

CHAPTER III

RESEARCH METHODOLOGY

This Chapter describe about research design, population and sample, source and type of data, variables and indicators, techniques of collecting data, and the technique of analyzing data.

A. Research Design

This research used a quantitative research method, involving data collection in the form of numbers that gave answers to the problems being researched. This research used a correlational model that investigated the correlation between variables. To determine if there was a correlation between VARK learning styles and students' English learning achievements, the researcher used using a retrospective approach. According to Creswell (2014) a retrospective approach is one where researchers collect data that was previously collected, for example, by using existing data such as report cards, and by asking for information from individuals who have experienced the situations being studied.

B. Population and Sample

1. Population

The population refers to the group that provides a source of information in a research study. According to Creswell (2014), the population is the total number of subjects to be studied according to the characteristics chosen by the researcher. From the subjects that had the specified characteristics, the researcher could these characteristics as a basis for concluding later. The population of this study consisted

of all tenth grade students at SMK YASEMI Karangrayung for the 2025/2026 academic year. The population is presented in the following table:

Table 3.1 State of the students populations

Class	Population
X AK 1	29
X AK 2	31
X AK 3	31
X DPB 1	27
X DPB 2	27
X DPB 3	26
X TKJ 1	28
X TKJ 2	38
X TKJ 3	35
X TKJ 4	37
X TKR 1	36
X TKR 2	36
X TKR 3	34
X TBSM 1	34
X TBSM 2	35
X TBSM 3	36
X TBSM 4	33
X TBSM 5	31
X TBSM 6	33
X TBSM 7	36
Total	653

The total number of students is 653. The selection of tenth grade students as the population was made because they were still in the early stages of school. It was very important to know their learning styles from the beginning so that the learning strategies could be improved and made more effective.

2. Sample

A sample is a part of the population. In this research, a small group of participants was chosen using the cluster sampling method. This method could be carried out by dividing the population into multiple categories and then selecting some of those groups as representatives. Some or all of the people in the selected

groups were analyzed. To determine the minimum sample size that could represent the population, the researcher used the Slovin formula.

$$n = \frac{N}{1 + N(e)^2}$$

n = Total sample

N = Total population (653)

e = Precision value error rate. (10%)

$$\begin{aligned} n &= \frac{N}{1 + N(e)^2} \\ &= \frac{653}{1 + 653 \times (10\%)^2} \\ &= \frac{653}{1 + 653 \times (0,01)^2} \\ &= \frac{653}{1 + 6,53} \\ &= \frac{653}{7,53} \\ &= 86,7 \end{aligned}$$

According to the Slovin formula with a 10% margin of error, a minimum sample size of 87 students was obtained from a total population of 653 students in the tenth grade at SMK YASEMI Karangrayung. Adding a number to the initial result (86,7) was done to ensure that the sample taken corresponded to all of the participants as accurately as possible. Because the population was very large and distributed between a variety of classes, this research used cluster sampling. From the total number of classes available. In this research, the sample was taken by selecting three classes as representatives namely X TBSM 1, X TKR 2, X TKR 3.

After the three classes were selected, the researcher were selected students from within them to serve as the data source for the research.

C. Source and Types of Data

This part, describes the source data and types of data collection.

1. Source of the Data

This research used primary data and secondary data

a. Primary Data

The primary data were collected using data collection techniques such as questionnaires on learning styles. The results of the learning style test were taken using the VARK questionnaire developed by Neil D. Fleming (2001). The questionnaire includes 16 multiple-choice questions, and each question provides four options (a, b, c, and d) corresponding to the four learning styles.: visual (V), auditory (A), read/write (R), and kinesthetic (K). Additionally, the researcher used interviews to help understand this research clearly. Interview data were collected from several students as supporting data to gain a deeper understanding of students' learning styles and their English learning achievements. Interviews were conducted with five students from each class that served as the research sample using semi-structured interviews. Through these interviews, students were allowed to share their experiences and opinions about the English language learning process. It needed to be noted that the interview data is not used as the primary data for the research. The interview data was only used as additional information to support and enhance the interpretation of the research results.

b. Secondary Data

Secondary data in this study were obtained from students' English report card grades in the first semester. The data were used to measure the correlation between students' learning styles and their English learning outcomes. The English report card grades helped researchers understand students' learning achievements and analyze whether there is a correlation between learning styles and students' learning achievement.

D. Variables and Indicators

1. Variables

The research variable is something that is meant to be researched or measured, which serves as the focus of the research. In this research, there were two main variables namely: Variable X, which was the influencing factor, while Variable Y is the influenced factor. The variables that were utilized in this research was as follows:

X: students' learning styles.

Y: students' English achievement.

2. Indicators

In a research variable, there is something called an indicator. An indicator is a specific measure or characteristic used to evaluate or measure the research variable. The indicators that were used to study the correlation between students' learning styles and students' achievement included the following:

a. Students' learning styles

To identify the students' learning styles, the researcher used a questionnaire from Fleming (2001), which was accessed by using the Fleming website, specifically the VARK Learn version 8.01. The VARK questionnaire consisted of 16 questions to determine students' learning styles. Each answer represented one of the five learning styles (V, A, R, K or Multimodal). To make it easier for students at SMK YASEMI Karangrayung, the questionnaire was translated into Indonesian and distributed through Google Forms to help students complete it more easily.

The score for each style was calculated based on the number of selected answers, and the style with the highest score indicated the most dominant learning preference. To facilitate the filling out at SMK YASEMI Karangrayung, the original questionnaire from vark-learn.com was translated into Indonesian. with the following details :

Components of Learning Styles

V = Visual

A = Auditory

R = Read/write

K = Kinesthetic

Table 3.2 Scoring chart

Question	(a) category	(b) category	(c) category	(d) category
1	K	A	R	V
2	V	A	R	K
3	K	V	R	A
4	K	A	V	R

5	A	V	K	R
6	K	R	V	A
7	K	A	V	R
8	R	K	A	V
9	R	A	K	V
10	K	V	R	A
11	V	R	A	K
12	A	R	V	K
13	K	A	R	V
14	K	R	A	V
15	K	A	R	V
16	V	A	R	K

b. Student English achievement

The English academic achievement data were collected from the first-semester English report card scores of tenth grade students in the 2025/2026 academic year. The scores ranged from 0 to 100 and were analyzed in their original form without being categorized into specific groups. This was done to maintain the accuracy and reliability of the data obtained directly from the school records.

E. Technique of Collecting Data

This research examined the correlation between learning styles and English learning achievement of students. This analysis utilized the SPSS 25 program to calculate the correlation coefficient and test the research hypothesis. This study aimed to determine if there was a correlation between learning styles and students' English learning achievements. Learning style data were obtained using the VARK

questionnaire distributed to students. Meanwhile, data on English learning achievement were collected from students' report card grades in the first semester. In addition, interviews were conducted to identify other factors that might influence both variables. The data collected were used to analyze and explain the correlation between students' learning styles and their English learning achievements.

F. Technique of Analyzing Data

The data collected from the VARK questionnaire and students' English report card grades were analyzed statistically using the SPSS 25 program. The researcher used the following steps to analyze the research data.

1. Calculating of data

The assessment was conducted by distributing the VARK questionnaire to respondents to identify the students' learning styles. The answers on the questionnaire used a nominal scale based on choices a, b, c, or d, which represent the four learning styles (Visual, Auditory, Read/Write, and Kinesthetic). After the questionnaires were collected, the scores from each learning style were calculated and displayed in tables. Furthermore, the researcher also present the students' academic achievements based on their first semester English report card grades.

2. Coding

The scores of students' learning styles and academic achievements need to be coded initially so that they can be analyzed using SPSS software. The code used refers to categorical data.

a. The code of the student's learning styles was as follows;

1) 1 = Visual (V)

- 2) 2= Auditory (A)
- 3) 3 = Read/write (R)
- 4) 4 = Kinesthetic (K)
- 5) 5 = Multimodal

- b. The researcher used raw data in the form of original numerical scores spanning 0 – 100 obtained from student report card grades for English achievement.

3. Prerequisite analysis test

Before conducting the hypothesis test, the researcher first conducted the prerequisite analysis tests to ensure that the data met the criteria for the use of statistical tests. The normality test was conducted to determine whether the research data were normally distributed. In this research, the Shapiro-Wilk test was used because the sample size was below 50 respondents. The data were considered normally distributed if the significance value (Sig.) was higher than 0.05.

4. Hypothesis test

The hypothesis test in this research used Spearman's rho correlation. This test was used to determine whether there was a correlation between students' learning styles and their English academic achievement. Spearman's rho correlation was used because the data were not normally distributed. The correlation coefficient was calculated using SPSS version 25. The decision was based on the significance value (Sig. 2-tailed). If the significance value was less than 0.05, The hypothesis decision is determined by the significance value. A significance value below 0.05 indicates that the two variables have a statistically significant correlation, meaning

that H_a is accepted and H_0 is rejected. Conversely, a significance value above 0.05 indicates that the correlation is not significant. Thus, H_0 is accepted, while H_a is rejected. On the other hand, if the significance value was greater than 0.05, there was no significant correlation. Therefore, H_0 was accepted and H_a was rejected. The degree of correlation between the two variables was then determined using the correlation coefficient. This research used the following guidelines for interpreting the correlation coefficient.

Table 3.3 Pearson Product-Moment

“r” values of Pearson Product-Moment correlation	Interpretation
0,00-0,19	Very weak Correlation
0,20-0,39	Weak Correlation
0,40-0,59	Moderate Correlation
0,60-0,79	Strong Correlation
0,80- 1,00	Very Strong Correlation