

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents an overview of the methodology of the study. It defines the research approach and method, data types and source, data collection technique, data analysis technique and research site and schedule.

A. Research Approach and Method

The researcher utilized the quantitative approach to determine the research hypothesis or whether using Jigsaw strategy may help students develop their English vocabulary mastery. According to Crowl (1996), through data collecting and statistical processing in numerical form, quantitative research examines the answers to questions.

A pre-experimental design was employed. To assess whether or not students have mastered English vocabulary through Jigsaw strategy, there is a one group pretest and post-test. According to (Apuke, 2017), the pre-experimental designs include a control group that is not chosen at random or an independent variable that does not change. This is how pre-experimental design is calculated:

1. Conducting a pretest to ascertain the dependent variable.
2. Applying therapy X to subjects in a research study.
3. Reassessing the dependent variable with a post-test.

Table 3. 1 One Group Pre-test Post-test Designs

Pre-test	Independent Variable	Post-test
O ¹	X	O ²

O1 = Measure student's vocabulary mastery using a pre-test (O1) before to starting the treatment.

X = Applying the treatment (X) and using the Jigsaw Strategy to help students expand their vocabulary in English.

O2 = It is suggested that students take the Post-Test to assess their progress in learning vocabulary following the treatment.

B. Data Types and Source

1. Data Types

The specific process that includes data collecting, analysis, and report writing is known as research design (Creswell, 2012). Since the purpose of this research was to make hypotheses on the connection between independent and dependent variables, the author used an experimental design. The goal is to determine whether the Jigsaw method has significantly improved students mastery of English vocabulary.

Pre-experimental designs typically take less time and cost less money than more thoroughly tested designs, which is why the author utilizes them. According to (Creswell, 2002), a pre-experimental design with a single group is utilized to facilitate simple deployment and a brief course of therapy. This may be a factor for resource-constrained researchers.

2. Source

This current research conducted at SDN Juntihilir 04 located in Katapang, Bandung. The data source for this research was 4th grade elementary school students. The researcher uses this site as a research target, taking into consideration the fact that students still face a number of challenges in building their vocabulary in English. The specific set of sampling categories that the sample is selected from is known as the target population Cresswell (2012). Furthermore, all 95 students in the 4th grade SDN Juntihilir 04 comprised the population of this study. The following table is population data for grade 4th grade SDN Juntihilir 04:

Table. 3.2 Data Source

Class	Total Students
IV A	48
IV B	47
Total Students	95

The sample was chosen from the population of 4th grade class B SDN Juntihilir 04, which consisted of 47 students. The researcher chose class IV B due to school constraints that required conducting a study in that class. This research employed a non-random sampling technique to obtain a sample. The non-random sampling technique excludes the possibility of

selecting a sample from every element or member of the population (Sugiyono, 2015).

C. Data Collection Technique

The methodology employed to gather the data for this study is known as the data collecting method. The researcher directed students to complete a multiple-choice test. Pre-, treatment-, and post-testing were all part of this study.

1. Research Instrument

a. Pre-Test

To determine the extent of students' vocabulary mastery, a pre-test was administered before to the start of the treatment. In order to find the answer to the research questions, a pre-test was employed as the instrument. Before administering a therapy to experiment participants, a researcher assesses a certain quality or characteristic through a pre-test (Creswell, 2012). The purpose of the pre-test was to determine each student's prior vocabulary mastery knowledge. There were twenty multiple-choice questions on the written test, and each question had four possible responses (A, B, C, and D).

b. Treatment

The experimental group's students received the treatment from the researcher. The experimental group received treatment in the form of jigsaw strategy instruction.

Table 3. 2 Treatment of The Research

No	Activity	Description
1.	First treatment	The researcher instructs students on a few common vocabulary words and asks them to set them to memory without employing a jigsaw strategy.
2.	Second treatment	After teaching and reviewing the prior language contents in the first treatment, the researcher presents the jigsaw

		strategy and its guidelines. Furthermore, the researcher assigns students to six-to seven-person teams.
3.	Third treatment	To enhance their learning, the researcher uses a Jigsaw approach to teach vocabulary for the second time. The researcher provides comments to students to improve their vocabulary mastery and retention at the conclusion of the activity. Additionally, the instructor exhorts students to put what they have learned into practice.

c. Post-Test

According to Creswell (2012), a post-test counts the number of traits or qualities that study participants have their attributes evaluated after receiving a therapy. Following their vocabulary-learning sessions using the jigsaw strategy, the students took a post-test administered by the researcher to determine how well they understood the reading comprehension lessons. The post-test consisted of twenty items with four choices, similar to the pre-test, which was completed in forty-five minutes. The order of the tests was the sole difference between the pre- and post-tests.

The final method for gathering data was the post-test. The researcher received a written multiple-choice exam. The post-test data was gathered for this study in order to track and quantify any discernible changes in the participants' vocabulary knowledge following instruction utilizing the Jigsaw method.

D. Data Analysis Technique

a. Validity

Validity is the degree to which a concept in quantitative research is accurately measured (Heale and Twycross, 2015). The validity of the

instrument was tested by the researcher working with SPSS version 25.0. If the value computation surpasses the table value ($r\text{-count} > r\text{-table}$), the data will be categorized as legitimate or significant. The validity of the measurement or inquiry is indicated by the table value of 5% significant level, which is 0.288, as 47 students took part in the item's validation.

The researchers followed two procedures to ascertain the validity of the test. Evaluating the relationship between the "r" count and "r" table is the first stage. If the "r" counts score is more than the "r" table score, the instrument is deemed genuine. If the significant score was less than 0.01 in the second phase, it is necessary to determine whether the instrument was authentic.

b. Reliability

According to Creswell (2012), reliability is the capacity of individual scores from an instrument to be nearly comparable to the table across administrations, free from measurement error sources and consistent. The greater the test's data dependability, the more likely it is that the findings obtained from it will be substantially the same if it is given to the same test-takers at a different time or to someone else.

Confirming practical tests as measurement tools requires testing for reliability. Reliability testing should be done on the instrument before use, and it can be deemed valid if the measurement results remain constant and consistent. The dependability of the instrument is tested in this study using the SPSS application; the appendix describes the implications of this type of reliability testing. The information from the validity question was used in the reliability test. If the scale's value is higher than 0.7, interval consistency is present. The following table shows Kuder Richardson's interpretation:

Table 3. 3 Interpretation of Kuder Richardson

Kuder Richardson Coefficient	Interpretation of Kuder Richardson Coefficient
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> 0.9	The internal consistency of the scale is high
$0.7 < 0.9$	The scale has internal consistency
$0.6 < a < 0.7$	The internal consistency of the scale is acceptable
$0.5 < a < 0.6$	The internal consistency of the scale is weak
$A < 0.5$	The scale has no internal consistency

c. Item Difficulty

The comparison of item difficulty is based on differences in the percentage of right responses for every item (KOÇDAR et al., 2016). The item difficulty scale, which runs from 0.0 to 1.0, indicates the proportion of students who answered a question correctly. An item is increasingly difficult the closer its difficulty hits zero. Put differently, item complexity contributes to higher test validity and reliability, indicating how well the items are working.

Table 3. 4 Item Difficulty Categories

Range	Item Difficulty
0.00-0.30	Difficult
0.31-0.70	Medium
0.71-0.100	Easy

d. Normality

In a model based on regression, the normality test attempts to ascertain if the independent variable, dependent variable, or both are normally distributed. In the present study, normalcy was evaluated using the Shapiro Wilk normality test. According to Sugiyono (2010), the normality test is a statistical tool used to determine how data are distributed. If the sample's significance score is more than 0.05, the data will be normal. The

Shapiro-Wilk, Liliefors, and Kolmogorov-Smirnov tests are the three types of normalcy tests. The requirements for every test are as follows:

- a) Over fifty responders use Kolmogorov Smirnov.
- b) Shapiro Wilk employs a sample of under 50 participants.

47 students from SDN Juntihilir 04 participated in this study. Because there were fewer than 50 respondents, the Shapiro-Wilk Test was used in the study. If the sample's significance score is more than 0.05, the data will be considered normal. In contrast, the data deviates from a normal distribution if the score is less than 0.05.

$p < 0,05$ = Data distribution is not normal

$p > 0,05$ = Data distribution is normal

e. Hypothesis Test

To compare the results of the pre-test and post-test, the researcher utilized a T-test with a paired T-test using SPSS version 25.0. The paired t-test, according to Priyatno (2009), is used to compare or analyze differences between data pairs related to the same research question. The research's hypothesis is described as follows:

1. Establish the level of significance (α). $\alpha < 0,05$ is considered a significant level in this investigation.
2. Establish the research's criteria: When t_0 is less than t_t , the null hypothesis (H_0) is rejected and the alternative hypothesis (H_a) is accepted. Using the Jigsaw strategy makes a big difference in the vocabulary mastery of the students.
3. $t_0 > t_t$, the null hypothesis (H_0) is accepted and the alternative hypothesis (H_a) is rejected. It indicates that there was no discernible change in the vocabulary mastery of the students before and after applying the Jigsaw strategy.

f. N-Gain

It used to measure the use of Jigsaw strategy in developing student English vocabulary mastery. It is used with the formula:

$$d = \frac{\Sigma post - test - \Sigma pre - test}{\Sigma pre - test maximum score - \Sigma pre - test}$$

Normal gain score acquired by Kothari (2004) is interpreted into the table below:

Table 3. 5 N-Gain Interpretation

Score	Interpretation
$g > 0.7$	High
$0.3 \leq g \leq 0.7$	Average
$g < 0.3$	Low

E. Research Site and Schedule

1. Research Site

The research was carried out at SDN Juntihilir 04, which is situated on Juntihilir Street, Katapang, Bandung, West Java, Indonesia. This location served as the study's goal and is highly significant to the researcher. Additionally, there is a circumstance where students' vocabulary has to be enhanced because they have not used different strategies to mastering vocabulary.

2. Research Schedule

The process was employed to create the instrument; as per Creswell (2012), a researcher required a research plan that included the technique and details regarding the study participants' risk. Pre- and post-treatment exams were used in the data gathering process to assess how well students were mastering English vocabulary through the Jigsaw method, which involved four meetings of treatment. The meeting schedule of the research at SDN Juntihilir 04 is below:

No	Meeting	Activity
1.	22 January 2024	Getting permission and observation
2.	3 June 2024	Validating Test

3.	5 June 2024	Pre-test and First Treatment
4.	7 June 2024	Second Treatment
5.	10 June 2024	Third treatment and Post-test

