CHAPTER III
RESEARCH METHOD

A. Research Design

Before doing the research, the researcher arranged a research design. Considering the purposes of the research and the nature of the problems, this research is quantitative one. In this research, the researcher used true experimental design (pretest-posttest control group design) to identify the effectiveness of using pictures to improve listening comprehension skill of narrative texts at the eighth grade of SMP N 31 Semarang in the academic year of 2011/2012.

There are two groups in pretest-posttest control group design that are chosen randomly, and then they are given pretest to know the initial condition whether there is a difference between experiment group and control group. The sketch of this design can be seen as follow:[1]

R	O_1	X	O_2
R	O_3		O_4

Explanation:

R : Experimental and control class that are chosen randomly

O_1 & O_3 : Pre-test of experimental and control class

O_2 & O_4 : Post-test of experimental and control class

X : Treatment (Teaching listening of narrative texts by using pictures)

B. Setting and Time

The writer conducted the research at the eighth grade of SMP Negeri 31 Semarang in the second semester of the academic year of 2011/2012. She conducted this research from 2nd of April 2012 to 21th of April 2012.

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[1]Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R & D*, (Bandung: Alfabeta, 2009), p. 76

Table 1

List of time of the study

No.	Activity	April						
		4th	10th	11th	17th	18th	19th	20th
1.	Try out	■						
2.	Pre test		■	■				
3.	Treatment 1				■			
4.	Treatment 2					■		
5.	Post test						■	■

C. Population, Sample and Sampling Technique

1. Population

Population is all the subject of the research.[2] In other word, population is the big research group chosen to represent all members of group. The population of the study was the seventh grade students of SMP N 31 Semarang in the academic year of 2011/2012. The eighth grade students of SMP N 31 Semarang is divided into eight classes. There are class VIII A, VIII B, VIII C, VIII D, VIII E, VIII F, VIII G, and VIII H. There are 30-32 students in each class. The total number of the population is 246 students.

Table 2

List of population

Class	Male	Female	Total
VIII A	19	13	32
VIII B	18	14	32
VIII C	18	14	32
VIII D	18	12	30

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[2]Suharsimi Arikunto*, Prosedur Penelitian : Suatu Pendekatan Praktik*, (Jakarta : PT. Rineka Cipta, 2006), 13th Ed, p. 130.

VIII E	18	12	30
VIII F	18	12	30
VIII G	20	10	30
VIII H	18	12	30
Total	137	109	246

1. Sample

   Sample is representative of population that will be observed.[3]The writer took sample in this research because the respondents are more than 100. The respondents are less than 100, it is better to take them all as sample.[4] The important thing in this study is the aim of sampling is to construct a sample that can represent the entire population. It means that sample must be able to represent the whole data of population.

   Sample in this research is class VIII F as control class, VIII D as experimental class. VIII F as control class and VIII D as experimental are selected by random.

2. Sampling technique

   In this research, the writer used simple random sampling technique. It is simple because the way of taking sample from population is done randomly without considering the strata or level of the population. Simple random sampling technique is used if the member of population is homogeny.[5] The researcher chooses two classes as sample in this research, they are class VIII F as the control class and VIII D as the experimental class.

   In getting sample of the research, the writer took some procedures. Because there are eight classes at eighth grade of SMP N 31 Semarang, the researcher wrote down number 1 to 8 on small piece of

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[3]Suharsimi Arikunto, *Prosedur Penelitian : Suatu Pendekatan Praktik*, p. 131.

[4]Suharsimi Arikunto, *Prosedur Penelitian : Suatu Pendekatan Praktik*, p. 134.

[5]Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R & D*, p. 82.

paper. The small piece of paper was placed in a box and well mixed, and a sample of the required size was selected.

D. Research Variable

Variable is a variation object of the study. There are two types of variables: dependent variable (y) and independent variable (x). The dependent variable is the variable of focus or the central variable on which other variables will act if there is any relationship. The independent variable is selected by researcher to determine the relationship with the dependent variable.[6] So, the variables in this study are:

1. Independent Variable (x).

Independent variable in this research is the use of pictures to teach narrative text

2. Dependent Variable (y).

Dependent variable in this study is the listening skill of narrative text achievement score of students at the eighth grade of SMP Negeri 31 Semarang.

E. Data Collection Technique

The researcher must use instrument to get the better data. The instrument of the research is a tool or facility that is used by researcher for collecting data in order to get better result. To get the accurate data, in this study the researcher chose some instruments for collecting the data, they were:

1. Test

In simple terms, test is as a method which is used to measure competence, knowledge, intelligence, and ability of talent which is possessed by individual or group to collect data.[7] The instrument of the test in this research is objective test. By using objective test, it can measure how students' mastery on the material.

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[6]Suharsimi Arikunto, *Prosedur Penelitian: Suatu Pendekatan Praktik*, p. 118-119.

[7]H. Douglas Brown, *Language Assessment: Principles and Classroom Practices,* (San Fransisco: Longman, 2004), p. 3.

Objective test is frequently criticized on the grounds that they are simpler to answer than subjective test. Objective tests are divided into transformation, completion, combination, addition, rearrangement, matching, correct and incorrect (true/false) and multiple choice.[8] The researcher used one test type only. It was multiple-choice. It means students have to choose the right answer among a, b, c, or d.

The researcher used multiple choice forms. The choice of the test type is based on the consideration that multiple choice test are:[9]

a. The technique of scoring is easy.

b. It was impossible for students to avoid the grammar point being evaluated.

c. This is sensitive measure of achievement multiple-choice language test; it allows teachers to diagnose the students' problems.

In this research, the researcher conducted pre-test and post test. Pre-test was given before the teacher taught new material by using pictures, the teacher asked students to do the test related in the materials that they was known by them before. Pre-test was given to the experimental and control classes in same way. This test was given before the experiment run.

Post-test was given to the experiment class and control class. It was given in order to know students' achievement after they were taught pictures (experimental class) and without pictures (control class). In this case, students were asked to do the objective test about narrative text.

The score of students' achievement can be calculated by using this following formula:[10]

$$Score = \frac{The\ number\ of\ rigth\ answer}{The\ number\ of\ questions} \ x\ 100\ \%$$

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[8]Ngalim Purwanto, *Prinsip-prinsip dan Teknik Evaluasi Pengajaran,* (Bandung: PT. Remaja Rosda Karya, 2002), 11th Ed., p. 35-36.

[9]H. Douglas Brown*, Language Assessment: Principles and Classroom Practices,* p.43 .

[10]Suharsimi Arikunto, *Prosedur penelitian Suatu Pendekatan Praktik*, p. 235.

2. Documentation

Documentation is tool aiming at identifying documents or to the field of study devoted to the study of documents.[11] In this research, the researcher will get the data from the school. While during the experiment, the researcher gets the documentation from the teacher's note. In this research, the researcher will get the data from the school.

In this research, the researcher got the syllabus, lesson plan of teaching and learning process, report of students' development, teachers' name list, and sketch of SMPN 31 Semarang in the academic year of 2011/ 2012. The documentation is used to know data of the students and teachers in the school. To get the result of documentation easily and systematically, the data was gained by the help of English teacher of related in school.

The steps of collecting the data by getting documentation are as follows:

a. The researcher got the resources from the teacher's note while conduct the experimental research. The researcher collected the documentation was gained by the help of the English teacher.

b. The researcher collected the data of students' development, teachers' name list, and sketch of SMPN 31 Semarang in the academic year of 2011/ 2012. The data was taken when the researcher conducted the research. The documentation that help researcher to collect the data is needed in this research.

In this study, the researcher collected the data of students' name list, teachers' name list from the academic office, sketch of the school and organization structure of the official SMPN 31 Semarang in the academic Year of 2011/ 2012.

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[11]Houghton Mifflin Company, "Documentation", in *http://en.wikipedia.org/wiki/documentation*, accessed on Januari, 12nd of 2012

F. Technique of Data Analysis

1. Try Out-Test

A try out test is the result will be used to make sure that the measuring instrument has such characteristics as validity and reliability of instrument test. The instrument to be tried out was the composition test. The result of test was used to find out the validity and reliability, difficulty level and also the discrimination power of each item.[12]

The tryout was given to VIII B of the students of SMPN 31 Semarang. After finishing the test, the answer sheets were collected in order to be scored. From 25 items test of tryout, some items were chosen as the instrument of the test. The choosing of the instrument had been done by considering: validity, reliability, the degree of test difficulty and discriminating power.

a. Validity

A valid test is one that in fact measures what it claims to be measuring.[13] The result was consulted to critical score for r-product moment. If the obtained coefficient of correlation was higher than the critical score for r-product moment, it means that a paragraph was valid at 5% alpha level significance. The validity is an important quality of any test. It is a condition in which a test can measure what is supposed to be measured.

The validity of an item can be known by doing item analysis. It is counted using product – moment correlation formula:

$$ r_{xy} = \frac{N \sum XY - \sum (X) \sum (Y)}{\sqrt{\left\{ N \sum X^2 - \left(\sum X \right)^2 \right\}\left\{ N \sum Y^2 - \left(\sum Y \right)^2 \right\}}} $$

r_{xy} : The correlation coefficient between X variable and Y variable

N : The number of students

[12] Suharsimi Arikunto, *Prosedur penelitian Suatu Pendekatan Praktik*, p.167.

[13] H. Douglas Brown, *Language Assessment: Principles and Classroom Practices,* p.22.

X   : The number of each item score

Y   : The number of total score

Calculation result of r_{xy} is compared with r_{table} of product moment by 5% degree of significance. If r_{xy} is higher than r_{table}, the item of question is valid.[14]

b. Reliability

Reliability means "consistent and dependent".[15] Besides validity, a good test should have reliability as well. Reliability is necessary characteristic of any good test. The method is used to find out reliability involved scoring of first and last part of the items separately by making table. To get the coefficient of correlation, the researcher applies the *product-moment* formula and then continued to the *spearman-brown* formula. The formula of product moment as follow:

$$r_{XY} = \frac{N\Sigma xy - (\Sigma x)(\Sigma y)}{\sqrt{\left\{N\Sigma x^2(\Sigma x)^2\right\}\left\{N\Sigma y^2(\Sigma y)^2\right\}}}$$

In which,

r_{XY} : Coefficient of correlation between the scores of the first and last part of the items.

N   : The number of students / subject participating in the test/ testee.

Σ_X : The score of first part.

Σ_Y : The score of last part.[16]

After finding r_{XY} the computation is continued to the *spearman-brown* formula as follow:

[14]Suharsimi Arikunto*., Prosedur penelitian Suatu Pendekatan Praktik*, p. 78.

[15]H. Douglas Brown, *Language Assessment: Principles and Classroom Practices,* p.20 .

[16]Suharsimi Arikunto*, Prosedur penelitian Suatu Pendekatan Praktik*, p. 181.

$$r_{11} = \frac{2 \times r_{xy}}{1 + r_{xy}}$$

In which,

r_{11} : The reliability of the instrument.

r_{xy} : Coefficient of the correlation between the first and last part. [17]

Calculation result of r_{11} is compared with r_{table} of product moment by 5% degree of significance. If r_{11} is higher than r_{table}, the item of question is reliable.

c. Degree of Test Difficulty

A good question is a question that is not really difficult and not really easy. Formula for degree of test difficulty is: [18]

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

In which,

FV : The index of difficulty.

R : Number of students who answered the item correctly.

N : Number of students. [19]

The level of difficulty of each item was determined by using this following categorization:

FV $\leq$ 0.00 : very difficult.

0.01 - 0.30 : difficult.

0.31 - 0.70 : medium.

0.71 - 1.0 : easy.

FV $\geq$ 1.0 : very easy. [20]

d. Discriminating Power

[17]Suharsimi Arikunto, *Prosedur penelitian Suatu Pendekatan Praktik*, p.180.

[18]Ngalim Purwanto, *Prinsip-prinsip dan Teknik Evaluasi Pengajaran,* p.119.

[19]Harold S. Madson, *Technique in Testing,* (USA: Oxford University Press. Inc., 1983) p. 181.

[20]Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan, Revised Ed.,* (Jakarta: Bumi Aksara, 2002), 3rd Ed., p. 207.

The discriminating power is a measure of the effectiveness of a whole test. It is used to know how accurate the question differ higher subject and lower subject.[21] The formula for discriminating power is Split Half:

$$D = \frac{Correct\ U - Correct\ L}{N}$$

In which,

D : The discrimination index.

U : The number of the students in the upper group who answered item correctly.

L : The number of the students in the lower group who answered item correctly.

N : The number of the students who answered correctly in one group.

The criteria of discriminating power as follow:

$D \leq 0.00$: Very Poor.

0.01 - 0.20 : Poor.

0.21 - 0.40 : Medium.

0.41 - 0.70 : Good.

0.71 - 1.00 : Excellent.[22]

2. Pre-Test

Pre-test was given before the treatments. The researcher determined the statistic analysis technique whether groups that have normal distribution. If the data have normal and homogenity distribution, the treatment and teaching can be conducted to both classes.

a. Normality Test

It is used to know the normality of the data that is going to be analyzed whether groups that have normal distribution or not. The normality test with Chi-square is done to find out the distribution data.

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[21]Ngalim Purwanto, *Prinsip-prinsip dan Teknik Pengajaran,* p.120.

[22]Harold S. Madson, *Technique in Testing,* p. 183.

Step by step Chi-square test is as follows:

1) Determine the range (R); the largest data reduced the smallest.

2) Determine many interval classes (K) with formula:

K = 1+ (3, 3) log n

3) Determine the length of the class, using the formula:

$$P = \frac{range}{number\ of\ class}$$

4) Make a frequency distribution table.

5) Determines the class boundaries (bc) of each class interval.

6) Calculating the average Xi ($\overline{X}$), with the formula:

$$\overline{X} = \frac{\sum f_i x_i}{\sum f_i}$$

7) Calculate variants, with the formula:

$$S = \sqrt{\frac{\sum f_i (x_i - \overline{x})^2}{n-1}}$$

8) Calculate the value of Z, with the formula:

$$Z = \frac{x - \overline{x}}{s}$$

x = limit class

$\overline{x}$ = Average

S = Standard deviation

9) Define the wide area of each interval

10) Calculate the frequency expository (Ei), with formula:

Ei = n x wide area with the n number of sample

11) Make a list of the frequency of observation (Oi), with the frequency expository as follows:

class	Bc	Z	P	L	Ei	Oi	$\frac{Oi - Ei}{Ei}$

12) Calculate the chi-square (X^2), with the formula:

$$X^2 = \sum_{i=1}^{k} \frac{(O_i - E_i)^2}{E_i}$$

13) Determine dk = k-3, where k is the number of class intervals and $\alpha = 5\%$

14) Determining the value of X^2 table

15) Determining the distribution normality with test criteria:

If $X^2{}_{count} > X^2{}_{table}$ so the data is not normal distribution and the other way if the $X^2{}_{count} < X^2{}_{table}$ so the data is normal distribution.[23]

b. Homogeneity Test

It was meant to get the assumption that sample of research came from a same condition or homogenous. It is used to know whether experiment class and control class, those are taken from population that have same variant or not.

The steps as follows:

1) Calculate variants both classes (experimental and control classes), with the formula:

$$S_1^2 = \frac{\sum (x - \bar{x})^2}{n_1 - 1} \quad \text{And} \quad S_2^2 = \frac{\sum (x - \bar{x})^2}{n_2 - 1}$$

2) Determine $F = \dfrac{Vb}{Vk}$

Where:

Vb   : Bigger Varian

Vk   : Smaller Varian

Determine dk $= (n_1 - 1) : (n_2 - 1)$

3) Determine F_{table} with $\alpha = 5\%$

4) Determining the distribution homogeneity with test criteria:

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[23]Sudjana., *Metode Statistika,*(Bandung: Tarsito, 2005), p. 272.

If $F_{count} > F_{table}$, the data is not homogeneous and the other way if the $F_{count} < F_{table}$, the data is homogeneous.[24]

c. Test of the Average

It is used to examine average whether experiment group and control group have been decided having different average.[25]

T-test is used to analyze the data of this research. A t-test would be the measure you would use to compare the mean scores of the two groups.[26]

If $\sigma_1^2 = \sigma_2^2$ (has same variant), the formula is:

$$t = \frac{\overline{X}_1 - \overline{X}_2}{S\sqrt{\dfrac{1}{n_1} + \dfrac{1}{n_2}}}$$

With

$$S = \sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2}}$$

Where:

$\overline{X}_1$: The mean score of the experimental group

$\overline{X}_2$: The mean of the control group

n_1 : The number of experiment group

n_2 : The number of control group

S_1^2 : The standard deviation of experiment group

S_2^2 : The standard deviation of both groups

If $= \sigma_1^2 \neq \sigma_2^2$ (has no same variant) the formula is:

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[24]Sugiyono, *Statistika Untuk Penelitian,* p. 140.

[25]Anas Sudijono, *Pengantar Statistik Pendidikan* (Jakarta: PT. Raja Grafindo Persada, 1995) 6th Ed., p. 326-327.

[26]H. Douglas Brown, *Language Assessment: Principles and Classroom Practices,* p. 205.

$$t^1 = \frac{\overline{X} - \overline{X}_2}{\sqrt{\dfrac{S_1^2}{n_1} + \dfrac{S_1^2}{n_2}}}$$

The hypotheses are:

Ho $= \mu_1 = \mu_2$

Ha $= \mu_1 \neq \mu_2$

μ_1 : average data of experiment group

μ_2 : average data of control group

If $t_{count} > t_{table}$ so Ho is rejected and there is no difference of average value from both of groups. Moreover, the other way if the $t_{count} < t_{table}$ so Ho is accepted and there is significant difference of average value from both of groups.[27]

3. **Post-Test**

Post-test was held after all treatments were conducted. This test was used to measure students' achievement after they were given treatments. The result of test was analyzed statistically.

a. Normality Test

Steps normality second step is the same as the normality test on the initial data.

b. Homogeneity Test

Steps homogeneity second step is the same as the homogeneity test on the initial data.

c. Test Average (Right-hand Test)

This test proposed that hypothesis test in average similarity with the right test as the steps right-hand test the initial data.

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[27] Anas Sudijono, *Pengantar Statistik Pendidikan* p.272-273.