KULLIYYAH OF INFORMATION & COMMUNICATION TECHNOLOGY

CSCI 4343 Data Science

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GROUP PROJECT PROPOSAL

Title: Higher Education Students Performance Evaluation

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1.0 BACKGROUND

Students' knowledge and comprehension of course material, their capacity to apply what they have learned to practical situations, and their capacity for critical thinking and problem-solving are all usually evaluated to know the overall performance of the student. In addition, students' participation in class, punctuality, and overall level of involvement in the learning process may also be taken into consideration as part of the evaluation of their educational performance. The main goal of student performance assessment in higher education is to inform students of their progress, strengths, and areas for improvement to pinpoint any potential problem they are facing. Institutions can also use the evaluations to spot areas where their course content or teaching strategies need to be improved. In higher education, there are many different ways to determine a student's performance, including exams, quizzes, projects, essays, and other tasks that can be affected by many factors like their studying strategies, financial situation, social status, health, and so on. Overall, student performance evaluation in higher education is essential for making sure that students are getting a top-notch education and are adequately prepared for their future careers.

2.0 PROBLEM DESCRIPTION

Evaluating student achievement in higher education is fraught with difficulties and problems. A few of the most important issues are:

1. Subjectivity: The subjective nature of the process makes evaluating student success one of the major difficulties. It is possible for instructors to have varying grading criteria, which could result in inconsistent evaluations of their pupils.
2. Assessment tools and techniques: Choosing suitable assessment tools and techniques that accurately gauge student learning outcomes presents another challenge. Exams and essays are examples of traditional evaluation techniques that might not completely reflect a student's knowledge and abilities.
3. Academic dishonesty: Evaluations of student achievement can be seriously hampered by plagiarism, cheating, and other types of academic dishonesty. These actions could jeopardise the integrity of the educational system and threaten the validity and dependability of assessment outcomes.
4. Insufficient feedback: In some instances, students might not get enough feedback on their performance, which makes it challenging for them to advance and hone their abilities.
5. Limited resources: The efficiency of student performance assessment can also be impacted by limited resources like time, people, and technology. It's possible that instructors lack the resources needed to use creative evaluation techniques or to give students timely, meaningful feedback.

To guarantee that student performance evaluation is a valid and reliable indicator of student learning outcomes in higher education institutions, all of these difficulties and problems must be resolved.

3.0 RESEARCH QUESTIONS

1. How does the financial status of a student affect their education performance?
2. How will the parent's background affect the student’s performance?
3. What is the relation between studying preparation styles and good education performance?
4. Does the performance get influenced by the social life of the students?

4.0 HYPOTHESIS

Students from families with a history of high educational attainment may have greater access to academic resources and role models, which could positively impact their academic performance. Additionally, students who receive scholarships or financial aid may experience less financial stress and have greater access to academic resources, which could also positively impact their academic performance. Conversely, students who are burdened with high levels of debt may experience greater stress and financial difficulties, which could negatively impact their academic performance. Moreover, students who engage in consistent and frequent studying habits may have better academic performance than those who cram for exams or rely on last-minute studying. Finally, students who prioritize social activities over academic responsibilities may experience academic challenges and lower performance due to a lack of time and focus on academic pursuits.

5.0 RESEARCH OBJECTIVES

1. To determine whether a student's financial situation has an impact on their academic performance.
2. To ascertain whether a student's academic performance is influenced by their parents' background.
3. to investigate the relationship between studying preparation styles and academic performance, with the goal of identifying effective strategies to improve student success.
4. To explore the correlation between students' social lives and academic performance.

6.0 DATA SOURCE

We will be using the "Higher Education Students Performance Evaluation" dataset from Kaggle(https://www.kaggle.com), which comprises 33 columns and 145 rows. This dataset includes information about students from faculty of engineering and faculty of educational sciences in 2019 only. After cleaning the data, we will use various tools including Google Colab, Numpy, Matplotlib, Pandas, and ScikitLearn to conduct data analysis and

visualization. Our analysis will involve identifying maximum and minimum values, making comparisons, and computing the mean to gain insights from the data.

7.0 DATA ANALYTICS TOOLS POTENTIALLY USED

i. Google Collab: Google Colab is an online platform that provides free cloud-based computing resources for data analysis and machine learning tasks. It allows users to write, run, and share code in a web-based environment without requiring any installation or setup. Colab provides access to high-performance hardware such as GPUs and TPUs for faster computation. Additionally, it allows users to collaborate with others in real-time and provides integration with popular data science libraries such as Numpy, Matplotlib, Pandas, Scikit-Learn, and Keras.

ii. Numpy : Numpy is a crucial Python package for data science that provides an array object that is faster and more efficient than the traditional lists. It is used for a wide range of functions such as linear algebra, statistical operations, sorting, selecting, and more.

iii. Matplotlib : Matplotlib is another Python library used for data visualization and 2-D graph plotting that allows users to derive patterns and trends in the data.

iv. Pandas : Pandas is another open-source library that facilitates working with labelled data and makes data manipulation and restructuring easier.

v. ScikitLearn : Scikit-Learn is a commonly used library for performing machine learning tasks in Python. We can do some ML models below with scikit learn.

- Regression
- Classification
- Clustering
- Normalisation.

vi. Keras : Keras is a Python library that can be used for performing various machine learning tasks. It is particularly beneficial for neural networks and has a user-friendly interface with easy-to-use APIs. It also provides clear and practical error messages that make it easier to debug code.

8.0 EXPECTED RESULT

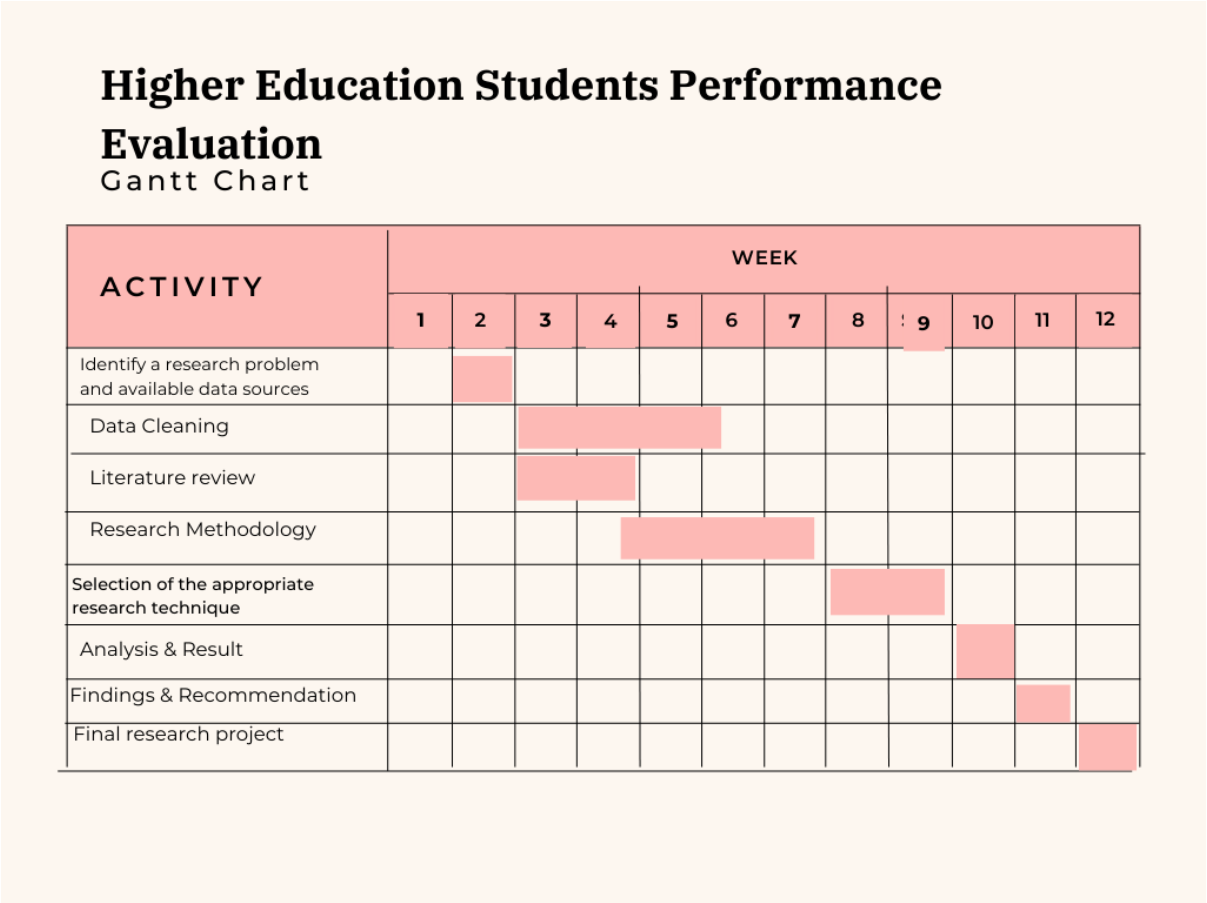
The data was collected from the Faculty of Engineering and Faculty of Educational Sciences students in 2019 to forecast their end-of-term performances using ML approaches. In this project, we will try to find out if the student's Financial status, parent's background, and social life all have an impact on academic success. Financial limitations can cause worry and anxiety, while students who receive scholarships or financial aid may perform better academically. Parent involvement in their education can also benefit a child's performance, as well as studying preparation styles. Social life can also present opportunities for networking and establishing connections that can benefit students in their future professional lives.

9.0 LIMITATIONS

It’s obvious to face some difficulties during any project work. We are also expecting to face some challenges with our dataset. The biggest challenge for us would be collecting the data manually. So, we decided to choose the dataset from an online resource as the dataset for our topic was already available in Kaggle.

Another expected challenge is to clean the dataset while not affecting the relationships between the variables to make the prediction and understanding of the data accuracy. As this dataset is not collected by us, there might be a misunderstanding of how important a certain variable is to the prediction. Again, Some irrelevant values and blank columns must be deleted from the dataset to get a correct result.

10.0 SCHEDULE



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