

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Types of research

This research is a descriptive research with a qualitative approach. Qualitative descriptive research aims to describe, describe, explain, explain and answer in detail the problems to be studied by studying as much as possible an individual, a group or an event. In qualitative research, it is a research instrument and the results are written in the form of words or statements that are in accordance with the actual situation. This research was conducted by distributing questionnaires/questionnaires to active students who were studying at the Public Health Study Program Universitas Muhammadiyah Kalimantan Timur.

3.2 Primary data

Primary data in this study is data collected from the intended research object, namely closed questionnaire/questionnaire data obtained from online respondents. The primary data used is an assessment from students regarding the satisfaction of online learning performance at the Public Health Study Program Universitas Muhammadiyah Kalimantan Timur.

3.3 Population and Sample

The target population and sample in this study were active students from the Class of 2019 and 2020 who are currently studying online at the Public Health Study Program Universitas Muhammadiyah Kalimantan Timur.

3.4 Data collection technique

3.4.1 Questionnaire/Questionnaire

In this study, the data collection technique used a questionnaire/questionnaire which was distributed to students of the Public Health Study Program Universitas Muhammadiyah Kalimantan Timur. With satisfaction dimensions that include tangibles, reliability, responsiveness, assurance, and empathy.

Table 3. 1 Questionnaire

No	Question	Dimension
1	The appearance of the lecturer meets the standards (neat, polite clothes)	Tangibles
2	Online Lectures on time and according to schedule	
3	Learning facilities (lecture materials) are well prepared	
4	Lecturers provide practical materials using videos/practices directly in the Lab with the Covid-19 health protocol system alternately	Reliability
5	Lecturers always deliver the lecture contract at the beginning of the lecture	
6	Availability of time That's for discussion	
7	The material provided is in accordance with the RPS	
8	Practical lectures are carried out according to the number of meetings that have been determined	
9	Lecturers are willing to help students who have difficulty with the subjects being taught	Responsiveness
10	Responsiveness of lecturers in answering questions from students	
11	Lecturers always accompany lectures to completion (zoom and google meet)	
12	Lecturers help students who have difficulty understanding practical material	
13	There are sanctions for students who violate the rules that have been set and apply to all students without exception	Assurance
1 4	The lecturer discusses the tasks given at face-to-face via (zoom, google meet and open learning)	

1 5	Online lectures make it easier to interact with students	
1 6	Lecturers are friendly, open, cooperative with students	Empathy
1 7	Lecturers are easy to contact either via Whatsapp, telephone, e-mail, or others	
1 8	Lecturers try to help understand the interests and needs of students	

In scoring in the questionnaire/questionnaire, this research uses a Likert scale technique to measure the level of satisfaction with positive to negative values, with a 4-level scale (1. Very Dissatisfied; 2. Dissatisfied; 3. Satisfied; 4. Very Satisfied).

3.5 Instrument Testing Techniques

3.5.1 Validity test

The validity test is carried out as a measure that shows that the variables measured in the questionnaire are indeed the variables to be studied. Validity is a measure to show the levels of validity or validity of an instrument. An instrument is declared valid if it has high validity. Conversely, if the validity is low then the instrument is declared invalid. To calculate the validity, the Pearson product moment correlation formula is used using the Excel application. The level of validity can be measured by comparing the coefficient achievement value (Nurul, 2020).

3.5.2 Reliability Test

Reliability test is conducted to show the extent to which the measuring instrument (questionnaire) can be trusted or relied upon because it has a high level of consistency and stability. Which means that the instrument has been tested for reliability and is reliable. Calculation of reliability using Cronbach's Alpha formula using Microsoft Excel. Instruments are declared reliable if $r > 0.60$ and unreliable if $r < 0.60$. (Nurul, 2020) .

3.6 Percentage Calculation

The data obtained need to be scored research data so that it can be interpreted in the following equation:

$$P = \frac{f}{n} \times 100\%$$

Information:

- n : Total Score Ideal
- f : Total Score, obtained through:
- Very Satisfied : The number of items is worth 4 x S P score (4)
 - Satisfied : The number of items is worth 3 x P score (3)
 - Dissatisfied : The number of items is worth 2 x T P score (2)
 - Very Dissatisfied : Number of items is worth 1 x ST P Score (1)

3.7 Data analysis technique

3.7.1 C4.5 Algorithm

In this study, student satisfaction with online learning performance cannot be separated from 5 aspects of tangible, reliability, assurance, responsiveness and empathy. The C4.5 algorithm is a type of Decision Tree data mining classification method that can produce a good decision tree model (Natuzzuhriyyah & Nafisah, 2021) . In its calculations, the C4.5 algorithm uses the basic formula of entropy:

$$Entropy (S) = - \sum_{i=1}^n p_i * \log_2 p_i$$

Information:

S : case set

n : number of partitions S

p_i : the proportion of S_i to S

The above equation will be used to calculate the total entropy in this study. The number of cases (S) which will be calculated with the total initial cases, while for n (the number of partitions S) is the number of dissatisfied and satisfied

responses in this study. After calculating the entropy of each case, the gain information is used for the object separator. With the formula:

$$Gain(S, A) = Entropy(S) - \sum_{i=1}^n \frac{|S_i|}{|S|} * Entropy(S_i)$$

Information:

S : case set

A : attribute

n : number of attribute partition A

|S_i| : number of cases on partition i

|S| : number of cases in S

3.7.2 Rapid Miner

Rapid miner is an application for analyzing data mining, Rapid miner is used to determine decision trees using the C4.5 algorithm method.

3.8 Research Design

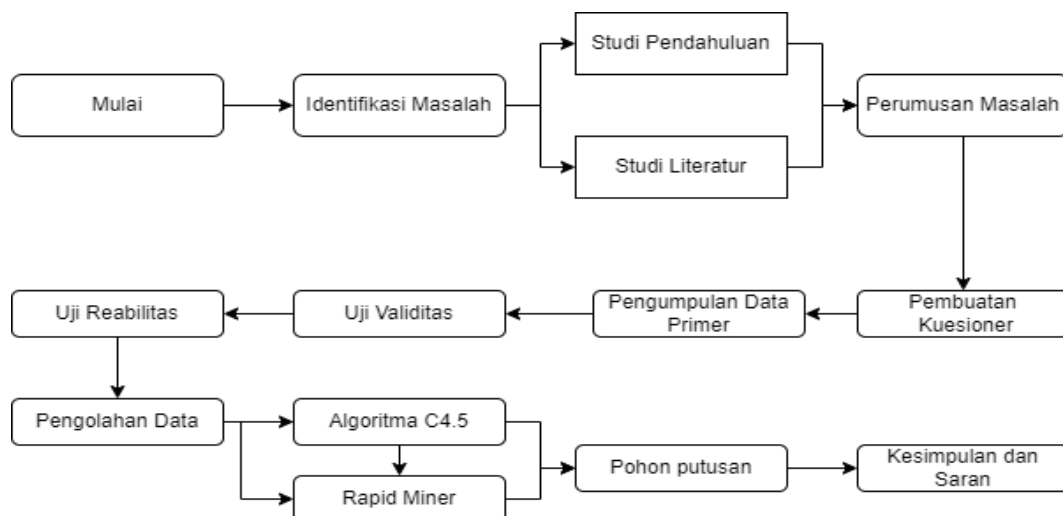


Figure 3 1 Flowchart of research design

Explanation of the flow of this research:

1. Preliminary Study and Literature Study

Preliminary studies and literature studies are the initial stages carried out so that this research has the concepts and theories of previous research so that the flow of this research is more well structured.

2. Problem Identification and Formulation

going through the preliminary study and literature studies, the next step is to identify the phenomena that occur so that they can formulate research problems.

3. Research Limits and Objectives

The limitation of this research is determined from the title which is determined by collaborative research of student lecturers, where this research only focuses on the Public Health Study Program Universitas Muhammadiyah Kalimantan Timur. The purpose of this study was to determine the level of student satisfaction with online learning performance.

4. Questionnaire Creation

At this stage, make a questionnaire that refers to the 5 dimensions of satisfaction and use a Likert scale to score the level of satisfaction.

5. Primary Data Collection

After distributing the questionnaires, data will be collected based on the target respondents of the Public Health Study Program Universitas Muhammadiyah Kalimantan Timur.

6. Reliability

Reliability tests are carried out to show the extent to which the measuring instrument can be trusted or reliable before the next step.

7. Validity

Validity is carried out to determine the extent of the truth or accuracy of a measuring instrument.

8. Data processing

The data that has been obtained through the results of filling out the questionnaire can be processed immediately.

9. C4.5 Algorithm

After the data is obtained from the results of filling out the respondents, the next step is to start manual calculations using the C4.5 algorithm method which will carry out data processing.

10. Data Processing Using Rapid Miner Tools

After going through validity and reliability testing, data processing using the C4.5 algorithm with Rapid Miner tools will produce data in the form of student satisfaction results on online learning performance at the Public Health Study Program Universitas Muhammadiyah Kalimantan Timur.

11. Decision Tree

The decision tree is obtained from the use of rapid miners using the C4.5 algorithm.

12. Conclusions and recommendations

After knowing the final results of the research, conclusions can be made that will be described according to the final results so that they can find out the level of satisfaction of online learning performance, with these final results can provide suggestions for further research if there is a study with the same title.