

CHAPTER III

RESEARCH METHODOLOGY

A. Research Design

This research employed a quasi-experimental design using a pre-test and post-test approach to examine the hypothesis. As noted by Trochim (2020) in Research Method: The Essential Knowledge Base, quasi-experimental designs are applied when researchers are unable to randomly assign participants to experimental or control groups. He explains that this design enables the evaluation of an intervention's effect by comparing a treatment group with a non-treatment group, even though external variables may influence the outcomes.

The procedure of this study included administering a pre-test, applying the Inquiry-Based Learning method as the treatment, and conducting a post-test to assess the results. Creswell (2015) states that in a pretest-posttest control group design, researchers select a sample, divide it into two groups, give both groups a pre-test, apply an intervention to one group, and then administer a post-test to both groups to determine the intervention's impact. The following section presents the variable formula used in this research:

Table 3.1. Variable Formula

Group	Pre-Test	Treatment	Post-Test
Experiment Group	Y_1	X_1	Y_2
Control Group	Y_3	X_2	Y_4

Description:

Y_1 & Y_3 : Both groups completed a pre-test to determine any initial differences in their ability to write narrative texts.

Y_2 : Post-test administered to the experimental group following instruction using the Inquiry-Based Learning approach.

Y_4 : Post-test administered to the control group after undergoing instruction through conventional methods (without Inquiry-Based Learning).

X_1 : Treatment applied to the experimental group through the implementation of the Inquiry-Based Learning strategy.

X_2 : Treatment applied to the control group using traditional teaching methods (without Inquiry-Based Learning).

B. Population and Sample

1. Population

The population of this study comprised all eighth-grade students at SMP Plus Ja'al Haq in Bengkulu City. This

included every student enrolled in grade VIII during the academic year of the research, offering a complete representation of writing proficiency within this educational setting.

2. Sample

The sample for this study was selected using a non-random technique, specifically purposive sampling, based on predetermined objectives. In this context, the researcher selected one eighth-grade class (control and experimental) consisting of 20 students, including 11 male and 9 female participants. The detailed description of the chosen sample is presented below:

Table 3.2 Samples' Value

No	Student's Gender	Total	Mean Score
1	Male	11	65.2
2	Female	9	66.5
Total Mean Score		20	65.85

C. Operational Definition of Variables

1. Independent Variable (X): Inquiry-Based Learning Method

Inquiry-Based Learning is described as an instructional approach that promotes active student involvement through questioning, exploration, and investigation. Within the scope of this research, IBL will be

implemented during designated sessions of speaking lessons, encouraging students to formulate questions, participate in group discussions, and present their investigative findings. The indicators are as follows:

- 1) The level of student participation in the discussion.
- 2) The frequency of questions raised by students throughout the learning process.
- 3) The quality of student presentations after applying the IBL method.

2. Variable Dependent (Y): Writing Ability

The dependent variable in this research is the writing proficiency of eighth-grade students, particularly in composing narrative texts. This variable includes several aspects that indicate the students' level of writing competence, such as:

- 1) Content: The ability to develop ideas and themes effectively within a narrative context, including the use of relevant details and examples.
- 2) Organization: The structure of the narrative, including the logical flow of events, coherence, and the use of appropriate narrative techniques such as exposition, rising action, climax, and resolution.
- 3) Language Use: This includes grammar, vocabulary, and sentence structure. It assesses how well students utilize language conventions to convey their ideas clearly and effectively.

- 4) Creativity: The originality and inventiveness demonstrated in the narrative writing, including the ability to create engaging characters, settings, and plots.
- 5) Mechanics: The correct use of spelling, punctuation, and formatting in written narratives.

D. Data Collection Techniques

The study will proceed through three stages: Pre-Test, Treatment, and Post-Test, as outlined below:

1. Pre-Test

The pre-test serves as an initial assessment administered prior to the implementation of the Inquiry-Based Learning approach. Its purpose is to evaluate students' speaking proficiency before the treatment is applied.

- a. Method: Students will be asked to make a presentation or speak on a specific topic. Assessment will be done based on criteria such as fluency, pronunciation, vocabulary, and grammar.
- b. Measurement: Scores from the pre-test will be recorded for each student as a baseline of their speaking ability.

2. Treatment

Following the pre-test, the experimental group will undergo treatment through the application of the Inquiry-

Based Learning method. This approach will be implemented over a specific period during writing instruction, whereas the control group will continue learning with their regular teacher using the traditional lecture-based method.

- a. Process: Students will be engaged in activities that encourage them to question, discuss, and investigate the learning topic. Here for the detail:

Table 3.3 Teaching Activities in Experimental and Control Classes

Component	Experimental Class (IBL) <i>Orientation & Conceptualization</i>	Control Class (PBL) <i>Problem Identification</i>
Opening	- Teacher greets students and introduces today's focus: "<i>Orientation & Conceptualization in Narrative Text.</i>" - Teacher asks stimulating questions: "<i>What do you usually find at the beginning of a story?</i>" - Students respond and share prior knowledge about narrative texts.	- Teacher greets students and introduces today's focus: "<i>Problem Identification in Narrative Text Writing.</i>" - Teacher presents a problem: "<i>Why do many students fail to write a complete narrative text?</i>" - Students listen and prepare to identify the problem.
Main Activities	- Students read a short narrative text provided by the	- Students are divided into groups.

	teacher. - In groups, they identify the elements of the story (orientation, complication, resolution). - Students create guiding questions such as “<i>Who are the characters?</i>” “<i>Where does the story take place?</i>” - Teacher facilitates and guides students in formulating questions.	- Each group discusses the given problem: “<i>What difficulties do students usually face in writing a narrative text?</i>” - Groups brainstorm ideas to identify specific problems (e.g., lack of vocabulary, poor organization, weak plot). - Teacher monitors group work and provides clarification when needed.
Closing	- Groups present their guiding questions and findings. - Teacher highlights the importance of asking questions to understand narrative structure.	- Groups present their identified problems. - Teacher summarizes the main issues and emphasizes key aspects of narrative writing that students should improve.

- b. Duration: The treatment will be given in four weeks (six meetings), depending on the curriculum that has been developed. Research shows that basic gymnastics skills can be mastered in 6 meetings. This refers to research by Bayraktar (2011), who concluded

that with that many meetings, students can achieve good mastery of the skills taught.

3. Post-Test

The post-test is administered after the treatment to assess the changes in students' speaking proficiency resulting from the implementation of the IBL approach.

- a. Method: Students will be required to deliver a presentation or speak on the same or a different topic, evaluated using the same rubric applied during the pre-test.
- b. Measurement: The post-test results will be compared with the pre-test scores to identify whether there has been a significant improvement in students' speaking proficiency following the treatment.

E. Research Instruments

The research utilized a narrative writing test as its primary instrument, administered as both a pre-test and a post-test to assess students' writing proficiency before and after the implementation of inquiry-based learning strategies.

According to J. B. Heaton (1988), writing tests can be creative writing tasks, reports, or essays that allow students to demonstrate their abilities in a variety of language contexts (See Appendix 2). The research instrument used has been validated by an expert, the results show that the writing test does not require further validity. Therefore, the researcher can

directly continue the research process without the need to conduct additional validity testing of the instrument.

The narrative writing test is considered highly effective as it closely corresponds with the objectives of fostering students' creativity and critical thinking. Hyland (2003) notes that writing is a complex cognitive activity that requires more than just linguistic mechanics; it also demands the capability to structure ideas and communicate meaning clearly.

a. Rationale for Choosing Narrative Writing Test:

1. Direct Assessment of Writing Skills: A narrative writing test specifically measures skills associated with crafting narratives, including plot development, character building, and overall coherence. This corresponds with the aim of the study, which seeks to improve students' proficiency in narrative writing.
2. Standardized Measurement: Employing a structured writing prompt ensures a standardized evaluation, facilitating easier comparison of results among students and between different stages (pre-test and post-test).
3. Reflects Inquiry-Based Learning Outcomes: The narrative structure promotes creativity and self-expression, both of which are key elements of inquiry-based learning. This approach enables students to apply their understanding of narrative components in a real-world context.

b. Assessment Rubric

To evaluate the narrative writing test, a detailed rubric will be used. This rubric will assess various dimensions of writing ability, ensuring a comprehensive evaluation of each student's work. Below is an example rubric with criteria and scoring levels:

Table 3. 4 Assessment Rubric Alfianika, N., & Sitohang, K. (2022).

Criteria	Excellent	Good	Average	Poor
Content	Richly developed ideas; clear theme; engaging plot well defined characters	Clear Ideas; identifiable theme; coherent plot with some character development.	Some ideas are present but lack clarity; weak theme; underdeveloped plot or characters.	Ideas are unclear or irrelevant; no identifiable theme; disorganized plot.
Organization	Logical flow; effective use of transitions; well-structured beginning, middle, and end.	Generally logical flow; some transitions used; clear structure but may have minor issues.	Some organization present but lacks clarity; weak transitions; confusing structure.	Lack organization; no clear structure; difficult to follow.
Language Use	Sophisticated vocabulary; varied sentence structure; few or no	Uses suitable vocabulary with generally varied sentence	Demonstrates restricted vocabulary usage, overuses similar sentence	Uses very limited vocabulary, employs basic sentence structures,

	grammatical errors.	structures; contains some grammatical errors, though they do not hinder comprehension.	structures, and includes recurring grammatical errors that hinder overall clarity and comprehension	and includes numerous grammatical mistakes that obstruct comprehension
Creativity	Highly original ideas and perspectives; engaging and imaginative storytelling.	Some original ideas presented; story telling is interesting but may lack depth.	Few original ideas; storytelling lacks engagement or imagination.	No originality in ideas; storytelling is dull or uninteresting.
Mechanics	Virtually no spelling, punctuation, or formatting errors.	Minor Spelling, punctuation, or formatting errors that do not distract from content.	Noticeable errors in spelling, punctuation, or formatting that distract from content.	Frequent spelling, punctuation, or formatting errors that severely distract from content.

Scoring:

1. Each criterion will be scored on a scale from 1 to 4.
2. The total score will be calculated by summing the scores from all criteria, providing a comprehensive assessment of each student's narrative writing ability.

3. The pre-test and post-test scores will be analyzed to evaluate the effectiveness of the inquiry-based learning approach in improving students' writing abilities.

F. Data Analysis Technique

1. Normality Test

Prior to performing additional statistical analyses, a normality test must be carried out to verify whether the data follows a normal distribution. Commonly applied methods include the Kolmogorov-Smirnov Test or the Shapiro-Wilk Test. If the p-value is greater than 0.05, the data is considered normally distributed. Formula for the Normality Test:

$$W = \frac{(\sum_{i=1}^n a_i x_{(i)})^2}{\sum_{i=1}^n (x_i - \bar{x})^2}$$

Figure 3.1 Formula Shapiro-Wilk

Where:

$x_{(i)}$ represents the arranged sample values,

a_i denotes constants based on the expected values of order statistics,

n refers to the total number of samples,

$\bar{x}$ indicates the mean of the sample.

$$D = \max |F_n(x) - F(x)|$$

Figure 3.2 Formula Kolmogorov-Smirnov

Where:

$F_n(x)$ is the empirical distribution function,

$F(x)$ is the cumulative distribution function of the normal distribution.

2. Homogeneity Test

The homogeneity test was conducted to determine whether the data were homogeneous. Levene's test was employed for this purpose, and the results were compared against an alpha level of 0.05. If the significance value (2-tailed) was equal to or greater than 0.05, the data distribution was considered homogeneous.

3. Inferential Statistics (t-test)

Inferential statistical analysis will be employed to identify whether significant differences exist between the pre-test and post-test scores. The paired sample t-test will be utilized, as it compares the means of two related datasets (pre-test and post-test results).

Formula for Paired Sample T-Test:

The calculation of the t-value for a paired sample t-test is as follows:

$$t = \frac{\bar{d}}{s_d / \sqrt{n}}$$

Figure 3. 3 formula t-test

Where:

$\bar{d}$ = Mean difference between paired observations
(post-test score pre test score)

sd = Standard deviation of the differences

n = Number of pairs (students)

