

CHAPTER III

METHODOLOGY

A. Research Method

Quantitative research is a formal, objective, meticulous, deductive, and systematic strategy to generate and refine knowledge to solve problems. Its design can be either experimental or non-experimental and aims to obtain accurate and reliable measurements. This research involves systematic observation and description of the characteristics or attributes of objects or events to determine the relationship between independent variables (predictors) and dependent variables (outcomes) within a population (Mohajan, 2020). The experimental design is used to measure the impact of the VAK method on students' English vocabulary acquisition.

B. Research Location

This research was conducted at MTs Nur Rahmah, located in Bengkulu City. The school was officially established in 2022 and currently has six classes. The number of teachers and supporting facilities is still limited; for example, the school library is relatively simple and the number of available dictionaries is very minimal, which limits students' access to additional learning resources. Furthermore, the teaching methods applied at MTs Nur Rahmah have not widely adopted innovative or interactive approaches. As a result, the learning process tends to be conventional and less able to attract students'

interest. This condition affects students' low learning motivation, particularly in English vocabulary learning, which actually requires creative stimulation and more varied teaching methods so that students can understand and master vocabulary more effectively.

C. Research Design

This study employed a pre-experimental research design using a pre-test and post-test format in one class without a control group as a comparison. According to Sugiyono (2013:74), a one-group pretest-posttest design is a research activity that begins with administering an initial test (pre-test) to determine students' prior ability before the treatment is given. After the treatment or intervention is implemented, a final test (post-test) is administered to measure the changes in students' performance.

Through this design, the effectiveness of the treatment can be analyzed more accurately because the researcher can compare the scores before and after the intervention. Although this design does not involve a control group, it still provides a clear depiction of the learning outcomes that are assumed to result from the intervention. The research design is presented as follows:

Table 3.1 The research design

Pre-test	Treatment	Post-test
O ₁	X	O ₂

Sugiyono (2013:74)

O₁ : Pre-test

O₂ : Post-test

X : VAK Learning

D. Population and Sample of the Research

1. Population

The population in this study refers to the generalization area, which includes the objects or subjects of the research that possess certain characteristics and attributes in accordance with the research objectives. The researcher identifies a relevant population so that the conclusions drawn can represent the entire group under study. In other words, the population can be defined as all individuals or groups that are the subjects of the research and serve as the basis for making generalizations. Generalization is the process of drawing broadly applicable conclusions based on data or findings obtained from the research sample, allowing the results to be applied to the entire population.

In the context of this study, the population consists of all seventh-grade students at MTs Nur Rahma, Bengkulu City, divided into two classes: 7 Mekkah and 7 Madinah,

with a total of 28 students. This population was selected because all members share similar characteristics in terms of educational level, the curriculum implemented, and the learning programs followed, enabling the researcher to obtain representative data regarding the influence of the applied learning method on English vocabulary mastery.

Table 3. 2 Total Students

No.	Class	Gender		Total
		Female	Male	
1.	7 Mekkah	6	8	14
2.	7 Madinah	6	8	14
Total				28

2. Sample

A sample refers to a group of individuals selected from the population to be the subject of the research. The sample is chosen with the aim that the research findings can be generalized to describe the conditions of the population as a whole. The sample taken should reflect the characteristics of the broader population so that the research results can be more representative.

In this study, the researcher uses a Non-probability Sampling technique, with a Purposive Sampling approach. This technique was chosen because the researcher sets

specific criteria for selecting the sample that aligns with the research objectives. In this case, class 7 Mekkah is selected as the sample because it is considered representative for obtaining data related to the application of the Visual, Auditory, Kinesthetic (VAK) method in improving English vocabulary. The first step in sample collection is population identification, where the researcher identifies all 7th-grade students at MTs Nur Rahma Bengkulu City, consisting of two classes: 7 Mekkah (14 students) and 7 Madinah (14 students). Next, in the sample selection stage, the researcher chooses class 7 Mekkah as the sample based on specific criteria, such as the students' willingness to participate in the study and the characteristics of the class that are suitable for the experiment. The sample size in this study is determined based on the number of students in class 7 Mekkah, which is 14 students. This sample size is considered sufficiently representative for measuring the impact of the VAK method on English vocabulary acquisition.

Table 3. 3 Total Students In The Experiment

No	Class	Male	Female	Total
1.	7 Mekkah	6	8	14
Total				14

E. Operational Definition of Variables

An operational definition of a variable explains in detail how the variable being studied will be measured or observed. The purpose is to provide a clear and specific understanding of the variable, making it easier to collect data and analyze it. This operational definition is important to ensure that the variable is consistently understood by both the researcher and the readers, and that the research findings can be compared with other studies using similar variables. The operational definitions of the variables are as follows:

a. Independent variable (X)

The variable that influences another variable. In this study, the independent variable is the Visual, Auditory, Kinesthetic (VAK) Learning method.

b. Dependent variable (Y)

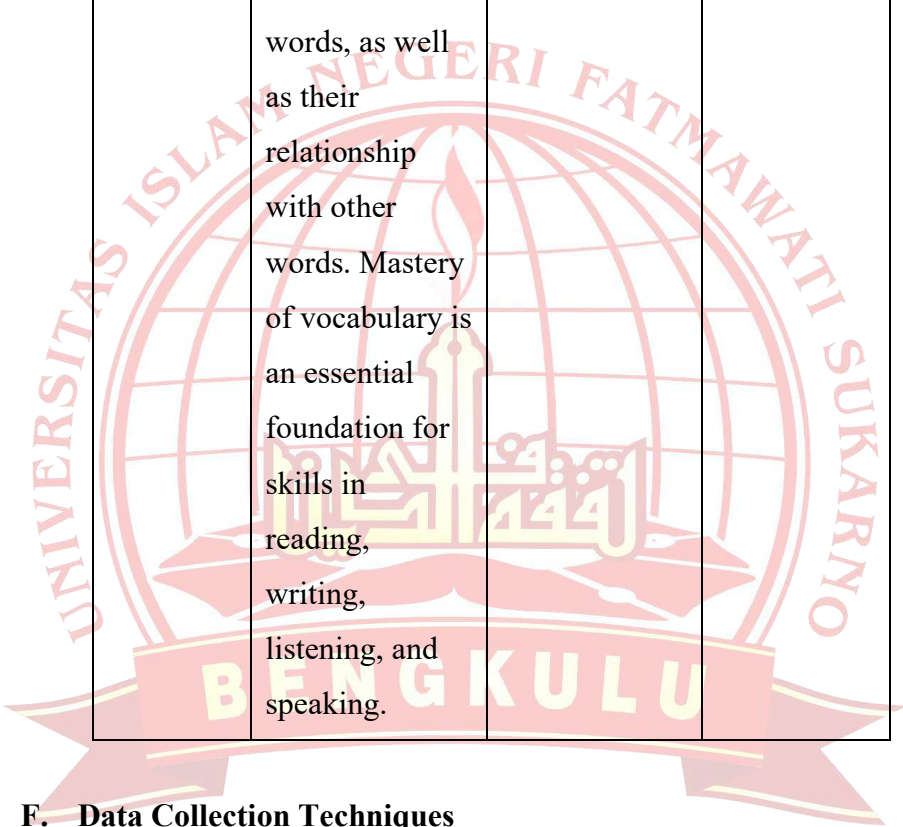
This is the variable that is influenced by the independent variable. In this study, the dependent variable is the improvement of English vocabulary.

Table 3.4 Operational Definition of Research Variables

Variable	Operational Definition	Indicator	Measurement
VAK Learning (X)	The VAK Learning Method	1. Variations in the types of tasks assigned	Test technique

	(Visual, Auditory, Kinesthetic) refers to the use of learning techniques that involve three learning styles: visual (using images or visualizations), auditory (listening to instructions or sound repetitions), and kinesthetic (engaging in physical activities that support learning, such as games or physical exercises). By	2. The level of student participation in completing tasks 3. Feedback received by students after completing tasks 4. The ability of students to apply appropriate vocabulary and sentence structure while completing tasks	
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	combining these three learning styles, students not only memorize new vocabulary but also understand how to use it comprehensively, making the learning process more effective and enjoyable.		
English vocabulary (Y)	Vocabulary is a collection of words in a language used for communication, both orally and in writing. In language learning,	1.Mastery of new words 2.Usage of vocabulary in sentences 3.Pronunciation and articulation of vocabulary	Assessment rubric



	vocabulary includes the recognition, understanding, and use of words, as well as their relationship with other words. Mastery of vocabulary is an essential foundation for skills in reading, writing, listening, and speaking.		
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F. Data Collection Techniques

To obtain accurate and relevant data in this study, it is necessary to use appropriate and systematic data collection techniques. Data collection is a crucial step because the data obtained will serve as the basis for testing the research hypotheses and support the overall validity of the research findings. In this study, the researcher employed three types of

data collection techniques, namely observation, documentation, and tests, which complement each other to provide a comprehensive understanding of the phenomenon being studied.

1. Observation Technique

Observation is one of the most important data collection techniques in research, conducted by directly observing the phenomena or events that are the focus of the study (Nabila et al., 2023). According to Sugiyono (2015: 204), observation is an activity in which the researcher systematically observes the research object to obtain accurate and relevant data. Through observation, the researcher not only records what is visibly seen but also pays attention to the behaviors, interactions, and reactions of the research subjects in their natural context. This technique allows the researcher to gain in-depth information about the processes, conditions, and dynamics that occur, which can be used to support analysis, make interpretations, and draw valid and scientifically accountable conclusions. Observation also helps minimize bias, as data are obtained directly from the source rather than relying solely on reports or third-party perceptions.

In this research, the researcher conducted direct observation of the 7 Mekkah students at MTs Nur Rahma, Bengkulu City, to evaluate the effectiveness of using the Visual, Auditory, and Kinesthetic (VAK) Learning method

in improving English vocabulary. The observations were conducted throughout the research process, starting from the pre-test, continuing with the treatment, and concluding with the post-test. In this study, the researcher conducted direct observations of 7 students in the Mekkah class at MTs Nur Rahma, Bengkulu City, to evaluate the effectiveness of the Visual, Auditory, and Kinesthetic (VAK) learning method in improving English vocabulary mastery. The observations were carried out comprehensively, starting from the pre-test, during the treatment, and continuing through the post-test, in order to assess the students' initial abilities, participation, interaction, and improvement in vocabulary mastery. This approach enabled the researcher to obtain accurate and contextual data regarding learning dynamics and the effectiveness of the VAK method in the classroom..

2. Test Technique

The test is used to measure students' ability to master English vocabulary before and after the intervention. In this study, the test consists of a pretest, treatment, and posttest. The steps for data collection through the test are as follows:

a. Pre-test

The pre-test is conducted to assess students' initial mastery of vocabulary before the intervention using the VAK method. This test is designed to measure how much and how well students understand and use basic

vocabulary in various contexts. The pre-test material is adjusted to the students' proficiency level, such as vocabulary related to daily activities, objects around them, or common verbs. The pre-test questions may be in the form of multiple choice, completing sentences, or matching words with images. The pre-test is administered before the lesson begins, ensuring that students understand the instructions and are given sufficient time to complete the questions. The pre-test results are analyzed to obtain baseline data, which will later be compared with the post-test results after the intervention.

b. Treatment

After the pre-test, the students are given an intervention involving English language learning through the VAK (Visual, Auditory, Kinesthetic) Learning method.

- Visual

Displaying images related to the vocabulary to be learned is an effective visual learning strategy, in which students not only view the objects briefly but are also given the opportunity to analyze and discuss the meaning of the images more deeply. This process encourages students to understand vocabulary from various aspects, including the visual form, word meaning, context of use in sentences, and its relation to real-life situations. In this way, students can develop a

more comprehensive and meaningful understanding of new vocabulary, enhancing their ability to remember and apply the words accurately in everyday communication. Furthermore, discussion and image analysis activities also train students' critical and collaborative thinking skills, making learning more interactive, enjoyable, and memorable.

- Auditory

Next, students will use songs or take turns repeating vocabulary aloud. Through activities that involve listening and imitating words in the form of songs, students can practice pronunciation in a more enjoyable and engaging way. By performing simple movements or dances while singing, students are more likely to remember the vocabulary they hear and pronounce, as the combination of rhythm, sound, and physical activity simultaneously helps reinforce the storage of information in long-term memory. This approach not only enhances students' linguistic skills but also strengthens engagement, self-confidence, and learning motivation, creating a more natural, interactive, enjoyable, and effective English learning environment for all students.

- Kinesthetic

This is followed by the kinesthetic method, where students will be divided into several groups.

Each group will be assigned tasks according to the material being taught, such as finding images, matching images with the correct vocabulary, or creating sketches and labeling them with the appropriate English terms. Through these activities, students not only learn visually and auditorily but also actively move and interact with their peers. This method is expected to provide a more tangible and enjoyable learning experience, helping students strengthen their understanding, remember vocabulary more effectively, and improve their practical use of English.

c. Post- test

The post-test was conducted after the implementation of the VAK method, aiming to measure the extent of students' vocabulary improvement following the learning intervention. The test was designed to evaluate the effectiveness of the VAK method in helping students better understand and use English vocabulary. The types of questions in the post-test were the same as in the pre-test, including multiple-choice, fill in the blank, and matching words with pictures, ensuring objective and consistent comparisons.

Through the post-test, the researcher could identify differences in students' abilities before and after the VAK method was applied. The post-test results were

then analyzed and compared with the pre-test results to determine any improvement in vocabulary mastery. Statistical analysis, such as the t-test, was used to assess whether the observed improvements were statistically significant. Therefore, the post-test results serve as a crucial basis for drawing conclusions about the effectiveness of the VAK method in enhancing students' English vocabulary skills.

3. Documentation Technique

Documentation is an essential data collection method because it supports the validity and completeness of research findings comprehensively. This method involves the collection, review, and analysis of relevant documents, such as books, scholarly articles, journals, academic reports, and official archives. In this study, documentation was used to reinforce the theoretical foundation of the Visual, Auditory, and Kinesthetic (VAK) learning method and its systematic application in teaching English vocabulary.

Moreover, documentation plays a crucial role in reviewing previous research to identify research gaps and provides relevant secondary data, such as students' learning outcomes, activity reports, and records of attendance and participation, all of which enrich and deepen the research analysis.

The documentation process was conducted at every stage of the study. During the pre-test, documentation

recorded students' initial vocabulary abilities as an objective basis for comparison. During the treatment, it was used to observe students' engagement, responses, and interactions during learning activities. In the post-test phase, documentation recorded the final results, which were then analyzed alongside previous data to comprehensively evaluate the effectiveness of the VAK method in enhancing students' vocabulary mastery.

Thus, documentation not only complements research data but also serves as authentic and reliable evidence that strengthens the validity and reliability of the findings, ensuring that the conclusions drawn are scientifically and objectively accountable.

G. Research Instruments

Research instruments are very important tools for researchers in collecting accurate and relevant data from respondents or research subjects. In this study, the instruments used included observation, documentation, and English vocabulary tests. Observation is conducted to assess students' activities, engagement, and participation during the learning process, while documentation serves to collect evidence of activities such as notes, photos, or recordings of the learning process. Vocabulary skills are used to measure the extent to which the application of VAK can improve students' understanding and mastery of vocabulary. By utilizing these

three instruments in an integrated manner, researchers can obtain comprehensive and in depth data to assess the effectiveness of the VAK learning method on 7th grade students at MTsNur Rahma, Bengkulu City.

H. Data Analysis Techniques

The data analysis in this study aims to examine in depth the effect of the Visual, Auditory, Kinesthetic (VAK) learning method on students' English vocabulary mastery. After data were collected through pre-tests and post-tests, the analysis was conducted to determine whether there were significant changes in students' vocabulary abilities after being taught using the VAK method. This analysis employed quantitative statistical techniques, ensuring that the results are reliable, objective, and accurate, and providing a strong basis for drawing valid conclusions about the effectiveness of this learning method in improving students' vocabulary skills.

In statistics, one technique used to determine the difference in coefficients between two data distributions is the t-test or t-statistic. In this study, the statistical technique used is the paired-sample t-test. This test is useful for comparing students' vocabulary test results before and after being treated using the VAK method. With this test, the researcher can determine whether the difference in scores is statistically significant, which can indicate that the VAK method has an impact on improving students' vocabulary skills.

Overall, this data analysis technique will provide a clear picture of the effectiveness of the VAK method in English vocabulary learning and demonstrate the extent to which this method can improve students' vocabulary skills.

1. T-test

The Paired Sample T-Test is used to determine whether there is a significant difference between the pre-test and post-test scores within the same group, namely the seventh-grade students of MTs Nur Rahma Bengkulu City. The use of this test is appropriate because the study employs a pre-experimental design with a one-group pre-test and post-test model. In situations where the data are obtained in pairs and are interdependent, the paired t-test is applied to compare the mean differences between two sets of scores from the same group, namely the pre-test and post-test results of the experimental group.

The analysis will be conducted using the T-test in the SPSS program, and formulas will also be used. If other independent variables are considered constant, the test is conducted to assess the partial significance of the influence of independent factors on the dependent variable.

- a. If the significance level $< \alpha$ (0.05), then the independent variable individually has an effect on the dependent variable.

- b. If the significance level $> \alpha$ (0.05), then the independent variable individually does not have an effect on the dependent variable.

2. Normality Test

The normality test is used to assess whether the data in the variables are normally distributed. In this study, the Shapiro-Wilk test was applied to examine the normality of the data, since the sample size consisted of fewer than 50 respondents. The Shapiro-Wilk test is appropriate for small samples of no more than 50 participants (Ghasemi & Zahediasl, 2012, p. 487).

According to Sugiyono (2018:160), a normality test is used to examine whether the data from each variable have a normal distribution or not. This test is important because many parametric statistical analyses require the data to be normally distributed in order for the results to be valid and accurately interpretable. Thus, the normality test is a crucial initial step in ensuring the reliability and validity of the research findings. In this study, the normality test is conducted using the SPSS program.

- a. If Sig. > 0.05 , then the data are normally distributed.
- b. If Sig. ≤ 0.05 , then the data are not normally distributed.

3. Homogeneity Test

According to Sugiyono (2013:276), the purpose of the homogeneity test is to ensure that data from two or more sample groups come from respondents with similar variation,

allowing valid comparisons between groups. In this study, the homogeneity test was conducted using Levene's Test with the assistance of SPSS 27 for Windows. The testing criteria are as follows: if the Levene value $\leq$ the table value or the significance ≥ 0.05 , the population of the groups is considered homogeneous, meaning that the variances between groups are equal. This test is essential for validating the uniformity of the data before conducting further analysis, such as the t-test.

