

## CHAPTER III

### RESEARCH METHODOLOGY

This chapter is intended to describe the research methodology that is used to conduct the study and the way of collecting and analysing the data. In this chapter the researcher describes the, research design, place and time, population and sample, instrument, data collection, and data analysis.

#### 3.1 Research Design

This study utilized a quasi-experimental design involving two groups: an experimental group and a control group. It also involved pre-test and post-test measures. Quasi-experimental design is widely used in educational setting because of the compulsion to use the preexisting classes organized by school (Creswell, 2012). In a quasi-experimental design, the researcher must have a minimum of two classes or groups for the study. One group serves as the control group and the other group serves as the experimental group. The following is an overview of the research design of this study, which is based on Creswell:

Group A : ----- X ----- O

Group B : ----- O

Explanation:

A : Experimental group

B : Control Group

O : Pre-test and post-test

X : Treatment

### 3.2 Place and Time of the Study

The researcher conducted research at Ban Erawan School. The school is located at Pha In Plaeng, Erawan District, Loei, Thailand. This research was conducted from September 11, 2023 to October 11, 2023.

### 3.3 Population and Sample

All fifth-grade students at Ban Erawan School in Loei, Thailand in the 2023/2024 school year were included in the population of this study. They were divided into five classes namely 5 / 1, 5 / 2, 5 / 3, 5 / 4, and 5 / 5.

This study used a non-probability sampling technique, namely purposive sampling. Purposive sampling is a sampling method by selecting samples according to the researcher's wishes so that they can represent the characteristics of the population (Nursalam, 2017). In purposive sampling, researchers are allowed to determine the sample with certain considerations. The considerations used in this research were suggestions from the class teacher and class 5 English teacher. So that classes 5/3 and 5/1 could be obtained for research use as experimental and control groups. This class meets the criteria set by the researchers in this study. Researcher have also used a homogeneity test with SPSS on both samples using the scores of the two classes. It can be proven that both samples are included in homogeneity from the results below.

**Table 3.1 Test of Homogeneity**

#### Test of Homogeneity of Variances

Hasil Siswa

Levene Statistic	df1	df2	Sig.
.291	1	58	.591

Based on the output above, it can be seen that the significance value (sig.) is  $0.591 > 0.05$ , so It can be concluded that both classes are homogeneous.

### **3.4 Research Instrument**

The instrument utilized in this study for assessing English vocabulary acquisition consists of a standardized short-answer test consisting of 20 questions. Although there were cultural aspects in this study, the instruments used did not use pictures involving culture. In the treatment, the images used were pictures of batik and the Ramayana story. However, the instrument used was a different picture, which was a short answer question with a clearer-cut picture. This was due to the limited number of batik pictures with the same theme in this study. If using the same picture, there will be repetition for the experimental class. Because the purpose of this instrument is to determine the comprehension of control and experimental class students after being given treatment and not repeating, a picture with a clearer cut is used for the instrument. Both pretest and posttest instruments were identical, ensuring consistency in measuring students' language skills before and after exposure to the Picture Word Inductive Model (PWIM) with a focus on Indonesian culture. The use of the same tests allows for direct comparison of student performance and allows identification of any significant changes resulting from the intervention. In addition, this study used a control group to provide a basis for comparison, thereby increasing the reliability and validity of the instrument in evaluating the effectiveness of PWIM in improving English vocabulary mastery among young learners.

The reliability and validity of the test instruments were carefully assessed using statistical analysis carried out through the Statistical Package for the Social Sciences (SPSS) version 20.0. The instrument that will be tested for validity and reliability has 40 questions.

#### **1. Validity**

Validity test is a test tool used to test whether an instrument is valid or not. If valid then the instrument can be used to measure the sample that should be measured (Sugiyono, 2014). The validity test was carried out by testing the validity of the research instrument items. Validation is carried out to test the validity of the instrument items. Items can be declared valid if  $r_{\text{count}} > r_{\text{table}}$  with a

significance level of 5% or 0.05. Validity results will be displayed in **Table 3.2**  
The validity test assessment criteria are:

- a. If  $r_{\text{count}} > r_{\text{table}}$  then the item is said to be valid.
- b. If  $r_{\text{count}} < r_{\text{table}}$  then the item is said to be invalid

Construct validity will use the Pearson product moment correlation formula, as follows:

$$r_{\text{hitung}} = \frac{n \cdot (\sum XY) - (\sum X) \cdot (\sum Y)}{\sqrt{[n \cdot \sum X^2 - (\sum X)^2] \cdot [n \cdot \sum Y^2 - (\sum Y)^2]}}$$

Information:

n = number of respondents

X = variable score (respondent's answer)

Y = total score of the variable for the nth respondent

**Table 3.2 Validity Test Result**

<b>Question numbers</b>	<b><math>r_{\text{count}}</math></b>	<b><math>r_{\text{table 0.05}}</math></b>	<b>Description</b>
1.	0,084	0,355	Invalid
2.	0,848	0,355	Valid
3.	0,009	0,355	Invalid
4.	0,521	0,355	Valid
5.	0,848	0,355	Valid
6.	0,198	0,355	Invalid
7.	0,705	0,355	Valid
8.	0,236	0,355	Invalid
9.	0,206	0,355	Invalid
10.	0,572	0,355	Valid

11.	0,355	0, 355	Valid
12.	0,145	0, 355	Invalid
13.	0,069	0, 355	Invalid
14.	0,409	0, 355	Valid
15.	0,848	0, 355	Valid
16.	0,848	0, 355	Valid
17.	0,164	0, 355	Invalid
18.	0,848	0, 355	Valid
19.	0,482	0, 355	Valid
20.	0,048	0, 355	Invalid
21.	0,653	0, 355	Valid
22.	0,107	0, 355	Invalid
23.	0,009	0, 355	Invalid
24.	0,157	0, 355	Invalid
25.	0,270	0, 355	Invalid
26.	0,140	0, 355	Invalid
27.	0,429	0, 355	Valid
28.	0,009	0, 355	Invalid
29.	0,154	0, 355	Invalid
30.	0,511	0, 355	Valid
31.	0,221	0, 355	Invalid
32.	0,160	0, 355	Invalid
33.	0,452	0, 355	Valid
34.	0,737	0, 355	Valid
35.	0,357	0, 355	Valid
36.	0,005	0, 355	Invalid
37.	0,045	0, 355	Invalid
38.	0,429	0, 355	Valid
39.	0,464	0, 355	Valid
40.	0,457	0, 355	Valid



\* Correlation is significant at the 0.05 level (2-tailed).

The table above indicates that the value used for the r-table is 0.05. The next step is to calculate the degree of freedom (DF) value using the formula ( $df = n - 2$ ). Where n is the sample size. The sample number is 31, so  $DF = 31 - 2 = 29$ . So, the  $r_{table}$  obtained is 0,355. As with the criteria already mentioned, if the calculated  $r_{count}$  is higher than 0,355 then it is considered valid. From the table it is very clear that there are 20 items that are greater than 0,355, so these 20 tests are considered valid. Last it can be concluded that of the 40 items there are exactly half the number of valid items. So, there are 20 valid questions used in this study.

## 2. Reliability

Reliability testing is carried out using an internal consistency test, carried out by testing the instrument only once. This test is carried out using the split half technique from Spearman Brown because the instrument only has one correct answer. Reliability testing with the split half technique is carried out by testing the instrument once and then dividing the test results into two.

Reliability results will be displayed in **Table 3.3** The reliability coefficient is calculated using a formula known as Spearman Brown. If the correlation analysis results are  $> 0.80$ , then the research instrument is declared reliable (Sarwono, 2015). The following is Spearman Brown's formula:

$$r_i = \frac{2r_b}{1 + r_b}$$

$r_i$  = overall internal reliability instrument

$r_b$  = Product Moment correlation between odd split with even split

**Table 3.3 Reliability Test Result**

Reliability Statistics			
Cronbach's Alpha	Part 1	Value	.804
		N of	10 <sup>a</sup>

		Items	
	Part 2	Value	.700
		N of Items	10 <sup>b</sup>
	Total N of Items		20
Correlation Between Forms			.829
Spearman-Brown Coefficient	Equal Length		.906
	Unequal Length		.906
Guttman Split-Half Coefficient			.865
a. The items are: soal1, soal2, soal3, soal4, soal5, soal6, soal7, soal8, soal9, soal10.			
b. The items are: soal11, soal12, soal13, soal14, soal15, soal16, soal17, soal18, soal19, soal20.			

The output table above provides information regarding the overall reliability of the items. Based on the output table above, it is known that the correlation value is  $0.865 > 0.80$ , so it can be concluded that the competency variable items as a whole are declared reliable.

### 3.5 The Procedure of Study

The research followed the following procedures:

#### 1. Observation

Before conducting the research, researchers made observations of the location and population. The research was conducted on two classes, namely the experimental group and the control group. From the observed population of grade 5, there are two classes that fit the purpose of the study. Class 5/3 will be used as the control group, and class 5/1 will be used as the experimental group.

#### 2. Pre-test

The researcher administered a pre-test to both the experimental and control classes to assess the student's English vocabulary in the topics of colors, animals,

and parts of the body before starting the treatment. The pre-test was a 20 short answer questions in which they write their answer in 60 minutes. One question will be given 3 minutes for students to answer.

### 3. Treatment

The researcher teaches 3 English topics, namely colors, animals, and body parts in the experimental group and control group. Researcher gave the same material to both classes but with different treatment. In the control class, researchers used conventional methods from the lesson plans available at school. In the experimental group was given treatment using Picture Word Inductive Model (PWIM) which focused on Indonesian culture. The following is the treatment schedule for both groups.

**Table 3.4 List of Schedule in Control Group**

No	Activities Control Group (5/1)	Meeting Duration	Date & Time of Implementation	Activities Description
1.	Pre-test	1 Hour	19 September 2023 (11:00-12:00)	Students conduct an initial proficiency test
2.	Implementation of Session 1 (Color)	1 Hour	20 September 2023 (13:00-14:00)	Students take part in learning color topic introduction through flash card
3.	Implementation of Session 2 (Color)	2 Hour	21 September 2023 (09:00-11:00)	Students work on task 1 and 2 with questions that match the previous learning
4.	Implementation of Session 3 (Animal)	1 Hour	26 September 2023	Students take part in learning animal



			(11:00-12:00)	name through flash card
5.	Implementation of Session 4 (Animal)	1 Hour	27 September 2023 (13:00-14:00)	Students take part in learning the topic of animal names and fill the task
6.	Implementation of Session 5 (Animal)	2 Hour	28 September 2023 (09:00-11:00)	Students take part in learning the topic of animal names and general characteristics and answer the questions
7.	Implementation of Session 6 (Animal)	1 Hour	2 October 2023 (11:00-12:00)	Students discuss work results at previous meetings together
8.	Implementation of Session 7 (Part of Body)	1 Hour	3 October 2023 (14:00-15:00)	Students took part in learning on the topic of body part names and answer some questions
9.	Implementation of Session 8 (Part of Body)	1 Hour	9 October 2023 (09:00-10:00)	Students took part in learning on the topic of body part names and remember the function
10.	Implementation of	1 Hour	10 October 2023	Students do the

	Session 9 (Part of Body)		(11:00-12:00)	tasks given by the teacher
11.	Post-test	1 Hour	11 October 2023 (10:00-11:00)	Students conduct a final ability test .

**Table 3.5 List of Schedule in Experimental Group**

No	Activities Experimental Group (5/3)	Meeting Duration	Date & Time of Implementation	Activities Description
1.	Pre-test	1 Hour	12 September 2023 (14:00-15:00)	Students conduct an initial proficiency test
2.	Implementation of Session 1 (Color)	1 Hour	13 September 2023 (09:00-10:00)	Students take part in learning color topic introduction through PWIM batik flora (5 vocabulary)
3.	Implementation of Session 2 (Color)	2 Hour	18 September 2023 (13:00-15:00)	Students work on task 1 with questions that match the previous learning and follow the learning by forming groups to make output topics color, by drawing batik flora

4.	Implementation of Session 3 (Animal)	1 Hour	19 September 2023 (13:00-14:00)	Students take part in learning animal name topic recognition through PWIM batik fauna
5.	Implementation of Session 4 (Animal)	1 Hour	19 September 2023 (14:00-15:00)	Students take part in learning the topic of animal names and general characteristics through PWIM batik fauna
6.	Implementation of Session 5 (Animal)	1 Hour	20 September 2023 (09:00-10:00)	Students take part in learning the topic of animal names and general characteristics through PWIM batik fauna
7.	Implementation of Session 6 (Animal)	1 Hour	25 September 2023 (14:00-15:00)	Students take part in learning to discuss together the topic of animal names and general characteristics through PWIM batik fauna
8.	Implementation of Session 7 (Animal)	1 Hour	26 September 2023	Students take part in learning the

			(14:00-15:00)	topic of animal names and general characteristics through PWIM batik fauna
9.	Implementation of Session 8 (Part of Body)	1 Hour	27 September 2023 (09:00-10:00)	Students took part in learning on the topic of body part names through PWIM ( <b>Story of Ramayana and Topeng Barong</b> )
10.	Implementation of Session 9 (Part of Body)	1 Hour	2 October 2023 (10:00-11:00)	Students take part in learning on the topic of names and functions of body parts through PWIM ( <b>Story of Ramayana and Topeng Barong</b> )
11.	Implementation of Session 10 (Part of Body)	1 Hour	3 October 2023 (13:00-14:00)	Students take part in learning to discuss together the topic of names and functions of body parts through PWIM ( <b>Story of Ramayana and Topeng Barong</b> )
12.	Post-test	1 Hour	10 October 2023	Students conduct a

			(10:00-11:00)	final ability test after PWIM treatment that focuses on Indonesian culture
--	--	--	---------------	--

#### 4. Post-test

In the next step, the researcher gave a post-test to the experimental group and the control group. The wording of the questions in this test was identical to the pre-test. The test results were collected and analyzed to evaluate the impact of PWIM on students' ability to master new vocabulary. Students will be given the same time to answer these questions as given in the pre-test, which is 3 minutes for each question.

#### 3.6 Data Collection

In this study, data collection involves two stages: pretest and post-test, where a group of students is divided into control and experimental groups. The pretest is administered before implementing the Picture Word Inductive Model (PWIM), which emphasizes Indonesian culture. During this stage, students respond to a short-answer test assessing their English vocabulary comprehension. Following the intervention, a post-test, identical to the pretest, is conducted to gauge changes in students' English vocabulary skills after exposure to PWIM. The study collects and analyzes test results from both groups to evaluate the effectiveness of PWIM in enhancing English vocabulary mastery, specifically focusing on Indonesian culture. The test comprises 20 questions, maintaining consistency between the pre-test and post-test.

#### 3.7 Data Analysis

Researcher use quantitative data analysis as the final step in their experimental design. To achieve the findings of this study, researchers analyzed the data obtained using IBM SPSS Statistics version 20.0.

## 1. Descriptive Statistics Analysis

This descriptive statistical analysis is useful for describing and describing research data which includes the amount of data, maximum value, minimum value, average value and so on.

The purpose of statistical description is to present information that is easy to understand and provide an overview of the characteristics of the data. By using the statistical description method, the researcher can make an informative summary of a phenomenon or variable based on the data that has been collected.

## 2. Normality Test

Normality test was used to know whether the data came from the normal distribution or not. Normal data is an absolute requirement before performing parametric statistical analysis (paired sample t-test and independent sample t-test).

The criteria of determining the normality of the test are as follows:

- a. If the significant value is  $> 0.05$  then the residual value is normally distributed.
- b. If the significant value is  $< 0.05$  then the residual value is not normally distributed.

To analyze the research data, it can be seen based on the output results obtained, if for the data the significance value (Sig.) in the Kalmogrof and Saphiro-wilk tests  $> 0.05$ , it can be concluded that the research data is normally distributed. If the data is normally distributed, it can use parametric statistical analysis (independent sample t-test). However, if for the data the significance value (Sig.) in the Kalmogrof and Saphiro-wilk tests is  $< 0.05$ , it can be concluded that the research data is not normally distributed. If the data is not normally distributed, then non-parametric statistics (Mann Whitney) can be used to analyze the research data.



### **3. Homogeneity Test**

The purpose of the homogeneity test is to determine if the data has come from a population with homogeneous variances. The criteria of determining the homogeneity of the variance are as follows:

- a. If the significant value is  $> 0.05$  then it can be said that the variants are homogeneous.
- b. If the significant value is  $< 0.05$  then it can be said that the variants are not homogeneous.

From the above criteria, it can be seen that if the significant value is higher than 0.05, it can be said that the variance is homogeneous. However, if the significant value is smaller than 0.05 then the variance is said to be not homogeneous.

### **4. Statistical Hypothesis**

In this activity researcher will do test to determine whether there is a difference in student post-test scores between experimental group and control group. There are two ways to know the result, it depends on the results of the data normality test and homogeneous test. The first, independent sample t-test is used when the data is shown to be normally distributed and homogeneous. The second, Mann Whitney test is used as an alternative to the independent sample t-test, if the research data is not normally distributed and not homogeneous.

Hypotheses in research are basic assumptions about how research results will occur. A hypothesis is a prediction of a phenomenon. Based on the research questions, the following are the hypotheses in this study:

- a. Null hypothesis ( $H_0$ ): There is no significant difference in students' vocabulary acquisition between the experimental group using PWIM focusing on Indonesian culture and the control group using conventional methods.
- b. Alternative hypothesis ( $H_a$ ): There is a significant difference in students' vocabulary acquisition between the experimental group using PWIM

focusing on Indonesian culture and the control group using conventional methods.

To prove the hypothesis, using a significance level of 5%, the testing criteria are as follows:

- a. Sig (2-tailed) < 0.05 : The alternative hypothesis ( $H_a$ ) is accepted and the null hypothesis ( $H_0$ ) is accepted and rejected.
- b. Sig (2-tailed) > 0.05 : The null hypothesis ( $H_0$ ) is accepted and the alternative hypothesis ( $H_a$ ) is rejected.

According to the criteria mentioned above, it can be concluded that if the p-value is less than 0.05, there is a significant difference in students' vocabulary acquisition between the experimental group, which used PWIM with a focus on Indonesian culture, and the control group, which used the conventional method. If the p-value is higher than 0.05, it means that there is no significant difference in students' vocabulary acquisition between the experimental group, which used PWIM with a focus on Indonesian culture, and the control group, which used the conventional method.