III. RESEARCH METHOD

This part deals with research design, population and samples, research instrument, the data collection techniques, the procedure of collecting data , and try out of the test (validity, reliability, level of difficulty, discrimination power, scoring system, research procedure, data analysis, and hypothesis testing).

3.1 Research Design

This research is a quantitative research. It was carried out to see and find out the result of implementing Jigsaw in improving students' reading comprehension. The design used in this research was one group pretest-posttest design. It means before the first teaching, pretest is carried out and after three teachings, a posttest is conducted. The research design can be presented as follows:

Table 3.1

Sample of the research	**Teaching Activities**	**Teaching Treatment**
Group I	T_1 X T_2	Jigsaw Technique

This research was conducted in order to find out whether there is a significant difference of students' reading comprehension especially in teaching descriptive text at seventh grade of SMPN 1 Kedondong before and after being taught through Jigsaw technique.

3.2 Population and Samples

1. Population

According to Gay (1987:102), population is the group of interest to research or to which she/he would like the result of the study to be generalize able. The population of this research is the year seven students of SMP Negeri 1 Kedondong in academic year 2012/2013. The number of population can be seen in table below.

Table 3.2 Number of Population

Class	**Number of students**
VII_A	30
VII_B	30
VII_C	32
VII_D	32
VII_E	33
VII_F	31
Total	**188**

2. Samples

Since the amount of population is quite large, the writer used a cluster sampling because the students are already formed into classes. Cluster sampling is a method for choosing samples. Gay (1980:111) says that cluster sampling is sampling in which groups, not individuals, are randomly selected. All the members of selected

groups have similar characteristics. By using lottery, the writer chose class VII.2 as the sample of the research.

3.3 Research Instrument

There are many types of instruments that can be used to collect the data; questionnaire, test, multiple choices. However, the research instrument that was used in this research is a multiple-choice test that consists of 35 items which are shared in 4 reading texts. It only focused on reading comprehension, so the writer decided to focus on three components of reading, it can be seen on the table 3.3 below.

Table 3.3
Table of Specification of Try Out Test

No	Objectives	Item Numbers	Total Items	Percentage
1	Identify the main idea	3,4,16,18,21,22,24,29,31	9	25 %
2	Vocabulary in Context	30,17	2	6 %
3	Specific information	1,2,5,6,7,8,9,10,11,12,13, 14,15,19,20,23,25,26,27, 28,32,33,34,35	24	69 %
4	Inference	-		
5	Reference	-		
TOTAL			35	100 %

3.4 Data Collection Techniques

The data of study were the scores of the students reading comprehension that could be obtained by giving a pre-test that was conducted before the instruction (method) used. Post-test was given after the teaching and learning process within three meetings. The test was aimed to measure how much the students understood the material given. The question given in the pre-test is the same as the material given in the post-test.

1 Pre-test

The writer administered the pre-test which took 90 minutes. The purpose of the test is to know the preliminary ablity in comprehending descriptive text. In administering the pre-test, the writer provided a multiple choice test in which the items derived from the selection of try out test.

2 Post-test

The writer administered the post test spending 90 minutes. The purpose of this test is to know the students' improvement in comprehending descriptive text after the writer gives treatments by using Jigsaw. The technique of giving post-test is similar to the pre-test because the writer wants to know the students improvement after three treatments.

3.5 The Procedure of Collecting Data

These are the procedures in collecting the data:

1. Pre-Test

The pre-test was conducted to determine the students' ability in reading comprehension before they are given the treatment. The items in the pre-test are determined by the selection of the items of try out test. The time allocation for pre-test is 90 minutes.

2. Treatment

The treatment is Jigsaw in learning reading comprehension. The treatment was conducted in pre-activities or post-activities of teaching learning process about 15 minutes.

These are the procedures in collecting the data for every meeting:

1. The teacher divided up the students into teams of about five members.
2. The teacher appointed one person from each group as the leader.
3. The teacher divided the lesson into segments to match the number of people in each group.
4. The teacher assigned one member of each group to learn each lesson segment.
5. The teacher gave students time to work on step 4.
6. The teacher gathered students into 'Expert groups,' which are the segmented mini groups. Give them time to discuss their findings of step 4.
7. The teacher brought the students back into their main groups.
8. The teacher had each student present his or her findings to the main group.
9. The teacher moved from group to group as a facilitator wherever needed.

10. The teacher gave quiz or otherwise tested the material covered to determine retention.

Table 3.4
Materials in Treatment Phase

Meeting	Materials
1	Agnes Monica
2	England
3	Debby Putti

3. Post-Test

The items that will be used for post-test were similar to the test items of pre-test with the same level of difficulties. The time allocation is 90 minutes. Post test is administered in order to measure the improvement of students' reading comprehension achievement. The result of post-test is the final data for this research.

3.6 Try Out of the Test

Try out of the test was conducted to measure whether the instrument of the research is good to be administered so that it can obtain valid data.

a. Validity

Validity is the extent to which the test measures what it is supposed to be measure and nothing else (Heaton, 1991 : 159). There are four types of validity: content

validity, face validity, construct validity and empirical validity. To measure whether the test has good validity, the writer used content and construct validity.

1. Content Validity

   Content validity is the extent to which the test measures a representative sample of the subject matter content. 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)

2. Construct Validity

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

   These types of validity assume the existence of certain learning theories or construct underlying the acquisition of ability and skills (Heaton, 1991 : 161)

   Nuttal (1985) states that the validity of the instrument refers to the content and construct validity in which the question represents five of sort reading skill, i.e. determining main idea, finding the detail information, reference, inference and vocabulary.

b. 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). In this writer use Split-Half Method or Odd-Even Method. The formula is:

$$r_1 = \frac{\sum XY}{\sqrt{\sum X^2 \sum Y^2}}$$

Note:

r_1 : coefficient or reliability between first and second half group

X : Total numbers of first half group

Y : Total numbers of second half group

X^2 : square of X

Y^2 : square of Y

(Lado (1961) in Hughes, 1991: 3)

The researches uses "Spearmen Brown's Prophecy formula" (Hatch and Farhady, 1982 :262) to know the coefficient correlation of the whole items.

The formula is as follow:

$$rk = \frac{2\,rl}{1 + rl}$$

Where :

rk : the reliability of the test

rl : the reliability of the half test

The criteria of reliability are:

0.90 – 1.00 : high

0.50 – 0.89 : moderate

0.0 - 0.49 : low

c. Level of difficulty

To see the level of difficulty, the writer uses following formula:

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

Where:

LD : Level of difficulty

R : the number of the students who answer correctly

N : the total number of the students following the test

The criteria test are:

<0.30 : difficult

0.30 – 0.70 : average

>0.70 : easy

(Shohamy, 1985: 79)

d. Discrimination Power

To see the discrimination power, the writer uses the following formula:

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

Where :

DP : discimination power

U : the proportion of the upper group students

L : the proportion of the lower group students

N : total number of the students

The criteria are:

1 If the value is positive discrimination, it means that more high level students than low-level students get the correct. If the value is zero, it means that no discrimination.

2 If the value is negative, means that more low level students than the high level students get the item correct.

3 In general, the higher the discrimination index, the better. In the classroom situation most items should be higher than 0.20 indexes (Shohamy, 1985:81)

e. Scoring System

In scoring the students' result of the test, the writer uses Arikunto formula. The ideal high score is 100. The score of the pre-test will be calculated by using formula as follow:

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

Where :

S : The score of the test

R : The total of the correct answer

N : The total items

(Arikunto, 1997:212)

3.7. Research Procedure

The procedures of the research are such following:

1. Determining the subject of the research: the subject of the research will be determined through simple random probability sampling, in assumption that every class has the same ability. There are six classes of seventh grade at SMP N 1 Kedondong.
2. Selecting instrument materials: the instrument materials (reading test) are chosen from the students' textbook and authentic materials. The selecting process considered materials that had been thought at the students and the students' interest.
3. Conducting the pre-rest: the pre-test was held before the treatment.
4. Determining research materials: for reading test (pre-test and post-test), the materials are taken from the students textbook and from the authentic materials.
5. Giving treatments: the technique was given in four weeks. The treatment was done for three meetings and the time allocation was 90 minutes for each meeting..
6. Conducting post-test: the post-test was held after the treatment done.
7. Analyzing, interpreting, and concluding the data.

3.8. Data Analysis

The writer analyzed the data statistically using repeated measure t-test. T-test is probably is the most widely used in statistical test for the comparison of two means because it can be used with very small sample size (Hatch and Farhady, 1982:108). The writer only used one class for experimental class and there is no control group. Repeated measure t-test is to analyze the data of students' reading improvement.

To know the average score of students in pre-test and post-test, the writer will use formula as follow:

$$\mathbf{M = \frac{FX}{N}}$$

Notes:

M = Mean

FX = Total number of students' score in one test.

N = Number of students

(Hatch and Farhady, 1982:114)

Then the mean of pre-test was compared to the mean of pos-test to see whether Jigsaw have positive effect toward students' reading comprehension. In order to know whether the students get an improvement, the writer will use the following formula.

$$\mathbf{I = M2-M1}$$

Notes:

I : the improvement of students' reading achievement.

M2 : the average score of post-test

M1 : the average score of pre-test

3.9. Hypothesis Testing

The hypothesis testing was used to prove whether the hypothesis propose in this research is accepted or not. The hypothesis analysis by using repeated measure T-test through computing with statistical package for social science (SPSS). The hypothesis was formulated as follows:

Ho : There was no significant difference of students' reading comprehension in descriptive text after being taught through jigsaw

H_1 : There was significant difference of students' reading comprehension in descriptive text after being taught through jigsaw

To see whether Jigsaw made significant improvement or not, the researcher used the formula as follow:

$$t = \frac{\bar{\chi}_1 - \bar{\chi}_2}{S_{D\bar{}}} \qquad \text{in which} \qquad S_{D\bar{}} = \frac{S_D}{\sqrt{n}}$$

Where:

$\bar{X}_1$ = mean score of pre-test

$\bar{X}_2$ = mean score if post-test

$S_{\bar{D}}$ = standard error of differences between two items

S_D = Standard Deviation

N = number of students

(Hatch and Farhady, 1982: 116)

The criteria are:

If the t-ratio is higher than t-table : H_1 is accepted

If the t-ratio is lower than t-table : H_0 is accepted