

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Types of research

The type of research used is qualitative research. According to (Sukmanasa et al., 2017) states that qualitative research has the characteristics of describing an actual situation, but the report is not just a form of reporting an event without a scientific interpretation. This study aims to obtain an overview of how the performance of lecturers on student satisfaction.

3.2 Population and Sample

The population in this study were active students of the Pharmacy Study Program at Universitas Muhammadiyah Kalimantan Timur. The sampling technique used in this study is the Purposive Sampling Technique. According to (Susanto, 2012) states that purposive sampling is a sampling technique from the population based on certain criteria. Thus, the sample used in this study was Class 2019 students. The reason for using the sample in this study was because Class 2019 students had done face-to-face learning before COVID-19. By conducting face-to-face learning before COVID-19, these students will be able to better assess the facilities on Universitas Muhammadiyah Kalimantan Timur.

3.3.1 Validity test

Used to test the extent to which the accuracy or evidence of an instrument as a research instrument is elastic. If the measuring equipment is valid or correct, the measurement results will also be correct, or in other words, validity talks about how the measuring equipment used has measured what it wants to measure.

$$r_{xy} = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{\{N\Sigma X^2 - (\Sigma X)^2\}\{N\Sigma Y^2 - (\Sigma Y)^2\}}}$$

X = ... Y = ... XY = ... X² = ... Y² = ... n = ...

X = Score obtained by the subject of all items

Y = Total score obtained from all items

X = Total score in X distribution

Y = Total score in Y distribution

X² = Sum of squares in the score distribution X

Y² = Sum of squares in the Y distribution score

N = Number of respondents

3.3.2 Reliability Test

This is done to see the suitability of numbers from a questionnaire that is carried out by a respondent on different occasions or times and with similar questionnaires.

$$r_{11} = \frac{k}{k-1} \left(1 - \frac{\sum \sigma_b^2}{\sigma_t^2}\right)$$

r₁₁ = instrument reliability

k = number of questions

$\sum \sigma_b^2$ = number of item variances

σ_t^2 = total variance

3.3 Data collection technique

Data collection techniques are usually carried out with research activities in an effort to collect or collect a number of data in the field needed to answer the researcher's questions. In this study, researchers used observation and questionnaire techniques.

The most important data collection technique in this research is through a questionnaire. The use of the questionnaire technique is expected to be able to collect the information needed by not giving questions or answers directly. Questionnaire or questionnaire is a technique or method of collecting data indirectly. The form of the questionnaire used is structured with a closed answer form where the answers are already available and the respondent only answers each question by means of the available alternative answers.

Table 2 Questionnaire

No	Question	Attribute
1	The friendliness of the education staff in serving students.	<i>Assurance</i>
2	Educational Personnel Initiatives in serving students.	
3	Lecturers have the ability according to educational background.	
4	Lecturer's ability to explain the subject accurately.	
5	Lecturer's mastery of the latest issues in the field being taught.	
6	Campus security level.	
7	Lecturer readiness in giving practicum.	<i>Reliability</i>
8	Orderliness of the administration of education.	
9	Implementation of learning activities according to the academic calendar.	
10	Lecturer's ability to express opinions.	
11	Providing solutions to students' academic problems by Academic Advisors.	<i>Empathy</i>
12	Student problems are considered by the Study Program Manager.	
13	Educational staff's attention to students' difficulties in activities on campus.	
14	Availability of lecture infrastructure (e.g.: lecture hall, classroom, laboratory room.)	<i>Tangible</i>
15	Easy access to internet services.	
16	Availability of worship facilities.	

17	Utilization of various media in Lecturer learning.	
18	Speed of service Education staff	<i>Responsiveness</i>
19	Lecturer's willingness to clarify the material if students have difficulty understanding the lecture material.	
20	Lecturer's ability to liven up the classroom atmosphere.	

In collecting data using a Likert scale based on linear has 4 levels of scale (1. Very Dissatisfied, 2. Dissatisfied, 3. Satisfied, 4. Very Satisfied) which can group against a social phenomenon where the answer to each instrument item has a graduation from negative until positive.

Pada awal perkuliahan dosen menyampaikan tentang kemampuan yang didapatkan mahasiswa setelah mengikuti perkuliahan ini *

1 2 3 4

Sangat Tidak Setuju Sangat Setuju

Picture 2 Likert scale

3.4 Percentage Calculation

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

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

Information:

n : Total Score Ideal

f : Total Score, obtained through:

- a. Very Satisfied: The number of items is worth 4 x SS score (4)
- b. Satisfied: The number of items is worth 3 x S score (3)
- c. Dissatisfied: The number of items is worth 2 x TS score (2)

d. Very Dissatisfied: Number of items is worth 1 x STS Score (1)

3.5 C4.5 Algorithm

In the C4.5 Algorithm, it will look for the value of Entropy, and Gain.

A. Entropy

Entropy is a probability measure of uncertainty.

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

Where :

S: case set

n: number of partitions S

p_i: proportion of S_i to S

B. Gain

Modification of Information gain whose purpose is to reduce bias from branching attributes.

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

S: case set

A: attribute

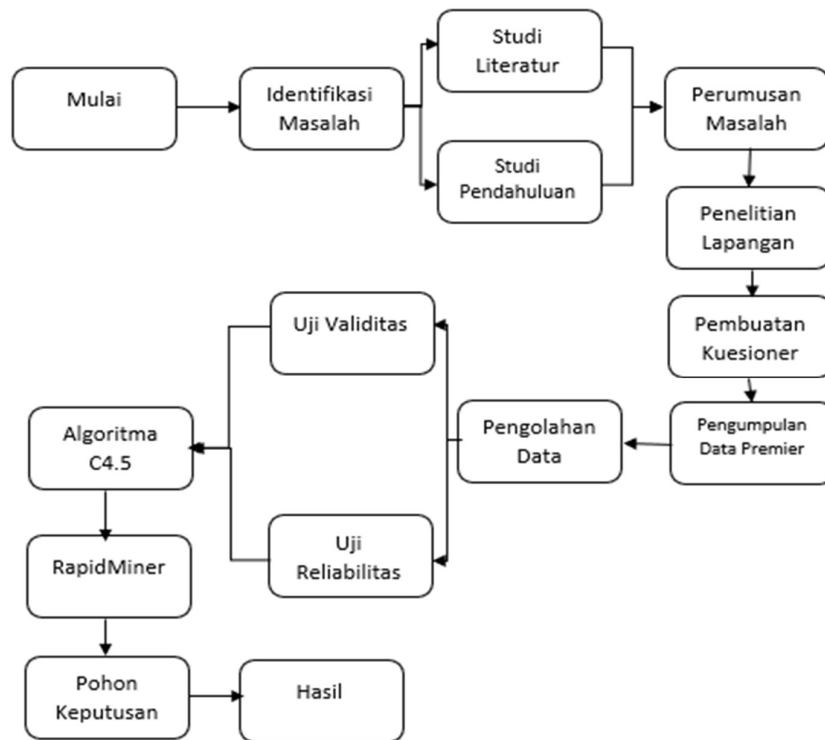
n: number of partition attribute A

|S_i|: number of cases on partition i

|S|: number of cases in S

3.6 Research design

The design of this research can be seen in the flowchart design as follows:



Picture 3 Flow chart

The explanation of the flowchart in this study is:

a. Preliminary Study and Literature Study

Preliminary Study and Literature Study are the initial stages that are tried so that this research has designs and theories through previous research so that the preparation of this research is more well organized.

b. Formulation of the problem

After going through the preliminary study stage and literature study, this research carried out the identification of the phenomena that occurred so that they could formulate research problems.

c. Research Limits and Objectives

The limitations of this research were determined by the collaborative design of student lecturers which in this research was carried out through the Pharmacy Study Program at the University of Muhammadiyah East Kalimantan with

distribution in each case study. The purpose of this study was to determine the level of offline learning for Universitas Muhammadiyah Kalimantan Timur.

d. Questionnaire Creation

At this stage carry out the manufacture of a questionnaire that leads to 4 dimensions of satisfaction and uses a Likert scale to determine the level of student satisfaction regarding the performance of offline learning.

e. Primary Data Collection

After distributing the questionnaires, the data will be combined based on the target respondents of the Pharmacy Study Program, Universitas Muhammadiyah Kalimantan Timur and will be tested for validity and reliability.

f. Validity

Validity is done to find out to what extent the authenticity or accuracy of a measuring instrument.

g. Reliability

Reliability testing is carried out to prove to what extent the measuring equipment can be trusted or can be expected before the next stage.

h. Data processing

After testing the validity and reliability, data processing is carried out using the c4.5 algorithm and using RapidMiner.

i. C4.5 Algorithm

After conducting the Validity Test and Rehabilitation Test, then start with manual calculations using the C4.5 Algorithm which will be carried out with data processing.

j. Rapid Miner

After going through the Validity Test and Reliability Test, the data processing uses the C4.5 Algorithm using the RapidMiner software and produces data in the form of student satisfaction results for offline learning at the Pharmacy Study Program, Universitas Muhammadiyah Kalimantan Timur.

k. Decision Tree

Decision tree of the calculation manually using the C4.5 Algorithm and using

RapidMiner.

I. Results

The result will come out When the result of manual calculation of C4.5 Algorithm appears and the final result of RapidMiner appears.