

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Student Satisfaction

According to (Harmen et al., 2019), Student satisfaction is the extent to which students' hopes and desires for teaching and learning activities are expected with the reality received by students. From the statement above, it can be concluded that student satisfaction is a student's response to learning achievement that matches or even exceeds student expectations. Student satisfaction can be interpreted as a feeling of pleasure, satisfaction and relief for students both for the physical and non-physical services provided during the lecture process.

In this study, the author refers to previous research that is relevant to this research. The following are some relevant research results that are used as study material for researchers, can be seen in table 2.1 :

Table 2.1 Previous Research

No	Author / Year	Problem	Method	Finding and Evaluation
1	(Saragih et al., 2021)	Classify levels of student satisfaction with information system services in the Department of information systems	C4.5 algorithm classification	By using the C4.5 method, the satisfaction level of STIKOM Tunas Bangsa students can be clearly measured. From several aspects that become the benchmark for assessing student satisfaction, it can be seen that the most dominant aspect of satisfaction is job expectations.

Table 2.2 Previous Research (continued)

2	(Sari et al., 2019)	To predict student satisfaction with lecturer teaching methods at stikom tunas bangsa pematangsiantar.	Naïve Bayes algorithm	From 100 training data processed, the test results showed an accuracy of 92.00%, with 22 respondents expressing dissatisfaction and 78 respondents expressing satisfaction. With class precision, the dissatisfied prediction has a value of 85.00%, while the satisfied prediction has a value of 93.75%. Class recall on true dissatisfied has a value of 72.27%, while on true satisfied, it has a value of 96.16%.
3	(Sodik & Ma'sum, 2021)	Analysis of Student Satisfaction Levels with Services Academic Information System	Fuzzy Service Quality Method	The results of respondent's answers indicate that the level of satisfaction with services The University's academic information system obtained a percentage of 86% of the 166 data samples.

### 2.1.1 Dimensions of Student Satisfaction

The success of a Department can be seen by the size of student satisfaction.

To measure student satisfaction, (Shabri & Yanti, 2020) revealed that there are five determinants of service consisting of :

- a. Reliability aspect is the ability of lecturers/employees/managers to provide services as promised, reliable, accurate, and consistent.
- b. Responsive is a willingness of lecturers/employees/managers and institutional owners to assist customers and provide services quickly and meaningfully as well as a willingness to hear and resolve complaints submitted by consumers.
- c. Assurance is the ability of lecturers/employees/managers to generate confidence and trust in the promises that have been made to consumers.

- d. Empathy is a willingness of lecturers/employees/managers to be more concerned in giving personal attention to customers.
- e. Tangible is a physical dimension Such as campus physical facilities, for example, the availability of infrastructure.

### **2.1.2 Student Satisfaction Benefits**

Prospective students and students are customers for universities that need good service in fulfilling their expectations, so these customers are the main value in actualizing these educational institutions to the public that the college is of high quality. A good impression will make students tell good things to others, as well as a bad impression will make students tell bad things to others(Dartini, 2015). Some of the benefits of student satisfaction include:

1. The relationship between the University and its students is harmonious.
2. Can encourage the creation of student loyalty.
3. Forming a word-of-mouth recommendation that is beneficial for universities.
4. The reputation of the University is getting better in the eyes of students, so there are more and more enthusiasts.

## **2.2 C4.5 Algorithm**

The C4.5 Algorithm is a development of ID3 which can classify data using the decision tree method, which has the advantage of being able to process numeric (continuous) and discrete data, can handle missing attribute values, produce rules that are easy to interpret, and are the fastest among other algorithms. An algorithm that uses the main memory in the computer (R.H. Zer et al., 2022).

The C4.5 Algorithm is a decision tree structure where there are nodes that describe the attributes, each branch describes the results of the tested attributes, and each leaf describes the class (Prasetyo & Prasetyo, 2020). In the C4.5 Algorithm, the first step after preparing training data is the selection of attributes that can be calculated using the concept of entropy. Before calculating the gain value, first calculate the entropy value (Medy Wisnu Prihatmono, 2014). The application of the C4.5 Algorithm is one of the case-solving solutions that is often

used in solving problems in classification techniques that have characteristics, namely by the process of determining the entropy value and gain value from the possibility of each criterion that becomes the decision reference, followed by the ranking process of the decision results.

### 2.3 Confusion Matrix

The confusion matrix is the method used to perform the calculation of accuracy on the concept of data mining. The confusion matrix is depicted with a table that states the correct amount of test data and the correct amount of test data wrong (HUSNA, 2021). This concept is carried out to evaluate the classification model based on the process of calculating testing data that predicts true or false values.

The confusion matrix consists of data that has two classes that are positive and negative. Table The confusion matrix consists of 4 cells, namely true positive, false positive, true negative, and false negatives. Can be seen in table 2.2 :

Table 2.3 Confusion matrix

Observation Class	Predict Class	
Real class	Class =satisfied	Class = dissatisfied
Satisfied	True positive	True negative
Dissatisfied	False Positive	False negative

Where true Positive (TP) is the number of positive data records classified as a positive value, false Positive (FP) is the number of negative data records classified as a positive value, False Negative (FN) is the number of positive data records classified as a negative value, and True Negative (TN) is the number of negative data records classified as a positive value.