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Analysis the Effect of Social Media on University Education Through COVID-19 Pandemic Using the Naive Bayes Algorithm

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ABSTRACT

The spread of the COVID-19 around the world has led to changes in social practices and how institutions operate. The education sector was not immune to these changes, as the epidemic imposed unprecedented measures that led to the suspension of work in many government institutions, and the application of social distancing. It should be noted that the educational process is based on interaction between individuals, which contradicts the principles of social distancing, and threatens the educational process and exposes it to collapse. As a result, educational institutions have sought to find alternatives to traditional education, which is embodied in the adoption of the e-learning style through various electronic platforms that support the educational process. In this paper, we will discuss the extent of the impact of social media on university education by taking a sample of Al-Qasim Green University teachers using the Naive Bayes algorithm. Through this study, it was concluded that the social media greatly influences university education, with an accuracy of about 95%.

Keywords: Social Media, University education, COVID-19, Naive Bayes, Classification.

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INTRODUCTION

The information and technological revolution has changed many areas of human learning. one of the most important features of the present time. The revolution affected every aspect of lifestyle, as it contributed to a state of communication and rapprochement and the elimination of class and ethnic differences, borders and intermarriage between cultures, additionally to the daily monitoring of events occurring on the international stage. Communication between people through social networking sites, which is one of the products of because of its technical capabilities and numerous technical media, these technological advancements have permeated our daily lives and become one of the essential tools that have turned the world into a tiny cosmic village that is astonishingly connected and quick. Although the main purpose of creating these sites is social communication between individuals, this use has grown to

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encompass all facets of daily life, activities on all scales, including cultural, social, and economic activities. The public can now communicate freely and directly on social media sites, which became a participant in most fields of knowledge, the education sector is one of these areas that has experienced a great deal of change and is affected by these developments, especially in the time of the Corona pandemic, which is one of the pandemics that sweeps humanity from time to time. In order to combat these pandemics, countries resort to a series of measures to limit the speed of their spread, which necessarily leads to the paralysis of most aspects of life, including the suspension of studies in schools and universities. Given the importance and sensitivity of the education sector, educators and academics had to search diligently for an alternative to traditional education, which necessarily requires the presence of the teacher and student in one place, at a specific time, under specific conditions and an environment that suits the educational process. Here, e-learning - which many consider a historical development and a form of distance education - emerges as an alternative to traditional education, especially as it is compatible with the desires of many students of the current generation who are passionate about everything that is electronic. This study comes to show the extent of the impact of social media on university education, using one of the machine learning algorithms, the Naive Bayes algorithm, which is considered one of the most important classification algorithms. It is the probability that the old case and the new case will be identical can be calculated statistically. Naive Bayes needed training data in order to simplify computer complexity to simple multiplications at the beginning of the calculation.

LITERATURE REVIEW

This section reviews some of the previously proposed methods related to classification by Naive Bayes such as Siti Aisyah et al 2021 they study within a private institution in Medan's north-sumatra region, interviews and questionnaires were used to collect data for an analysis of the impact of professor satisfaction using Naive Bayes. Preparation, sympathy, dependability, and accountability are the evaluation criteria. According to the tests, the accuracy level is 85.48 percent, with 81.08 percent precision, and a recall value of 93.75 percent. Shadab Adam Pattekari and Asma Parveen 2012 they proposed an Intelligent System utilizing data mining modeling (Naive Bayes). The user responds to predetermined questions in this web-based application. It extracts hidden information from a database that has been saved and compares user values to a trained data set. It can respond to intricate questions about the diagnosis of heart disease and help medical professionals make wise clinical judgments that conventional decision support systems cannot. It also aids in lowering treatment costs by offering efficient treatments. Imrus Salehin et al 2020 they study They suggested a RHMCD model, which aided them in achieving their desired outcome, in Impact on Human Mental Behavior after Passing Through a Long-Term Home Quarantine. Algorithms for machine learning are present in the model. They looked at their work using logistic regression, support vector machines, and naive Bayes classifiers. They employed the sentiment analysis technique to obtain the report of mental health issues. They also employed a decision tree method to gauge the severity of the depression. Abu Elnasr E. Sobaih et.al 2022 they study They studied the impact of Social media on Indian students amid COVID an online questionnaire The study

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revealed that students' evaluations of social media's usability and usability led them to be more satisfied with their use of it. Tomi Herdiawan1 et al.2022 they Employment Sentiment Analysis in Indonesian Telematics Using Multinomial Nave Bayes Data from online news websites and social media sites like twitter.com were downloaded for the project, concluded this approach is sufficiently practical to be employed in community sentiment analysis based on labor variables and employment so that it may be used as an assessment material by growing labor competence and increasing employment. Huma et al 2021 study determine whether there may have been a connection between social media forums and mental health during the COVID-19 pandemic outbreak used PRAW for the extraction and for classifiers Naive Bayes, Support Vector Machine, and Random Forest. Author noticed an improvement in the classification of mental illnesses of 1% to 5%.

METHODOLOGY

Data

Data Collection

Data collection is the process of getting information from numerous fields. Generated Google Form and shared it on social media to collect data. Because of the lockdown, social media has become the only avenue for people to communicate with one another. Because of the epidemic scenario, Facebook, Instagram, WhatsApp, and YouTube have become everyone's best friend. As a result, we designed our Google form with a series of 7 questions to collect data. We also collect data physically. (200) lecturers from Al-Qasim Green University were included in the sample. A common problem due to COVID-19 (Corona virus). The lecturer responded to us really well.

Data Processing

We need to get data from various people if we want to design any system that works well and produces good results. Then, we may have completely new values and the highest degree of precision. For adequate testing and findings, we used our Standard dataset from various means. For our testing, we only use the top few attributes (total question 7). There, the professor gave us a lot of information. Additionally, we used various levels to gather data. Using many levels to identify each one is really beneficial. Age and gender are calculated separately in our data collection process. Figure 1 depicts the data from our entire sample, which is composed of 65% male and 35% female data.

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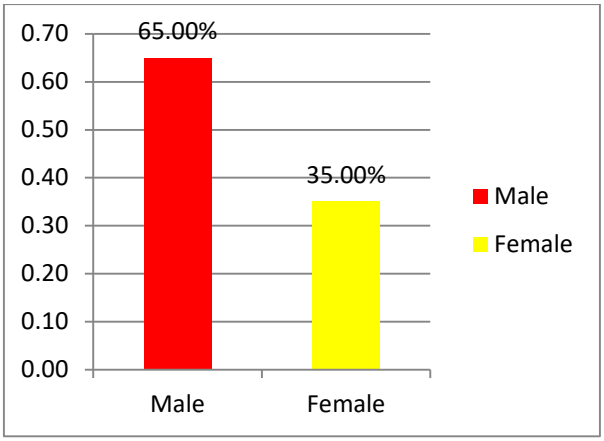

Figure 1: Showing percentage of gender

We varied the ages provided in our questionnaire, and we computed the ratio of men and women based on those ages. Data was gathered from individuals aged under 56 and older. Starting with those above age 27, our survey was completed. We can determine which age groups are most impacted by social media using their age. As indicated in table 1, you may also determine which gender it is.

Table 1. Displaying gender at various ages

Age	Gender	Usage of Social Media	
		High	Low
27-35	male	95%	5%
	female	90%	10%
36-45	male	91%	9%
	female	86%	14%
46-55	male	87%	13%
	female	86%	14%
Above 55	male	85%	15%
	female	85%	15%

In our study we depend on the criteria shown in table 2

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Table 2: criteria of the study

NO.	Criteria
1.	Do you believe teachers should use social media platforms such as YouTube, WhatsApp, Facebook, and Instagram for educational purposes?
2.	Do you believe that social media is the best approach for instructors to communicate with their students?
3.	Do you believe that implementing social media will improve your results?
4.	Lectures should increase and encourage the use of social media in the classroom
5.	Social media provides useful platforms for academic group work
6.	I s social media helps to develop communication skills?
7.	Do you think personal data is safe on social media ?

Model Development

Definition of Social Media

Social networking sites are a type of technology that makes it easier for people to communicate with one another in virtual communities. They primarily rely on Internet access through devices like computers, tablets, and phones and give users quick access to documents, videos, and photos as well as personal information. Social media platforms include Facebook, Twitter, YouTube, Telegram, and WhatsApp.

Classification

One of the activities so-called intelligent systems perform most commonly is supervised classification. As a result, many methods based on statistics and artificial intelligence (such as logic- and perceptron-based methods) has been created (Bayesian Networks, Instance-based techniques). Building a clear model of class label distribution based on predictor features is the aim of supervised learning. When the values of the predictor characteristics are known but the values of the class label are unknown, the resulting classifier is utilized to give class labels to the testing examples. Predictive data mining is the most significant of the many applications for machine learning (ML). The same collection of features is used to represent each instance in each dataset that machine learning methods are applied to. The features could be binary, categorical, or continuous. Learning is referred regarded as supervised learning if instances are provided with known labels (the associated accurate outputs), as opposed to unsupervised learning, where instances are unlabeled. Statistical approaches differ from

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classification-only approaches in that They have a clear probability model supporting them that indicates the likelihood that a specific occurrence belongs in each class. Instance-based methods and Bayesian networks are examples of this type of classification algorithms.

Naive Bayes

Naive Bayes is a fundamental learning method that applies the Bayes rule. And the fundamental assumption that the attributes are conditionally independent given the class. While Naive Bayes frequently produces competitive classification accuracy, this independence assumption is frequently broken in practice. Because of this, naive Bayes is frequently used in practice. It also has a lot of other desirable properties, such as being computationally efficient. In this paper Naive Bayes Classifier uses the probabilistic method to determine the probability condition and the condition's likelihood using the work technique. The impact of Social Media on University Education on The value of accuracy is spread among the characteristics of the major impact data collection university. The Naive Bayes algorithm has an impact on education. The Naive Bayes Algorithm operates on the Bayes theorem. Probability and Sentimental Analysis are the most typically used for Naive Bayes. Algorithms were utilized to determine the reasons of Social Media on University Education.

$$p((c|x) = p(x|c)p(c)/p(x)p(c|x) \qquad (1)$$

Where **c** the target class and , x the attributes, $\boldsymbol{p(c|x)}$is known as class's Posterior Probability. P(c) is the class Priority probability. P(x) the Predictor's Predicted Probability. $\boldsymbol{p((x|c)}$ the probability of the given Predictor class.

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Method

At this stage, as shown in Figure 2, there are several steps.

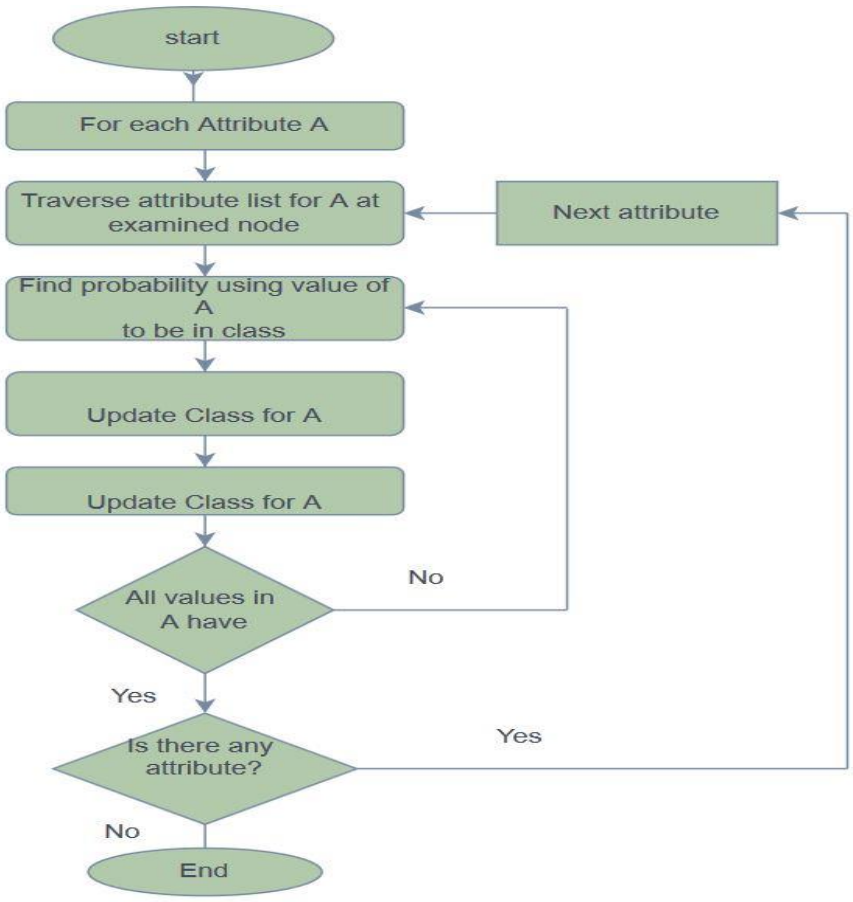

Figure 2: Diagram of the Naive Bayes algorithm

The following can be explained in view of the flowchart in Figure 2:

a) Collecting and inputting questionnaire data from the concerned lecturer at Al-Qasim Green University in Babylon.

b) Testing of pre - classified training data.

b) Evaluate the algorithm's performance. During the testing procedure, the algorithm's performance is evaluated using a data test set, which differs from the training data set in terms of data.

d) In addition, past data is implemented utilizing the Naive Bayes classification algorithm to generate accurate accuracy.

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e) The method then produces results in the form of a percentage Social media's impact on university education.

DATA ANALYSIS AND RESULTS

In this paper we are Determine effects of Social media (Yes, No) on University Education using the measured characteristics. The characteristics include Gender, Age and usage of Social media. Below is a sample training set.

Table2. Sample of Training data

Gender	Age	Usage of Social media	Impact
Male	27-35	High	yes
Female	27-35	High	yes
Male	36-45	High	yes
Female	36-45	High	yes
Female	46-55	Low	No
Male	27-35	High	Yes
Male	36-45	High	Yes
Female	Above 56	Low	No
Male	36-45	High	Yes
Female	27-35	High	Yes
Male	36-45	High	Yes
Male	46-55	Low	No
Female	36-45	High	yes
male	Above 56	Low	No

We want to determine the greatest impact of social media on university education. For the classification as Yes, the table 3 show the probability of the following example where the probability of Yes= 0.714. P (Male/ 27-35/High/) Yes.

Table3: The Probability of Yes.

Attribute	Probability
Male/yes	0.5
27-35/yes	0.3
High/yes	0.9

For the classification as No, the table 4 show the probability for the same example where the probability of Yes= 0.285. P (Male /27-35/High)/ No.

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Table4: The Probability of No.

Attribute	Probability
Male/No	0.75
27-35/No	0.25
High/NO	0.0

We noted probability of (Yes) greater than probability of (No), we predict the sample is yes. According to the Accuracy Performance Value, in the below equation.

Accuracy = No. correct answer / total answer*100% (2)

= 190/200*100%
=95%

CONCLUSION

The classification task is one of the most significant issues in machine learning. An accuracy level of 95% is attained, as shown by the outcomes of tests using the data set offered and the Naive Bayes method. The Naive Bayes classify can be used for anticipate the effect of social media based on test results. It is feasible to mix or examine this study's findings against other categorization algorithms due to its high accuracy.

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