# Teacher Performance Prediction Using Machine Learning

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**Abstract***: Student performance is one of the crucial and necessary part in the educational system due to its large volumes of real-time data that cannot be analyzed manually by the humans. So, here comes machine learning that is used to easily predict the performance of the students. This job is being performed by educational data mining (EDM). EDM contains the methods that are used to discover the data in the educational environment and are used for understanding the student and their learning environment. The educational institutions are responsible and also at the same time curious to know about the performance of the students and teachers to know the current status of the functioning of the institution towards a better path. In this project, 3 models namely students assessments grades, final student performance, teachers performance. The result shows that both all the models will be showing an accurate result. A system is designed to predict the performance of the teachers based on the average of the grades of all the students, Students review and the staff members review are taken as input and the performance of the teachers is predicted accordingly. And at the same time, we will also be predicting the performance of the students based on their previous academic performance and gives suggestions.*

**Keywords:** Students, Teachers, Association rule, Data mining, Web mining.

## I. INTRODUCTION

All educational institutions are currently concentrating on enhancing student learning abilities in order to increase the quality of teaching. According to the studies, we may utilize university data as a gauge to assess how well the institution is performing by looking at its student data. One benefit of analyzing student performance is that it can help the university determine whether changes to its curriculum are necessary to better support students in the workforce. In order to make the appropriate arrangements, educational institutions frequently wonder how many students will pass or fail. It has been noted in earlier studies that many researchers focus on choosing the best algorithm for only classification and neglect to find solutions to issues that arise during the data mining phases, such as data high dimensionality, class imbalance, and classification mistake, among others. These kinds of issues made the model less accurate.

One of the first studies on data mining applied in education was published in 1995 by Sanjeev and Zytkow. Researchers gathered the knowledge discovery as terms like "P pattern for data in the range R" from university database [3].Another study on data mining applied in education was published in 2000 by Becker and his friends who are performed for defining and understanding the impact of changes in curriculum on students at a university in Brasil[4]. A data mining application in which defining of student characteristics are used for measuring the satisfaction of students at higher education was performed by Luan in 2002 [5].Maltepe University students identifying characteristics had been clustered using K-means algorithm in 2005 by Erdoğan and Timor. In that study 722 students' data was used and the relationship between the university entrance exam results and achievements was examined

## II. LITERATURE SURVEY

Ioannis E. Livieris, et al. built an Artificial Neural Network (ANN) classifier to predict the performance of students in Mathematics. From their experiments they found that the modified spectral Perry trained artificial neural network performs better classification compared to other classifiers. [1]

A study was conducted by S. Kotsiantis,et al. which investigated in distance learning of machine learning techniques for dropout prediction of students. Important contribution was made by this study as it was a pioneer and helped to carved the path for such educational data mining. Machine learning techniques were applied in other areas, he and his team were the first people to implemented machine learning methods in an academic environment. An algorithm was fed on demographic data and several project assignment rather than class performance data to make prediction of students. [2]

Moucary, et al. applied a hybrid technique on K-Means Clustering and Artificial Neural Network for students who are pursuing higher education while adopting a new foreign language as a means of instruction and communication. Firstly, Neural Network was used to predict the student's performance and then fitting them in a particular cluster which was form using the K-Means algorithm. This clustering helped in serving a powerful tool to the instructors to identify a student capabilities during their early stages of academics. [3]

## III. PURPOSE

The educational institutions are responsible and also at the same time curious to know about the performance of the students and teachers to know the current status of the functioning of the institution towards a better path. In this project, 3 models namely students assessments grades, final student performance, teachers performance. The result shows that both all the models will be showing an accurate result. A system is designed to predict the performance of the teachers based on the average of the grades of all the students, Students review and the staff members review are taken as input and the performance of the teachers is predicted accordingly. And at the same time, we will also be predicting the performance of the students based on their previous academic performance and gives suggestions.
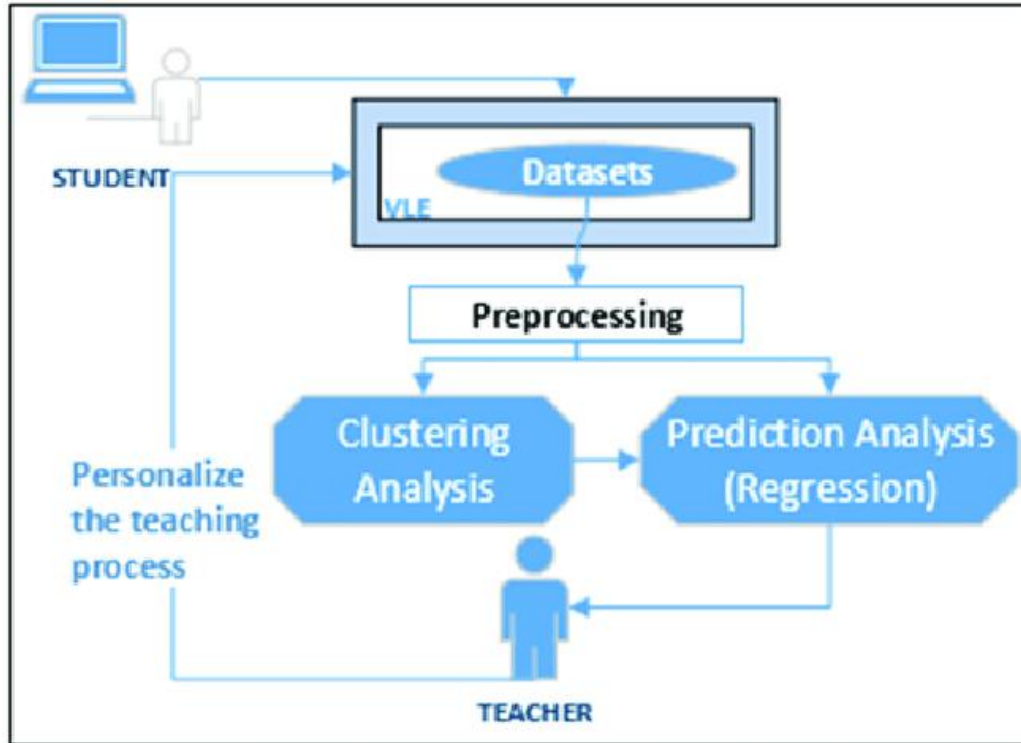
## IV. OBJECTIVE OF SYSTEM

- **Enhanced Access:** Provide Indian farmers with easy access to comprehensive agricultural information and resources.
- **Decision Support:** Assist farmers in making informed decisions related to crop management, weather conditions, market trends, and agricultural practices.
- **Technology Integration:** Integrate technological solutions such as data analytics, machine learning, and mobile applications to optimize farming processes.
- **Knowledge Empowerment:** Empower farmers with up-to-date knowledge and expertise in various aspects of agriculture, including crop selection, pest management, and soil health.
- **Resource Efficiency:** Promote the efficient use of resources such as water, fertilizers, and pesticides through tailored recommendations and best practices.

## V. PROPOSED SYSTEM

There are no such system which could inform farmers about the weather prediction. In this system there is additional feature of weather forecasting which will help all the farmers to work according to weather prediction and get fruitful results. With respect to this farmer got an amazing option of predicting the future lines of production based on previous data and history populated in the system. So system will gain knowledge about the process and in outs, once farmer feeds in their previous experience. In previous systems the farmer does not get information related to market rate, weather and government schema. Therefore in this system all these features are added.

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359

**SYSTEM ARCHITECTURE**



**Advantages:**
- Detection of anomalies faster.
- Better Predictions.
- Saves Time and Money

**Disadvantages:**
- Inacurate Prediction.
- Difficult to Interprit.

## VI. CONCLUSION

In order to increase student performance on the final exam, instructors could fine-tune their delivery methods with the aid of an early assessment of students' attention. The major objective of this paper is to create a data mining model that assesses and forecasts student and instructor performance. We will do this by using actual data sets to test our methodology. A artificial neural network model along with some machine learning algorithms is proposed in this paper for predicting the students' and teachers performance. Through the experiment we found that a ANN can perform better even with less amount of data by having deep knowledge about dataset and quality tweak on the model. The proposed model is expected to achieve an accuracy of 95%. With larger dataset records and features, ANN can achieve higher accuracy and will outperform other machine learning algorithm.

## VII. ACKNOWLEDGMENT

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