III. METHOD

This chapter deals with research design, variables, data source, instruments, the technique of collecting data, and data analysis would be applied in this research.

3.1 Design

This research is relied on affective psychology and second language to examine the relationship between students’ reading interest and students’ achievement of reading comprehension. To find out the answer of the research problem, a quantitative descriptive research is employed in this research because it is very useful for providing picture or factors connected with second language development. Setiyadi (2002) mentions that a qualitative research is associated with social survey technique like structural interviewing and self administered questionnaire, experiments structured observation, context analysis of official statistics it implies the application of measurement predetermined of qualitative study that can examine broader issues, in a wide geographical spread of representative samples, and is sometimes called a macro approach.

*Ex post facto* research design is used in this research because there is no treatment on subject of the research but the data are collected by seeing the correlation between cause and effect that may happen (after the fact). *Ex post facto* involves only one group and does not use class control. This design is often called co-
relational study. The research designed of *Ex post facto* co-relational study is formulated as follows:

\[ T1 \quad T2 \]

Where:  
T1: Students’ interest  
T2: Students’ reading comprehension

### 3.2 Variables

In this research, there are two variables; they are independent and dependent variable. Students’ interest is classified as an independent variable because it influence to the students’ reading comprehension. The data from students’ reading comprehension test is classified as a dependent variable because it is influenced by students’ interest.

### 3.3 Population and Sample

#### a. Population

According to Suharsimi Arikunto (2010: 173) “Population is all research objects. The research is a population research. When there are someone wants to make research all elements in the research area, the study or research is also being the population study or census study“.

The population was taken as source of this research was all of the second year students of the SMAN 1 PUNGGUR on academic year 2014/2015. The total numbers of this population are 228 students.
b. **Sample**

Sample is a part of the population which is investigated (Arikunto, 2006: 131). The researcher used the method of population research, if the research subject less than 100 is better to take all of it. Thus, it is regarded as a population research. If the research subject more than 100, the researcher can takes 10-15% or 20-25% from the population (Arikunto, 2006:134). Because of the population of this research were more than 100, so the researcher took 20% of the population to represent total about 30 students. In determining the class the researcher used simple random probability. So that those all the second year classes got the same chance to be the sample.

3.4 **Instruments**

The instruments of this research are questionnaire and reading test. The questionnaire was given to measure the level of students’ interest toward reading. Beside the questionnaire, reading test was also used as the instrument in this research. This test was given to know learners’ reading comprehension.

3.4.1 **Reading Test**

There are many kinds of reading assessment such as multiple choice items, written and oral recall, cloze, sentence completion items, open-ended question, true/false, matching activity, checklist, and fill in the blank. It is important to note, that different assessment task may not test the same ability. Individual assessment task provides limited representation of reading comprehension; however, many reading researchers continue to use only task to measure comprehension.
In this research, the researcher used multiple choice questions to measure students’ reading comprehension. The multiple choice questions was created based on two criteria that made by Wolf (1993): (a) All items are passage dependent, and (b) some of items require the reader to make inference. In addition, correct responses cannot be determined by looking at the other question on page. For each multiple-choice question, there are five possible responses, one correct response and four distracters. All distracters in the multiple-choice questions are plausible (Wolf, 1993), and multiple-choice questions cannot be answered correctly by students without having read and understand relevant parts of passages.

The scoring criterion was determined around 0-100, so that if a student was able to answer all the test items, his score was 100. In scoring the students’ result of the test, the formula could be seen as follow:

\[ S = \frac{r}{n} \times 100 \]

Where:
- \( S \) = The score of the test
- \( r \) = The total of the right answer
- \( n \) = The total items

(Henning, 1987)

### 3.4.2 Questionnaire

Questionnaire is commonly used as a research method chosen to collect the data. According Arikunto questionnaire is the number of written questions that used to acquire information from respondents (Arikunto, 2006: 151).
Questionnaire in this research was question or statement about student’s interest toward reading. It was given to the students in order to know the level of students’ reading interest. The questionnaire that was created in this research contained 20 items of interest variables.

The result of questionnaire was scored based on Likert Scale. The scores range from 1-5. It provides the students with these following optional answers:

<table>
<thead>
<tr>
<th>Table 3.1 Specification Scale of score of questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer Alternatives</td>
</tr>
<tr>
<td>A. Sangat Setuju (Strongly Agree)</td>
</tr>
<tr>
<td>B. Setuju (Agree)</td>
</tr>
<tr>
<td>C. Tidak tahu (Neither agree nor disagree)</td>
</tr>
<tr>
<td>D. Tidak Setuju (Disagree)</td>
</tr>
<tr>
<td>E. Sangat tidak setuju (Strongly disagree)</td>
</tr>
</tbody>
</table>

The objective of the questionnaire was to know the students’ reading interest scores. In order to know whether the questions on the questionnaire were suitable for this research, the formula Pearson Product Moment Correlation was conducted. The Students’ Interest Questionnaire as the instruments to gain data of students’ level of interest in reading was also tried out by the researcher in order to find the reliability of the questionnaire by Cronbach alpha.

3.5 Try Out of The Instrument

The try-out was done to prove whether the test had good quality or not. There were four criteria of good test, that is, validity, reliability, level of difficulty, and
discrimination power. That try-out of the instrument was divided into two, that is, try-out of students’ reading interest questionnaire and try-out of reading comprehension test. Theoretically, to determine the quality of those tests, the researcher analyzed four criteria of good test as follow.

### 3.5.1 Reliability

Reliability refers to whether the test is consistent in its score and gives us an indication of how accurate the test score are (Shohamy, 1985: 70).

#### a. Reliability of Reading Test

A test is called reliable if the score gained by examiners is constant whenever and by whomever the test is conducted. A test would be a good parameter if the test is suitable or constant. The test was determined by using Pearson Product Moment which measures the correlation coefficient of the reliability between odd and even number (reliability of half test) in the following formula:

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

Where:

- \( n \): the number of students in sample
- \( r_{xy} \): coefficient of reliability between odd and even numbers items
- \( x \): odd number
- \( y \): even number
- \( \sum x^2 \): total score of add number items
- \( \sum y^2 \): total score of even number items
- \( \sum xy \): total score of odd and even number
After getting the reliability of the half test, the researcher used Spearman Brown formula. This formula was used to determine the reliability of the whole tests. The formula as follow:

\[ r_n = \frac{2r_{xy}}{1 + r_{xy}} \]

Where:
- \( r_n \) = reliability all items
- \( r_{xy} \) = coefficient of reliability between odd and even number

The criteria of coefficient correlation are:
- 0.00 - 0.19 = very low
- 0.20 - 0.39 = low
- 0.40 - 0.59 = average
- 0.60 - 0.79 = high
- 0.80 - 1.00 = very high

(Hatch and Farhady, 1982: 122)

b. Reliability of Questionnaire

In order to know the reliability coefficient of the questionnaire, each items of questionnaire were analyzed by using Cronbach Alpha. It was done to indicate that reliability coefficient of questionnaire were reliable and applicable for measure both students’ interest and it’s correlation toward reading comprehension on this research. The alpha ranges between 0 and 1. The higher the alpha, the more reliable the questionnaire will be (Setiyadi, 2002). Arikunto (2006) explains the way to examine the reliability of questionnaire by using Alpha Formula, as follow:

\[ r = \left( \frac{n}{n - 1} \right) \left( 1 - \frac{\Sigma i^2}{\sigma i^2} \right) \]

Explanation:
- \( r \) = reliability
\( n \) = the number of item

\( \sum \sigma_i^2 \) = total variance of all items

\( \sigma_i^2 \) = the total variance

To find out the variance, the researcher uses the formula as follow:

\[
\sigma = \frac{\sum X^2 - (\sum X)^2}{N}
\]

Explanation:

\( \sigma \) = variance

\( \sum X^2 \) = the total square of the number of data

\( (\sum X)^2 \) = square of the total number of data

\( N \) = the number of data

And for knowing the classification of reliability are as follows:

a. Between 0.800 to 1.00 = very high reliability
b. Between 0.600 to 0.800 = high reliability
c. Between 0.400 to 0.600 = moderate reliability
d. Between 0.200 to 0.400 = low reliability
e. Between 0.000 to 0.200 = very low reliability

3.5.2 Validity

Validity refers to the extent to which the test measures what is intended to measure. A test can be said valid if the test measures the object to be measured and suitable for the criteria (Hatch, and Farhady, 1982: 251). In general, there are four kinds of validity as follows:

- Face validity, concerns with the layout of the test;
• Content validity, depends on a careful analysis of the language being stated;
• Construct validity, measures certain specific characteristic in accordance with a theory of language learning;
• Criterion-related validity, concerns with measuring the success in the future as in replacement test.

In this study, the researcher used content validity and construct validity.

a. Validity of Reading Test

As mentioned before, the researcher used content validity and construct validity. Content validity emphasizes on the equivalent between the material that has been given and the items tested. Simply, the items in the test must represent the material that has been taught. To get the content validity, the test adapted from the students’ handbook and based on the objectives of reading activity. Moreover, the researcher also made a table of specification in order to judge whether the content validity is good or not.

Table 3.2 Table Specification of Reading Comprehension Try-out Test

<table>
<thead>
<tr>
<th>No</th>
<th>Reading Skills</th>
<th>Items Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Identifying main idea</td>
<td>1, 7, 11, 16, 23, 28, 31, 36</td>
<td>20%</td>
</tr>
<tr>
<td>2.</td>
<td>Making predictions</td>
<td>2, 6, 8, 12, 13, 21, 26, 33, 38</td>
<td>22.5%</td>
</tr>
<tr>
<td>3.</td>
<td>Interpreting problems/solutions</td>
<td>5, 15, 19, 25, 29, 34, 40</td>
<td>17.5%</td>
</tr>
<tr>
<td>4.</td>
<td>Understanding vocabulary</td>
<td>4, 9, 14, 17, 20, 24, 30, 32, 35, 39</td>
<td>25%</td>
</tr>
<tr>
<td>5.</td>
<td>Making a generalization</td>
<td>3, 10, 18, 22, 27, 37</td>
<td>15%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>40 items</td>
<td>100%</td>
</tr>
</tbody>
</table>

Furthermore, construct validity is concerned with whether the test is actually in line with the theory of what it means to know the language (Shohamy, 1985: 74). To make sure the test reflected the theory in
reading comprehension, the researcher examined whether the test questions actually reflected the means of reading comprehension or not.

**b. Validity of Questionnaire**

To get construct validity, the questionnaire used based on the theory about interest from Frymeir (in Crawley and Mountain, 1995). He identified six factors that influenced the development of children's interests. These factors are as follows:

1. **Previous Experience.**
   
   Students may not develop their interest toward something new that they have never been experienced.

2. **Self Concept.**
   
   Students may reject information that feels threatened; otherwise the student may receive it if it is felt useful and help them to improve their skill.

3. **Value**
   
   Student interest arises if a subject is presented by an authoritative people.

4. **Understandable Subject**
   
   Information that is easily understood by students may attract their interest.

5. **The Level of Pressure Involvement.**
   
   If students feel that they have some rate options and is less pressure, their reading interest may be higher.

6. **The Complexity of subject material.**
Students who are better intellectually and psychologically flexible are more attracted to something more complex.

Questionnaires are valid if the item questionnaire is able to express something that will be measured. Students were asked to rate their interest in reading.

**Table 3.3 Table of Reading Interest Questionnaire Specification**

<table>
<thead>
<tr>
<th>No</th>
<th>Factors that influence students reading interests</th>
<th>Item Number of Questionnaire</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Previous Experience</td>
<td>1, 9, 12, 18</td>
</tr>
<tr>
<td>2.</td>
<td>Self Concept</td>
<td>2, 3, 10, 13, 16</td>
</tr>
<tr>
<td>3.</td>
<td>Values</td>
<td>14, 15, 18, 19</td>
</tr>
<tr>
<td>4.</td>
<td>Understandable Subject</td>
<td>4, 5, 8,</td>
</tr>
<tr>
<td>5.</td>
<td>The Level of Pressure Involvement</td>
<td>6, 7,17</td>
</tr>
<tr>
<td>6.</td>
<td>The Complexity of Subject Material</td>
<td>11, 20</td>
</tr>
</tbody>
</table>

### 3.5.3 Level of Difficulty

Level of difficulty relates to how easy or difficulty the item taken from the point of view of the students who take the test. It is important since test items which are too easy (that all students get right) can tell us nothing about differences within the test population (Shohamy, 1985: 79).

Moreover, the difficulty level of an item shows how easy or difficult that particular item does by the participants (Heaton, 1975:182). The students were divided into two groups that were upper and lower groups. The students’ scores of try out were listed from the highest score and lowest score.
It is calculated by the following formula:

\[ LD = \frac{U + L}{N} \]

Where:
- \( LD \): level of difficulty
- \( U \): the number of upper group who answer correctly
- \( L \): the number of lower group who answer correctly
- \( N \): the total number of students in upper and lower groups

The criteria are as follows:
- \( < 0.3 \) : difficult
- \( 0.3 \leq 0.7 \) : average
- \( > 0.7 \) : easy

(Shohamy, 1985: 79)

3.5.4 Discrimination power

Discrimination power refers to the ability of the test items to distinguish the students who have high capability from those who have low capability. A good item, based on that criterion, is an item which is correctly answered by high level students and is incorrectly answered by low level students.

The calculation of the discrimination power is as follows:

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

Explanation:
- \( D \) = discrimination power
- \( U \) = number of upper-group students who answer correctly
- \( L \) = number of lower-group students who answer correctly
- \( N \) = total number of the students
The criteria of the discrimination power are:

\[ D = 0.00 - 0.20 \text{ = poor} \]
\[ D = 0.21 - 0.40 \text{ = satisfactory} \]
\[ D = 0.41 - 0.70 \text{ = good} \]
\[ D = 0.71 - 1.00 \text{ = excellent} \]

(Arikunto, 2006)

3.6 Results of Try Out Test

The try out test was tried out to the 30 students (XI IPA 3) of the second year of SMAN 1 Punggur on Mei 6\textsuperscript{th}, 2015. That test was administered to determine the quality of the instruments used in the research and also to decide which item should have been dropped and revised. The try-out test was divided into two parts, they were try out of students’ interest questionnaire that consist of 20 questions and 40 items of multiple choice reading comprehension test with five optional alternative answers (A, B, C, D, and E), one is the correct answer and the others are the distracters. The questionnaire had been conducted in 20 minutes and the reading test had been done in 60 minutes. Each result of the try out test will be elaborated as follows.

3.6.1 Result of Try Out of Students’ Interest Questionnaire

In this result of tryout of students’ interest questionnaire, the researcher determined the reliability coefficient of the questionnaire. This reliability coefficient gained through Cronbach’s Alpha (SPSS). The result of the tryout of students’ interest questionnaire can be seen in appendix 1 and 2.
It can be seen from appendix 2, the result shown that reliability coefficient of the questionnaire is 0.875. According to Arikunto (2001) this kind of category has high reliability level. It means that the instrument was reliable and can be used to obtain data.

3.6.2 Result of Try Out of Reading Comprehension Test

Before administrating the reading comprehension test, the try-out of reading comprehension test was also conducted in class XI. 3 of SMAN 1 Punggur in order to analyze the reliability, level of difficulty, and discrimination power to achieve good criteria of the research instrument. There were 40 questions in the test that were created based on five of reading sub skills; identifying mind idea, making prediction, interpreting problems/solutions, understanding vocabulary, and making a generalization. Those items were in the form of multiple choices, which contained five options of answer for each (A, B, C, D, and E), and the students were given 60 minutes to answer all the questions.

Based on the table in appendix 5, there were 40 items in the try-out test. After analyzing the criteria of good test by using level of difficulty and discrimination power, it could be seen that 5 items were dropped. Such as item number 3, 9, 22, 23, and 40. The try out consisted of two difficulty items, they are number 22 and 23. Besides that, the test also consisted of 38 average items (1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 24, 25, 26, 27, 28, 29, 30, 21, 32, 33, 34, 35, 36, 37, 38, 39, and 40).

It found that 35 items were good and administered for the reading comprehension test. On the other hand, 5 items were detected as bad and
dropped item because those items did not fulfill the criteria of level difficulty and discrimination power. So, there were 35 items that administered to the sample of the research. Below is the summarized of specification of reading test:

Table 3.4 Table Specification of Reading Comprehension Test

<table>
<thead>
<tr>
<th>No.</th>
<th>Reading Skills</th>
<th>Items Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Identifying main idea</td>
<td>1, 9, 12, 19, 23, 26, 31</td>
<td>20%</td>
</tr>
<tr>
<td>2.</td>
<td>Making predictions</td>
<td>6, 10, 28,</td>
<td>8.6%</td>
</tr>
<tr>
<td>3.</td>
<td>Interpreting problems/solutions</td>
<td>2, 5, 13, 15, 17, 21, 24, 29, 35</td>
<td>25.7%</td>
</tr>
<tr>
<td>4.</td>
<td>Understanding vocabulary</td>
<td>4, 7, 11, 16, 20, 25, 27, 30, 34</td>
<td>25.7%</td>
</tr>
<tr>
<td>5.</td>
<td>Making a generalization</td>
<td>3, 8, 14, 18, 22, 22, 29, 32, 33</td>
<td>20%</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>35 items</td>
<td>100%</td>
</tr>
</tbody>
</table>

To analyze the reliability of the try-out, split-half technique was used to estimate the reliability of the test and to estimate the reliability of the test and to measure the coefficient of the reliability between odd and even group, Pearson Product Moment formula was used. The computation showed that reliability coefficient of the test was 0.78 (Appendix 6). It could be stated that the test had a high reliability since the range of high criteria in the criteria of reliability was 0.60 – 0.79 (Hatch and Farhady, 1982: 122). It means that the instrument was reliable and can be used to obtain data.

3.7 The Procedures of Collecting Data

The procedures of collecting data are such the following:

- **Determining research instruments:** for reading test, the tests were made based on materials that have been taught. The reading comprehension test was tried out and it consisted of 40 items. It was administered for about 60 minutes. Meanwhile, Students’ Interest Questionnaire was the means to
gain the data of students’ level of interest. The questionnaire on this study concerned on interest on reading.

*b. Determining the subject of the research*: the subjects of this research were determined through simple random probably sampling. There were eight classes of the second year of SMAN 1 Punggur. However, only class XI science II had chance to become the sample of this research. This research used only one class and did not use control class because there was no treatment to the sample but the data were collected by seeing the correlation between the data from questionnaire and the data from reading test.

c. *Trying out the instruments*: the instruments were tried out to the students whose level was equal to the students of SMAN 1 Punggur in order to balance their reading proficiency with the subject of the research. XI. Science 3 was the try out class.

d. *Revising of the instruments*: in this part, the instruments were revised based on the result of the tryout. The revision was done by changing the ambiguous statements, distracters, double correct answer, ect or dropping the items that did not fulfill the good criteria of the research instrument.

e. *Conducting the Interest Questionnaire*: the students had to fill Students’ Interest Questionnaire in order to know their level of interest. They were given 20 minutes to complete interest the questionnaire.

f. *Conducting the reading test*: after the students had filled Students’ Interest Questionnaire, the students did the reading test directly without
any treatment first. They were instructed to finish the multiple choice question in 60 minutes.

**g. Analyzing the data from the instruments:** the data from reading test and students’ Interest Questionnaire were analyzed by using Pearson product moment correlation in order to investigate whether there is any significant correlation between them or not.

### 3.8 Data analysis

In analyzing the data, the result of interest questionnaire and the result of reading comprehension test were used in order to find the coefficient correlation between them. The data was correlated them by using *Pearson Product Moment Correlation* (SPSS) in order to investigate whether any correlation or not, the formula as follow:

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

Where:

- $r_{xy}$ = Coefficient Correlation
- $n$ = the number of students in sample
- $\sum x$ = the sum of students’ reading test score
- $\sum y$ = the sum of students’ interest questionnaire score
- $\sum x^2$ = the sum of square of students’ reading test score
- $\sum y^2$ = the sum of square of students’ interest questionnaire score
- $\sum xy^2$ = the sum of product of x and y scores for each students.

(Sudjana, 1996: 369)

If $r > 0$ there is positive correlation between students’ interest and students’ reading comprehension

If $r < 0$ there is negative correlation between students’ interest and students’ reading comprehension
Coefficient correlation (r) has a range between -1 and 1. If the coefficient correlation (r) approaches 1 so the correlation approaches a perfect. Meanwhile, negative and positive coefficient correlation(r) indicates the direction of correlation. Positive coefficient signifies that x is increasingly high cause the rise of y (x and y are variable). The criteria of coefficient correlation by Sudjana (2002) are:

0 – 0,199 : very low correlation and it can be not respected
0,20 – 0,399 : low correlation
0,40 – 0,599 : average correlation
0,60 – 0,799 : high correlation
0,80 – 1,0 : very high correlation

3.9 Hypotheses testing

After finding the coefficient correlation between students’ reading interest and their reading comprehension and the coefficient influence value of students’ reading interest and their reading comprehension, the researcher should find out the criterion of the hypothesis acceptance. To determine whether the first hypothesis was accepted or rejected, the following criterion acceptance was used:

\[
\text{H}_0 = \text{r value} < \text{r table} \\
\text{H}_1 = \text{r value} > \text{r table}
\]

\( \text{H}_0 \) : There is no positive correlation between students’ reading interest and students’ reading comprehension. We can accept this hypothesis if r value is lower than r table.
H_1: There is positive correlation between students’ reading interest and students’ reading comprehension. We can accept this hypothesis if r value is higher than r table.