

CHAPTER III

RESEARCH METHOD

A. Objective of the Study

The objective of the study as follows:

To find out the effectiveness of using a song to improve students' understanding on Vocabulary in the four grade students of SD Negeri I Kutamendala Tonjong-Brebes.

B. Setting of the Study

The writer did research at SD Negeri 1 Kutamendala Tonjong-Brebes. She conducted this research from 1st - 30th of Mart 2010.

C. Procedure and Timeline

In collecting data, the researcher needs six weeks and done some steps as follows:

1. 1st week, asks permission to headmaster of the school
2. 2nd week, the writer asks permission and meet to the English teacher.
3. 3rd week, the writer gives pre-test to both control and experiment class (IV A and IV B)
4. 4th week, the writer teaches experiment class (IVA) and control class (IVB).
5. 5th week, the writer gives post-test to both experiment class (IVA) and control class (IVB).
6. 6th week, the writer calculates the data.

Table 1
List of time of the study

Number	Activity	Month/Date				
		Mart				
		2 nd	9 th	16 th	23 rd	30 th
1.	Try out	-				
2.	Pre test		-			
3.	Treatment 1			-		
4.	Treatment 2				-	
5.	Post test					-

D. 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. It is used to study the influence on the student's vocabulary by using a song in the teaching arithmetic operation. Variable is the object of research or something that become the concern of research.¹ Variables can be classified into two kind of variables; they were independent variables and dependent variable. In this study there are two variables. They are Independent Variable (x) and Dependent Variable (y).

1. Independent Variable (x)

independent variable is selected by researcher to determine the relationship with the dependent variable.² Independent variable in this research is the use of song in teaching English arithmetic vocabulary.

2. Dependent Variable (y)

Dependent variable is the variable that focuses on the central variable, and other variables will act if there is any relationship.³

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

² Sugiyono, *Statistika untuk Penelitian*, (Bandung: CV. Alfabeta, 2007), p.4.

³ Sugiyon, lo, cit, p.4

Dependent variable in this study is the students' score of arithmetic vocabulary test.

E. Research Method

In this research, the writer conducted an experimental study. An experimental 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 (Anderson 1969)”.⁴ 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 a songs and control class which was taught without using a songs.

In this study, 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. It will explain the result of pre - test and post – test.

F. Population and Sample

1. Population

Population is all of subject of research.⁵ The population of this study is the fourth grade of SD Negeri Kutamendala 1 Tonjong – Brebesin the academic year 2009/2010. The total number of fourth-grade students were 79 divide into two classes, class A and class B. The writer choose this Elementary School because English is given to the students as a local content subject of study. There are class 1V A and 1V B. There are 39 and

⁴ Rodgers and Brown, *Doing Second Language Research*, (Cambridge: Oxford Press 2002), p. 221.

⁵ Suharsimi Arikunto, op, cit, 13th Ed, p.130

40 students in each class. The total number of the population is 79 students.

Table 2
List of population

Class	Male	Female	Total
IVA	23	17	40
IV B	12	27	39
Total	35	44	79

2. Sample

A sample is representative of population that will be observed.⁶ Arikunto explains that subject of research less than 100, it is the better to take all so that this research is population research.⁷ The total number of the students in population is 79 students. The researcher chooses class B contain 39 students as an Experimental group and class A contain 40 students as a control group. So, that can be expected to represent its population. In this connection, Arikunto states that sample is “a part of research population”⁸ The writer took sample in this research because the respondents are less than 100. The respondents are less than 100, it is better to take them all as sample.⁹

Sample in this research is class 1V B is as experimental class; 1V A is as control class.

G. Technique of Data Collection

Instrument that are used to collect the date as follows:

1. Test

Test is a question which is used to measure competence, knowledge, intelligence, and ability of talent which is possessed by

⁶ Ibid, p.131

⁷ Ibid, p.134

⁸ Sutrisno Hadi, Statistik (Yogyakarta: Andi, 2004) 2nd Vol, 2nd Ed, p. 221.

⁹ Suharsimi Arikunto, *op cit*, p. 134.

individual or group to collect data.¹⁰ Arikunto explained that a tests is question or exercises and other tools which used to measure skill, intelligence, knowledge, and ability that had by individual or groups.¹¹ In this research, the test was given to tryout class, control class and experimental class.

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.¹² 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

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

- a. Pre-test

Before the teacher taught new material by using songs, the teacher gave vocabulary test to the students. Pre-test was given to the experimental and control classes in same way. This test was given before the experiment was run.

- b. Post-test

Post-test was given to the experiment class and control class. It was given in order to know the score of students' achievement after they were taught using songs (experimental class) and without using mind mapping (control class).

¹⁰ M. Chabib Thoha, *Teknik Evaluasi Pendidikan* (Jakarta: PT Raja Grafindo Persada, 2003), p. 43.

¹¹ Suharsimi Arikunto, *op, cit*, p. 134

¹² J.B Heaton, *Writing English Language Tests* (London: Longman, 1975), p. 12-13.

The score of students' achievement can be calculated by using this following formula:¹³

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

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.¹⁴

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

¹³ Suharsimi arikunto, *op, cit.*, p. 235.

¹⁴ Burhan Nurgiyantoro, *Penilaian dalam Pengajaran Bahasa dan Sastra* by Modification, (Yogyakarta: BPFY Yogyakarta, 2001), p.307-308.

	understanding						
4	Students are enthusiastic to answer teacher's questions						
5	Students are enthusiastic doing the test						
6	Students enjoy learning English (arithmetic terms)						
7	Students pay attention to English learning						

H. Technique of Data Analysis

1. Try-out instrument of the test

The writer prepared 20 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 1V C of the students of SD N1 Kutamendala. 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 20 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 purpose to be measured.¹⁵

According to Heaton, "every test, whether it is a short, informal classroom test or public examination, should be as valid as the construction can make it".¹⁶ Briefly, the validity of the test is the extent

¹⁵ Suharsimi Arikunto, *op cit*, p. 65.

¹⁶ Heaton, J.B. *Op Cit*, p.152

to which it measure what it is supposed to a measure what it is supposed to measure and nothing else.¹⁷

Is measurement that shows the validity of instrument? The validity of an item can be known by doing item analysis. It is counted using biserial correlation coefficient formula:

$$\gamma_{pbi} = \frac{M_p - M_t}{S_t} \sqrt{\frac{p}{q}}$$

γ_{pbi} = The biserial correlation coefficient

M_p = Score average from the validity subject's answer

S_t = Total score average

P = The students proportion true answer

Q = The students proportion from mistake answer

Calculation result of γ_{pbi} is compared with r_{table} of biserial coefficient correlation by 5% degree of significance. If γ_{pbi} is higher than r_{table} , the item of question is valid.¹⁸

b. Reliability

According to Groundlund, reliability refer to the consistency of measurement that is, to how consistent test or other evaluation result are from one to measuring to another.¹⁹ There are many techniques to measure the reliability of the test. In this study, the writer uses the Spearman-Brown method in item formula.

It means "consistent".²⁰ Reliability refers to the consistency of test scores. Besides having high validity, a good test should have high reliability too. To facilitate the computation, the writer composes the

¹⁷ Suharsimi, Arikunto. *Op Cit*, p.168

¹⁸ Suharsimi Arikunto, *Dasar-Dasar Evaluasi Pendidikan* (Jakarta: Bumi Aksara, 2007) 7th Ed, p. 79.

¹⁹ Grounlund, Norman.E. 1981. *Measurement and Evaluation Teaching*. USA: Macmilan Publishing Co. Inc.p.93

²⁰ J.B. Heaton, *op cit*, p. 155.

data, which are needed in the computation. The correlation of the variable, which may show the reliability of the test. Alpha formula is used to know reliability of test is:

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.²¹

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.

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

Where:

P : The difficulty's index

J_A : The number of participant 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:

²¹ Suharsimi Arikunto, *op cit.*, p. 100.

$P = 0,00 \leq p \leq 0,30$ 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 question 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 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

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

P_B : The proportion of participants in lower group that answered true.²²

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, He examined the normality and homogeneity test of the data.

²² *Ibid.*, p. 213.

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. The normality test with Chi-square is done 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:

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

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 (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	$\frac{O_i - E_i}{E_i}$
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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 $X^2_{count} > X^2_{table}$, the data is not normal distribution and the other way if the $X^2_{count} < X^2_{table}$, the data is normal distribution.²³

b. Homogeneity Test

Is used to know whether experiment 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.²⁴

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

²³ Sudjana, *Metode Statistika*, (Bandung: Tarsito, 1996), p. 273.

²⁴ David Nunan, *Research Method in Language Learning* (Cambridge: University Press, 1992) p. 27.

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.²⁵

c. Test of the Average

It is used to examine average whether experiment group and control group have been decided having different average.²⁶

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.²⁷

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:

²⁵ Sudjana, *op cit*, p. 250.

²⁶ Anas Sudijono, *Pengantar Statistik Pendidikan* (Jakarta: PT. Raja Grafindo Persada, 1995) 6th Ed, p. 271.

²⁷ Rodgers and Brown, *op cit*, p. 205.

$$t^1 = \frac{\bar{X} - \bar{X}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

The hypotheses are:

$$H_0 = \mu_1 = \mu_2$$

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

μ_1 : average data of experiment group

μ_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.²⁸

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.

c. Test Average (Right-hand Test)

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

$$H_0 = \mu_1 = \mu_2$$

$$H_a = \mu_1 > \mu_2$$

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

²⁸ Sudjana., *op.cit* p. 239.

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

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:

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

Testing criteria that apply Ho 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 Ho rejected.²⁹

²⁹ Sudjana, *op cit*, p. 243.