

## **CHAPTER 3**

### **RESEARCH METHODOLOGY**

This chapter focuses on the research methodology utilized in the present study. First, a review of the research design is introduced. Next, a description of the research population and sample is provided, followed by an explanation of the study procedures. Research instruments and how to construct them are then explained. Data collection methods are identified, and a description of the data analysis is given.

#### **3.1 Population and Samples**

##### **3.1.1 Population**

The populations of this study were 14 Prathomsuksa 4 students who enrolled in the fundamental English course (E14101) in the second semester of academic year 2011 at Ban Nong Chum Sang School, Huai Thalaeng District, Nakhon Ratchasima Province under Nakhon Ratchasima Primary Educational Service Area Office 2.

##### **3.1.2 Samples**

The samples of the study were 14 Prathomsuksa 4 students (9 boys and 5 girls) who enrolled in the fundamental English course (E14101) in the second semester of academic year 2011 at Ban Nong Chum Sang School, Huai Thalaeng District, Nakhon Ratchasima Province under Nakhon Ratchasima Primary Educational Service Area Office 2. They were selected by purposive sampling technique with the three main reasons. Firstly, they were taught fundamental English course (E14101) by the

researcher herself. Secondly, the researcher was their advisors. Lastly, the students in this classroom consisted of a mix of low, moderate and high English proficiency.

### **3.2 Research Instruments**

The main instruments employed in this study were as follows:

3.2.1 Lesson plans for teaching English vocabulary through games for Prathomsuksa 4 students conducted by the researcher. There were 10 lesson plans which consist of 10 sets of vocabulary: numbers 11-30, things in classroom, colors, animals, parts of body, fruits and vegetables, occupations, places, my family, and months of the year.

3.2.2 English vocabulary achievement test (pretest and posttest) which was designed from list of words in the English vocabulary curriculum for Prathomsuksa 4 students which was used in this study. There were 40 items of 4 multiple choices test examined by the experts to measure the content validity and reliability.

3.2.3 The questionnaire for the students' satisfaction toward learning English vocabulary through games was designed to collect the information from the samples in this investigation.

### **3.3 The Construction of Research Instruments**

The procedures of the research instruments construction and the determination of the instruments' quality were explained as following:

#### **3.3.1 Lesson Plans for Teaching English Vocabulary through Games**

Lesson plans for teaching English vocabulary through games for Prathomsuksa 4 students were written by the researcher with the following steps:

3.3.1.1 The researcher studied and analyzed the Basic Education Core Curriculum B.E. 2551 (A.D. 2008) about vision, principles, goals, learners' key competencies, desirable characteristics, indicators, learning areas, strands and learning standards of foreign languages.

3.3.1.2 The researcher studied the limitations and details of contents in curriculum based on English learning for Prathomsuksa 4 students at Ban Nong Chum Sang School, Huai Thalaeng District, Nakhon Ratchasima Province under Nakhon Ratchasima Primary Educational Service Area Office 2.

3.3.1.3 The researcher studied the methods employed steps of using games in class and techniques of constructing lesson plans for teaching.

3.3.1.4 The researcher selected 10 games for improving English vocabulary learning from documents and books, such as "100 Language Games" by Amphaiphan, "Teaching English Through Songs And Games" by Muadmanee, "Word Games With English 1" by Williams and Herd, and websites.

3.3.1.5 The researcher constructed 10 lesson plans for improving English vocabulary learning focusing on teaching through games comprising various parts of objectives, contents, activities, materials, evaluation, and suggestions.

**Table 3.1****Ten Sets of Vocabulary and Games Used in this Study**

<b>Lesson plan</b>	<b>Vocabulary</b>	<b>Game</b>	<b>Source</b>
1	Numbers	Hop! Hop!	Amphaiphan (2002)
2	Things in classroom	Look and Write	Amphaiphan (2002)
3	Colors	Crossword	Williams and Herd (1990)
4	Animals	Scrambled Words	Amphaiphan (2002)
5	Parts of body	Simon Says	Amphaiphan (2002)
6	Fruits and vegetables	The Market	Muadmanee (1997)
7	Occupations	Throw the ball	Supakaew (2007)
8	Places	Categories	Muadmanee (1997)
9	My family	Deaf and Dum Spelling	Sripramong (2004)
10	Months of the year	Bingo	Muadmanee (1997)

3.3.1.6 The lesson plans were examined and commented by advisors on objectives, contents, appropriateness of games and objectives, activities, learning assessment and content validity. The researcher improved the lesson plans based on the advisors' suggestions.

3.3.1.7 Lesson plans were then examined by the same group of 3 experts on content validity by using five-point Likert's rating scale as follows (Srisa-ard. 2002 : 102):

5 marks for the most appropriate

4 marks for more appropriate

3 marks for average appropriate

2 marks for less appropriate

1 marks for the least appropriate

Therefore, it was confident that the instruments used in this research presented accepted validity. The names of three experts were as follows:

1. Dr. Surachai Piyanukool, the Associate Dean of Graduate School and also the English lecturer at Buriram Rajabhat University.

2. Dr. Narumon Somkuna, the Associate Dean of Graduate School at Buriram Rajabhat University.

3. Mr. Sarom Mok, an English lecturer at the Royal University of Phnom Penh and also Doctoral degree student at Buriram Rajabhat University.

3.3.1.8 The researcher analyzed the scores collected from the experts to find out the mean scores and compared them with these criteria (Srisa-ard, 2002 : 99-103).

**Table 3.2**

**The Five-point Likert Scale Used in this Study**

Meaning	Opinion Level
4.51 - 5.00	Most Appropriate
3.51 - 4.50	More Appropriate
2.51 - 3.50	Average Appropriate
1.51 - 2.50	Less Appropriate
1.00 - 1.50	Least Appropriate

Appropriate mean score at 3.50 and upper were considered that the lesson plans can be utilized as showed in Table 3.3.

**Table 3.3****The Results of Lesson Plans Analysis**

<b>Lesson Plan</b>	$\bar{x}$	<b>S.D.</b>	<b>Level of Appropriateness</b>
1	4.31	0.47	More Appropriate
2	4.11	0.32	More Appropriate
3	4.27	0.45	More Appropriate
4	4.16	0.37	More Appropriate
5	4.22	0.42	More Appropriate
6	4.29	0.46	More Appropriate
7	4.22	0.42	More Appropriate
8	4.11	0.32	More Appropriate
9	4.36	0.48	More Appropriate
10	4.18	0.39	More Appropriate
<b>Total</b>	<b>4.22</b>	<b>0.42</b>	<b>More Appropriate</b>

As shown in Table 3.3 above, the mean score of lesson plans for teaching English Vocabulary through games obtained was 4.22 (S.D.= 0.42).

3.3.1.9 The researcher conducted the complete lesson plans for teaching English vocabulary through games for the Prathomsuksa 4 students in the second semester of academic year 2011 at Ban Nong Chum Sang School, Huai Thalaeng District, Nakhon Ratchasima Province under Nakhon Ratchasima Primary Educational Service Area Office 2.

3.3.1.10 The lesson plans were tried out with 20 Prathomsuksa 4 students who were not the samples in academic year 2011 at Ban Mueng Plabpla School, Huai Thalaeng District, Nakhon Ratchasima Province under Nakhon Ratchasima Primary Educational Service Area Office 2 in order to find out the weak points and then improved the lesson plans for teaching English vocabulary through games before trying with the samples (See Appendix C).

To appraise the efficiency of the lesson plans for teaching English vocabulary through games, there were three steps to perform. The three steps of the pre-trials were as following (Phromwong. 1978):

#### 1. The Individual Trial

The lesson plans for teaching English vocabulary through games are utilized with 3 different proficiency level students, namely, 1 high, 1 moderate and 1 low proficient student who were not the samples in the study. The criteria of discrimination divided the students into different levels of English learning achievement were: 1) the students who had got grade 4 in English in English in Prathomsuksa 3 in the semester of academic year 2010 was high proficient students, the student who had got grade 2 or 3 was moderate proficient student, and the students who had got grade 1 was low proficient student; and 2) the three students were allocated to carry out a pretest, and they learned English vocabulary through games for 10 sixty minute periods. While the students were studying English vocabulary through games, they were requested to do the exercises. After that, they were requested to do a posttest and give some opinions about lesson plans for teaching English vocabulary through games for a period. The scores which the students gained from the exercises and the posttest were computed to find out the efficiency of process ( $E1 = 79.67$ ) and the efficiency of the outcomes ( $E2 = 79.17$ ) respectively. Then the researcher improved the lesson plans for teaching English vocabulary through games based on the students' comments.

#### 2. The Small Group Trial

The nine students who participate in this step were 3 high proficient, 3 moderate proficient, and 3 low proficient students. Before learning English

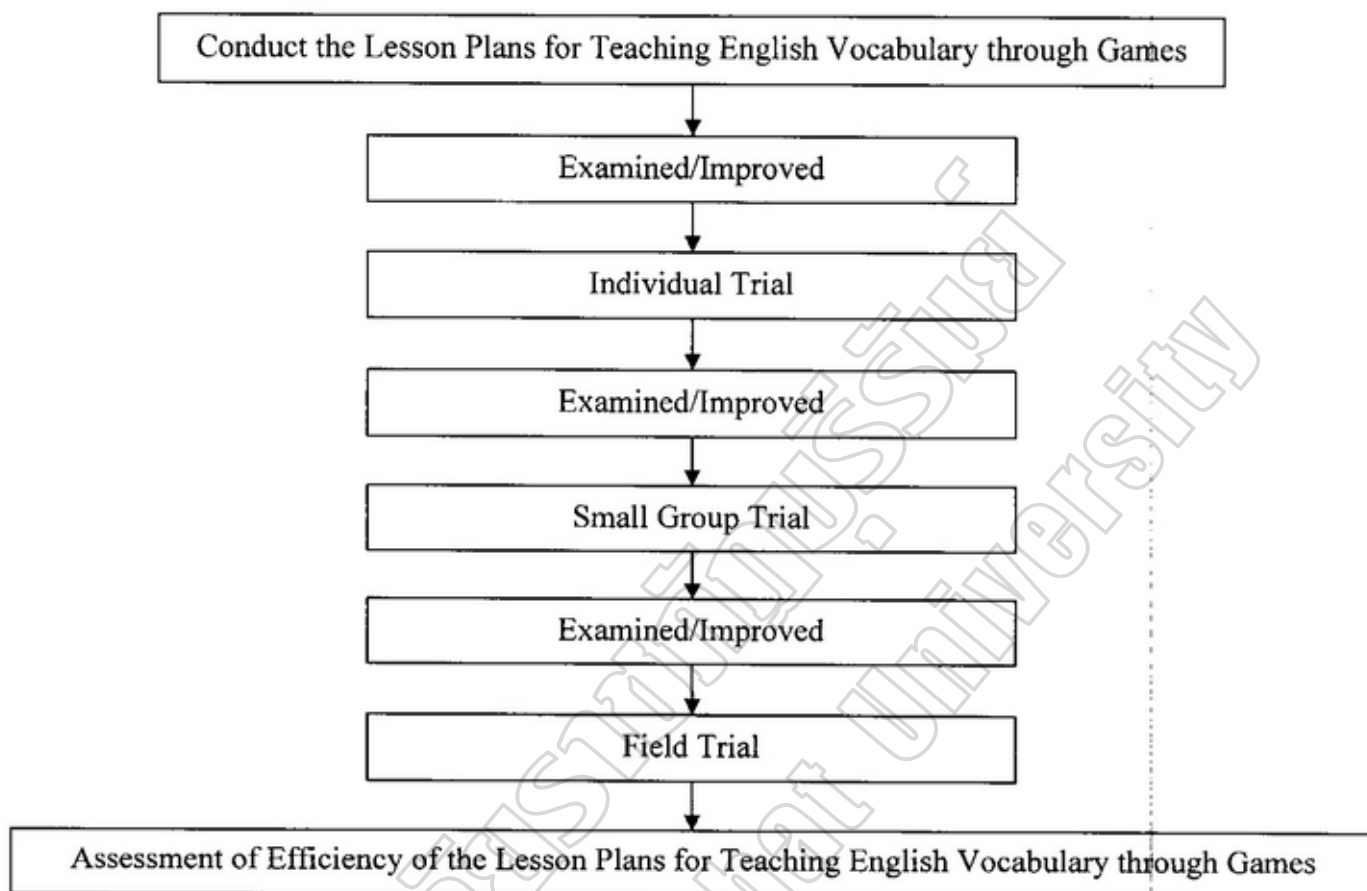
vocabulary through games for 10 sixty minute periods, they took a pretest for a period. While the students were learning English vocabulary through games, they did the exercises. Then took a posttest and provided some opinions for a period. In this step, the efficiency of the process ( $E1= 81.56$ ) and the process of the outcomes ( $E2= 82.22$ ) were analyzed from the students' exercises and a posttest, respectively.

### 3. The Field Trial

In this step, there were 20 students with three different proficiency levels of English achievement participated. They took pretest for a period. Then they learned through English vocabulary through games for 10 sixty minute periods, they did the activities while learning English vocabulary through games. After learning, they took a posttest. The scores of the activities in learning English vocabulary through games, and the posttest scores from the field trial were decided to find out the efficiency of the lesson plans for teaching English vocabulary through games based on 80/80 standard level (Phromwong. 1978). The result of the field trial revealed that the efficiency index of the lesson plans for teaching English vocabulary through games was 82.45/83.75 which met the criterion set.

To conduct this study, the assessment of efficiency of the lesson plans for teaching English vocabulary through games was performed as shown in the following figure.





**Figure 3.1** Steps of Trying out the Lesson Plans

**Source:** Suwanbenjakul (2002 : 52)

3.3.1.11 The researcher conducted the complete lesson plans for teaching English vocabulary through games (See Appendix F) to use with 14 samples which were selected by purposive sampling technique of Prathomsuksa 4 students at Ban Nong Chum Sang School in academic year 2011.

### 3.3.2 English Vocabulary Achievement Test

Pretest and posttest were multiple choices, consisting of 40 items of 4 multiple choices that required the students to choose the correct answer. The samples did both

pretest and posttest which were the same parallel test. The researcher constructed the test in the following steps:

3.3.2.1 The researcher studied the syllabus for Primary level of English subject and the contents of vocabulary for Prathomsuksa 4 students.

3.3.2.2 The researcher studied documents and books, such as "Testing English as a second Language" by Harris (1969 : 58-67) and "Testing and Assessment of Teaching English" by Wongsothorn (1995 : 131-208).

3.3.2.3 The researcher constructed the test consisting of 60 multiple choice questions with four alternatives to measure English vocabulary achievement based on 10 word groups: numbers 11-30, things in classroom, colors, animals, parts of body, fruits and vegetables, occupations, places, my family, and months of the year.

3.3.2.4 The items of the test were edited and revised by the advisor before proposing them to three experts to examine the validity by using IOC formula as follows (Phattiyathanee. 2003 : 219).

+1 = When it is certain that each item of the test is coincident with the objectives.

0 = When it is uncertain that each item of the test is coincident with the objectives.

-1 = When it is sure that each item of the test is not coincident with the objectives.

3.3.2.5 The researcher calculated IOC index, and chose the questions which have the IOC index at level 0.50-1.00 to be a test and the IOC Index is 1.00 (See Appendix D).

3.3.2.6 The complete test was piloted with 9 students who study in Prathomsuksa 5 at Ban Nong Chum Sang School, Huai Thalaeng District, Nakhon Ratchasima Province under Nakhon Ratchasima Primary Educational Service Area Office 2.

3.3.2.7 An item analysis was carried out of the data obtained from the study. Each question was analyzed for the level of difficulty ( $p$ ) and the discrimination power ( $B$ ) by Brennan method with the software programme to calculate. The criteria set used to select the test items was level of difficulty ( $p$ ) at 0.20-0.80, and the discrimination power ( $B$ ) at 0.20-1.00 (Srisa-ard, 2002: 82-84). It indicated that the level of difficulty ( $p$ ) was at 0.43-0.77, and the discrimination power ( $B$ ) was at 0.20-0.53 (See Appendix D).

3.3.2.8 The reliability of the test was determined by using the Lovett's method ( $R_{cc}$ ). The software programme is used to calculate the data, the reliability of the test will be accepted at  $\geq 0.7$  (Srisa-ard, 2002: 96). The reliability of the test ( $R_{cc}$ ) is 0.89 (See Appendix D).

3.3.2.9 The researcher selected the approved 40 items as achievement test (pretest and posttest) (See Appendix D).

### **3.3.3 Satisfaction Questionnaire**

The researcher designed and created a questionnaire to investigate the satisfaction of the students toward learning English vocabulary through games. The questionnaire was written both in Thai and in English to avoid misinterpretation or confusion. It was divided into 3 main parts as following:

Part 1: Personal Information. The samples were required to answer the questions about gender, age, and time of starting English learning. This part was in the form of a check list.

Part 2: Information of Satisfaction Questionnaire. This section comprised 10 statements of five-point rating scales questionnaire with Likert's rating scale. It aimed to elicit students' satisfaction toward learning English vocabulary through games. Five-point Likert scales used for rating their satisfaction were as follows (Srisa-ard. 2002 : 102):

Meaning		Levels of Opinion
5	means	Most satisfactory
4	means	Very satisfactory
3	means	Average satisfactory
2	means	Less satisfactory
1	means	The least satisfactory

Part 3: Additional Opinions. This section was about another opinion in learning English vocabulary through games apart from Part 2. The question was in an open-ended form which the samples could write their suggestions or comments down.

The questionnaire was constructed and developed gradually by the researcher as following:

3.3.3.1 The researcher reviewed the literature on satisfaction, how to construct the satisfaction questionnaire as explicated by Likert's rating scales and studied the questionnaire already used in topic related research.

3.3.3.2 The researcher gathered and arranged the issues concerning learning English vocabulary through games into a list.

3.3.3.3 A draft questionnaire was constructed focusing on learning English vocabulary through games, both in Thai and English versions.

3.3.3.4 The researcher proposed the statements to the advisors before creating 10 statements based on the issue compiled from learning English vocabulary through games.

3.3.3.5 The statements were examined by 3 experts to check for correctness and appropriateness. There were five scales as follows (Srisa-ard, 2002 : 102):

Strongly agree	gives	5 scores
Agree	gives	4 scores
Uncertain	gives	3 scores
Disagree	gives	2 scores
Strongly disagree	gives	1 score

The researcher calculated the obtained data to find out the mean scores. The appropriate scores at 3.50 and upper were considered as the questionnaire item statements, the mean score was 4.53 (See Appendix E). The researcher edited and revised the questionnaire if they had weak points.

3.3.3.6 The researcher organized the statements and tried out with 20 Prathomsuksa 4 students who are not the samples at Ban Mueng Plabpla School in academic year 2011.

3.3.3.7 Each item of five-point rating scales was calculated by utilizing Pearson's correlation coefficient formula ( $R_{XY}$ ) to find out the discrimination power which had to be at 0.20-1.00 level (Srisa-ard, 2002 : 110). The discrimination power was 0.60-0.71 (See Appendix E).

3.3.3.8 The method of coefficient alpha of Cronbach ( $\alpha$ -Coefficient) (Srisa-ard. 2002 : 99) was used to find out the reliability coefficient which the value must be more than 0.80. The data was calculated by a software programme. The reliability coefficient of the questionnaire was 0.90 (See Appendix E).

3.3.3.9 The researcher selected ten statements which had the most significant differences at .05 level to be part of the questionnaire.

### 3.4 Data Collection Procedures

In this study, the research design is one group pretest-posttest design (Sai-yot & Sai-yot. 1995) as shown in Table 3.4 below:

**Table 3.4**

**Research Design**

Group	Pretest	Treatment	Posttest
Experimental	T <sub>1</sub>	X	T <sub>2</sub>

As shown in Table 3.4 above, T<sub>1</sub> is the pretest, X is learning English vocabulary through games or treatment, and T<sub>2</sub> is the posttest, respectively.

To collect the data, the present study included English vocabulary achievement test, and the satisfaction questionnaire. The procedures for collecting data were as follows:

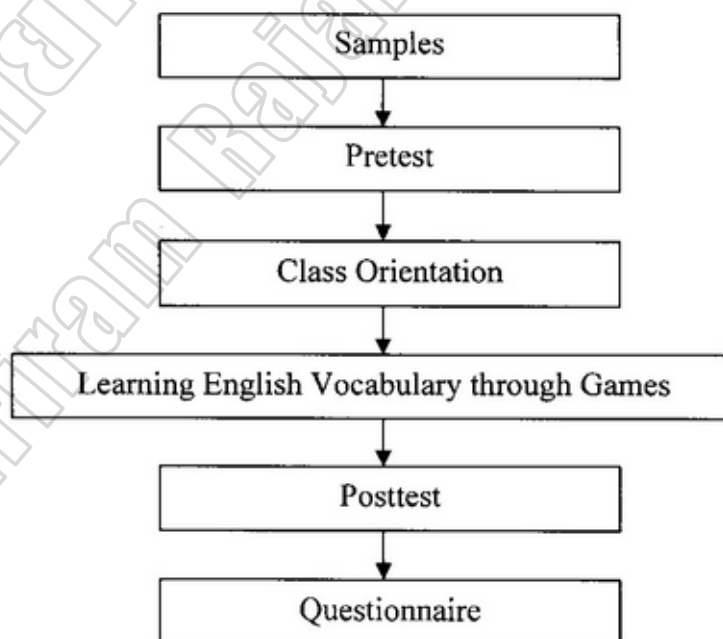
3.4.1 A study was done with a pretest. The pretest was given to all of the samples at the beginning of the study by using a multiple choice test with 40 items for 1 period.

3.4.2 The samples were orientated to understand the learning method, students' role, learning objectives and the assessment procedures. Then they were taught English vocabulary by using games and did activities for 10 periods which each period was 1 hour.

3.4.3 The posttest was administered with all of the samples after completing all the lesson plans for teaching English vocabulary through games.

3.4.4 After doing the posttest, the samples were asked to fill out the questionnaires focusing on their satisfaction about learning English vocabulary through games.

The steps of data collection could be illustrated below.



**Figure 3.2: Data Collection Procedures**

### 3.5 Data Analysis Procedures

The data were analyzed and deduced procedures by using the data analysis methods as following.

#### 3.5.1 Pretest and Posttest Scores

3.5.1.1 In order to evaluate the students' English proficiency before and after being taught through games, the pretest and posttest were computed to find out the percentage (%), mean ( $\bar{x}$ ) and standard deviation (S.D.).

3.5.1.2 The scores obtained from the exercises and the posttest were calculated to find out the efficiency of process (E1) and the efficiency of the outcomes (E2), respectively.

3.5.1.3 Dependent samples t-test was used to compare the difference Of the pretest and the posttest mean scores to detect a significant difference set at .05 level.

#### 3.5.2 Students' Satisfaction toward Learning English Vocabulary through Games

3.5.2.1 In order to evaluate the students' satisfaction toward learning English vocabulary through games, the data from five-rating scales was computed for mean ( $\bar{x}$ ) and standard deviation (S.D.). The following criterion was employed for interpretation (Srisa-ard. 2002 : 103).

Meaning		Interpretation
1.00 – 1.50	means	The Least Satisfaction
1.51 – 2.50	means	Less Satisfaction
2.51 – 3.50	means	Average Satisfaction
3.51 – 4.50	means	More Satisfaction



4.51 – 5.00 means The Most Satisfaction

3.5.2.2 Frequency and percentage were used to analyze the personal data of the samples.

### 3.5.3 Additional Opinions Data

The data obtained from the students' opinions and suggestions in the last part of the questionnaire were analyzed by content analysis technique to find out their satisfactions and reactions toward learning English vocabulary through games.

## 3.6 Statistics Used in Data Analysis

### 3.6.1 Statistics Used to Find out the Quality of Instruments

3.6.1.1 Validity of achievement test by using Index of Congruence (IOC) (Phattiyathanee. 2003 : 220).

$$IOC = \frac{\sum R}{N}$$

IOC = Index Item of Congruence between Question and Objective

$\sum R$  = Total Scores of Experts' Opinion

N = Number of Experts

### 3.6.1.2 Difficulty of the Achievement Test

$$P = \frac{P_U + P_L}{2}$$

P = Level of Difficulty

$P_U$  = Ratio of Correct Answer in High Group Students

$P_L$  = Ratio of Correct Answer in Low Group Students

### 3.6.1.3 Discrimination index of each question of the test (B) by using

Brennan's method (Srisa-ard. 2002 : 90).

$$B = \frac{U}{n_1} - \frac{L}{n_2}$$

B = Discrimination Index

U = Number of Correct Answer in High Group Students

L = Number of Correct Answer in Low Group Students

$n_1$  = Number of High Group Students

$n_2$  = Number of Low Group Students

### 3.6.1.4 Reliability of the test by using Lovett's method (Srisa-ard. 2002 :

96).

$$r_{cc} = 1 - \frac{k \sum X_i - \sum X_i^2}{(k-1) \sum (X_i - C)^2}$$

$r_{cc}$  = Reliability of the Test

k = Numbers of Items

$X_i$  = Students' Scores

$\sum X_i$  = Total of Students' Scores

$\sum X_i^2$  = Summation of Squared Scores

C = Midpoint of the Test of 50 %

### 3.6.1.5 Discrimination of each item for five-point rating scale

questionnaire by using Pearson's Correlation Coefficient (Srisa-ard. 2002 : 110)

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

$r_{xy}$  = Correlation coefficient between variable X and variable Y

X = Total scores of variable X index

$\sum Y$  = Total scores of variable Y index

$\sum XY$  = Total of multiplied result between variable X and variable Y

$\sum X^2$  = Total scores of variable X index's square

$\sum Y^2$  = Total scores of variable X index's square

N = Number of a pair of variables index or number of samples

### 3.6.1.6 Reliability coefficient of the satisfaction questionnaire by using

Cronbach's Alpha-coefficient ( $\alpha$ -Coefficient) (Srisa-ard. 2002 : 99).

$$\alpha = \frac{k}{k-1} \left[ 1 - \frac{\sum S_i^2}{S_t^2} \right]$$

$\alpha$  = Reliability coefficient

k = Number of statements

$\sum S_i^2$  = Total of each statement's variance

$S_t^2$  = Variance of total scores

### 3.6.1.7 The Efficiency of Learning English Vocabulary through Games

(E<sub>1</sub>/ E<sub>2</sub>)

$$E_1 = \frac{\sum X}{\frac{N}{A}} \times 100$$

E<sub>1</sub> = Efficiency of the process

$\sum X$  = Total scores of exercises that the samples gained

N = Number of samples

A = Total score of the exercises in the lessons

$$E_2 = \frac{\sum F}{\frac{N}{B}} \times 100$$

E<sub>2</sub> = Efficiency of the outcomes

$\sum F$  = Total score of samples who pass the posttest

N = Number of samples

B = Total score of the posttest in the lessons

### 3.6.2 Basic Statistics

#### 3.6.2.1 Percentage (Srisa-ard. 2002 : 104)

$$P = \frac{f}{N} \times 100$$

P = Percentage

f = Frequency of the data

N = Numbers of Frequency

### 3.6.2.2 Mean ( $\bar{x}$ ) (Srisa-ard. 2002: 105)

$$\bar{x} = \frac{\sum x}{N}$$

$\bar{x}$  = Mean

$\sum x$  = Total of Scores in Group

N = Number of Scores in Group

### 3.6.2.3 Standard Deviation (S.D.) (Srisa-ard. 2002 : 106)

$$S.D. = \sqrt{\frac{N \sum X^2 - (\sum X)^2}{N(N-1)}}$$

S.D. = Standard Deviation

X = Score of each item

$\sum X$  = Total of Scores in Group

N = Number of scores in group

### 3.6.3 Statistics Used to Examine the Difference of Pretest and Posttest

#### Score Using Dependent Samples T-test (Srisa-ard. 2002 : 112)

$$t = \frac{\sum D}{\sqrt{\frac{n \sum D^2 - (\sum D)^2}{(n-1)}}}$$

t = Statistic to Compare with Crucial

D = Different between Scores

n = Number of Samples

### 3.7 Summary of the Chapter

In summary, this chapter has presented in detail the methods and instruments adopted in the research. They have exercised caution and deliberation in the design of the present study. In the process, this research exercised care in dealing with threats to validity and reliability. In the next chapter, Chapter Four, the researcher will turn to the most interesting and significant parts of this research, which are the major findings and results gained through the various instruments illustrated in this chapter.