

### **III. RESEARCH METHODS**

This part discusses the design of this research and how to collect the data from those samples. The researcher encloses the data collecting technique and the procedures of this research. The researcher also gives the scoring system and how the data were analyzed.

#### **3.1. Research Design**

The researcher conducted quantitative research with *control group pretest posttest design* in her research that belongs to the true experimental design. The researcher used the design because she wants to compare 2 techniques (jigsaw learning strategy and CTL Strategy) which one of them is more effective in increasing students' reading comprehension achievement.

Since she used true experimental design, therefore there were classes – those are experimental class and control class. She gave three treatments to each class. The students of the experimental class was taught reading comprehension about narrative text (related to aspects – those are main ideas, details, inferences, references, and vocabularies) through Jigsaw Learning Strategy. Whereas the students of control class was taught reading comprehension about narrative text (related to aspects – those are main ideas, details, inferences, references, and vocabularies) through CTL Strategy. Both classes received the same pretest

posttest. Pretest was administered to see the students' basic ability within both groups in order to ensure that their ability is equal before treatments. Then, after giving the treatments, she administered posttest to both groups.

According to Hatch and Farhady (1982: 22), the researcher design was presented as follows:

**G1 (Random) : T1 X1 T2**

**G2 (Random) : T1 X2 T2**

Symbol	Meaning
G <sub>1</sub>	= the experimental class
G <sub>2</sub>	= control class
T <sub>1</sub>	= the pretest
T <sub>2</sub>	= the posttest
X <sub>1</sub>	= treatment by the researcher (Teaching reading through Jigsaw Learning Strategy)
X <sub>2</sub>	= treatment by the researcher (Teaching reading through CTL Strategy)

### 3.2. Variables

In this research, there are three variables were studied:

1. The first independent variable is Jigsaw Learning Strategy (X<sub>1</sub>)
2. The second independent variable is CTL Strategy (X<sub>2</sub>)
3. The dependent variable is reading comprehension achievement (Y)

### **3.3. Population and Sample**

#### **3.2.1 Population**

The population of the research was the first year students of SMAN 1 Bandar Lampung. There were 18 classes in this school and each year has 6 classes. The total number of the population was 656 students, consisting of 344 female students and 312 male students. In this research, the researcher chose the first year students in the second semester of academic year 2010/2011 were investigated. There were six classes of the first year students, they are X1, X2, X3, X4, X5, X6 and each class consists of 34 students. Their ages range from 15-16 years old.

#### **3.2.2 Sample**

Based on the population above, two classes were taken as the sample of this research, one as experimental class, class that was given the treatment by the researcher (teaching reading of narrative text using Jigsaw Learning Strategy), and second as control class that was given the treatment by the researcher (teaching reading of narrative using CTL Strategy). Two of the classes were the sample of this research which was selected using simple random sampling. Those classes were selected randomly by using lottery, since the first year students in SMAN 1 Bandar Lampung is not stratified class. There is no priority class. It is applied based on that consideration that every class in the population had the same chance to be chosen and in order to avoid the subjectivity in the research. Next, to determine which class is as the experimental class and as the control class, the researcher used a coin by flipping it.

### **3.3.Data Collecting Technique**

The following steps were taken in collecting the data as follows:

#### **1. Pretest**

The researcher administered the pretest before giving the treatment in order to reveal the students' basic reading comprehension. There were 30 test items of multiple choices with five options of each item. One of the options is the correct answer and the rests are as distracters. The total score is 100 points, so if the students answer the whole questions correctly they got 100 point.

#### **2. Posttest**

After conducting the treatments to each group, the researcher gave the posttest to both groups. The text type of the posttest is also about the reading comprehension text. The items of the posttest are the same as the pretest that the items have been analyzed. This test is given to know the students' reading comprehension achievement after they receive the treatment.

### **3.4.Research Procedures**

#### **1. Determining the Population and Sample**

The population of this research is the first year students of SMAN 1 Bandar Lampung. The samples of this research are two classes of whole.

## 2. Selecting and Determining the Materials

This research used the materials based on School Based Curriculum 2006 (KTSP) for the first year students.

## 3. Conducting Try Out

Before the test was given, firstly the researcher tried out the test. The test was given to other class that has the same ability to the experimental class. It is aimed at knowing the quality of the test. The try out was administered for 50 items in 2 x 45 minutes. There was 50 items of multiple choices with five options and one of them was as the correct answer. The total score was 100 point, so if the students answer the whole questions correctly they would get 100 point.

**Table 2. Tabel of specification of try out test**

No	Objectives	Item Numbers	Total Items	Percentage
1	Identify the main idea	8,12,14,24,28,45	6	12%
2	Vocabulary in Context	1,5,13,17,21,26,32,34,40,49,50	11	20%
3	Specific information	3,4,7,9,15,19,20,25,27,29,30,33,35,36,41,42,46,47	17	36%
4	Inference	2,6,11,18,23,31,37,38,44,50	10	20%
5	Reference	10,16,22,39,43,48	6	12%
TOTAL			50	100%

Aspects that were measured consist of validity and reliability.

### **a. Validity of Test**

The validity of the test was considered in this researcher. The researcher took content and constructs validity for this research. It would be considered that the test should be valid and in line with reading theory and material.

According to Heaton (1999), there are five types of validity:

1. **Face Validity**  
It concerned with what the teachers and the students think of the test. If a test item looks right to other testers, moderators, and testees, it can be described as having at least face validity.
2. **Content Validity**  
This kind of validity depends on a careful analysis of the language being tested and of the particular course objectives. The test should be so constructed as to contain a representative sample of course. The test should be a good reflection of what has been taught and of the knowledge.
3. **Construct Validity**  
If a test has construct validity, it is capable of measuring certain specific characteristic in accordance with a theory of a language behavior and learning. This type of validity assumes the existence of certain learning theories or constructs underlying the acquisition of abilities and skills.
4. **Predictive Validity**  
This validity is obtained if the test is able to predict some future language performance.
5. **Concurrent Validity**  
A test has a concurrent validity if a attest is related with a given criterion or another test which measures the same skill.

There are many kinds of validity that explained above, but the researcher only focus on two kinds of validity in setting her test, those are content validity and construct validity.

### **b. Reliability of the Test**

Reliability refers to the extend to which the test is consistent in its score and gives us an indication of how accurate the test score are.(Hatch and Farhady, 1982:244).

The test should not be elastic in their measurement, if a student takes a test at the beginning of the course and again at the end, any improvement in his score should be the result of the differences in his skill and not inaccuracies in the test. In the same way, it is important that the student's score should be the same (or as nearly as possible the same) whether he takes one version of a test or another, and whether one person marks the test or another. Reliability also means the consistency with which a test measures the same thing all the time. There are there aspects to reliability, the circumstances in which the test is taken, the way in which it is marked, and the uniformity of the assessment it makes. Reliability of the test can be determined by using the Spilt half method in order to estimate the reliability of the test.

To measure coefficient of the reliability the first and second half group, the researcher used the following formula:

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

Notes:

$r_1$  : The coefficient of reliability between first half and second half group

X : The total numbers of first half group

Y : total numbers of second half group

$X^2$  : The square of X

$Y^2$  : The square of Y

(Lado in Hughes, 1991:3)

Then the researcher used “Spearman Brown’s Prophecy Formula” (Hatch and Farhady, 1982: 256) to determine the reliability of the test as follow:

$$Rk = \frac{2rl}{1 + rl}$$

Notes:

Rk : the reliability of the test

rl : the reliability of half test

The criteria of reliability are:

0.90 – 1.00 = high

– 0.89 = moderate

– 0.49 = low

### c. Level of difficulty

Level of an item simply shows how easy or difficult the particular item proved in the test. To see the level of difficulty, the researcher used the following formula:

$$D = \frac{U + L}{N}$$

Where:

LD : level of difficulty

U + L : the number of the students who answer correctly

N : the total number of the students



The criteria are:

< 0.30	= difficult
0.30 – 0.70	= average
> 0.70	= easy

(Shohamy, 1985: 79)

#### d. Discrimination Power

A good test item should be able to differ between the good students and the poor students. To see the discrimination power, the researcher used following formula:

$$DP = \frac{U - L}{n}$$

Where:

- D : Discrimination Power
- U : Upper half
- L : Lower half
- n : The total number of the students

(Shohamy, 1985: 81)

The criteria are:

0,00 – 0,19	: poor
0,20 – 0,39	: satisfactory
0,40 – 0,69	: good
0,70 – 1,00	: excellent

Notes:

- If the value is positive, it has discrimination because a large number or more knowledgeable students than poor students get the item correct. If the value is zero, it means no discrimination.
- If the value is negative, it has negative discrimination because more low-level students than high level students get the item correct.

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

(Shohamy, 1985: 82)

#### **4. Administering the pretest**

This test has aim to know the students' basic reading comprehension ability before they are given the treatments. It consists of 30 items of multiple choices and is conducted within 45 minutes. At least, if a student could answer all items correctly, s/he would get 100 points.

#### **5. Conducting treatments**

The researcher taught the students reading comprehension in reading text used Jigsaw Learning Strategy for the experimental class and CTL Strategy for the control class. The researcher gave three times of treatments in three meetings, which take 2X45 minutes in every meeting. The texts were taken from the students' English textbook that are Let's Talk and English on Sky for Grade VIII of Junior High School and internet for second grades.

## 6. Administering the posttest

The researcher conducted the posttest to measure the students' ability in reading comprehension after giving treatment. It consists 30 items of multiple choices and reading texts which takes 45 minutes.

## 7. Analyzing the data (pretest and posttest)

In his step, the pretest and posttest results in experimental and control class are analyzed by using independent group T-Test to compare the data of the two means scores (Hatch and Farhady. 1982: 108).

### 3.5 Scoring System

In scoring the result of students' work, the researcher used Arikunto's formula (1997: 212). The researcher calculated the student's score of the pre-test and post-test by using this formula:

$$S = \frac{R - W}{n - 1}$$

Where :

- S : The score of the test
- R : The rights answer
- W : The wrong answer
- n : Number of option

### 3.6 Data Analysis

The researcher computed the students' score in order to find out the students' achievement in reading narrative text through Jigsaw Learning Strategy and CTL Strategy using the following steps:

- Scoring the pre-test and post-test.
- Tabulating the results of the test and calculating the score of the pre-test and post-test.
- Drawing conclusion from the tabulated results of the pre-test and post-test administered, that was by statistically analyzing the data using statistical computerization i.e. *Independent Groups T-Test of Statistical Package for Social Science (SPSS) version 15.0 for windows* to test whether the increase of students' gain is significant or not, in which the significance was determined by  $p < 0.05$ . It is used as the data come from the two samples (Hatch and Farhady, 1982:111).

### 3.8 Treatment of the data

In order to determine whether the data are good or not, the data should meet the criteria:

#### 1. Random test

This test is used to know that the data will be taken is random. The data were tested by Statistic Formula in Descriptive Formula (SPSS 15).

The criteria for Random test are:

$H_1$ : the data is random

$H_0$ : the data is not random

The hypothesis is accepted if the result of random test is higher than 0.05 (sign > ). In this case, the researcher used 0.05, level of significance.

## **2. Normality test**

This test is used to measure whether the data in two classes are normally distributed or not. The data were tested by One-sample Kolmogorov-Smirnov Formula (SPSS 15).

The criteria of normal distribution are:

The hypothesis is accepted if the result of the normality test is higher than 0.05 (sign > ). In this case, the researcher used level of significance of 0.05

## **3. Homogeneity test**

This test is used to know whether the data of the posttest from the experimental class 1 and from the experimental class 2 are homogeneous are homogeneous or not. The data were tested by Independent Sample Test (SPSS 15). The criteria for the homogeneity of pre test are:

H<sub>1</sub>: There is no significant difference in the level of ability (equal)

H<sub>0</sub>: There is a significant difference in the level of ability (not equal)

The criteria for the hypothesis is: H<sub>1</sub> is accepted if the result of Homogeneity test of pre test is higher than 0.05 (Sign > ).

### **3.9 Hypothesis Test**

After collecting the data, the researcher recorded and analyzed the data in order to find out whether there is an increasing in students' ability in reading

comprehension of narrative text or not after the treatment. The researcher used Independent Group T-test to know the level of significance of the treatment effect.

The formulation is:

$$t_{obs} = \frac{\bar{X}_e - \bar{X}_c}{S_{(\bar{X}_e - \bar{X}_c)}}$$

With:

$$S_{(\bar{X}_e - \bar{X}_c)} = \sqrt{\left(\frac{S_e}{\sqrt{n_1}}\right)^2 + \left(\frac{S_c}{\sqrt{n_2}}\right)^2}$$

$\bar{X}_e$  : Mean from the difference pre-test and post-test of experimental class and control class

$\bar{X}_c$  : Mean from the difference pre-test and post-test of experimental class and control class

$S_{(\bar{X}_e - \bar{X}_c)}$  : Standard error of differences between means

n : Subjects on sample

(Hatch and Farhady, 1982:111)

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