CHAPTER III
RESEARCH METHOD

A. Objective of the Study

The objective of the study as follows:

To find out the effectiveness of using songs to improve students' understanding on preposition in the eight grade students of SMP Hj. Isriati Baiturrahman Semarang.

B. Setting of the Study

This study was conducted in SMP Hj. Isriati Baiturrahman Semarang. It located at Abdurrahman Saleh Street 285 Semarang. The subjects of this study were the eighth grade students of SMP Hj. Isriati Baiturrahman Semarang in the academic year of 2010/2011. This study was conducted in second semester. Due to limitation of time, the writer did not take all students as the subjects of the study, but drew a sample.

C. Variable of the Research

According to Fred D. Kerlinger as cited by Arikunto, that all experiments have one fundamental idea behind them; to test the effect of one or more independent variables on a dependent variable (it is possible to have more than one dependent variable in experiments).[1]

This research, that used song as media in the teaching of preposition, had two variables. Those variables were:

1. The independent variable

Independent variable is the variable that the experimenter changes within a defined range. The independent variable in this research was the use of media in the teaching learning process for both groups. The experimental

[1] Suharsimi Arikunto, *Prosedur Penelitian Suatu Pendekatan Praktik*, (Jakarta: PT Rineka Cipta, 2006), p. 119.

group used songs to teach preposition while the control group without the aid of songs (by using pictures).

2. The dependent variable

Dependent variable is variable that measures the influence of the independent variable. The dependent variable in this study was the students' achievement in the test score.

D. Research Method

Research method played an important role in a research because the quality of research greatly depended on the design. In this research, the writer used the form of an experimental research involved two groups: experimental group and control group. An experimental group received a new treatment while control group received a usual treatment. According to Nunan, experiment is designed to collect data in such a way that threats to the reliability and validity of the research are ministered.[2] This study used pre-test and post-test.

The design of the experiment could be described as follows:

$$E\ 01\ X\ 02$$
$$C\ 03\ Y\ 04$$

Adopted based on Arikunto opinions.[3]

Where:

E = experimental group

C = control group

01 = pre-test for experimental group

02 = post test for experimental group

03 = pre-test for control group

04 = post test for control group

X = treatment by using songs

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[2] David Nunan, *Research Method in Language Learning*, (Cambridge: Cambridge University Press, 1992), p. 47.

[3] Suharsimi Arikunto, *op.cit.*, p. 86.

Y = treatment without songs

From the design above, subjects of research were grouped into an experimental group (top line) and a control group (bottom line). The quality of subjects was first checked by pre-testing them (01 and 03). Then, the experimental treatment (taught by using songs) was applied to the experimental group, while the control group was taught without the aid of songs. The test was held in the form of composition. The results of post-test (02 and 04) were then computed statistically.

E. Population and Sample

1. Population

According to Encyclopedia of Educational Evaluation as cited by Arikunto, population is a set (or collection) of all elements possessing one or more attributes of interest.[4] The population of this research was the eight grade students of SMP Hj. Isriati Baiturrahman in the academic year of 2010/2011.

The total numbers of eight grade students were divided into three classes, class A, B and C. The writer chooses the junior high school because English is given to the students as a local content subject of study. There are class VIII A, VIII B and VIII C. There are 40, 40, and 39 students in each class. The total number of the population is 119 students.

Table 2

List of population

Class	Male	Female	Total
VIII A	25	15	40
VIII B	15	25	40
VIII C	21	18	39
Total	61	58	119

[4] *Ibid*, p. 130.

2. Sample

Sample is a representative group from population to serve as respondents.[5] Arikunto opinioned that sample is a part that can represent all the population observed. It is called sample research when we want to generalize the sample research result.[6] The writer selected two groups of students from the population as sample in this study. The total number of the students in population is 119 students. The researcher chooses class A contains 40 students as a control group and class B contains 40 students as an Experimental group. So, that can be expected to represent its population. In this connection, Arikunto states that sample is "a part of research population"[7] The writer took sample in this research because the respondents are more than 100. The respondents are more than 100, it is better to take them all as sample.[8]

Sample in this research is class VIII A is as control class; VIII B is as experimental class.

F. Technique of Data Collection

Instrument that are used to collect the data as follows:

1. Test

In this research, the writer used test to collect data. Brown states that a test is a method of measuring a person's ability, knowledge, or performance in a given domain.[9] Heaton states that achievement test is generally used to refer to more formal tests which have been designed to show mastery of a particular syllabus. This test is similar to class progress tests in the sense that they are generally based on syllabus and measure what has been taught and learnt.[10]

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[5] Tuckman, *Introduction to Linguistic Research*, (Great Britain: Longman), p. 226.
[6] Suharsimi Arikunto, *op.cit.,* p. 131.
[7] Sutrisno Hadi, Statistik (Yogyakarta: Andi, 2004) 2 *nd* Vol, 2 *nd* Ed, p. 221.
[8] Suharsimi Arikunto, *op cit,* p. 134.
[9] Douglas Brown, *Language Assessment Principles and Classroom Practices*, (San Francisco: Longman, 2004), p. 3.
[10] J. B. Heaton, *Writing English Language Test,* (London: Longman, 1975), p. xi.

Based on the statements above, the writer conducted the achievement test in his research. This test was used to measure students' achievement. The test, which was conducted before the treatments, called pre-test. It was used to find out the initial condition of students before treatment. The test, which was done after all treatments, called the post-test.

The instrument of the test in this research is objective test. 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.[11] The writer used multiple choice forms and matching items form. The choice of the test type is based on the consideration that multiple choice test are**:**

a. The technique of scoring is easy.
b. It was easy to compute and determine the reliability of the test.
c. It was more practical for the students to answer

The score of students' achievement can be calculated by using this following formula:[12]

$$Score = \frac{The\ number\ of\ right\ answer}{The\ number\ of\ questions} x100\%$$

2. Observation

Observation is the activity that is done by the researcher to get data. There are two kinds of observation, they are:

a) Non systematic observation which is done by the researcher without using instrument.
b) Systematic observation which is done by the researcher using instrument as the guide of the research.[13]

In this research, the researcher will observe of school, students and English teacher of the school. In this research the writer will use

[11] *Ibid*, p. 12-13.
[12] Suharsimi Arikunto, *op, cit*., p. 235.
[13] Burhan Nurgiyantoro, *Penilaian dalam Pengajaran Bahasa dan Sastra* by *Modification*, (Yogyakarta: BPFE Yogyakarta, 2001), p.307-308.

check list (√) to get the data. The observation is used to know the activities during teaching and learning process, such as how teacher is explains the material, what is the students' respond and how is the student's work in doing the test.

In this study, observation is only used to support the data about students' imagination on reflected on their engagement in learning processes.

Table 4
CHECKLIST OF OBSERVATION

No	Aspects of observation	1	2	3	4	5	Total Score
1	Students are enthusiastic in listening to teacher's explanation						
2	Students show curiosity by asking the questions						
3	Students ask questions to clarify understanding						
4	Students are enthusiastic to answer teacher's questions						
5	Students are enthusiastic doing the test						
6	Students enjoy learning English						
7	Students pay attention to English learning						

G. Technique of Data Analysis

1. Try-out instrument of the test

The writer prepared 25 items as the instrument of the test. Before the items were given to the students, the writer gave tryout test to analyze validity, reliability, difficulty level and also the discrimination power of each item. The tryout was given to VIII C of the students of SMP Hj. Isriati Baiturrahman Semarang. After finishing the test, the answer sheets were collected in order to be scored. An analysis was made based on the result of test by using the formula of validity, reliability, the degree of test difficulty and discriminating power.

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. The Validity

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. According to Arikunto, a test is valid if it measures what it purposes to be measured.[14]

According to Heaton, validity is the extent to which it measure what is supposed to measure and nothing else.[15] Briefly, the validity of the test is the extent to which it measures what it is supposed to measure and nothing else.[16]

To calculate the validity, the writer used the formula as follows:

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

Where:

r_{xy} = the correlation of the scores

ΣY = the total of students who have right answer

ΣY = the total of students' scores

X = the number of the students who have right answer

Y = the students' scores

N = the number of students

b. Reliability

[14] Suharsimi Arikunto, *op cit*, p. 65.
[15] J. B. Heaton, *op cit* , p. 153.
[16] Suharsimi, Arikunto. *Op Cit*, p.168

Reliability refers to the stability or the consistency of the test scores. Heaton states that reliability is a necessary characteristic of any good test; for it to be valid at all, a test must first be reliable as a measuring instrument.[17] In this study, the reliability of the test was measured by comparing the obtained score with r-score product moment. Thus, if the obtained score was higher than the table r-score, it could be said that the test was reliable.

To calculate the reliability of the test, the writer used the formula as follows:

K - R. 20.

$$r_{11} = \left(\frac{k}{k-1}\right)\left(\frac{S^2 - \sum pq}{S^2}\right)$$

Where:

r_{11} : The reliability coefficient of items

k : The number of item in the test

p : The proportion of students who give the right answer

q : The proportion of students who give the wrong answer

S^2 : The standard deviation of the test

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.[18]

c. Degree of Test Difficulty

Heaton states that the index of difficulty of an item simply shows how easy or difficult the particular item proved in the test.[19] If a teacher knows deeply about item difficulty in making a test, he can make his test easy, medium, or difficult.

To know the item difficulty, the writer used the formula:

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[17] J. B. Heaton, *op.cit.*, p.155.
[18] Suharsimi Arikunto, *op cit.*, p. 100.
[19] J. B. Heaton, *op.cit.*, p.172.

$$P = \frac{B_A + B_B}{J_A + J_B}$$

Where:

P : The difficulty's index

J_A : The number of participant in the upper group

J_B : The number of participant in the lower group

B_A : The number of participants in the upper group who answered the item correctly

B_B : The number of participants in the lower group who answered the item correctly

The criteria are:

P = $0{,}00 \leq p \leq 0{,}30$ Difficult question

P= $0{,}30 \leq p \leq 0{,}70$ Sufficient

P= $0{,}70 \leq p \leq 1{,}00$ Easy.

d. Discriminating Power

It is used to know how accurate the questions differ higher subject and lower subject. The formula for discriminating power is Split Half:

$$D = \frac{B_A}{J_A} - \frac{B_B}{J_B} = P_A - P_B$$

Where:

D : The degree of question distinctive

J_A : The number of participant in the upper group

J_B : The number of participant in the lower group

B_A : The number of participants in the upper group who answered the item correctly

B_B : The number of participants in the lower group who answered the item correctly

PA : The proportion of participants in upper group that answered true

PB : The proportion of participants in lower group that answered true.[20]

The criteria are:

$0{,}00 \leq p \leq 0{,}20$ Less

$0{,}20 \leq p \leq 0{,}40$ Enough

$0{,}40 \leq p \leq 0{,}70$ Good

$0{,}70 \leq p \leq 1{,}00$ Excellent

2. Pre-request Test

Before the writer determines the statistical analysis technique used, the writer examined the normality and homogeneity test of the data.

a. Normality Test

The first step that had to be done before doing the research was to test the data normality. It was aimed to know whether the data came from normal distribution or not. The writer used Chi-square to find out the distribution data. Step by step Chi-square test is as follows:

1) Determine the range (R); the largest data reduced the smallest.
2) Determine the many class interval (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 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:

[20] *Ibid*., p. 213.

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

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

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

x = limit class

$\bar{x}$ = 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	$\frac{Oi - Ei}{Ei}$

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 α = 5%

14) Determining the value of X^2 table

15) Determining the distribution normality with test criteria:

If $X^2_{count} > X^2_{table}$, the data is not normal distribution and the other way if the $X^2_{count} < X^2_{table}$, the data is normal distribution. [21]

[21] Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 273.

b. Homogeneity Test

Is used to know whether experimental class and control class, that are taken from population have same variant or not. According to Nunan, a test should be given to both classes of students before the experiment just to make sure that the both classes really are the same.[22]

The writer used the formula as follows:

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

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

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

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:

If $F_{count} > F_{table}$, the data is not homogeneous and the other way if the $F_{count} < F_{table}$, the data is homogeneous.[23]

c. Test of the Average

It is used to examine average whether experiment group and control group have been decided having different average. [24]

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.[25]

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[22] David Nunan, *Research Method in Language Learning* (Cambridge: University Press, 1992) p. 27.

[23] Sudjana, *op cit*, p. 250.

[24] Anas Sudijono, *Pengantar Statistik Pendidikan* (Jakarta: PT. Raja Grafindo Persada, 1995) 6th Ed, p. 271.

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

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

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:

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

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

Criteria test is: Ho is accepted if $-t_{(1-\frac{1}{2}\alpha)} < t < t_{(1-\frac{1}{2}\alpha)}$, where $t_{(1-\frac{1}{2}\alpha)}$ obtained from the distribution list t with $dk = (n_1 + n_2 - 2)$ and opportunities $\left(1 - \frac{1}{2}\alpha\right)$. Values for other t Ho rejected.[26]

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[25] Rodgers and Brown, *op cit,* p. 205.

[26] Sudjana., *op.cit* p. 239.

3. Analysis Phase End

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.

Test Average (Right-hand Test)

Proposed hypothesis test in average similarity with the right test is as follows:

Ho = $\mu_1 = \mu_2$

Ha = $\mu_1 > \mu_2$

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

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

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:

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

Testing criteria that apply Ho is accepted if $t_{count} > t_{table}$ with determine dk = ($n_1 + n_2 - 2$) and α = 5% with opportunities (1 - α) Values for other t Ho rejected.[27]

[27] Sudjana, *op cit*, p. 243.