main focus of the research. In this research, the population was all the first grade students of the second semester in academic year 2014-2015, at SMAN 10 Bandar Lampung. There are ten classes of the first grade which consisted about 30 to 35 students in each class.

3.2.2. Sample

Based on the population above, the researcher had determined the sample by using simple random sampling where every individual in population had probability to be chosen as a sample. The researcher used a lottery to determine the sample of the population. Then, X5 class had been selected as the sample of this research which consisted of 30 students there.

3.3. Research Procedure

There were some procedures that would be applied for taking the data, they were:

1. Determining the Population and Selecting the Samples

As what has been explained before that the population and sample of this research was one class from the total ten classes at first grade of SMAN 10 Bandar Lampung. After finding the population and sample, then the researcher find students who have Visual, Auditory or Kinesthetic learning style in that class which had already been chosen randomly by the researcher.

2. Administering the Try-Out for the Reading Test

The researcher had prepared the try-out material of reading comprehension and administered it to another class which had the same characteristic as the sample that had been chosen before. This had been expected to measure the validity and reliability of the test. There were 40 questions of multiple choice in the test and students' were given 90 minutes to answer. The aim of try-out was to determine the quality of the reading test used as the instrument of the research and also to determine which item should have been revised or dropped for the reading comprehension test.

3. Distributing Questionnaire

In this step, the researcher gave questionnaire to students which will indicate their learning style by completing its questionnaire. There were 24 items in the questionnaire to check what style of learning students had; Visual, Auditory, and Kinesthetic. Then, they needed to check strongly agree, agree, or strongly disagree in each item which implies their own characteristic in learning something. The result from this questionnaire was used to identify the students into their style of learning.

4. Administering the Reading Test

After selecting reading test of this research based on the result of try-out test, the researcher tried to administer the sample by giving reading comprehension test. As what already described before that there were 30 questions in this reading test and the researcher used five components of reading included in the test. There were identifying main idea, understanding specific information, finding reference, inference, and difficult word in order to find an average score of all students.

5. Analyzing, Interpreting, and Concluding the Data

The last procedure in doing this research was analyzing, interpreting, and concluding the data of the test. Those data which already gained from the test were tabulated and calculated then. The result of reading comprehension test had been analyzed by using SPSS for window version 16.0 to find out whether there was an effect of learning style on students' reading comprehension.

3.4. Research Instruments

The instruments which were used for collecting data of this research are as follows:

3.4.1. Questionnaire

It must be known well that questionnaires are effective mechanisms for efficient collection of certain kinds of information. While the specific information which researcher wanted to know here was students' learning style.

In this research, questionnaire was as the first instrument which was used by the researcher in order to know students' learning style. All statements in the questionnaire were designed into "bahasa" so it was not really complicated for students in order to minimize their' misinterpretation of the questions. The questionnaire consisted of 24 items that had been prepared based on the indicators of visual, auditory, and kinesthetic learning style, and it had been determined which items design to measure the three learning styles. Each item has numerical value, for example:

1 = Strongly disagree

3 = Agree

5 = Strongly agree

From those three options, students might choose the closest one which related to their own character while learning something.

Further insight can be seen from the following table:

Table 3.1 Table of Specification (Questionnaire)

Items Number	Learning Style			Total Items
	Visual	Auditory	Kinesthetic	
2, 3, 7, 10, 14, 16, 19, 22	✔			8
1, 5, 8, 11, 13, 18, 21, 24		✔		8
4, 6, 9, 12, 15, 17, 20, 23			✔	8
Total				24

All items used in the questionnaire were testing about learning style whether they were visual, auditory, or kinesthetic learner. There were 8 questions indicating each learning style. So, the total items were 24 questions.

3.4.2. Reading Test

In case of doing reading test, the researcher created the reading test which consists of 30 questions with five available multiple choices to be answered in each number. Narrative text was chosen as a type of text which was used in the reading test with the curriculum orientation. Finally, the result of this test would be used to know students' achievement in comprehending a text related to their own character of learning style whether it was visual, auditory, or kinesthetic. It meant that, there would be revealed what learning style had the highest effect on students' reading comprehension achievement.

3.5. Validity and Reliability

To see whether the test was suitable to be used in doing a research, the writer needed to check the validity and reliability of each test. Those would be described as follows:

3.5.1. Validity of the Questionnaire

In case of doing research, a test can be said valid if it measures the object become suitable with the criteria (Hatch and Farhady, 1982: 250). Still Hatch and Farhady (1982: 251), they say that there are two basic types of validity, content validity and construct validity. While according to Shohamay (1985: 74),

validity refers to the extent to which the test measures what was intended to be measured. This meant that it related directly to the purpose of the test.

Thus, to know whether the test had good validity, the researcher looked from the content and construct validity.

1. Content Validity

In content validity, it is intended to see whether or not the questionnaire is good representation which will be tested to analyze students' learning style. The focus of the content validity is adequacy of the sample and not simply on the appearance of the test (Hatch and Farhady, 1982: 251). In this research, to understand better how students prefer to learn and process information, the researcher asked them to answer 30 statements in the questionnaire as honestly as they could, then researcher would use the scoring directions to evaluate students' responses through all the statements which had already been tested.

2. Construct Validity

Regarding the construct validity, it measures whether the construction had already inline with the objective of the learning (Hatch and Farhady, 1982: 251). A test can be considered valid in its construction if the test item measures every aspect which suitable with the specific objective of the instruction. In this questionnaire, there were 30 statements related to human personality in learning something. This was done to check whether the students belonged to what learning style; visual, auditory, or kinesthetic.

3.5.2. Validity of Reading Test

Heaton (1991) states that validity of the test is the extent to which it measures what it is supposed to be measure. It meant that the test should measure every items that included in one aspect that would be measured. So, when we were conducting the test, we should have known or identify what kind of aspect or content included in the topic of the subject for the test itself. Furthermore, to know whether the test had good validity, the researcher looked from the content and construct validity.

1. Content Validity

Relating to the content validity, it is intended to see whether or not the tests were good representation of the materials to be tested. In case of reading testing, the ways to find out this kind of validity were formulating the questions for the first year of senior high school students and choosing the topics of the texts based on the themes provided in the guidelines of curriculum 2014 for the first year of senior high school. The following table is the content of the test:

Table 3.2. Table of Reading Test Specification

No.	Skills of Reading	Item Number	Percentage of Item
1.	Identify the main idea	3, 8, 9, 11, 15, 23, 28	23,4 %
2.	Specific information	1, 2, 7, 10, 14, 21	20 %
3.	Reference	4, 6, 16, 19, 24, 26, 29	23,4 %
4.	Inference	13, 17, 18, 20, 27	16,6 %
5.	Vocabulary	9, 12, 22, 25, 30	16,6%
	Total	30	100

2. Construct Validity

Construct validity examines whether or not the test is in line with the theory of what it meant to know. A test can be considered valid in its construction if the tests item measured every aspect that was suitable with the specific objective of the instruction. In this case, the test was designed by nature and the concept of reading comprehension.

3.5.3. Reliability of the Instrument

Reliability refers to the consistency of the measure. In this research, the result of the questionnaire was scored based on *Likert Scale*. Related to the item in the research, the students would choose a number from 1 to 3 related to their style in learning by using the criteria below:

1. strongly agree

2. agree

3. strongly disagree

Then, in order to measure the consistency of items in the questionnaire, it applied Conbach Alpha Coefficient since it is the most commonly used one. Here, the alpha range is between 0 to 1 which the higher the alpha, the more reliable the questionnaire is. According to Arikunto (1998: 260), the standard of reliability of the instrument can be described as follows:

1.	0.80 -1.00	: very high reliability
2.	0.60 -0.79	: high reliability
3.	0.40 -0.59	: medium reliability
4.	0.20 -0.39	: low reliability

3.6. The Difficulty level of the Test Items

According to Heaton (1975 : 185), the difficulty level of an item shows how easy or difficult which particular item done by the participants (students). In general, level of difficulty expressed the percentage of the students who answered the item correctly.

It is also stated by Halim, Burhan, and Al Rasyid (1974: 142) that the items have the proper difficulty level. It means not too difficult and too easy for the group who will be examined. Moreover, Sudijono (1996: 374) classifies the level of difficulty as follows:

- Less than 0.30   = difficult
- 0.30-0.70   = middle (good item)
- More than 0.70-1.00   = easy

Based on the statements above, it is clear that all the test items should be based on the criteria above and the items which did not fulfill the requirements should be

omitted or revised. Then, to compute the difficulty level of the test items, the writer used the following formula:

$$DL = \frac{H+L}{N}$$

(Purwanto, 1985:112)

In which:

DL   : Difficulty Level

H   : The total of correct answer of the higher group

L   : The total of correct answer of the lower group

N   : The total of students of the higher and lower groups

3.7. Discriminating Power

The discrimination power is the proportion of the high group students getting the items correct minus the proportion of the low –level students who get the items correct.

The formula of the discrimination power is:

$$D = \frac{U - L}{\frac{1}{2} N}$$

(Shohamay, 1985 : 82)

In which:

D   : discrimination power

U   : the number of students from the upper who answer correctly

L   : the number of students from the lower who answer correctly

N   : the number of students

In accordance with Shohamay (1985: 81), there are some criteria of discrimination power of an item. First, an item is excellent if the discrimination index ranges from 0.10 to 1.00. Second, a good item ranges from 0.41 to 0.70. Third, a satisfactory item ranges from 0.21 to 0.40. Fourth, an item called poor if the discrimination index ranges from 0.00 to 0.20 and an item is called bad, if the discrimination index is negative.

3.8. Scoring System

In scoring students' result of the test, the researcher used Percentage Correct. The ideal highest score is 100 and the percentage correct score was used in reporting the result of classroom achievement tests. The researcher had calculated the result of the test by using this following formula:

$$S = \frac{r}{n} \times 100$$

(Henning,1987)

Where:

S = the score of the test

r = the total of the right answer

n = the total of test items

3.9. 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 or equal to the significant level selected, the effect for the term was statistically significant (Setiyadi, 2006). The criteria for accepting the hypothesis were as follows:

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

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

H_0 : There is no significant effect of learning style on students' reading comprehension achievement.

H_1 : There is a significant effect of learning style on students' reading comprehension achievement.