

Artificial Intelligence Aided Innovation Education Based On Multiple Intelligence

Vaishnavi Dali.A¹, Ganeshen.P², Vijaya KumarV.³

¹PG Student, Department of CSE, AVS Engineering College, Ammapet, Salem, Tamilnadu, India

²Assistant Professor, Department of CSE, AVS Engineering College, Ammapet, Salem, Tamilnadu, India

³Professor & HOD, Department of CSE, AVS Engineering College, Ammapet, Salem, Tamilnadu, India

ABSTRACT

The study of educational innovations has attracted increasing attention from academics around the world. Educational innovation proposes the implementation of new approaches or practices that are beneficial and make an impact on individuals or academic communities. The current educational model of many designed for this generation of “digital natives”. For this reason face the challenge of building teaching strategies that generate meaningful educational experiences. This research seeks to address this issue through a systematic mapping that includes empirical process that study innovations in educational practices. A qualitative and quantitative approach was applied using a four-stage research methodology to evidence innovation in higher education. After employing the selected methodology and applying all the exclusion criteria, related to the topic were identified. The proposed system using hybridization of linear vector quantization algorithm of learning, the context of learning, the role of the teacher, the role of the learner, and the performance improved and testing accuracy high. The meta-heuristic models to assess the performance of the students, then hybridization of linear vector quantization model for predicting the educational results and employability chances of the students is designed and developed an Ant Colony Optimization (ACO) with feature subset selection and Random Forest (RF) model for classifying educational DM.

Keyword: RF Model, Ant Colony Optimization, Hybridization of Linear VectorQuantization Algorithm.

INTRODUCTION

Education is a complex social, cultural and ethical process designed in a social or cultural context. It is related with social structures, cultural environments, values and ideas of people, society and the government. All these factors are dynamic. By all these definition of teaching has been changing depending on the time, place, and society. A good teaching programmer may be designed to affect maximum teaching and learning. Teaching has been one of the oldest and most respected professions in the world and the teachers are the kingpins of educational system. It is the most influential profession in society. It is said that teaching has acquired a status of profession because the need for teacher and his education and teaching have been imperative all these days. It is always a dynamic activity. It unfolds the world of knowledge and information and experience and erudition. The personality of the teacher is

a significant variable in the classroom. It is said that teachers affects eternity.

Need for Teacher Education

Training is essential for every teacher. A trained teacher can do more than untrained teachers. Demand of profession, the objective and expectations from a teacher certify the need of teacher training. Many skills are needed to communicate the information effectively such as the skill of questioning, illustrating, demonstrating, explaining and the skill of logically sequencing the subject matter. Teaching is not only confined to impart knowledge of subject matter to others. In a wider perspective, teaching aims at an all-round development of personality. Skills or attitudes can be developed through systematic training.

Author for correspondence:

Vaishnavi Dali.A

PG Student, Department of CSE, AVS Engineering College, Ammapet, Salem, Tamilnadu, India

MACHINE LEARNING

An ML model is defined as a computer-intensive mechanism and applies re-sampling and iterative methodologies for classification approaches. ML approaches are considered with optimal subset selection and eliminate the issues of classical classifiers like over-fitting as well as distributional demands of parameters. ML technologies that have emerged in computer science with logic and basic mathematics, statistics as ML approaches do not estimate the group features rather it is initialized with an arbitrary group separator and tunes frequently till satisfying the classification groups. ML examines the tuning variables and individual ML functions became unstable, which makes a suitable process. As the non-statistical nature is embedded, these approaches can apply the data in various formats like nominal data that generates maximum classification accuracies.

LITERATURE SURVEY REVIEW OF EXISTING EDM TECHNIQUES FOR HE STUDENTS

The EDM and Learning Abilities enable the learning institutions in overcoming these challenges by predicting the number of graduates and placements and thereby taking the right decisions at right time to increase this number. (Ji et al., 2018)[1]. DM helps to transform every model into data such as learning objectives, learning actions, learning priority, participation, competitiveness, functions, as well as accomplishment tend from student's participation for different learning events as the educational decision-makers apply the predefined data. Recently, DM and ML models have been employed in educational data, offering some solutions to the above-mentioned issues (Xing et al., 2019)[2]. ML algorithm has tried to follow the processes by studying and modeling them computationally, and is commonly classified into two approaches : supervised learning (classification) and unsupervised learning (UL) (clustering), which are also known as predictive and descriptive, correspondingly (Rao et al., 2021)[3].

The key objective of this study is two-fold (del Campo et al., 2020) initially, compare the estimation in 2 subjects like Business Administration Degree among Finland and Spain and, secondly, test the factors like gender, age, subject, students' inspiration, or priorities which affect the student assessment. In (Sarra et al., 2019) the main aim is to estimate the application of specific latent class model, Bayesian Profile Regression for identifying the students prone to drop out. By assuming the students' performance, motivation and resilience, it enables to make students profiles with maximum risk of academics. The real-time sample depends upon the data gathered by online queries by UG students of an Italian University.

EDM and Learning Analytics (LA) are employed to define and apply DM models in the next levels of education given by (Van Barneveld et al., 2021)[4]. It

provides a systematic model to gather, compute, report, and operate on digitalized data seamlessly for improving the learning methods. EDM as well as LA applied in the education field reform the available techniques of education by offering novel solutions to the interaction issue. LMS-Learning Management System is a virtualized educational platform that bridges the gap between faculty and students. It provides various means through which the faculty and student can have better communication. It enables the faculty to share materials and students to raise queries as well as to clear doubts.

Concentrated on the application of DM and data analytics for handling the data produced from the educational industry. The EDM and LA methodologies were defined for managing the big data in commercial as well as alternate communities. Also, it provides an extensive definition in EDM and LA which affects the function of shareholders in the PG level education center. Moreover, a brief description of applying these models, and examining the learning process of students, assessing the performance to provide extensive feedback practically. Eventually, these models affect the administrative principles which are qualified for all stakeholders in an educational institution.

Alsawaiet et al. (2021)[5] various data preparation process has been deployed with massive student records for preparing the students marks according to the assessment modules. Here, data is computed under various phases for extracting the categorical factor where student's marks have been refined in the data preparation state. Consequently, the final marks of students are not isolated from the enrolled modules. Followed by, the examination of EDM data pre-processing phases has been performed. Typically, it is finalized that educational information should not be developed similarly as alternate data types because of the variations like data sources, applications, and errors involved in them. Hence, coursework estimation ratio has been employed for considering various module assessment approaches at the time of preparing student transcription data. The impact of coursework assessment ratio (CAR) on detection by applying RF classifier has also been presented.

FEATURE SELECTION

The main aim of FS is to pick up a feature subset from the input data to limit the noise and unwanted parameters and exhibits an effective performance. The major applications in gene microarray analysis have been employed (Guyon et al., 2019)[6]. The remarkable gene expression data is composed of massive parameters were highly associated with alternate variables. The dependant parameters are not effective in providing additional data regarding classes and facilitated as noise for a predictor. It refers that overall data content can be attained from some exclusive features with higher differentiating data regarding the classes. Therefore, by the reduction of dependent parameters, the volume of data is mitigated which intends to enhance the classification function. In a

few sectors, parameters that are not connected are served as pure noise that develops a bias in predictor and limits the classification operation. It exists when the data is insufficient previously. Under the application of FS, few insights are obtained and maximize the processing demand as well as prediction accuracy.

PROFILING AND CLUSTERING STUDENTS

As the name suggests, the responsibility of these applications are profiling students relied on diverse parameters like features and knowledge. Grouping students are performed on the basis of diverse properties of profile data. Therefore, it is varied from clustering technology is varied from one another, since the aim is to cluster the students. Additionally, if the students are grouped, each individual seeks massive dissimilarity among clusters; however, it is not feasible in grouping tasks. At the time of developing a team in a course project, each member prefer to cluster the students. Likewise, the categories of applications, various DM approaches are utilized for these applications like FS and clustering. It presented a technology to segment the learners with the help of dissimilarity value using Random Forest (RF); employed sequence mining approaches to find learning behavior pattern for discriminating diverse student groups. It applied a process of grouping and profiling the learner according to the communications with ITS.

The preprocessing model of EDM is named as Clustering. It is defined as unsupervised technology for determining data in statistics, ML, pattern analysis, DM, and bioinformatics. It is applied for gathering identical objects for cluster development. A cluster is composed of objects which are identical to one another; however, it is no identical to the objects of alternate groups. It is used while examining the dataset obtained from the educational system is named as Educational Data Clustering (EDC). The educational center is categorized into 3 classes as Teacher, Student, and Environment. Communication between the 3 actors produces quantifies data which are grouped symmetrically for mining the valid data. Therefore, data clustering activates academicians for predicting student function, the associate learning style of diverse learner kinds, and the behaviors that enhance the institutional performance. Authors have performed various studies on educational datasets with better efficiency based on academic function in examinations.

SYSTEM ANALYSIS EXISTING SYSTEM

Specifically, there are two mentors for innovation education students. One is a university teacher, and the other is corporate executive or innovation elite, that is, on campus and off-campus mentors. The combination of basic theories inside the school and social practice outside the school can enrich the teachers and optimize the teacher

structure. It also truly realizes the docking of school-enterprise professional mentors and innovation mentors, the theoretical knowledge and innovation skills. It plays a huge positive role in cannot improve students' knowledge and literacy. Existing systems Innovation and education courses mainly include the content of innovation knowledge, innovation ability, and innovation awareness and innovation quality very low and performance complicated. From the perspective of the system, some courses will appear in the teaching plan of the business major. For this part of the course, teachers can be encouraged to incorporate relevant innovation knowledge in daily teaching, such as marketing courses and management courses. Some courses can be offered as electives, and students with innovation desire are encouraged to take such courses.

DISADVANTAGES

- Performance low
- Students' interaction analysis very low.
- Dataset testing difficult.
- Maintenance very complicated of this education systems

PROPOSED SYSTEM

The implementation of the dual mentor system in schools and enterprises can also facilitate. The effective hybridization of linear vector quantization model for foreseeing the educational performance and employability chances of the students is presented. The working model of the hybridization of linear vector quantization model for EDM. It assists the faculties in identifying poor learners in education and placement. In this objective, a predictive model using LVQ with random forest technique is integrated to develop a hybridization of linear vector quantization algorithm for predicting the employability chances and academic results of the students. The hybridization of linear vector quantization is simulated using an educational dataset and the students are investigated with varying threshold weights on a yearly basis. It performs prediction by the use of several factors like regular attendance, internal/ external marks, scoring in placement training programs, and so on.

ADVANTAGES

- Education Data maintenance simple
- More than one data tested of high accuracy
- Students' interaction is easy
- Different types of testing process
- Performance improved

SYSTEM ARCHITECTURE

The model is mainly executed in the pre-processing task. In this proposed method block diagram is represented in figure.

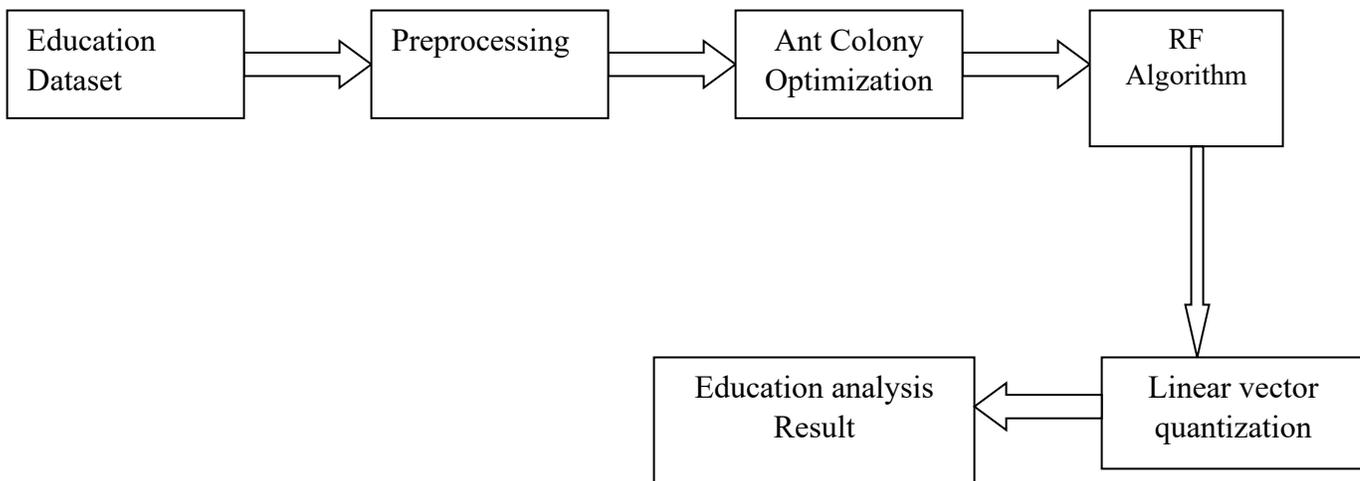


Fig 1: System Architecture Diagram

In this model is presented as an effective model that helps compute the performance of a student's education. It finds useful and essential for them to be placed in presumed educational institutions and reach a good position in the future. Then, it is not only a favorable system for students, it also useful for the professors for teaching and enhancing their skills and talents by contributing to diverse parts of academics where both students and teachers would empower their knowledge. The main aim of this model is to find the students' learning performance in education and detect whether they are skilled. The error is measured for every predictive task and validates whether the values are exact or not. Also, weights are extended if the samples are classified incorrectly in the upcoming rounds. Secondly, Boosted weight is fed as input to the LVQ approach to classify and detect the student's educational activities by means of the pass or fail as well as placement performance in light of got placed or not. Finally, a diverse set of models were employed on sample data for computing the classification accuracy of various approaches.

MODULE DESCRIPTION

PREPROCESSING

In the ACO-LR model, preprocessing takes place in two stages namely format conversion and data transformation. In the beginning, the format conversion process takes place where the data in any other formats such as .xls will be converted into.csv files. Then, the data transformation process will begin where the data present in diverse formats in the dataset are transformed in an appropriately.

ACO BASED FEATURE SELECTION

Here, ACO-FS is executed to pick up the feature subset from the educational data. ACO is a population-based metaheuristic algorithm which has the capability of searching the population in parallel. It offers a faster exploration of the optimal solution and adapts to modifications like new distance. Besides, the ACO algorithm has offered a better convergence rate. So, it is applied for the selection of features in the applied educational data. The intention of FS for ACO is to recognize the minimum feature count and to attain maximum classifier accuracy with the reduced processing expense.

EDM is an active research area and the DM techniques are used for the extraction of useful knowledge on the characteristics of the students in the learning process. In EDM, the FS process is mandatory for the generation of the subset of candidate parameters. As the FS task acts as a major part of the classification results, it becomes essential to determine the effectiveness of the student assessment methodology with the FS techniques. In this work, ACO algorithm is utilized as a feature selector to choose an optimal set of features.

The ant is presently at node i and has an option of which features to include subsequent to its route. It selects a feature j next using the transition rule, followed by k and l . Upon arrival at l , the present subset $\{i, k, l\}$ is computed for fulfilling the traversal termination criteria. The ant gets terminated its traversal and provides the feature. Proper heuristic desirability for traversal is applied between features which are subset evaluation functions. The heuristic desirability of traversal, as well as edge pheromone levels, are combined for producing probabilistic transition rule, which indicates the viability

of ant k at feature i decided to travel towards the feature j at time t :

$$P_{ij}^k(t) = \begin{cases} \frac{[\tau_{ij}(t)]^\alpha \cdot [\eta_{ij}(t)]^\beta}{\sum_{l \in J_i^k} [\tau_{il}(t)]^\alpha \cdot [\eta_{il}(t)]^\beta} & j \in J_i^k \\ 0 & \text{otherwise} \end{cases}$$

Where, η_{ij} denotes the heuristic desirability of deciding a feature j if at feature i is nonobligatory excluding often higher algorithmic outcomes, J_i^k represents the set of neighboring nodes of node i which is unvisited by an ant k . $\alpha > 0, \beta > 0$ are 2 attributes that proceed the equal importance of pheromone value as well as heuristic data and (t) refers the amount of virtual pheromone on edge (i, j) .

RF BASED CLASSIFICATION

Finally, the RF classifier gets executed to classify the feature reduced data to identify the class label in an appropriate way. The classification models mainly used for developing an approach for mapping the data to a specific class by means of existing data. It is employed for

extracting required data items from this method for detecting a data movement. The dependent attribute of the RF scheme is a binary-classification. to find an optimal subset, having accuracy comparable but size much smaller than the original Random Forest. We show that the problem of selection of optimal subset of Random Forest follows the dynamic programming paradigm.

Let us assume, we have a Random Forest containing four elements namely T1, T2, T3 and T4. Now to choose an optimal subset out of this forest, some elements have to be removed. Consider figure 5.4, in which one tree of the forest is eliminated in each iteration. The cost of computing accuracy of the subset obtained after removing trees T1 then T2 is the same as that obtained by first removing T2 and then T1. In this process of finding the optimal subset, many subsets of Random Forest re-appear.

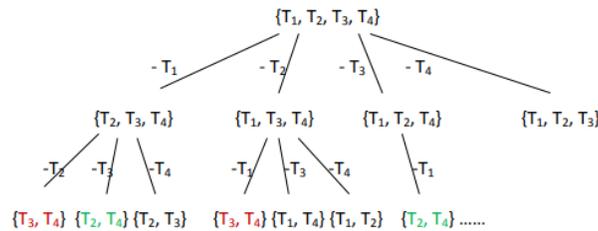


Fig 2:Dynamic Tree Implementation

We store the accuracy for each of the distinct subsets and later when the subsets reappear, values can be simply looked up. In this way problem of finding optimal subset of Random Forest has been modelled using Dynamic Programming. As can be seen from the Fig-2, at each stage

the number of unique subsets obtained by removing trees can be expressed as NCK where K is the size of subsets at that stage. Thus total number of distinct subsets can be shown as,

$$\sum_{k=1}^{N-1} \binom{N}{k} = 2^N - 1$$

Using the formula for binomial expansion. A close look at the expression reveals that we have in fact enumerated Power-Set of size N (2^N). The two subsets left out are the empty set, which is of no use, and the complete set, which represents the original Random Forest.

RESULTS AND DISCUSSION

Oneby automatic program code andotherby programmer’s manually written code. A code generator is a suite of programs that matches the input to an appropriate code template and from these produces modules of code. The code is made simple in such a way

that another programmer can easily understand and work on that in future. The crucial phase in the system development life cycle is the successful implementation of

the new system design. The process of converting as new or revised system into an operational one is known as system implementation.



Fig 3:Gender Wise Comparison Analysis

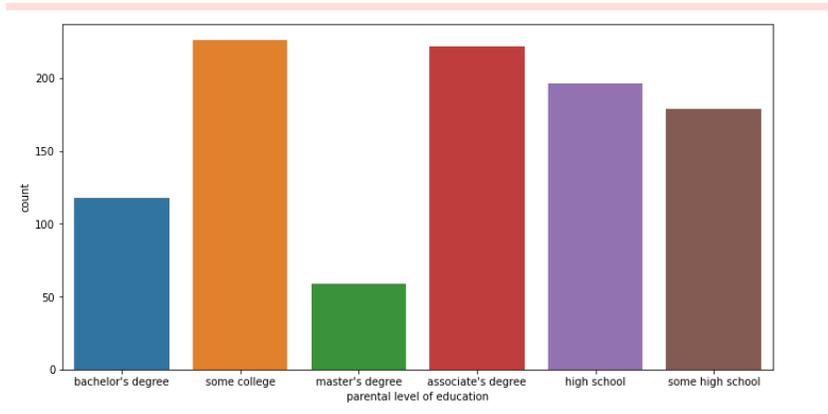


Fig 4:Degree Wise Comparison Analysis

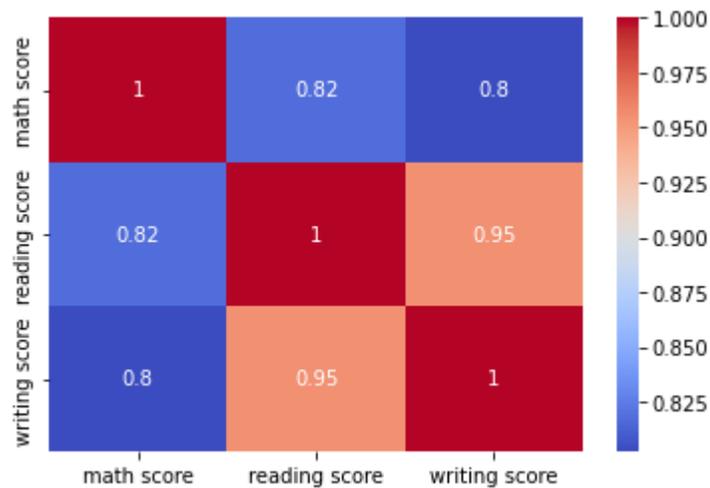


Fig 5:Score Wise Analysis

CONCLUSION

This work has concentrated on the design of effective DM models to examine the educational performance level to assist students as well as faculties to improve their performance to the next stage. The proposed research work has incorporated a set of three processes namely preprocessing, feature extraction, and classification. These research works involve a set of three research objectives and are successfully developed. Novel hybridization of linear vector quantization model is presented for predicting the academic performances and

employability chances of the learners. In this objective, a predictive model using RF is integrated to develop a hybridization of linear vector quantization algorithm for predicting the employability chances and academic results of the students. The proposed hybridization of linear vector quantization model assists to examine the academic student's performance and also predicted whether the student gets placement in a prestigious company for achieving the goals. The experimental result states that the hybridization of linear vector quantization model offers the forecast that has 90% precision comparatively greater than RF.

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