ABSTRACT

Educational Data Mining (EDM) is an emerging discipline, related to the application of data mining (DM), machine learning (ML), and statistics to the details produced from the educational environment. It is used for exploring the unique and increasingly large-scale data that come from educational settings and using those methods to understand the students effectively. Higher educational sectors are also started to use the significance of EDM models on the learning task and output for moving towards the university to the next level. Particularly, EDM assists educational institutions and educational plan makers in offering solutions to improve the effectiveness and quality of teaching and learning. The assessment of student's performance in educational institutions indicates the level of efforts taken by educational institutions should be done for enhancing the poor or average learner. The significance of applying EDM models, make use of the previous data of the students for predicting the unseen or upcoming performance of the students. This idea has attracted several researchers to develop classification models to predict the unknown labels of future instances.

Several research people and educational institutions started to get attracted to the domain of predicting the performance of the student to classify the educational level of student performance. Though the educational sector uses several techniques for extracting useful information on the features of students undertake the learning process, it is needed to develop a student performance assessment model to assist the students as well as faculties to improve their performance to the next stage. This research work majorly concentrates to examine and identify useful rules and patterns to motivate the students for handling their education as well as carrier in a good manner, also to improve the and functions of academics to supervise the policies for

student's benefit. Here, EDM is employed to identify the effective data which helps in applying the active learning in technical applications. The entire research work is divided into a set of different objectives as listed below.

- To carry out a review of different DM, machine learning (ML), and meta heuristic models to assess the performance of the students

- To present a hybridization of linear vector quantization (HLVQ) model for predicting the educational results and employability chances of the students

- To develop an Ant Colony Optimization (ACO) with feature subset selection and logistic regression (LR) model for classifying educational DM

- To propose an ensemble of density based clustering (DBC) with optimal multilayer perceptron (OMLP) based classification model, abbreviated as DBC-OMLP for effective EDM.

In order to validate the experimental results analysis of the proposed models, a series of simulations take place on the benchmark Student Performance assessment dataset. The results are validated interms of different measures namely precision, recall, accuracy, F-score, and kappa. The attained comparative results analysis stated the superior performance of the proposed models over the compared methods under different aspects. Therefore, the proposed models can be employed as an appropriate tool for mining educational data to achieve effective performance assessment of the students.