Analysis of the Opinion Students about The Online Learning System During the Pandemic Using The K-NN and Naïve Bayes Methods

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Article Information

ABSTRACT

Coronavirus or known as Covid-19 is an outbreak that has spread to various parts of the world including Indonesia. Residents of Ambon city also felt the difficult times of surviving in the midst of a pandemic. The adverse impact of this pandemic has notharmed the people of A mbon city, especially the lower middle class. Since the entry of this pandemic into the city of Ambon, the local government has continuously taken steps to overcome the pandemic by conducting PSBB, PPKM, and implementing various rules aimed at limiting community activities outside the home so that crowds do not occur. The negative impact due to Covid-19 also spreads to all aspects such as economic, socio-cultural, tourism aspects, and also affects the learning process in the city of Ambon, where the learning process is carried out online. This online learning process is a problem for people who do not have the supporting means to learn online. Since the Ministry of Education and Culture made this online learning decision, there have been various student opinions in response to this, especially Pattimura University students. In this study, an analysis of student opinions was carried out to find out negative sentiment, positive or neutral sentiment in students related to the online learning process policy made by the government using the K-Nearest Neighbors method and the Naïve Bayes Classifier method. in this study produced an accuracy value from the classification obtained using the KNN method was 37.12%, and the Naïve Bayes method produced a greater accuracy value of about 42.89% which was positive. This shows that the student's response to the performance and rules of online learning at one of the state universities in Ambon, Pattimura University is felt to be good for the online teaching and learning process.

1. INTRODUCTION

WHO (World Health Organization) officially declared coronavirus disease 2019 (covid-19) on March 11, 2020, as a pandemic; widespread in the world [13]. Several developed and developing countries have also experienced the Covid-19 pandemic, one of which is Indonesia [12]. Then the Indonesian government responded to the COVID-19 pandemic as a national disaster on April 13, 2020, in the form of a Presidential Decree of the Republic of Indonesia number 12 of 2020 concerning the determination of non-natural disasters of the spread of COVID-19 which stipulates various policies of the central and regional governments [1].

Various government policies in response to the Covid-19 pandemic have brought various ranging from health, social, religious, economic, and education [2]. We can see the impact of the virus on the world of education from the central government to local governments in covering learning activities that take place outside the home and challenging [15] them with online learning activities at all levels of education ranging from Early Childhood Education (PAUD) [14] to Higher Education by the decree of the Minister [11] of Education and Culture of the Republic of Indonesia related to Circular Letter Number 4 of 2020 About the Implementation of Education Policies in the Emergency Period of the Spread of Corona Virus Disease (Covid-19) [16]. The learning system is carried out through a personal computer (PC) or laptop connected to an internet network connection [3].

This is done to prevent the spread of the Corona Virus. It is hoped that covering activities outside the home, will minimize the spread of the Corona Virus [17]. Ambon City is also one of the regions in Indonesia where until now there are still cases of exposure to the Corona Virus [4]. therefore, one of the State Universities in Ambon City [18], Pattimura University participated in helping to maximize local government policies to minimize the spread of the Corona Virus by conducting online lectures based on the decision contained in the decision stated in Circular Letter of the Rector of Pattimura University ambon Number2084 / UN13 / LL / 2020 dated 17Maret2020. [5]

Online learning is learning that takes place in a network where teachers and those who are taught do not meet face to face [6]. Online learning can be understood as formal education organized by schools whose students and teachers are located in separate locations so that it requires an interactive telecommunications system to connect the two and the various resources needed in it [7]. Online learning is a form of conventional learning delivery that is poured into digital formats through the internet [8].

In the process of changing the learning method from a classical or face-to-face learning method to an online learning method, it received various reactions from students [19], not a few students complained about the burden of internet quota fees and did not get waivers in terms of tuition payments, also coupled with piling up

lecture assignments made students seem to be lazy to do assignments given by lecturers. Pun [9] stated that online learning, which was considered a strategy, then became controversial because of the need for adaptation [9]. Differences in infrastructure, connection quality, devices used, and high internet quota costs are the main obstacles. The sudden change from face-to-face learning to online learning on a large scale led to a variety of responses in society [10]. This is what convinces researchers to make a study of the public (student) opinions on the performance and rules of online learning at one of the universities in Ambon, Pattimura University. There are several research questions in the form of online questionnaires that aim to find out various opinions of students in response to this, especially Pattimura University students, therefore the purpose of this study is to find out negative sentiments, positive or neutral sentiments in students related to policies made by the government using the K-nearest Neighbors and Naïve Bayes Classifier methods

Based on the research conducetd by Putera *et al* that conclude that the student in several university gave a positive responding in online learing system because they thought they were more enjoying the learing season with the lecturer. Some of student feel better when they were into online learning system instead of offline learning system. Its mean, the online learning system during pandemic covid 19 is effective to increase the produticity of the student [1].

2. RESEARCH METHOD

According to [10], the research method is used to look for the influence of certain treatments on others. This research uses quantitative methods using surveys, this survey aims to be an evaluation material for online learning, due to the pandemic period that has not yet been completed [20]. The data collection technique used in this research uses a sample collection technique, namely, snowball sampling by disseminating questionnaires through Google Forms. In this study, 439 respondents were students of the Faculty of Medicine, at Pattimura University. Overall, the sample taken in this study was 439 students with different answers from the 11 questions given in the online questionnaire

a. Preprocessing Text

Preprocessing Text Is the stage of the initial process of the text to prepare the text into data to be processed further. Preprocessing stages:

1) Numeric Elimination (Remove Numbers)

Remove the numbers in the answers from each respondent on the online questionnaire

Table 1. Numeric Elimination

Before the Removal of Numbers	After the Removal of Numbers
I Strongly Disagree With The Learning Process Of Dring In 2020	I Strongly Disagree With The Learning Process Of Dring Years

2) Remove Punctuation and Emoticons

Delete any punctuation marks on the data obtained and also emoticons

3) Elimination of meaningless words (Remove Stop Words)

Remove words that generally appear frequently but have no meaning in the data they get.

Table 2. Meanngless word

Emoticon	Conversion
☺☺☺)=)=)☺	Smile
:D:-D =D	Laugh
☹☹	Sad
:-):$ >:[☹	Disappointed
;-);)	Blinking
:-P:P	Mockery
:-/:/	Hesitate

Table 3. Before and After Detection

Before Deletion	After Deletion
I Strongly Disagree With The Online Learning Process Of 2020	Strongly Disagree With The Online Learning Process IN 2020

4) Change text to lowercase

The existing data is converted into letters.

Table 4. Before and After Modification

Before it was changed	After modification
I Strongly Disagree With The Online Learning Process Of 2020	Strongly disagree with the online learning process in 2020

5) Tokenizing

Tokenizing is the process of dividing a text that can be a sentence or paragraph to become a specific ba ha gian-ba ha gian. This process is the final process to process the

data into a sentiment analysis where each sentence is divided into each token usually carried out by researchers. Here's an example implementation of tokenizing.

Table 5. Before and After Tokenizing

Before Tokenizing	After Tokenizing
I strongly disagree with the online learning process of 2020	Very do not Agree process Learning daring year 2020

b. Validation with K-Fold Cross Validation

Data that has been weighted with TF-IDF will be validated using k-fold cross validation [9]. The K-Fold Cross Validation technique is one of the groups between training data and test data, then the testing process is repeated K times. The test results are then averaged to produce a value. The influence of a K value that is too small is that it can produce low accuracy. This is because with a small K value, the analysis will be more affected by noise. Meanwhile, the influence of a K value that is too large is that it can produce great accuracy.

This is the flow of research made by the author:

FIGURE 1. VALIDATION

3. RESULTS AND DISCUSSION

Data obtained from an online questionnaire made by the author and shared with students of pattimura university Faculty of Medicine with a total of 439 respondents, Scraping data using Rapid Miner. Here the author used 11 questions on the online questionnaire, and analyzed 11 answers of the 11 existing questions that were obtained from 439 respondents.
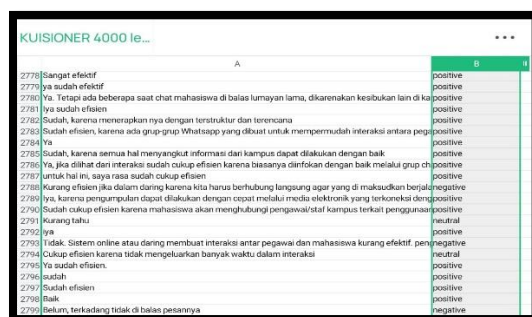

Figure 2. Online questionnaire on Google form

Figure 3. 4707 Online questionnaire data that has been converted into Excel data Of the 439 respondents, there were 4707 questionnaire data used for processing in Rapid Miner.

The data is entered into the Rapid miner on the read csv menu after that we use the set role menu to add a description to the attribute which we later make a label
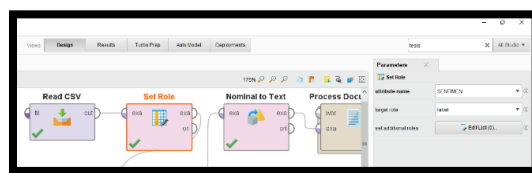
Figure 4. Rapid Miner Data Entered

After that, the data below to the process document from data menu to be carried out in several stages of pre-processing
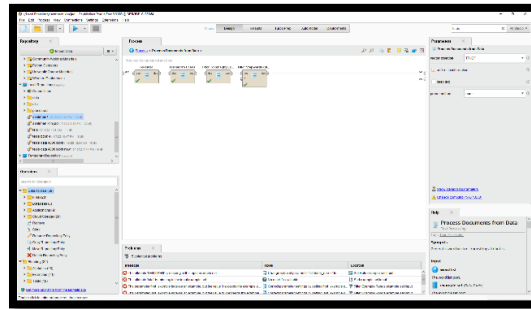
Figure 5. Stages Porcessing

1. Tokenize

Here tokenize is divided into 2 parts on 2 Process document from data. The first Tokenize is in charge of removing symbols on the data, and the 2nd Tokenize is in charge of removing numbers on the data, and also its function is to break sentences word by word.
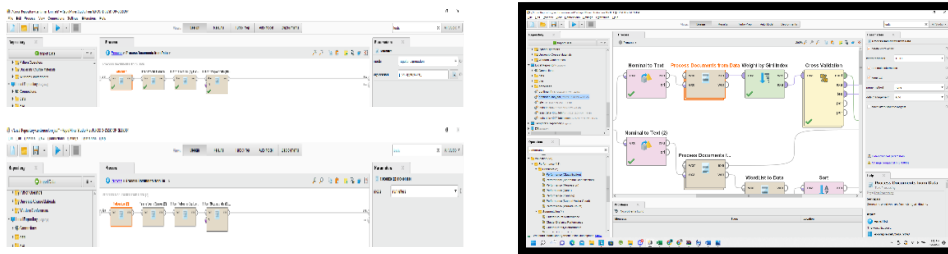

Figure 6. Tokenize

2. Transform cases

The operator is used to convert all data that can be small (lower case) and various

3. Filter Tokens (by length)

To limit the minimum and maximum characters in one word, here the author uses a minimum of characters = 4 and a maximum of characters = 25, meaning that if there is a minimum and maximum in one word more or less than what is listed, we do not enter it in the data.

Figure 7. Filter Tokens

4. Filter stopwords (dictionary)

To remove words that have no meaning when they stand alone, for example, a separate conjunction.
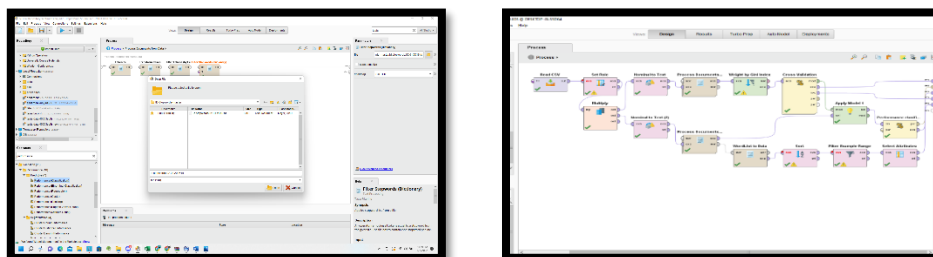

Figure 8 Filter stopwords

5. Document Process with K-Nearest Neighbor method

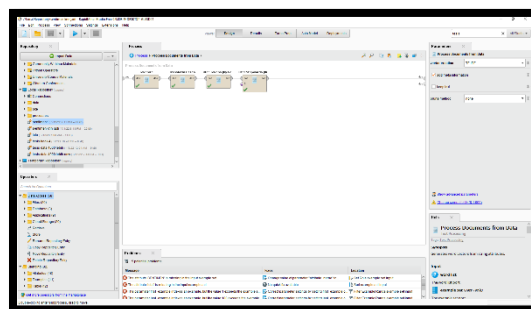In this process it is tested with training data from excel. As seen in the image below

Figure 9. Data Document Process

In the data document process, there is also the TF IDF process, the TF IDF process is carried out to calculate the occurrence of each word in the training data created. and get the results of the data set (process document from data) as follows:
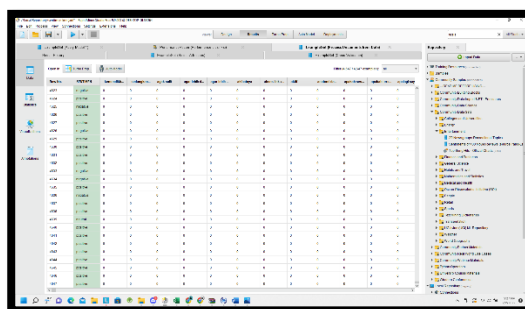

Figure 10. Data set result

Based on sample testing, the classification results are shown in the figure below. The results of classification calculations using the K-Nearest Neighbor (KNN) Method method obtained an accusation of 37.12% where positive predictions on true positive amounted to 916 comments, with precision class results on 100% positive pred as seen in the figure below.
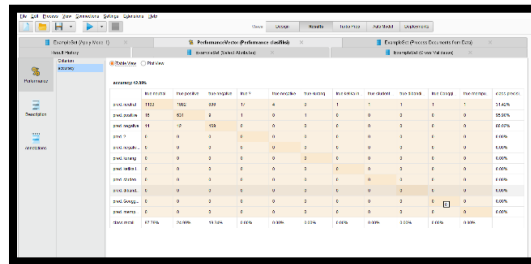

Figure 11. Accuracy with the K-NN Method **on RapidMiner**

In this test, the k value resulted in the data test in Figure 6 above, which resulted in an accuracy value of 37.12%.

Accuracy Calculation with Naive Bayes Classifier on RapidMiner

The accuracy produced by the Naive Bayes Classifier method in RapidMiner is shown in the image below:
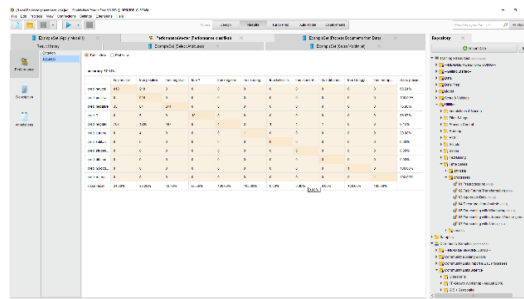

Figure 12. Accuracy can be used by the Naïve Bayes method

The results of the accuracy of classification calculations using the Naive Bayes Classifier Method method were obtained by 42.89%. Where there were 631 positive pred comments on true positive, with precision class results on positive pred 95.90%

Comparison of K-NN and Naive Bayes Method Test Results

Comparison of accuracy tested on RapidMiner tools using the Naive Bayes Classifier and K-Nearest Neighbor (KNN) methods. The results of the accuracy test using the K-Nearest Neighbor method were the accuracy rate was obtained at 37.12% while the

accuracy rate with the Naive Bayes Classifier method was 42.8 9%. therefore the level of accuracy obtained using the Naïve Bayes method is better. Table 2 will show a comparison of the two methods tested in the RapidMiner tools.

Table 6. Comparison of Naive Bayes and K-NN test results

Method	Predicate Level	True Positive	True Negative	Class Precision
Naive Bayes Classifier	Pred. Positive	631	9	95,90%
	Before. Negatives	12	169	88,02%
K-Nearest Neighbor	Pred. Positive	916	0	100%
	Before Negatif	84	374	75,86%

4. CONCLUSION

This research was conducted to determine negative sentiment, positive or neutral sentiment in students related to policies made by the government. In this study, the authors used an online questionnaire as data. because remembering we as a community must be social distancing and follow the applicable Health Protocols. By using the K-Nearest Neighbors and Naïve Bayes Classifier methods. Of the two methods, the accuracy value of the classification obtained using the KNN method was 37.12% of which there were 916 positive comments, and the Naïve Bayes method produced a greater accuracy value of about 42.89% with a number of positive comments 631. This shows that there is satisfaction with the performance of Pattimura University Ambon in responding to the regulations made by government in terms of minimizingisir and inhibiting the pace of the spread of Covid 19 in Ambon City

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