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# CHAPTER III

# RESEARCH METHODOLOGY

## A. Research Methodology

The research method in this study is to investigate the correlation coefficient among the variables and to understand if the correlation coefficient is significant or not. The method of this study is correlational study using mixed-method design because the researcher intended to collect both quantitative and qualitative data. The quantitative data is needed to find out the correlation among the variables. The qualitative data is needed to to find out deeper information related to the student resourcing process. Nunan (1992) defined correlation as a group of statistical techniques for evaluating the strength of the connections between the data. Elliot (1999) stated that correlational study aimed to find out the existence the connecton between variables. According to Nunan (1992:39), the perfect possitive correlation will result in +1, while the perfect negative correlation will result in -1.

1) Positive correlation

   The result will be possitive when both variables increase and decrease at the same time.

2) Negative correlation

   The result will be negative when on variable increase, followed by other vaiable decreases.

3) No correlation

   It indicates that there is no correlation between the variables.

The independent variable and dependent variable are two different types of variables, according to Ary (1985: 30). He claims that a variable is an attribute that is thought to reflect or convey a certain idea. Additionally, he added that the phenomena under research and being investigated is the dependent variable. Even if the independent variable is a factor that may be measured apart from the

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dependent variable, it may still be related to it. In this research, there are three variables are mentioned below:

1) The independent variables:
   a. Students' resourcing ability in English text (X1)
   b. Vocabulary mastery (X2)

2) The dependent variable:
   a. Reading comprehension (Y)

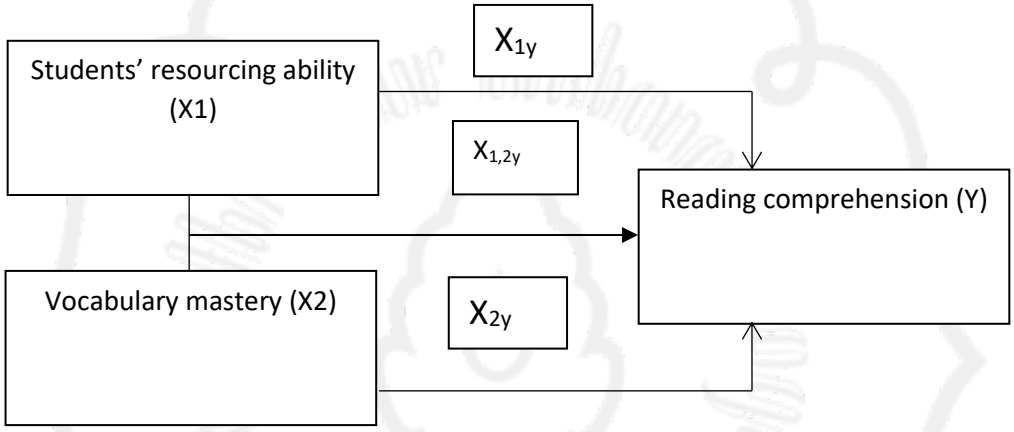


*Figure 3.1. Diagram of the relationship between resourcing ability (X1) and vocabulary mastery (X2) and reading comprehension (Y)*

## B. The Setting of the Research

1. The place of the research

   This study was done at the tenth grade of SMK Negeri 2 Surakarta in the academic year of 2021/2022. SMK Negeri 2 Surakarta is located Jl. Adi Sucipto No.33, Manahan, Kec. Banjarsari, Kota Surakarta, Jawa Tengah.

2. The time of research

   The researcher conducted this research from June 2022 until July 2022.

## C. Population, Sample, Sampling

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1. **Population**

   In accordance with the statement of Arikunto (1996), the overall research subject is called as population. In this research, the population is all students in the first grade of Teknik Kendaraan Ringan (TKR) classes of of SMK Negeri 2 Surakarta. There are four classes and each class contains 30 students. The total of the students is 120.

2. **Sampling**

   According to Hadi (1994), sampling is a strategy for choosing a sample from a population. Random sampling is the greatest method for obtaining a certain type of sample. All component of the population have equal chance to be involved in a sample. The method of sample collection used by the researcher is cluster random sampling. Due to the homogenous nature of all the courses, this strategy is employed. The steps of getting the sample are as follows:

   a. Every class's name is written in each small paper with each name or code in alphabeth.
   b. After that, the researcher bundles the paper into a jar after rolling it.
   c. The rolls of paper are shaken.
   d. After setting the paper aside, the researcher picks two at random.
   e. The class in the chosen paper will be the sample.

   The result is X TKR D to be the sample of the research. The chosen class will be the sample to collect the data and to be the participants of the try out is X TKR B.

3. **Sample**

   Johnson and Christensten (2000:1 58) stated that the result from taking a component from a population by following paticular rule is called as sample. The technique to collect the sample is cluster random sampling. The chosen class for this research is X TKR D which consists of 30 male students with

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various social and economic background. The students of X TKR B which consists of 30 students is taken as the participant of the try out.

## D. Techniques of Collecting the Data

### 1. The Instrument of Collecting Data

In accordance with Arikunto (2002: 136), the intrument of the research defined as a kind of equipment used by researcher to collect the data in order to make the process of the research easier and get a good result, complete and well organized. The instrument that the researcher used for this research is mentioned below:

#### a) Test

Mason and Bramble (1997) defines test as a systematic procedure to asses the performance of the sample. Using test in this research is helpful for the researcher to calculate the achievement of the students, the progress of the students and to evaluate the proces of teaching and learning especially in measuring students' resourcing ability, vocabulary mastery and reading comprehension.

To collect the data of the students' resourcing ability, the researcher uses short answer question test where there will be 1 score for the one correct answer and 0 score for the one wrong answer. For the students' vocabulary mastery and reading comprehension, the researcher use a multiple choice type of test where the students are expected to choose a correct anser among choices. The correct answer gets 1 score and the wrong answer gets 0 score.

#### b) Interview

In collecting qualitative data, the researcher used interview to figure out the process of students while doing the resourcing ability test in order to measure if the students could fulfill the indicators of resourcing ability. The researcher took four samples of students to be interviewed. The

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interview was done after the students finished the resourcing ability test. Furthermore, the researcher gave open-ended questions so the students could express their experiences unconstrained by any perspectives of the researcher or past research findings.

Before using the list of questions for the interview, the researcher consulted with the advisor to help examining the questions so that the list of questions was in accordance with the indicators to be measured.

**2. Try Out the Instruments**

a. The Instrument Validity

According to Ary et al. (2010), the main crucial factor in creating and assessing devices is validity. He said that the amount of how good instrument actually measured what it promised to measure is what is known as validity.

Pearson Product Moment is used to compute the items validity of students' resourcing ability, vocabulary mastery and reading comprehension, the researcher used the. The formula is as follows:

$$r_{xy} = \frac{N\sum xy - (\sum x)(\sum y)}{\sqrt{\{N\sum x^2 - (\sum x)^2\}\{N\sum y^2 - (\sum y)^2\}}}$$

The validity test is done with all the sample data totaling 30 students. The validity values are compared with r-table. If the value of r obtained is more than the value of r table then it can be said that the test item is valid. If the value of r obtained is less than the value of r-table then it can be said that the test item is invalid. The level of significance $\alpha = 5\%$. The value of $R_t$ for $\alpha = 0.05$ for $n = 30$ is 0.361. After computing the data, the researcher found that there were 2 invalid items out of 17 items in resourcing ability test. The computation can be seen in Appendix 12 page 90. While in vocabulary mastery test, there were 2 invalid items out of 32 items. The computation can be seen in Appendix 13 page 93. Furthermore, in reading

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comprehension test, there were 5 invalid items out of 35 items. The computation can be seen in Appendix 14 page 99.

b. The Reliability of The Instrument

The writer uses Kuder Richardson-20 formula or KR-20 in determining the reliability of the items of resourcing ability, vocabulary mastery and reading comprehension test:

$$r_{KR20} = \left[\frac{k}{k-1}\right]\left[1 - \frac{\Sigma pq}{\sigma^2}\right]$$

From the reliability test KR-20 above:

The value of reliability is compared with r-table. If the value of reliability is more than r-table then the correlation is said to be significant so that it is said that the test items are reliable, and vice versa if the value of reliability is less than r-table it is stated that the test items are unreliable.

The significance of $\alpha = 5\%$. The value of $R_t$ for $\alpha = 0.05$ for $n = 30$ is 0.700. After computing the data, the finding showed that $R_o$ of resourcing ability test (0.760) is higher than $R_t$ (0.700). So that it can be concluded that the resourcing ability test is reliable. The computation can be seen in Appendix 12 page 92. While in vocabulary mastery test, the finding showed that $R_o$ (0.876) is higher than $R_t$ (0.700). The computation can be seen in Appendix 13 page 98. Furthermore, in reading comprehension test, the finding showed that $R_o$ (0.856) is higher than $R_t$ (0.700). The computation can be seen in Appendix 14 page 104.

## E. Techniques of Analyzing the Quantitative Data

1. Description of the Data

a. Mean

The average of a data group is its mean score.

It is determined by adding together each member's individual scores in the group and dividing that amount by the number of participants.

1) Individua Data

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$$\bar{x} = \frac{\sum x}{n}$$

2) Mean in frequency distribution : $\bar{X} = \frac{\sum \text{fiXi}y}{n}$

(Ngadiso, 2011: 5)

b. Mode

The value in a collection of data that appears the most frequently is the mode.

1) Individual data : 6 7 9 11 12 12 13

2) Mode in frequency distribution : $Mo = L + i\left(\frac{f_1}{f_1+f_2}\right)$

(Ngadiso, 2011: 5)

c. Median

The middle score, or median, is the one that lies between the lowest and greatest values in an arrangement of scores.

1) Individual scores 6 7 9 11 12 12 13

2) Data in frequency distribution $Me = L + i\left(\frac{\frac{n}{2}-cfb}{fw}\right)$

(Ngadiso, 2011: 6)

d. Standard Deviation

The standard deviation measures how far a value deviates from the mean.

1) Individua Score

$$s = \sqrt{\frac{\sum(x-\bar{x}}{n-1}} \text{ or } \sqrt{\frac{\sum x^2}{n-1}} \text{ where } \sum x^2 = \sum x^2 - \frac{(\sum x)^2}{n}$$

2) Data in frequency distribution

$$s = \sqrt{\frac{\sum f_1 X_i^2 - \frac{(\sum f_i X_i)^2}{n}}{n}}$$

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(Ngadiso, 2011: 7)

2. Prerequisite Test

a. Normality Test

This test is intended to determine if the population samples are normally distributed or not. The researcher uses Liliefors' formula to determine if the research sample is typical. The formula of Liliefors is as below:

$$LO = F(Z_i) - S(Z_i)$$

$$Z_i = \frac{x-\bar{x}}{s} \qquad s = \sqrt{\frac{\sum x^2}{n-1}}$$

Where:

L0 : the highest of the difference of F (Zi) and S (Zi)

F (Zi) : the opportunity of the data

F (Zi) : 0.5 ± table value

Counting F (Zi) 0.5 + table value was used when Zi has a positive score, and 0.5 – table value will be used when the value of Zi has negative score.

S (Zi) : the proportion of the data

X : the score of each respondent

$\bar{X}$ : the mean of the score of all respondents

$\sum X2$ : the sum of $x - \bar{x}$

The data are in normal distribution if $L_o$ is lower than $L_t$.

(Ngadiso, 2011: 8)

b. Linearity and Significance of Regression

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To determine if there is significant linear regression between two variables, the linearity test is utilized. The formula of the linearity test, as follows:

1) The Linearity of a Single Regression

$$F_o = \frac{MS_{\text{lack of fit}}}{MS_{\text{lack of error}}}$$

$$MS_{lack\ of\ fit} = \frac{SS_{lack\ of\ fit}}{df} \qquad MS_{error} = \frac{SS_{error}}{df}$$

$$SS_{error} = \sum\left\{\sum Y_1^2 - \frac{(\sum Y_1)^2}{n}\right\}$$

$$SS_{\text{lack of fit}} = SS_{residue} - SS_{error}$$

The data is linear if $F_o$ is lower than $F_t$

(Ngadiso, 2011: 10-11)

2) The Significance of Single Regression

$$F_o = \frac{MS_{b/a}}{MS_{residue}}$$

Where :

$$MS_{b/a} = \frac{SS_{b/a}}{df}$$

$$MS_{residue} = \frac{SS_{residue}}{df}$$

$$a = \frac{(\sum Y)(\sum X^2) - (\sum X)(\sum XY)}{n\sum X^2 - (\sum X)^2}$$

$$SS_{total} = \sum Y^2$$

$$SS_{(a)} = \frac{\sum Y^2}{n}$$

$$SS_{(b/a)} = b\left\{\sum XY - \frac{(\sum X)(\sum Y)}{n}\right\}$$

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$$SS_{residue} = SS_{total} - SS_{(a)} - SS_{(b/a)}$$

The regression is significant if F observed > F table.

3) Multiple Linear Regression

To find out multiple regression using form, as follows:

$$\hat{Y} = a_0 + a_1X_1 + a_2X_2$$

$$F_o = \frac{SS_{regression/g}}{SS_{regression}(n-g-1)}$$

$$SS_{regression} = a_1 \sum X_1Y + a_2 X_2Y$$

$$SS_{total} = XY^2$$

$$SS_{residue} = SS_{total} - SS_{regression}$$

$$g = the\ number\ of\ independent\ variable$$

$$a_0 = \bar{Y} - a_1\bar{X}_1 - a_2\bar{X}_2$$

$$a_1 = \frac{(\sum x_2^2)(\sum x_1y) - (\sum x_1x_2)(\sum x_2y)}{(\sum X_1^2)(\sum x_2^2) - (\sum x_1x_2)^2}$$

(Ngadiso, 2011: 13)

4) Inferential Statistic

a) Single Correlation

$$r = \frac{\sum xy}{\sqrt{(\sum x^2)(\sum y^2)}}$$

$$\sum xy = \sum XY - \frac{(\sum X)(\sum Y)}{n}$$

$$\sum x^2 = \sum X^2 - \frac{\sum(X)^2}{n}$$

$$\sum y^2 = \sum Y^2 - \frac{\sum(Y)^2}{n}$$

$$r = \frac{\sum XY - \frac{(\sum X)(\sum Y)}{n}}{\sqrt{\left\{\sum X^2 - \frac{\sum(X)^2}{n}\right\}\left\{\sum Y^2 - \frac{\sum(Y)^2}{n}\right\}}}$$

Or

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$$r = \frac{n\sum XY - (\sum X)(\sum Y)}{\sqrt{\{n\sum X^2 - (\sum X)^2\}\{n\sum Y^2 - (\sum Y)^2\}}}$$

(Ngadiso, 2011:12)

b) Multiple Correlation

$$R^2 = \frac{SS_{regression}}{\sum y^2}$$

$$SS_{regression} = a_1 \sum x_1 y + a_2 \sum x_2 y$$

$$\sum y^2 = \sum Y^2 - \frac{(\sum Y)^2}{n}$$

$$F = \frac{R^2/g}{(1-R^2)/(n-g-1)}$$

(Ngadiso, 2011:15)

## F. Techniques of Analyzing the Qualitative Data

In analyzing qualitative data, firstly the writer transcribed the audiotape recorder of qualitative data into text data. Creswell states that the transcription is the process of converting audiotape recordings or field notes into text data. After transcribing the data, the researcher focused on analyzing the process of how the students doing the test and assessing if they could fulfill the indicators of resourcing ability which are about checking the words meaning using dictionaries, checking the words meaning using thesaurus, checking the words meaning using encyclopedia, checking the words meaning using textbooks and how they could match the meaning with the context of the sentence or the text. Finally, the researcher interpreted the data by developing a list of key points or important findings from the classified data.