III. METHODS

This chapter deals with the design, data, population and sample, instrument, data collecting techniques, scoring, data analysis, treatment the data, and hypothesis testing.

3.1 Design

The research was conducted at Senior High School. The one-group pre - test and post - test was used as design. This design meant that the students were given the pre - test before treatment or teaching and in the end of treatment or teaching the students were given the post - test. Pre - test was T1, Post - test was T2, and X was treatment. T1 had the function to measure the students' initial ability and T2 was to measure the students' final ability. X meant that treatment of teaching procedure text using sequence of pictures.

T1   = Pre - test

T2   = Post - test

X   = treatment

The pattern: T1 X T2

3.2 Data

The data of this research was the result of the students' writing ability whether the students' writing ability in procedure text improved after teaching writing through sequence of pictures.

3.3 Population and Sample

Population means the entire mass of observations, which is the parent group from which a sample is to be formed. Population also means the characteristics of a group (Singh, 2006:82). In doing a research, the whole population was used in conducting it. It means that all students in grade X of SMA N 15 Bandar Lampung were used as population. However, it needed extra time, energy, and money to do it. Therefore, to overcome this problem, the concept of sample was used. According to Tayie (2005:32), a sample is the subset of the population that is taken to be the representative of the entire population. While, Dawson (2002: 47) defines the sample is as a smaller, more manageable number of people who take part in the research. From the definition above, it is concluded that sample means a smaller unit of the population that represents the whole characteristics of the population. For that reason, X 5 was used in the research from the population.

3.4 Instrument

To gain the data, an instrument was applied in research. The instrument was the writing test. The written test was given to the students related to procedure text.

Students had to choose only one topic freely. The evaluation criteria were content, form, vocabulary, grammar, and mechanics.

3.5 Data Collecting Technique

In collecting the data, following techniques were used:

3.5.1 Administering Pre -Test

Heaton (1991: 137) suggest that writing can be a useful testing tool since it provides the students with an opportunity to demonstrate their ability to organize language material, using their own words and ideas, and to communicate. In addition, pre-test provided a degree of motivation, which may objective type tests fail to provide before treatment. In this research, the students were asked to write procedure text by using free topic. Pre-test was given before the treatment in order to know how far the competences of the students in writing procedure text.

3.5.2 Treatment

Sequence of pictures as a treatment was used that will be applied in this research. In organizing the procedure text, the students were given sequence of pictures.

3.5.3 Administering Post-Test

After treatment, students were given post-test. In this research, the students were asked to write procedure text by using free topic. The topic was related to procedure text. The result of the post-test was compared with pre-test in order to

know whether sequence of pictures could improve students' procedure text ability or not.

3.6 Scoring

3.6.1 Scoring System

In this research, impression method was used; a method of scoring that used multiple marking (Heaton, 1991:147) in order to minimize the subjectivity. Two ratters were used in scoring students' writing test. The first ratter was the English teacher and the second ratter was the researcher. The formula was:

$$FS = \frac{\delta 1 - \delta 2}{2}$$

Where:

FS: students' final score

$\delta 1$: score in pre-test

$\delta 2$: score in post-test

3.6.1 .1 Calculating of Mean

Listing the scores and calculating the means through mean formula as follows:

$$x- = \frac{\sum x}{N}$$

Where:

X^-: mean

$\sum x$: total score

N: number of students

Mean showed whether the test was easy or difficult. If the mean score was too high, it means the test was very easy for students and there was an error in giving the score for the students. According to Heaton (1991:175), the mean score of any test is the arithmetical average i.e. the sum of the separate scores is divided by the total number of students. It was the most efficient measure of central tendency yet it was not always appropriate.

3.6.1.2 Standard Deviation

Standard deviation was another way of showing the spread of scores. It measured the degree to which the group of scores deviates from the mean in other words. It showed all the spread of score thus degree to which the group of scores deviates from the mean. In other words, it showed how all the scores spread out and thus given as a fuller description of test scores than the range which simply described the gap between the highest and lowest marks and ignored the information provided by all the remaining scores.

To see the calculating of standards deviation, the following formula was used:

$$\textbf{s.d} = \frac{\sqrt{\sum d^2}}{N}$$

Where:

s.d : find out the amount by which each score deviates from the mean

$\sum d^2$: numbers of testees

N : total number of sample

(Heaton, 1991:177)

In order to know the students get any progress, the following formula was used:

I=M2-M1

Where:

I : the improvement of students' ability

M2: the average score of post - test

M1: the average score of pre - test

 (Arikunto, 1997:68)

3.6.1.3 Scoring Writing Test

Below was scoring criteria for writing test. In scoring the result of writing test, the analytic method of scoring ESL Composition profile was used. The ESL composition was used because it provided a well defined standard and interpretive framework for evaluating a compositions' students communication effectiveness which was suggested to be used in evaluating students' writing (Jacobs in Juniati 2008:27). Here were the ESL composition profiles:

Table 2. Aspects of Writing

No	Aspect of Writing	Criteria		
1	**Content**	20	Excellent	: All developing sentences support the main idea.
		15	Good	: Three of developing sentences support the main idea
		10	Fair	: Two of the developing sentences support the main idea.
		5	Poor	: One of the developing sentences supports the main idea.
		0	Very poor	: There is no developing sentences support the main idea.
2	**Organization**	20	Excellent	: There are at least two right uses of transitional words all the supporting sentence are written in spatial order.

		15	Good	: There are at least one right uses of transitional words and all the supporting sentence are written in spatial order.
		10	Fair	: Two of all the supporting sentences are written in spatial order.
		5	Poor	: One of all the supporting sentences are written in spatial order.
		0	Very Poor	: There is no the supporting sentences are written in spatial order.
3	**Vocabulary**	20	Excellent	: All of the vocabularies are used correctly.
		15	Good	: Three fourth of the vocabularies are used correctly
		10	Fair	: A half of the vocabularies are used correctly
		5	Poor	: A quarter of the vocabularies are used correctly
		0	Very Poor	: There are no vocabularies are used correctly
4	**Grammar**	20	Excellent	: All the sentences are written in the right form of present tenses.
		15	Good	: Three of the sentences are written in the right form of present tenses.
		10	Fair	: Two of the sentences are written in the right form of present tenses.
		5	Poor	: One of the sentences are written in the right form of present tenses.
		0	Very Poor	: There is no sentences are written in the right form of present tenses.
5	**Mechanics**	20	Excellent	: All the sentences use correct punctuation.
		15	Good	: Three fourth of the sentences use correct punctuation.
		10	Fair	: A half of the sentences use correct punctuation.
		5	Poor	: A quarter of the sentences use correct punctuation.
		0	Very Poor	: There are no sentences using correct punctuation.

Based on the criteria and scoring scale given by Jacobs above, five components were focused on this research. These five components chosen were vocabulary, content, mechanic, grammar, and organization.

3.6.2 Validity of the Test

Validity refers to appropriateness, meaningfulness, and useful of the inferences a researcher makes (Fraenkel and Wallen, 1990:126). It meant that validity refered to the extent to which an instrument gave to us the information we want. Validity was a matter of relevance; it meant that the test measures what was claimed to measure. To measure whether the test had good validity, it had to be analyzed from content and construct validity. In the content validity, the material and the test werre composed based on the indicators and objectives in syllabus of KTSP curriculum. The materials that were taught based on the students' handbook for first year of Senior High School. While construct validity focused on the kind of the test that was used to measure the students' ability.

3.6.3 Reliability of the Test

Reliability was defined as the extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials. In short, it was the stability or consistency of scores over time or across ratters. It was a measure of accuracy, consistency, dependability, or fairness of scores resulting from administration of particular examination.

Reliability is the measure of how stable, dependable, trustworthy, and consistent a test is in measuring the same thing each time (Worthen et al., 1993). In this case, two ratters were used in scoring the students' writing test. The formula is as follow:

$$r=1-\frac{6.\sum D^2}{N(N^2-1)}$$

Where:

r   : rank – difference

$\sum D^2$: the sum of difference between each pairs of ranks

(Harris, 1974:142)

In this case, the standard of reliability also was used (Arikunto, 1998:260)

0.81 – 1.0   = very high

0.61 – 0.8   = high

0.41 – 0.6   = medium

0.21 – 0.4   = low

0 – 0.2   = very low

The formula above was used in the research for measuring the writing test.

Table 3. The Reliability of Raters

Reliability	Pre - test	Post - test	Criteria
	0.8747	0.8657	Very high reliability

Based on the table above, it was found that the reliability coefficient of pre - test were 0.8747. Meanwhile, the reliability coefficients of post - test were 0.8657. both of tests were very high criteria and it could be used in this research.

3.7 Data Analysis

To measure the students' progress in writing, the students score was analyzed through this activity:

    a. Scoring the pre-test and post-test

    b. Finding the mean of the pre-test and post-test using this formula:

$$\mathbf{Md} = \frac{\Sigma d}{N}$$

    Where:

    Md   : mean

    Σ : total score of the students

    N   : number of students

    c. Drawing conclusion by comparing the means of the pre-test and post-test

3.8 Treatment of the Data

The following procedure was used in treating the data:

3.8.1   Random Test

The statistical formula of descriptive statistic (SPSS 15) was used to determine whether the data of the students' writing in experimental and control class were taken from the subject at random.

3.8.2   Normality Test

The normality test was used to determine whether the data in experimental class were normally distributed. The One-Sample Kolmogorov –Smirnov Formula (SPSS 15) was used to test the normality of the data.

3.8.3   Homogeneity Test

The homogeneity test was used to determine whether the data in experimental and control class were homogenous. The Independent Sample Test (SPSS 15) was used to know the homogeneity of the test.

3.9 Hypothesis Testing

The hypothesis testing which showed that there was any improvement of students' procedure text writing was approved at the significant level of 0.05 in which $\alpha <$ 0.05 (Setiyadi, 2006:97).

To determine whether the first hypothesis was accepted or rejected, the following criteria acceptance were used:

Ha   : There is any improvement of student's procedure text writing that is

             taught by sequence of pictures.

Ho   : There is no improvement of students' procedure text writing that is

             taught by sequence of pictures.

The criteria are:

Ha (alternative hypothesis) is accepted if *alpha level* is lower than 0.05 ($\alpha < 0.05$).

Ho (null hypothesis) is accepted if *alpha level* is higher than 0.05 ($\alpha > 0.05$).