

## CHAPTER III

### RESEARCH METHODOLOGY

#### A. The Method of the Research

In this research the writer used experiment research. There were two groups in this research: the experiment group and the control group. Both of group would be given different treatment thought by using Tic Tac Toe Game, and the other one was called control group was not given treatment.

The experimental method was the only method of research that could truly test hypotheses concerning cause and effect relationships. The researcher determiners “who gets what”, which group of subjects gets which treatment (Gay, 1987: 260).

In this study the writer had purpose to know the different effect of the treatment between experimental group who get teaching preposition by using Tic Tac Toe game and control group who does not get teaching preposition using that game.

There are two kind of quasi experimental, they are:

1. The times series design

The times series design is actually an elaboration of the one group pretest-posttest design. One group is repeatedly pre-tested, exposed to a treatment, and then repeatedly post-tested (Gay, 1987: 290).

## 2. The nonequivalent control group design

There are two classes and each class will be given pre-test and post-test but there is only a group which will be given a treatment (Consuelo, 1993: 109-113).

This study used two groups that are not equal, because the writer ignores the beginning of classes' condition. It is not possible to prepare equal classes due to the condition in the field. The writer only examine entry behavior (pre-test) to be compared with the post test administered at the end of treatment, Suwartono (2006 : 59).

The writer would use the quasi experiment research, especially non equivalent control group design, because it could measure the effectiveness of media especially Tic Tac Toe Game to teach preposition indicating in, at and on.

### **B. Place and Time of the Research**

#### 1. The place of the research

The research was conducted in SMP N 2 Buayan academic year 2009/2010. which is located Ngoraji village, Buayan, Kebumen. It was focused on seventh grade students as experimental class and control class.

#### 2. The time of the research

The time of the research was as follow:

Table 2

**Schedule of Research**

Activity	March				April				May				June			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Observation																
Making proposal																
Making instrument																
Giving pre test																
Giving treatment																
Giving post test																
Analyzing data																
Making Report																

**C The Object of the Research**

## 1. Population

Arikunto (1998: 115) stated that population is a set (collection) of all elements possessing one or more attributes of interest. The population of the research was the seventh grade students of SMP Negeri 2 Buayan academic year 2009/2010. The population of this research could be seen in following table:

Table 3

**Population of Research**

Class	Number of Students		Total Number of Students
	Male	Female	
7 A	23	15	38
7 B	22	18	40

7 C	22	18	40
7 D	20	20	40
7 E	17	23	40
7 F	24	16	40
<b>TOTAL</b>	<b>128</b>	<b>110</b>	<b>238</b>

From the table above, the population of the research was 238 students.

## 2. Sample

Sample is a part or representative of the population that being observed (Arikunto, 1998: 117).

The writer chose two classes as a sample based on certain consideration. It was 7C as an experiment class and 7E was a control class.

The step in choosing the sample was as follow:

1. Giving pre-test for two classes.
2. Looking for the mean of each class.
3. Deciding one class as control class and one class as experiment class.

## D. Technique of Data Collection

The writer used test for collecting data. A test is only series of question of exercise of other means of measuring the skill knowledge intelligence, capacities of aptitudes or on individual or group (Arikunto: 1997: 29).

The writer use two kinds of test, they are pre- test and post- test.

#### 1. Test

Arikunto (1993: 173) explains that a test is a sequence of questions or exercises of other tools which are used to measure skills, knowledge, intelligence or talent of individual or group.

In this research the writer uses two kind of the test. They are pre- test and post- test.

##### a. Pre – test

Pre- test was given to the two classes, that is experimental class and control class. This test was given before the classes were given treatment. The type of test was objective test, the writer used multiple choice and gap filling. The number of the test was 20 items for multiple choice and 10 items for gap filling.

##### b. Post- test

It was to measure the effect of certain treatment, in this case was teaching preposition using Tic Tac Toe Game. The instrument of test an objective test because it could be corrected objectively in correcting.

To found out whether teaching preposition using Tic Tac Toe Game of the seventh grade students of SMP N 2 Buayan, the writer used the formula for getting good data of the research.

Table 4

## Research Instrument Preparation

## The outline of Students Test

No	Preposition	Total number of Item	Items number
1.	In	10	Multiple choices (1, 6, 9, 13, 14, 18, 20); Essays (1, 7, 10)
2.	On	10	Multiple choices (2, 3, 7, 10, 11, 15, 16, 19); Essays (2, 4)
3.	At	10	Multiple choices (4, 5, 8, 12, 17); Essays (3, 5, 6, 8, 9)

**E. Technique of Analyzing Instrument**

Before the instrument was tested, the writer found the validity and reliability of the instrument.

**1. Validity**

Validity is a measurement that indicates the level of validity of an instrument, Arikunto (1998:160). He also said that an instrument can be said valid if it has high validity. The writer uses the following formula:

$$r_{xy} = \frac{N \sum xy - (\sum x)(\sum y)}{\sqrt{\{N \sum x^2 - (\sum x)^2\} \{N \sum y^2 - (\sum y)^2\}}}$$

Where:

$r_{xy}$  : validity of test

N : the total number of students

$\sum x$  : the sum of score in x distribution

$\sum y$  : the sum of score in y distribution

- $\sum x^2$  : the sum of the square scores in x distribution
- $\sum y^2$  : the sum of the square scores in y distribution
- $\sum xy$  : the sum of the square scores in xy

Arikunto (1998:162)

## 2. Reliability

Reliability is an important characteristic of good test, Arikunto, (2006:178). If the test is given two the same students in different occasion and the result is consistent. It shows that the test or instrument is reliable. There are many formulas to find out the test reliability.

The writer uses:

$$r_{11} = \left[ \frac{k}{k - 1} \right] \left[ \frac{v_t - \sum pq}{v_t} \right]$$

Where:

- $r_{11}$  : reliability of instrument
- $k$  : a sum of items
- $v_t$  : standard deviation of students score
- $\sum pq$  : the sum of multiple between the proportions of the students who answered correctly and incorrectly

Arikunto (1998:182)

Here are the steps to compute the calculation above:

1. Finding  $v_t$

a.

$$V_y = \frac{\sum y^2 - \left(\frac{\sum y}{N}\right)^2}{N}$$

$$V_t = V_x + V_y$$

b.

$$V_x = \frac{\sum x^2 - \left(\frac{\sum x}{N}\right)^2}{N}$$

Where :

$\sum x$  : the sum of score x

$\sum x^2$  : the sum square of score x

$\sum y$  : the sum of score y

$\sum y^2$  : the sum square of score y

N : total respondents

$V_t$  : total variants

2. Finding  $\sum pq$

Here are some steps in calculating  $\sum pq$

a. Determining p

$$p = \frac{\sum \text{correct answer}}{\text{number of subject}}$$

b. Determining q

$$q = 1 - p$$

c. Multiplying between p and q, then calculate the result of  $\sum pq$

d. Entering to the formula

Arikunto (1998:182)

### 3. Item Difficulty

The writer also computes the item difficulty to measure the difficulty test item, where:

$$P = \frac{\beta}{J}$$

Where:

- P : the item of difficulty
- $\beta$  : the sum correct of respondent
- J : the number of item

The writer uses criteria of difficulty index as follow that is sated by Arikunto (1998:209).

$P=0.00-0.30$  = It's difficult

$P=0.30-0.70$  = It's fair

$P=0.70-1.00$  = It's easy

### F. Technique of Analyzing Data

To know differences of experimental and control group, the writer used t-test for computing data. By using this formula, the writer calculated the significance in effect of students' preposition (in, on and at) mastering on the testing t-test calculation.

Afetr gathering the data, the data was computed by using statistical formulas:

#### 1. Scoring of each students

To find out the score of each students, the writer calculated the correct answer of the students. If an answer was correct, it got 1 point and 0 point for an incorrect answer.

Then the writer consults to the criteria as follows:

- 81-100 : very good
- 61-80 : good
- 41-60 : fair
- 21-40 : bad
- 0-20 : very bad

2. Second, the writer calculated the mean of each group. The writer used the formula as follows:

a. Means of experimental group

$$M_x = \frac{\sum x}{n}$$

b. Means of control group

$$M_y = \frac{\sum y}{n}$$

Where:

$M_x$  : mean score of experimental group

$M_y$  : mean score of control group

$\sum x$  : the score sum of experimental group

$\sum y$  : the score sum of control group

$n$  : the total number of respondents

3. Third, the sum of square deviation each group.

The formulas are as follow:

a. Experimental group

$$\sum x^2 = \sum x^2 - \frac{\sum x^2}{n}$$

b. Control group

$$\sum y^2 = \sum y^2 - \frac{\sum y^2}{n}$$

Where:

$\sum x^2$  : the square deviation sum of experimental group

$\sum y^2$  : the square deviation sum of control group

$\sum x$  : the score sum of experimental group

$\sum y$  : the score sum of control group

$n$  : the total number of respondents

4. Fourth, the writer applied all of them into t-test formula:

$$t = \frac{M_x - M_y}{\sqrt{\left[ \frac{\sum x^2 + \sum y^2}{N_x + N_y - 2} \right] \left[ \frac{1}{N_x} + \frac{1}{N_y} \right]}}$$

Where:

$M_x$  : mean of experimental group

$M_y$  : mean of control group

$\sum x^2$  : the total square of experimental group

$\sum y^2$  : the total square of control group

$N_x$  : the total number of experimental group

$N_y$  : the total number of control group

After the result of the t-test was found, it was compared to the value of t-table. If the result of comparison showed that the t-value was higher than value t-table, so the hypothesis was accepted.