A. The Method of Study

Research is a careful inquiry or examination to discover new information or relationship and to expand and to verify existing knowledge (Francis Rummel in Verma, 2004: 2). The method of research which was use in this thesis was experimental research. Experimental research is a research which aims to know whether there is any effect from something given to the subject of research or not (Arikunto, 2010: 9). In other words, experiment tries to look for the causal relationship by comparing one or more group which is given any treatments.

Based on Suwartono (2007: 58), there are 3 kinds of experimental methods, they are as follows:
1. Pre-Experimental design
2. Quasi-Experimental design
3. True Experimental design

The experimental design which is used in this research is quasi experimental design. This design is considered as one of the common designs used in educationally study. This design is usually used to the group whose members are collected naturally like the students in classroom. This research
used non-equivalent design since it was done based on the consideration as follows:

1. There were two groups or classes namely experimental class and control class is which each group would be given pre-test and post-test.

2. Before the experiment was done, the first conditions of the two classes were ignored because in the field condition is imposible to serve equivalent group.

3. The control class would be taught with conventional method, while the experimental class would be given Circle game as the treatment.

The purpose of this research was to find out the effectiveness of circle game for seventh grade students in junior high school in teaching English vocabulary. The design of the research as follows:

Experimental class = O1 X O2
Control class = O3 X O4

Where:
O1 = Pre-test of experiment class
O2 = Post-test of experiment class
O3 = Pre-test of control class
O4 = Post-test of control class
X = Treatment

In this study, there were experimental and control class. Both of the classes were taught English vocabulary with different treatment. The experimental class was taught by using circle game while the control class was taught by using conventional way as usually done before by the teacher.
B. The Subject of the Study

This research was conducted to the Seventh Grade Students of SMP Negeri 4 Purbalingga in Academic Year 2012/2013. The total students’ of the Seventh Grade of SMP Negeri 4 Purbalingga in Academic Year 2012/2013 was 240 students. There were eight classes in SMP Negeri 4 Purbalingga. Each class consists of 30 students.

In this research, it was decided to take two classes as the sample. Those classes were VII G class as the control class and VII H class as the experiment class. Each class consists of 30 students.

The reason of choosing those two classes was based on the consideration that before the experiment was done, the first conditions of the two classes were ignored because in the field condition is imposible to serve equivalent group and two classes is close-set.

C. The Place and Time of Study

1. The Place of Study

The research was held on SMP Negeri 4 Purbalingga in Academic Year 2012/2013.

2. The Time of Study

The research was conducted on April 30th – Juny 28th, 2013.
D. The Technique of Data Collection

Technique for collecting data is the way that can be used by the researcher to collect the data (Arikunto, 2010: 192). The data of the research were collected from test and questionnaire. Below are the descriptions:

1. Test

Data from this research will be collected through test. The test is used to measure the vocabulary mastery. According to Arikunto (2010: 193), test is question, exercise or other tools, which are used to measure skill, knowledge, or talent owned by individual or group. The test type is multiple choices and gap filling. In this research, it would be used two kinds of tests namely:

a. Pre-Test

Pre-test is used to know the vocabulary mastery of each group before treatment is given. Pre-test was given for both experimental class and control class. The instrument that was used in pre-test is multiple choices and gap filling. The numbers of pre-test that would be given are 20 items of multiple choice and 10 items of gap filling.

b. Post-Test

Post-test is used to measure the effect of certain treatment given, in this research teaching vocabulary using circle game. This test would be given after the treatment. The type of test given in the post-test was the same with that in pre-test; it was in the form of multiple-choice and
gap filling. Post-test was given for both experimental class and control class.

Table 1.3
The Blueprint of Instrument Test

<table>
<thead>
<tr>
<th>No.</th>
<th>Topic</th>
<th>Indicator</th>
<th>Number of Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Profession</td>
<td>Answering the question about profession</td>
<td>Multiple choice: 1 – 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gap filling: 6 - 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multiple choice: 1 – 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gap filling: 7 - 10</td>
</tr>
<tr>
<td>2.</td>
<td>Describing people</td>
<td>Answering the question about describing people</td>
<td>Multiple choice: 7 – 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gap filling: 5 - 6</td>
</tr>
<tr>
<td>3.</td>
<td>Things around school and house</td>
<td>Answering the question about things around school and house</td>
<td>Multiple choice: 11 – 16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gap filling: 1 – 2, 4 - 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multiple choice: 11 – 17</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gap filling: 1 - 4</td>
</tr>
<tr>
<td>4.</td>
<td>Procedure text</td>
<td>Answering the question about things around school and house</td>
<td>Multiple choice: 17 – 20</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Gap filling: 3 - 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Multiple choice: 18 – 20</td>
</tr>
</tbody>
</table>

2. Questionnaire

Questionnaire is a number of written question which is use to get information from respondent (Arikunto, 2010: 194). Questionnaire is a way to collect students’ perception about the use of circle game in teaching and learning process. So, questionnaire would be given to the experimental class. The result of questionnaire was determined whether circle game would be used further or not.

Suwartono (2007: 27) says the purposes of questionnaire are to describe and to measure. As a description, information is taken by
questionnaire able to give explanation about identity, for example sex, age, education, job, salary, etc. As a measure, information is taken able to present in form of percentage by scoring the questionnaire using certain valid system.

The score was converted into percentage to explain the rank of some condition. In this case, writer would be used closed questionnaire. To analyze it, the data must be reduced by using tally. Reducing is a process of simplify the data through grouping the answer for each statement. It has fourth options as follows:

SS (Sangat Setuju) = 4
S (Setuju) = 3
TS (Tidak Setuju) = 2
STS (Sangat Tidak Setuju) = 1

The result of reducing would be converted into percentage using the formula as follow:

\[
\frac{\text{Total of students' answer}}{\text{Total of score}} \times 100\%
\]

The total score of each questionnaire was counted by summing up the score of each statement. After that, the data must be presented using frequency of the criteria of score. The criteria of score are as follows:

81 – 100% = very good
61 – 80% = good
41 – 60% = fair
21 – 40% = bad
0 – 20% = very bad

Table 2.3

The Blueprint of Instrument Questionnaire

<table>
<thead>
<tr>
<th>No</th>
<th>Indicator</th>
<th>Number of Item</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Students’ perception in teaching and learning process</td>
<td>1 – 3</td>
</tr>
<tr>
<td>2.</td>
<td>Students’ activeness</td>
<td>4 – 7</td>
</tr>
<tr>
<td>3.</td>
<td>Students’ perception in the learning English</td>
<td>8 – 10</td>
</tr>
</tbody>
</table>

E. The Technique of Instrument Analysis

In getting good data of the research, the instrument must have characteristics, such as validity, reliability and item difficulty of analysis data.

1. Validity

Validity is a measurement that shows the level of a validation of an instrument. A valid instrument has high validity (Arikunto, 2010: 211). To find validity of the instrument, the writer uses the formula as follows:

\[ r_{xy} = \frac{N \Sigma xy - \Sigma x \Sigma y}{\sqrt{N \Sigma x^2 - \Sigma x^2 \Sigma y^2 - \Sigma y^2}} \]

Where:

\[ r_{xy} \] = validity of test

\[ N \] = number of students

\[ \Sigma xy \] = the total amount of the multiplication between the number of students who answer correctly for one question and the total score of the correct answer of the students for one question
\[ \Sigma x \]  = the number of the students who answer correctly for one question.

\[ \Sigma y \]  = the total number of correct answer of students

\[ \Sigma x^2 \]  = the sum of square of distribution x

\[ \Sigma y^2 \]  = the sum of squared score in distribution y (the multiplication between the score of the students and the total score of the students)

Then, the result is classified into the validity grade of test items as follows:

Criterion:

\[ 0.81 < r_{xy} \leq 1.00 \]  = very high

\[ 0.61 < r_{xy} \leq 0.80 \]  = fair

\[ 0.21 < r_{xy} \leq 0.40 \]  = low

\[ 0.00 < r_{xy} \leq 0.20 \]  = very low

\[ r_{xy} \leq 0.00 \]  = not valid

2. Reliability

Reliability is an important characteristic of a good test, if the test is administrated or given to the same student in different occasion and the result is consistent, it shows that the test or instrument is reliable.

The formula of reliability is:

\[ r_{11} = \frac{k}{k-1} \left( \frac{Vt - \Sigma pq}{Vt} \right) \]

Where:
\( r_{II} \) = reliability

\( k \) = the total items

\( V_t \) = total variant

\( p \) = proportion of subject who answer the question with the correct item (the proportion of subject who have a score 1)

\( q \) = proportion of subject who gets score of 0 (\( q = 1 - p \))

\( \Sigma pq \) : the sum of multiplication between the population of the students who answered correctly and the proportion of the students who had wrong answer

(Arikunto, 2010: 231)

This research was used some steps as follows:

a. Determining the total variant (\( V_t \))

The formula of total variant as follows:

\[
V_t = \frac{\Sigma y^2 - \frac{\Sigma y^2}{N}}{N}
\]

Where:

\( V_t \) = the variant of total score

\( \Sigma y \) = the sum of students’ total score

\( \Sigma y^2 \) = the sum square of students’ total score

\( N \) = number of students

According to Arikunto, the criterion of instrument’s reliability can be classified as follow:

\( r_{II} \leq 0.02 \) : lowest reliability
\[0.20 \leq r_{11} \leq 0.40 \quad \text{: low}\]
\[0.40 \leq r_{11} \leq 0.60 \quad \text{: enough}\]
\[0.60 \leq r_{11} \leq 0.80 \quad \text{: high}\]
\[0.80 \leq r_{11} \leq 1.00 \quad \text{: highest}\]

b. Calculating \( \Sigma pq \)

In calculating \( \Sigma pq \) here some steps:

1. Determining \( p \)
   \[ P = \frac{\Sigma \text{correct answer}}{\text{number of respondent}} \]

2. Determining \( q \)
   \[ q = 1 - p \]

3. Multiplying between \( p \) and \( q \)

c. Entering formula

After finding \( \Sigma pq \), \( vt \) and \( k \) then enter it to formula. After knowing the result then writer consults to the \( r \) table. If the \( r \) counted is higher than the \( r \) table, it means that the test is reliable.

3. Item Difficulty

Item difficulty show how easy or difficult the particular item proved in the test. It was calculated by using formula as follow:

\[ FV = \frac{F}{N} \]
Where:

\[ \text{FV} = \text{the index of difficulty} \]
\[ F = \text{the number of correct answer} \]
\[ N = \text{the number of students taking the best} \]

Arikunto (2010: 239) notes that an item is said to be too difficult if the index of difficulty is less than 0.30 and it is said too easy if the index of difficulty more than 0.70 it is supported by difficulty of test:

0.00 – 0.30 = difficult
0.30 – 0.70 = medium
0.71 – 1.00 = easy

F. The Technique of Data Analysis

After collecting the data, the writer would be analyzed the data. The steps of data analysis are:

1. The percentage scores of the individual work in the vocabulary mastery.

   a. Determining the individual vocabulary mastery, the formula is as follows:

   \[ P = \frac{F}{N} \times 100\% \]

   Where:

   P = percentage of class competence

   F = the frequency of the correct answer

   N = the total number of item
After knowing the percentage of individual score, the result was classified into five categories:

- 81 – 100% of the answer are correct = very good
- 61 – 80% of the answer are correct = good
- 41 – 60% of the answer are correct = fair
- 21 – 40% of the answer are correct = bad
- 0 – 20% of the answer are correct = very bad

b. Mean

Mean is used to find the average of the data distribution. This research used the formula as follows:

Experimental group  \[ M_x = \frac{\sum x}{N} \]

Control group  \[ M_y = \frac{\sum y}{N} \]

Where:

\( M_x \) = mean of score to the experimental class

\( M_y \) = mean of score to the control class

\( \sum x \) = residual of the score the experimental class

\( \sum y \) = residual of the score the control class

\( N \) = total number of students
c. The sum of square deviation each group.

This research used the formula as follows:

Experimental group \[ \Sigma x^2 = \Sigma x^2 - \frac{\Sigma x^2}{N} \]

Control group \[ \Sigma y^2 = \Sigma y^2 - \frac{\Sigma y^2}{N} \]

(Arikunto 2010: 355)

Where:

\[ \Sigma x^2 \] = square deviation of experimental group

\[ \Sigma y^2 \] = square deviation of control group

\[ \Sigma x \] = residual score of experimental group

\[ \Sigma y \] = residual score of control group

\[ N \] = respondent

2. T-test Computation

a. This research used the t-test formula as follows:

\[ t \text{-} \text{test} = \frac{Mx - My}{\frac{\Sigma x^2 + \Sigma y^2}{N_x + N_y - 2} \times \frac{1}{N_x} + \frac{1}{N_y}} \]

(Arikunto 2010: 354)

Where:

\[ Mx \] = the mean of experiment class

\[ My \] = the mean of control class

\[ \Sigma x^2 \] = the square deviation of experimental class
\[ \Sigma y^2 \] = the square deviation of control class

\[ Nx = \] the total number of students of experimental class

\[ Ny = \] the total number of students of control class

b. Finding degree of freedom (\( d.f \)) as follows:

\[ d.f = (Nx + Ny - 2) \]

(Arikunto 2010: 356)