

A Novel Approach to Enhance Teaching and Learning Through Mining and Learning Analytics

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ABSTRACT: Material and message skills brought-in utensils and methods in the field of learning that familiarized new notions of instruction and education. Learning supervision Scheme is one of the key tackles used in educational institutes to simplify e-learning. There is extraordinary digital divide between town and pastoral zones. Use of e-learning programs has been intensifying, with high demand for education, particularly in developing countries. The research addresses the problem of e-learning service quality in higher education environment. So it is more important to evaluate the superiority of e-learning contributions, as it is serious to the package accomplishment and endurance. In universal the detached is to have a cost operative education atmosphere fortified with the modern skills to afford apprentices an occasion to get understanding hooked on new material and message skills and e-learning atmosphere.

Keywords: e-learning, service superiority, fulfilment, learning gratified

1. INTRODUCTION

Due to drastic improvement in information and communications technology (ICT) the E-learning has obtained a remarkable position. E-Learning differs extensively from traditional classroom education by its synchronous and asynchronous behavior.

This education examines the effect of scholar arrogances on the getting of E-Learning. The data withdrawal knowledge is smeared to foresee the behavior of E-Learning Excellence of students calculation based on the individual norms and discernments. It also recognizes key variables that can be unhurried and investigated to sustenance an experimental calculation of the consequence of the variables on the purpose to assume E-Learning.

The Research work is organized as follows. The segment one defines about overview. Section 2 contracts about contextual study and its linked mechanism. The organization of the investigation work is clarified in section three. In section four representations the Research results. Lastly the paper is determined in last piece.

2. BACKGROUND AND RELATED WORKS

2.1 Literature Review

In this paper, diversified approach using various data mining techniques are collected to analyse and predict the e-learning quality of student's at various levels. The study related to data mining for extracting and predicting the e-learning rate prediction in various models and the comprehensive literature review of various researchers' works are stated below:

Mazen Qteishat, Jafar Alqatawna and Mohammad Al-Maaitah examined the influences causative to insolences near E-Learning in higher schooling between scholars in Jordan. The investigation industrialized a ERM-EL (Expertise Reception Model for E-learning) for forecasting the purpose to adopt E-Learning by the concepts of the Knowledge Reception Prototypical [9].

A.S. Arunachalam, and T.Velmurugan absorbed on gathering dissimilar models and inquiries from dissimilar colleges who uses E Learning tackles and pre course the composed greatest for the best explanations to appreciate the behavioral decorations of the scholars. Their training gave a clear knowledge of numerous landscapes removed for studying the behavioral decoration of a scholar with E Learning implement. They also painted new expansions counting investigation of data from enormous open operational sequences (MOOCs).

3. METHODOLOGY

E Learning analytics delivers cultured exploratory capability to progress the knowledge and schooling. It magnets after other grounds of study counting occupational acumen, web analytics, theoretical analytics, enlightening data withdrawal, and exploit analytics [11].

The education and learning purposes are:

- 1) To identify students at poor learning and to improve their educational standards
- 2) To provide suggestions in relative to interpretation substantial and education actions.
- 3) To notice the necessity for, and degree the consequences of, educational enhancements.
- 4) To acclimatize progression contributions [12].

- 5) To recognize educators with good presentation and who wants new instruction means.
- 6) To contribution in the scholar employment procedure.

The submissions of numerous data mining techniques which is adopted as a methodology to analyse and predict the E-Learning ability of the students. The most predictive data models applied are artificial neural networks, Naïve Bayes, K-Nearest Neighbour (KNN), Support Vector Machine, logistic regression, classification trees, classification and regression trees and discriminant analysis. The following section describes the popular models which are used to analyse the learning behaviour and characteristics of Students'. The steps involved in for analyzing the learning behaviour of Student's is explained in Figure 1.

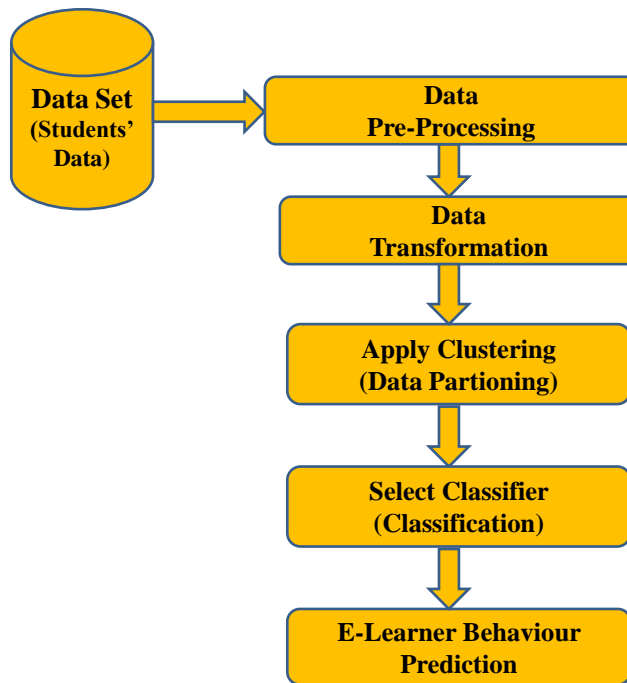


Figure 1: Steps involved in Predicting the Behaviour of E-Learner

4. EXPERIMENT RESULTS

The data set is collected from various College students' who are studying at Sivagangai district. At the outset a sample of 300 data is taken for analysis with different attributes. The description of Attributes is explained in Table 1.

The data set has been pre-processed; The K-Means and DBSCAN algorithms are applied over the data to partitioning the data into ($K = 5$) different clusters. The Random initialization method and the ten as the initial seed value are used to form the clusters. In K-Means, the Euclidean Distance and in DBSCAN, the Manhattan Distance metrics are used to measure distance between of an observation and the initial cluster centroids.

From the cluster data, the E-Learner behaviour is analysed through the classification technique Random Tree. In the classification the E-Learning Quality is taken as the class variable. In the classification, the class ($K=3$) is randomly chosen attribute at each node to construct a tree. The outcomes of the results are used to identify or categorize the different types of E-Learners. The interpretations are given in Tables 2 – 4 and Figures 2– 6.

Attribute-Names	Type	Possible-Values
Collaboration	Number	1 - Brainstorm 2 - groups-of-students 3 - Real-Time-Students 4 - Online-Chatting
Connectivity	Number	1 -web-browser 2 - Chromebooks 3 - iOS 4 - Android devices
Personalisation	Number	1 - laptop 2 - desktop 3 - Tablet 4 - Smartphone 5 - Read 6 - Listen 7 – Watch
Interactivity	Number	1 - Passive 2 - Limited 3 - Moderate 4 – Full
Extended-Opportunities	Number	1 - Apprenticeships 2 - Community service 3 - Independent study 4 - Online courses 5 – Internships
Flexibility	Number	1 - Andragogy 2 - Technological 3 - Interface Design 4 - Evaluation 5 - Resource 6 – Institutional
Motivation	Number	1 - Say Less 2 - Increase The Challenge 3 - Delay Judgment 4 - Appeal To Emotion 5 - Change The Difficulty 6 - Learners Take Control
E-learning-Quality	Nominal	Good, VeryGood, Average, Satisfied,Poor

Table 1 : Attribute Description

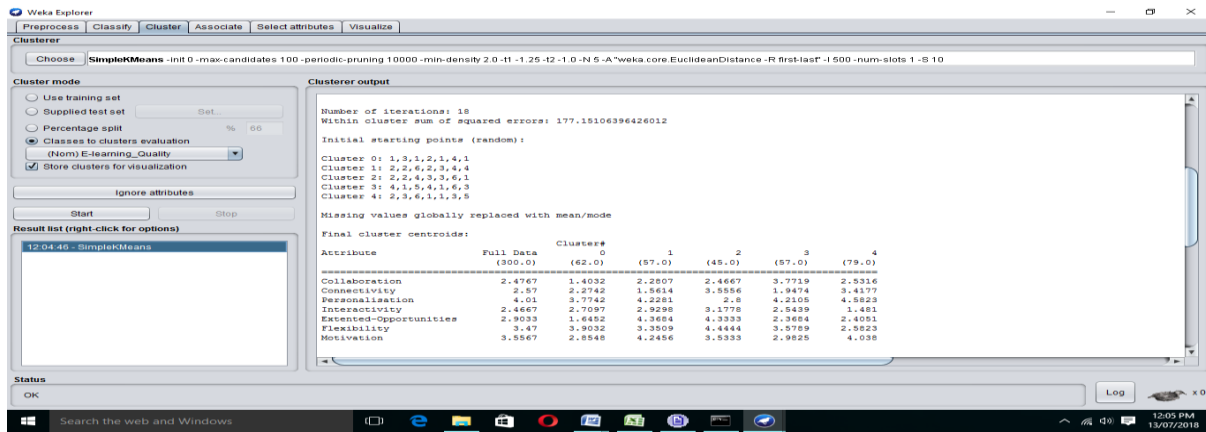


Figure 2 : Clustering by K-Means

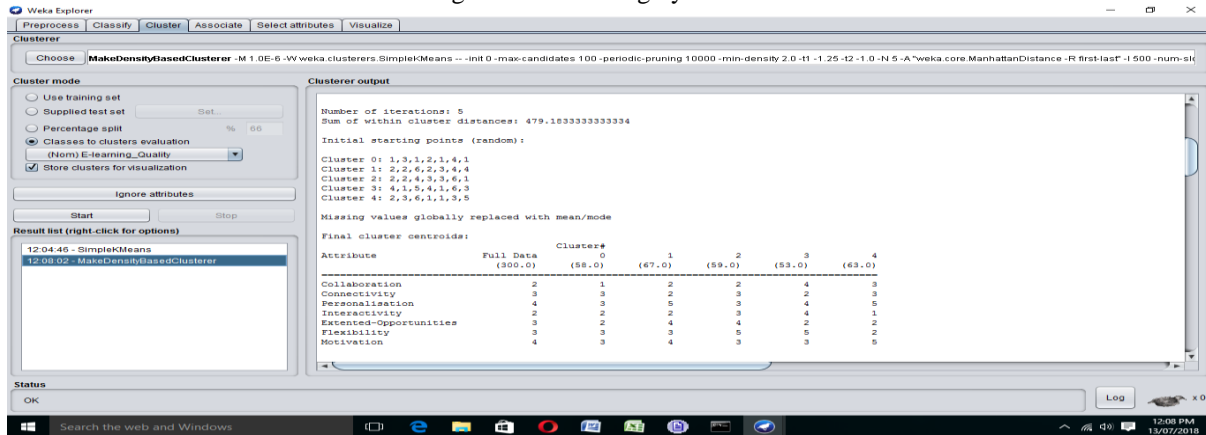


Figure 3 : Clustering by DBSCAN

Cluster-Name	Collaboration	Connectivity	Personalisation	Interactivity	Extended-Opportunities	Flexibility	Motivation	E-Learning-Quality
Cluster-0	1.4032	2.2742	3.7742	2.7097	1.6452	3.9032	2.8548	Satisfied
Cluster-1	2.2807	1.5614	4.2281	2.9298	4.3684	3.3509	4.2456	Poor
Cluster-2	2.4667	3.5556	2.8	3.1778	4.3333	4.4444	3.5333	Average
Cluster-3	3.7719	1.9474	4.2105	2.5439	2.3684	3.5789	2.9825	Good
Cluster-4	2.5316	3.4177	4.5823	1.481	2.4051	2.5823	4.038	VeryGood

Table 2 : Clustering by K-Means

Cluster-Name	Collaboration	Connectivity	Personalisation	Interactivity	Extended-Opportunities	Flexibility	Motivation	E-Learning-Quality
Cluster-0	1	3	3	2	2	3	3	Good
Cluster-1	2	2	5	2	4	3	4	Satisfied
Cluster-2	2	3	3	3	4	5	3	Poor
Cluster-3	4	2	4	4	2	5	3	Average
Cluster-4	3	3	5	1	2	2	5	VeryGood

Table 3 : Clustering by DBSCAN

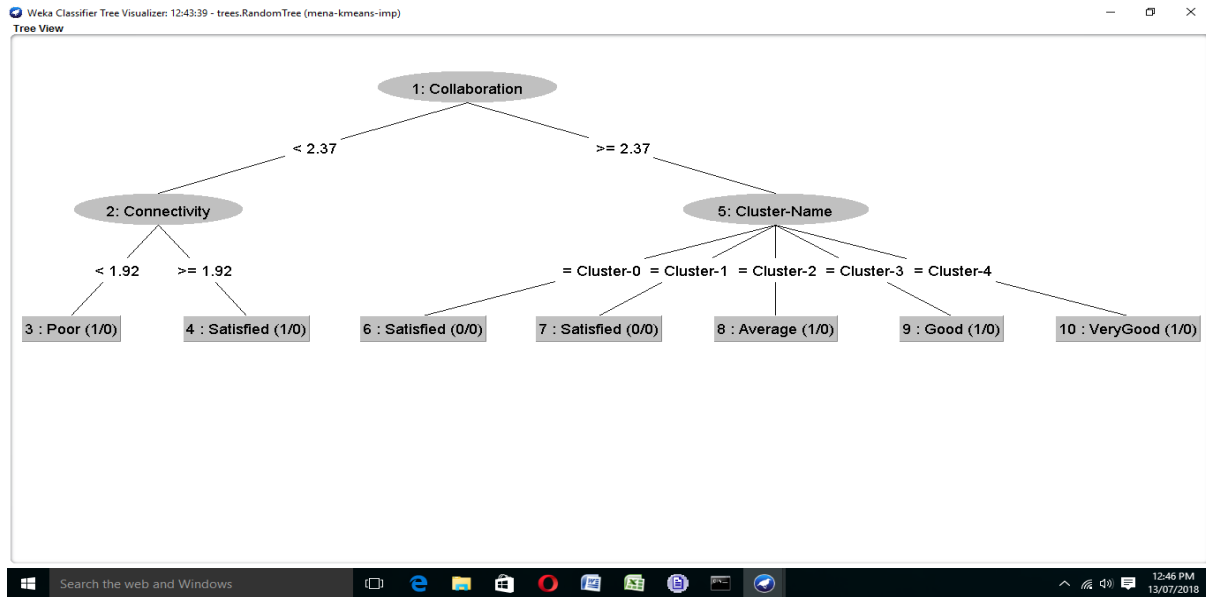


Figure 4 : Predicting E-Learning Behaviour from Random Tree for K-Means clustering data

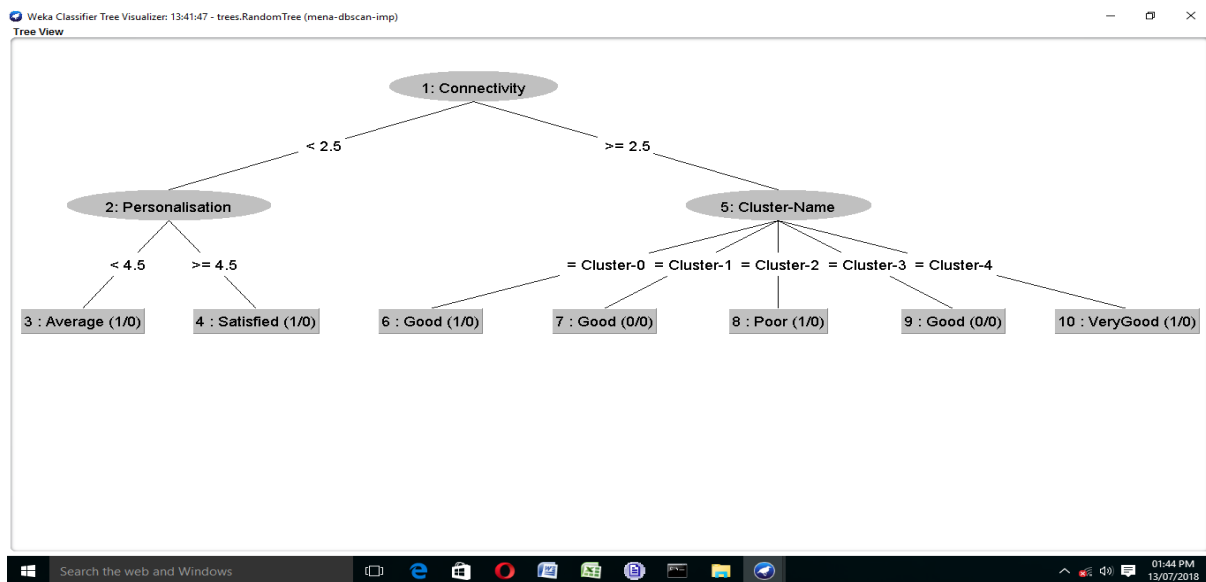


Figure 5 : Predicting E-Learning Behaviour from Random Tree for DBSCAN clustering data

Classification for- Cluster data	MAE	RMSE
Random-Tree (K-Means)	0	0
Random-Tree (DBSCAN)	0	0

Table 4 : Error-Accuracy by Classification for Cluster data

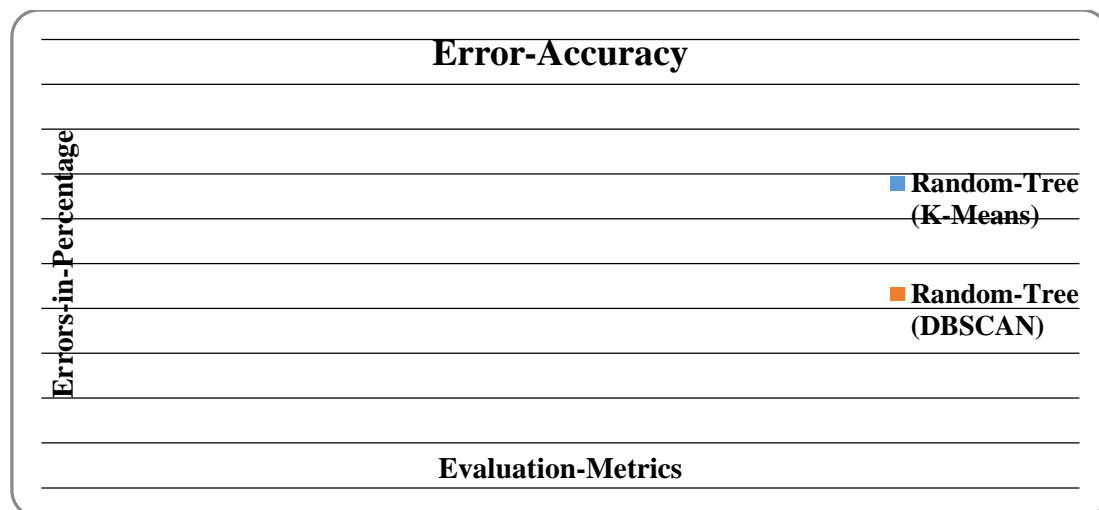


Figure 6: Error-Accuracy by Classification for Cluster data

5. CONCLUSION

E-learning is a new dimension of education system. The traditional approach in education is monotonous as well as predefined. In this paper the attributes of e-learning are analyzed Through the K-means and DBSCAN algorithms for grouping of similar data. The Random Tree classification algorithm is applied over the clustered data for predicting E-Learning quality of the students. The “E-Learning Quality” attribute is considered as the class label for the classification. The outcome of the classification algorithm generated the tree for the clustered data. From the tree generated for K-means data the e-learning qualities are classified as satisfied, poor, Average, good and Very good. Similarly for DBSCAN the e-learning qualities are predicted as Good, Satisfied, poor, Average and VeryGood. The error accuracy is analyzed by Random Tree for different measure metrics MAE and RMSE which produced no errors. It substantiate that the essential care and importance should be given to the e-learning students in accordance with their categories.

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