

**CHAPTER III**  
**RESEARCH METHODOLOGY**

**A. Objective of the Study**

The objective of this study is to identify the effectiveness of using songs in teaching English Articles with the third graders of MIN Purwokerto in the academic year of 2010 / 2011.

**B. Setting of the Study**

The writer did research at MIN Purwokerto. She conducted this research from 19<sup>th</sup> of January 2011 to 10<sup>th</sup> of February 2011.

**Table 1**  
**List of Time of the Study**

No.	Activity	Month/Date							
		January				February			
		19 <sup>th</sup>	20 <sup>th</sup>	26 <sup>th</sup>	27 <sup>th</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>	9 <sup>th</sup>	10 <sup>th</sup>
	In Experimental Class								
1.	Pre test	√							
2.	Treatment I			√					
3.	Treatment II					√			
4.	Post test							√	
	In Control Class								
1.	Pre test		√						
2.	Explaining I				√				
3.	Explaining II						√		
4.	Post test								√

**C. Variable of the Research**

A variable can be defined as an attribute of a person or an object. The object of the study is to see a causal relationship. Variable is the object of research or something that become the concern of research.<sup>1</sup> In this study there are two variables. They are Independent Variable (x) and Dependent Variable (y).

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<sup>1</sup> Suharsimi Arikunto, *Prosedur Penelitian: Suatu Pendekatan Praktik*, (Jakarta: PT Rineka Cipta, 2006), 13<sup>th</sup> Ed., p. 118.

#### 1. Independent Variable (x)

Independent variable is variable that influences or those to be cause of change the dependent variable.<sup>2</sup> The independent variable of this study, based on the definition above is using songs in teaching English articles.

#### 2. Dependent Variable (y)

Dependent variable is variable that was affected or that be the result because of the existence of the independent variable.<sup>3</sup> According to the definition above, the dependent variable of this study is students' achievement on English Articles.

### D. Research Method

In this research, the writer conducted an experimental study. An experiment is defined as “a situation in which one observes the relationship between two variables by deliberately producing a change in one and looking to see whether this alteration produces a change in the other”.<sup>4</sup> In other words, experiment is the way to find the causal relationship between two factors which are raised by the researcher in purpose by reducing or eliminating any distracting factors.

The subjects of this research were divided into two groups: experimental class which was taught using songs and control class which was taught without using songs.

In this research, the approach used by writer was quantitative approach. It is quantitative because the data that was gained were numeric and was analyzed by using statistical computation. Quantitative approach stressed the analysis to the numerical data that is processed by statistical method.<sup>5</sup> It will explain the result of pre test and post test.

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<sup>2</sup>*Ibid.*, p. 119.

<sup>3</sup>*Ibid.*

<sup>4</sup>James Dean Brown and Theodore S. Rodgers, *Doing Second Language Research*, (New York: Oxford University Press, 2002), p. 211.

<sup>5</sup>Burhan Bungin, *Metodologi Penelitian Kuantitatif : Komunikasi, Ekonomi dan Kebijakan Publik Serta Ilmu-Ilmu Sosial Lainnya* (Jakarta: Kencana, 2010), p. 120.

## E. Subject of the Research

### 1. Population

According to Arikunto, population is all the subject of the research.<sup>6</sup> In this case, the participants or the subjects of the research are the third grade students at MIN Purwokerto in the academic year of 2010/2011. The number of the population is 72 students. The population of the research was distributed as follow:

**Table 2**  
**List of population**

Class	Male	Female	Total
III Utsman bin Affan	11	13	24
III Umar bin Khotob	9	15	24
III Abu Bakar Ash Shidiq	12	12	24
<b>Total</b>	<b>31</b>	<b>41</b>	<b>72</b>

### 2. Sample

Sample is part of population.<sup>7</sup> There are two samples in this study, experiment class and control class. Experiment class is taken from III Utsman bin Affan that consists of 24 students. Control class is taken from III Umar bin Khotob that consists of 24 students.

### 3. Sampling

In this research, the writer used cluster random sampling technique. The object are regarded that each of groups has the equal chance to be chosen as the sample. In getting sample of the research, the writer took the procedure called the lottery method. It is each group of the population was presented by small piece of paper. The small piece of paper was placed in a box and well mixed, and a sample of the required size was selected.

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<sup>6</sup>Suharsimi Arikunto, *Op Cit.*, p.130.

<sup>7</sup>*Ibid.*, p. 131

The use of the lottery method of random sampling was easy because of the fact that it did not need difficult procedure. In this case, each of the classes' names was written on piece of paper. And then the paper was rolled and put into a slot of a box. After being well mixed, a paper was dropped out of the slot and these become the sample of the research.

And the last, the researcher got class the class III Umar bin Khotob and III Utsman bin Affan as a sample. The class III Umar bin Khotob as control class and III Utsman bin Affan is as the experimental class. Both of those classes have the same teacher and on the available time to teach them.

## **F. Technique of Data Collection**

The researcher must use instrument in order 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 or in other words, it can be occur complete and systematic.

To get the accurate data, in this study the writer chooses some instruments for collecting the data, they are:

### **1. Test**

Arikunto explained that a test is sequences of question of exercise often are used to measure skill, knowledge, intelligent, or talent of individual group.<sup>8</sup> 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. The writer used one test type only. The writer used fill in the blank. This type of test was chosen because of the following advantages:

- 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.

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<sup>8</sup>Ibid., p 150

In this research, the writer used pre test and post test, they are:

a) Pre-test

Before the writer taught the material by using songs, the writer gave a test to the students. Pre-test was given at the beginning of research, before the treatment was run to both control and experimental class with similar question that related to the topic. Pre test is given to know that the sample (control and experimental class) has same ability.

b) Post-test

Post-test was given to the experiment class and control class. It was given in order to know students' achievement on English articles. The post-test was given to the experimental class and control class after received treatment. The experimental class taught articles by using songs and the control class taught articles without using songs.

The score of students' achievement on English articles can be calculated by using this following formula:

$$\text{Score} = \frac{\text{The number of true answer}}{\text{The number of questions}} \times 100$$

## 2. Documentation

The documentation method is used to look for the data concerning matters or the variable that took from of the note, transcript, book, newspaper, magazine, inscription, ledger, agenda, etc<sup>9</sup>. It refers to the archival data that helps the researcher to collect the data needed. In this research, this method was used to get the data of students' name list that become respondents, syllabus, lesson plan, etc. the data was gained by the help of the English teacher.

## G. Technique of Data Analysis

### 1. Try Out Test

Before the test was used as instrument to collect the data, it had been tried out first to the students in another class. It was applied to analyze validity,

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<sup>9</sup> *Ibid*, p. 158

reliability, difficulty level and also the discrimination power of each item. The try out was given to III Abu Bakar Ash Shidiq of the students of MIN Purwokerto. The writer prepared items as the instrument of the test. From twenty test items of tryout, some items were chosen as the instrument of the test while some others were left out.

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. According to Arikunto, “a test is valid if it measures what it is supposed to be measured.”<sup>10</sup>

The validity of test is calculated using Product Moment Formula, which is 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 coefficient between X variable and Y variable

N : The number of students

$\sum X$  : The sum of score of X item

$\sum Y$  : The sum of score of Y item

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.<sup>11</sup>

#### b. Reliability

“Reliability is consistency of measurement”.<sup>12</sup> A reliable test score will be consistent across different characteristics of the testing situation.

<sup>10</sup>*Ibid*, p. 168

<sup>11</sup>Anas Sudijono, *Pengantar Evaluasi Pendidikan* (Jakarta: PT. Raja Grafindo Persada, 2008),p.179

<sup>12</sup>Lyle F. Bachman and Adrian S. Palmer, *Language Testing Practice: Designing and Developing Useful Language Test*, (New York: Oxford University Press, 1996), p. 19

Besides having high validity, a good test should have high reliability too. Alpha formula is used to know reliability of test is K - R. 20.<sup>13</sup>

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

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.<sup>14</sup>

### 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:

$$P = \frac{B}{JS}$$

Where:

$P$  : item difficulty

$B$  : number of students who answered the item correctly

$JS$  : number of students.<sup>15</sup>

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

$0 < P \leq 0.3$  is difficult

$0.3 < P \leq 0.7$  is medium

<sup>13</sup>Suharsimi Arikunto, *op.cit.*, p. 187

<sup>14</sup> *Ibid.*

<sup>15</sup> Anas Sudijono, *Op Cit*, p. 372

$P > 0.70$  is very easy.<sup>16</sup>

#### d. Discriminating Power

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. The formula for discriminating power is:

$$D = \frac{BA}{JA} - \frac{BB}{JB}$$

Where:

D: discrimination index

JA : member of student in upper group

JB : member of student in low group

BA : member of students in upper group who answer the item correctly

BB : member of students in low group who answer the item correctly

The criteria are:

$D < 0.2$  is poor

$0.2 < D \leq 0.4$  is fair

$0.4 < D \leq 0.7$  is good

$0.7 < D \leq 1$  is very good.

## 2. Pre Test

Pre-test was given before the treatments. The writer determines the statically analysis technique whether both groups have normal distribution. If the data have normal and homogeny 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 both groups have normal distribution or not. To find out the

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<sup>16</sup> *Ibid.*

distribution data is done normality test with the Chi-square. 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:

$$P = \frac{\text{range}}{\text{numberofclass}}$$

- 4) Make a frequency distribution table.
- 5) Determines the class boundaries (bc) of each class interval.
- 6) Calculating the average Xi ( $\bar{X}$ ), with the formula:

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

- 7) Calculate variants, with the formula:

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

- 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 (fh), with formula:

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

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

Class	Bc	Z	P	L	fh	$\frac{(f_o - f_h)}{fh}$

12) Calculate the chi-square ( $\chi^2$ ), with the formula:<sup>17</sup>

$$\chi^2 = \sum \frac{(f_o - f_h)^2}{f_h}$$

13) Determine the degree of validity (dk). In the calculation of this data is arranged in list of frequency distribution consisting of k pieces so that the interval to determine the criteria test used formula  $dk = k-3$ , where k is the number of class intervals and  $\alpha = 5\%$

14) Determining the value of  $\chi^2$  table

15) Determining the distribution normality with test criteria:

If  $\chi^2_{count} < \chi^2_{table}$  so the data is not normal distribution and the other way if the  $\chi^2_{count} < \chi^2_{table}$  so the data is normal distribution.<sup>18</sup>

#### b. Homogeneity Test

Homogeneity test is conducted to determine whether the data are homogeneous or not. The steps as follows:

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

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

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:

<sup>17</sup> Sugiyono, *Statistika untuk Penelitian*, (Bandung : Alfabeta, 2009), p.193

<sup>18</sup> Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 273.

If  $F_{count} > F_{table}$ , the data is not homogeneous and the other way if the  $F_{count} < F_{table}$ , the data is homogeneous.<sup>19</sup>

### c. Test of the Average

It is used to examine average whether experiment group and control group have been decided having different average.<sup>20</sup>

T-test is used to analyze the data of this research. It used to measure or to compare the mean scores of the two groups.<sup>21</sup>

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

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

With

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

Where:

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

$\bar{X}_2$  : 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:

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

<sup>19</sup>Sudjana, *op.cit.*, p. 250.

<sup>20</sup>Suharsimi Arikunto, *op.cit.*, p. 311.

<sup>21</sup>James Dean Brown and Theodore S. Rodgers, *op.cit.*, p.205.

The hypotheses are:

$$H_0 = \mu_1 = \mu_2$$

$$H_a = \mu_1 \neq \mu_2$$

$\mu_1$  : average data of experiment group

$\mu_2$  : average data of control group

Criteria test is:  $H_0$  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  $(1 - \frac{1}{2}\alpha)$ . Values for other  $t$   $H_0$  rejected.<sup>22</sup>

### 3. Post Test

#### 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.

Testing criteria that apply  $H_0$  is accepted if  $t_{count} > t_{table}$  with determine  $dk = (n_1 + n_2 - 2)$  and  $\alpha = 5\%$  with opportunities  $(1 - \alpha)$ . Values for other  $t$   $H_0$  rejected.<sup>23</sup>

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<sup>22</sup>Sudjana, *op.cit.*, p. 239.

<sup>23</sup>*Ibid.*, p. 243.