

AN ARTIFICIAL INTELLIGENCE APPROACH TO STUDY THE IMPACT OF WEB BASED LEARNING IN MUMBAI REGION AMONGST UNDERGRADUATE STUDENTS

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ABSTRACT

Predicting the impact of web based learning amongst undergraduate students helps in reducing and preventing the dropout rates. In this research paper, we have used five different algorithms, mainly Stochastic Gradient Descent (SGD), Support Vector Machines (SVM), K-Nearest Neighbor (KNN), Random Forest Algorithm, Decision tree algorithm. We have done a primary data analysis with 649 data sets from different parts of Mumbai region. SVM classifier is the best algorithm for predicting the impact of web based learning in Mumbai region, with the accuracy of 79.23 followed by SGD Classifier with accuracy of 78.6

Key words: ICT, SVM, KNN

INTRODUCTION

Since the advent of online education and information and communications technology (ICT), web-based learning has grown significantly, giving students the chance to master a variety of new skills. Since the pandemic outbreak began, online learning has shifted from being teacher-centric to being student-centric. The epidemic has prompted organizations and schools to work remotely, which has expanded the use of online learning.

Due to the internet's reach, which is not just in metropolitan areas but also in rural areas, India will experience a boom in the digital revolution. This has a significant impact on the educational industry and e-learning in India. Research forecast that the online education demand may rise up to \$350 Billion by 2025.

We have used 649 datasets in this analysis. The data set is collected from different parts of Mumbai region. The most important step in working with any machine learning method was preprocessing the data. To prevent missing data, outliers, etc., the majority of data sets utilized in machine learning algorithms are preprocessed. The machine learning algorithms can then train them. Each data set is unique and has a unique set of challenges.

In order to determine the effect of web-based learning on undergraduate students in the Mumbai region, this study employed classification model. In this study, we employed the support vector machine, the decision tree, the random forest algorithm, the logistic regression, and the K-Nearest Neighbors algorithm.

METHODOLOGY USED

The correlation analysis can be used to determine the relationship between two variables. This will make it easier for us to comprehend how dependent the two variables are on one another. For this research work's analysis, researchers additionally took into account and correlated number of other factors that are influencing web-based learning. These variables have been subjected to categorization methodologies, and numerous classes have been made as a result.

Table 1.1 Tabular data of descriptive statistics of data sets

LOH- Location of House

AWL-Awareness of web based learning

NOH-Number of hours you spent on web based learning ever day

Score-your score in percentage for the last exam

LWL-Like attending web based learning

WLC-Web based learning gives confidence

	Age	Gender	LOH	AWL	NOH	Score	LWL	WLC
count	649	649	649	649	649	649	649	649
mean	2.238	1.485	1.986	2.0508	1.8719	54.289	1.243	3.1679
std	0.509	0.500	0.449	0.48324	1.07840	15.11129	0.4294	0.9515
min	1.000	1.000	1.000	1.000	1.000	22.00	1.000	1.0000
25%	2.00	1.000	2.000	2.000	1.000	43.000	1.000	3.0000
50%	2.00	1.000	2.000	2.000	1.000	49.000	1.000	3.0000
75%	3.00	2.00	2.000	2.000	2.00	59.000	1.000	4.0000
Max	3.00	2.00	3.00	3.00	4.500	93.000	2.000	5.0000

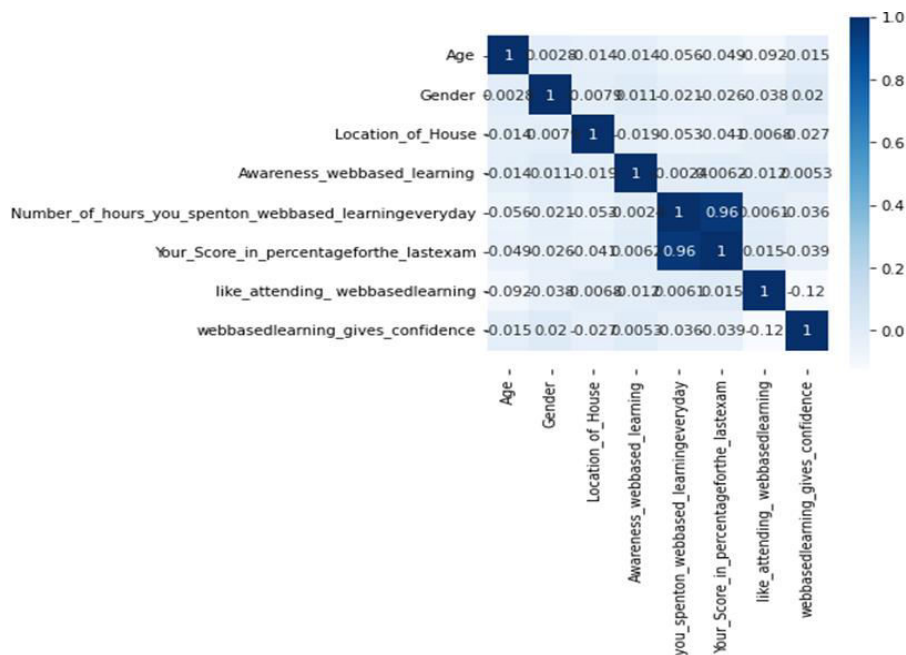


Figure 1.1 Heat Map (Correlation amongst indicators)

EVALUATING THE PERFORMANCE OF VARIOUS CLASSIFICATION MODELS.

To do the prediction, we have used the following classification algorithms to find the accuracy.

1. Stochastic Gradient Descent (SGD)

For prediction, we used the stochastic gradient descent approach. Stochastic refers to a procedure associated with random probability. Instead of using the whole data set for each iteration, samples are chosen at random in stochastic gradient descent.

2. Support Vector Machines (SVM)

A collection of supervised learning techniques called Support Vector Machine (SVM) is used for regression, classification, and outlier detection. SVM is mostly utilized for classification issues.

3. K-Nearest Neighbor (KNN)

The K-Nearest Neighbor algorithm, which is based on supervised learning methods, is the simplest and most often used algorithm in machine learning. Although the K-NN technique can be used for both classification and regression in machine learning, it is most frequently utilized for classification algorithms.

4. Random Forest Algorithm

A supervised machine learning algorithm is the random forest algorithm. This approach is frequently applied to classification and regression issues. The random forest algorithm's ability to handle data with continuous variables when dealing with regression problems and categorical variables when dealing with classification problems is one of its most notable properties.

5. Decision Tree Algorithm

A supervised learning method is the decision tree. This approach is applicable to both classification and regression issues. But it is primarily employed in classification issues. A decision tree is a classifier with a tree-structure. Internal nodes in this tree structure classifier reflect the data features, branching the decision rules, and each leaf node the result.

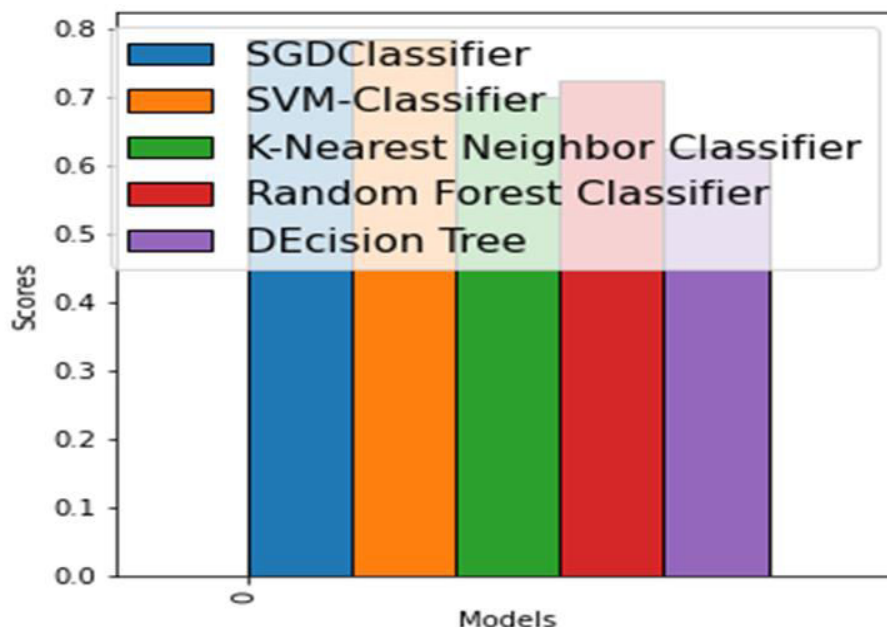


Figure 1.2 Comparisons of accuracy of different classifiers

Table 1.2 Tabular representation of comparison of various classifiers for the evaluation of Model

Sr.Number	Algorithm	Accuracy
1	SGD Classifier	78.6
2	SVM Classifier	79.23
3	KNN Classifier	70.00
4	Random forest Classifier	72.31

5	Decision Tree Classifier	62.31
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CONCLUSION

From the above analysis, we have come to a conclusion that SVM classifier is the best algorithm for predicting the impact of web based learning in Mumbai region, with the accuracy of 79.23 followed by SGD Classifier with accuracy of 78.6 and KNN Classifier with the accuracy of 70.00.

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