III. RESEARCH METHODS

3.1 Research Design

In doing this research, the researcher conducted quantitative research based on the experimental class. The researcher applied one group pretest-posttest design. The researcher selected two classes, one as try out class and another as the experimental class. The researcher conducted this research to see whether there is significant increase of students' reading comprehension achievement after being taught through jigsaw technique. The researcher conducted pretest, three treatments, and posttest. In this design, pretest and posttest were administered to see whether jigsaw technique could be used to increase students' reading comprehension achievement.

The design of the research is as follows:

T1 X T2

Where:

T1 = Pretest

X = Treatments (using jigsaw technique)

T2 = Posttest

(Hatch and Farhady, 1982: 20)

3.2 Variables

This research consists of the following variables:

1. Students' reading comprehension achievement of news item text as dependent variable (Y)
2. Jigsaw technique as independent variable (X)

3.3 Population and Sample

The population of this research was all the first grade students of SMAN 1 Punggur. There were six classes in which each of them consists of 38-40 students. Two classes of them were used as the sample. The class was selected randomly by using lottery since there was no stratified and priority class. It was applied based on the consideration that every student in the population has the same chance to be chosen in order to avoid the subjectivity in the research (Setiyadi, 2006:39). The first class as try out class, and the second class as experimental class, the class which was given the treatments by using jigsaw technique.

The steps are as follow:

1) Writing the six classes' code in six pieces of paper and to be rolled.
2) The rolled paper were entered into the box and shaken.
3) The researcher asked the teacher to take two rolled papers that become the sample. The first paper as try out class, and the second paper as experimental class.

3.4 Research Procedures

To make this research ran well, it was suggested to make the research procedures, they are:

1. Determining the research problems

   The problem of the research intended to find out whether jigsaw technique can increase students' reading comprehension achievement of news item text significantly.

2. Determining the research design

   The researcher conducted the research using one group pretest-posttest design.

3. Finding the population and sample

   The population of this research was all the first grade students of SMAN 1 Punggur. There were six classes in which each of them consists of 38-40 students. Two classes of them were used as the sample. The first class as try out class and the second class as experimental class. The class was selected randomly by using lottery since there is no stratified and priority class. The researcher used this technique because all of the classes of the first grade students had the same opportunity to be a subject of this research.

4. Selecting and determining the materials

   The materials in this research were based on the school based curriculum (KTSP) 2006 for the first year students. The materials were taken from

newspaper (Jakarta Post) and internet. The topics were about reading. The researcher used one type of reading text that was news item text.

5. Administering the tryout test

   It was conducted to measure the reliability of pretest and posttest and to make sure whether the test was good or bad for the students. The test was tried out to the students whose level was equal to the sample of the research. It was administered to find out the quality of the test before it was used, whether the items were good or not in validity, reliability, level of difficulty, and the discrimination power. The test was multiple choices that consist of forty items with four alternative options A, B, C, D. The try out test was conducted for sixty minutes.

6. Administering the pretest

   The pretest was administered from the result of try out test by preparing how many items, and what material that was given to the students before treatments. The test was multiple choices that consist of thirty items and it was conducted for forty five minutes.

7. Conducting the treatments

   After giving the pretest to the students, the researcher conducted the treatment for three meetings, which took 90 minutes in every meeting. The researcher taught reading comprehension of news item text by using jigsaw technique to the students in the experimental class.

8. Administering the posttest

   Posttest was used to evaluate the students' reading comprehension achievement after giving the treatments. The test was multiple choices that consist of thirty items and it was conducted for forty five minutes.

9. Analyzing the data

   Both of pretest and posttest results of the class were analyzed by using Repeated Measures t-test to compare the data of the two means score (Hatch and Farhady, 1982:108). The researcher analyzed the improvement by comparing the scores of pretest and posttest from the experimental class. If the score of posttest is better than pretest, it means that there is a progress of the students' reading comprehension achievement.

10. Concluding the results

    After analyzing the results of both pretest and posttest, the conclusion was drawn.

11. Reporting the results

    The results of this research were reported in the script including the suggestion from the researcher.

3.5 Data Collecting Techniques

The instrument of this research was reading test using news item text. The reading tests consist of two kinds, pretest and posttest. In giving the treatments, the researcher used reading texts. The texts were taken from English book for the first grade students of Senior High School, Jakarta Post and internet. In collecting the data, the researcher used the following steps:

1. Administering the pretest

   After getting the result of try out class, the researcher gave the pretest. Pretest was administered in order to find out the students' reading comprehension achievement before the treatments. It required 45 minutes for the test. The test was multiple choices that consist of thirty items with the option A, B, C, D. The materials were news item text.

2. Administering the posttest

   This test was administered after conducting the treatments to the students. The researcher gave posttest in order to know the result of this class in teaching learning process whether they had progress or not. The aim of this test was to find out the students' reading comprehension achievement after three times treatments. It required 45 minutes for the test. The test was multiple choices that consist of thirty items with the option A, B, C, D. The materials were news item text.

3.6 Instrument

The two reading tests were given to the students to check their reading comprehension achievement. They were pretest and posttest. The researcher used objective test. It was multiple choice (MC) tests consist of four options (A, B, C, D), to make it easy to correct and to give score. The material was about news item text. The researcher gave 30 items for pretest and 30 items for posttest. The purpose of pretest was to know the students' reading comprehension achievement before treatments. The purpose of posttest was to know the students' increase of reading comprehension achievement after treatments.

Criteria of a Good Try Out Test

To know whether the test was good or not, some criteria should be considered. The criteria of a good test are: validity (content validity and construct validity), reliability, level of difficulty and discrimination power.

3.6.1 Validity

Validity is 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. In this research, to measure whether the test has good validity or not, the researcher will analyze the content and construct validity.

3.6.1.1 Content Validity

Content validity is the extent to which a test measures a representative sample of the subject matter content, the focus of content validity is adequacy of the sample and simply on the appearance of the test (Hatch & Farhady, 1982:251).

It was intended to know whether the test is a good reflection of what has been taught and of the knowledge which the teacher wants the students to know, the researcher compare the test with table of specification.

In this research, the researcher will formulate table of specification, so every test items can be match with the goal and the materials have been taught. The content of the items is presented in the table of specification below:

Table 1. Table of specification of Data Collecting Instrument

No	**Reading Skills**	**Item numbers**	**Percentage (%)**
1	Main ideas	13., 15., 21., 31., 35.	12,5 %
2	Details	5., 6., 9., 16., 20., 29., 30., 37., 40.	22,5 %
3	references	17., 22., 23., 32.	10 %
4	inferences	8., 10., 12., 19., 26., 27., 33., 38.	20 %

5	vocabularies	1., 7., 11., 18., 24., 34., 39	17,5 %
6	Feature of text	2., 3., 4., 14., 25., 28., 36.	17,5 %
Total			**100%**

3.6.1.2 Construct Validity

Construct validity is concerned with whether the test is actually in line with the theory of what it means to know the language.

To know whether the test is true reflection of the theory of language that is being measured, it means that the items should really test the students whether they have mastered the reading text.

3.6.2 Reliability

According to Hatch and Farhady (1982:243), the reliability of a test can be defined as the extent to which a test procedures consistent result when administered under similar conditions. To estimate the reliability of the test, the split-half method is used in order to analyze the odd (x) and even (y) of the test items.

To measure the 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:

$$R_{xy} = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{(N\Sigma X^2 - (\Sigma X)^2)(N\Sigma Y^2 - (\Sigma Y)^2)}}$$

Notes:

R : the correlation of coefficient of reliability between odd and even numbers

N : the number of the students who take part in the test

X : the total number of odd number items

Y : the total number of even number items

X^2 : the square of X

Y^2 : the square of Y

$\sum X$: the total score of odd number

$\sum Y$: the total score of even number

(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:

$$rk = \frac{2rxy}{1 + rxy}$$

Where:

R_K = the reliability of the whole test

rxy = the reliability of the half test

(Hatch and Farhady, 1982: 198

The criteria of the reliability are:

0.80 up to 1.00 is very high

0.60 up to 0.79 is high

0.40 up to 0.59 is average

0.20 up to 0.39 is low

0.0 up to 0.19 is very low

3.6.3 Level of difficulty

Level of difficulty (LD) relates to "how easy or difficult the items is from point of view of the students who take the test" (Shohamy, 1985:79).

The level of difficulty can be determined by dividing the number of students who get it right by the total number of students (Shohamy, 1985:79).

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

Where :

LD = Level of Difficulty

R = The number of students who answer correctly

N = The number of the students

The criteria of difficulty level are :

1. 0.00- 0.30 = difficult
2. 0.30-0.70 = average
3. 0.71-1.00 = easy

3.6.4 Discrimination power

The discrimination power (D) is the proportion of the high group students getting the items correct minus the proportion of the low-level students who getting the items correct. The discrimination power of an indicate item the extent, to which the item discriminates between the test taker from the less able. The formula of the discrimination power is:

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

Notes:

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 the students

(Shohamy, 1985:82)

The criteria of discrimination power are:

1. If the value is positive, it has positive discrimination because large number or more knowledge students than poor students get the item correct. If the value is zero, it means that there is no discrimination.
2. If the value is negative, it has negative discrimination power because lower and higher level of the students gets the item correct.

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

   (Shohamy, 1985:82)

3.6.5 Scoring System

In scoring the result of students' test, the researcher used Percentage Correct (Lyman, 1971:95). The percentage correct score is used in reporting the result of classroom achievement tests. The researcher will calculate the average of the pre-test and posttest by using this formula:

$$X_{\%c} = 100\frac{R}{T}$$

(Lyman, 1971: 95)

Where:

$X_{\%c}$ = percentage of correct score
R = number of right answers
T = total number of items on test.

3.7 Data Analysis

The data was analyzed in order to determine whether the students' reading comprehension achievement increases or not. The researcher examined the students' scores using the following steps:

1. Scoring the pretest and posttest
2. Tabulating the results of the tests and calculating the scores of the pretest and posttest

3. Drawing conclusion from the tabulated-result of the pretest and posttest which statistically analyzed using *Repeated Measures T-Test* computed through SPSS version 16.0.

3.8 Hypothesis Testing

The hypothesis is used to prove whether the hypothesis proposed in this research is accepted or not. The hypothesis of this research is there is any increase of students' reading comprehension achievement of news item text after being taught through *jigsaw technique*.

The hypothesis is analyzed by using *Repeated measures T-Test* with Statistically Package for Social Science (SPSS) version 16.0. The level of significance is 0.05, and the probability of error in the hypotheses is 5%.

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