Finding How Student Mental Problem Effects Student Academic Performance Using Ml

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***Abstract*—Education system plays a vital role in any one's carrier. Student's health is an important research topic today because they are the cornerstone of our society. Researchers have employed various technological breakthroughs to address school children's and college/university learners' health issues. Machine learning is now frequently employed. However, to understand the efficacy of ML and progress in learner health research, a concise review of the influence of ML on learner health is required, which the proposed work provides. The primary objective is to examine which of the learner's health concerns are efficiently addressed by ML algorithms and the outcomes of the approaches. The study also discusses what leads learners to perform poorly in schools, colleges, and universities and if ML will improve learner health in the future. The main aim of the study is to find how learner health problems effect their educational outcomes. Unsupervised learning methods are utilized to analyze student-related datasets and identify links between health challenges and academic performance. The model introduces automation within the educational domain and is implemented as a web-based application for college use, developed using Microsoft tools including Visual Studio, C#, and SQL Server.**

1. INTRODUCTION

Mental Health disorders are a common issue among learners education sector today. Shifts in lifestyle, study patterns, and work environments have heightened the chances of mental health issues among students. Previous research has frequently highlighted this growing concern. Many research works tried to forecast learner psychological well-being problems using many data science algorithms. Many works employed ML algorithms to forecast psychological well-being disorders of learners at schools or colleges. Several steps can be taken to help learners with stress for mental well-being like counseling assistance, stress management sessions, career guidance, and health awareness programs.

Early identification of learners who will need such a help will improve the chances of such measures being successful. We hope to ease this process by using ML methods to develop a model to forecast the risk of mental disorders experienced and if treatment is required by an individual by taking some of his/her professional and personal factors as parameters collected in the form of carefully drafted surveys. Such an approach will not only help lecturers to understand better about their learners but also help in taking preventive measures to decrease the chance of an learner leaving the school/college or underperforming. We can also perform early forecastion if a learner requires treatment for his psychological well-being or not. There are many factors associated with learner psychological well-being disorders such as age factor, gender factor, study hours, family issues, friends issues, location, pressures etc. it is important to detect such factors to detect the learner health disorders easily.

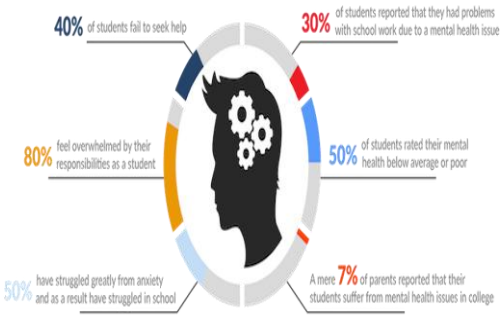

Fig: 1-Student Problems

Machine learning is the current trending technology which can be employed to process the psychological well-being data collections and detect the learners who are suffering for the disorders. Also it is important to forecast the disorders at early stages to provide the suitable treatment for the learner so as to overcome the health disorder and to achieve good educational outcomes. Datasets employed in the study downloaded from reputed websites such as , etc. Unlabeled data approach algorithms applied to process the training data collections and forecasts the relationship between learner psychological well-being disorders and educational outcomess. In our suggested model we considered all different types of psychological well-being disorders such as depression, anxiety, stress, panic disorders, fear etc... Proposed system build as GUI based study for the company where Microsoft technologies employed for the study development.

2. RELATED WORKS

Survey Papers:

2.1 Data Mining Applications In Healthcare Sector, Author:M. Durairaj, V. Ranjani (2013)

Description: This study explores various techniques, methodologies, and tools used in the healthcare sector, focusing on how they influence data-driven practices. The core objective of applying data mining in healthcare is to convert raw data—such as numbers, text, or facts—into meaningful insights that computers can process. The research emphasizes building automated systems to efficiently detect and share important healthcare-related information. It provides a comprehensive analysis of the different applications of data mining in healthcare, aiming to simplify the complexity of handling medical data. Additionally, the paper compares various data mining techniques and strategies used for extracting knowledge from healthcare databases. It also highlights the most effective algorithms and tools currently available that support improved healthcare services.

2.2 Graduate Student Mental Health, Author:Jenny K Hyun and Temina Madon (2016)

Description: This research explored the mental health needs, awareness, and use of counseling resources among graduate students at a major university in the western U.S. Nearly half of the participants reported experiencing stress or emotional difficulties in the past year, while more than half knew a peer with similar issues. Findings indicated that mental health concerns were more common among those with lower financial confidence, weaker advisor relationships, limited social interaction, or single status. Use of counseling services was higher among students with more depressive symptoms, longer enrollment duration, and those identifying as female. Students who faced serious psychological challenges and maintained supportive advisor relationships were especially likely to seek counseling. Overall, the study highlights the importance of addressing graduate students' mental health, particularly financial stability and advisor support, as critical factors in their well-being.

2.3 Research on the College Students' Psychological Health, Author:Sichuan Judicial And Police Officers Professional College, Deyang (2016)

Description: In recent years, college learners' psychological problems are becoming more and more prominent, and due to the lack of high-quality resources in psychological well-being education, it is difficult to meet the needs of learners. In this paper, the author analyses the college learners' psychological health management based on data mining and cloud platform. Cloud computing is the latest network application technology, its advantage lies in the integration of resources, it can integrate psychological well-being education resources into the cloud and share each other's quality resources. Through the analysis of college learners' psychological health management system, we puts forward some measures to promote the management of college learners' psychological health.

3. PROPOSED SYSTEM

The system functions as a real-time application that applies machine learning to examine the link between student mental health issues and academic performance. It is designed with a graphical user interface for the education sector and can be accessed by both teachers and students through any

web browser. Training data collections collected from a college and real time data employed in the study work. System uses many factor such as gender, age, panic disorders, fear, stress, low academic scores, average scores, high scores etc..

The system applies advanced clustering techniques, specifically the ECLAT algorithm, to analyze collected datasets. It is developed for college use and implemented with full-stack technologies including Visual Studio, SQL Server, HTML, and CSS.

3.1 Parameters

- Gender
- Pressure
- Family Issues
- Fear
- Anxiety
- Obsession
- Paranoid
- Nervousness
- Injury
- Interpersonal sensitivity
- Stage fear
- Stress

3.2 Datasets: After analyzing existing system and limitations of existing system, it is understood that there is no proper system to detect the learner psychological well-being problems and reasons for low educational outcomes or scores. It is important to forecast how learner psychological well-being problems are associated with educational outcomess and also learner psychological well-being disorders should be identified at the early stages, so that education sector can come up with some solution to overcome the learner psychological well-being disorders. The proposed system automates the prediction of students' psychological well-being. It assists colleges in making quicker and more informed decisions. For forecasting academic outcomes, the model considers multiple factors such as age, gender, pressure, family problems, fear, anxiety, obsession, paranoia, nervousness, interpersonal sensitivity, stage fright, and past injuries. All these parameters are more relevant for forecastion and we are using around 1000 to 2000 records to get better results.

4. METHODOLOGY

In our study work both labeled data approach and clustering approach algorithms employed to process educational data collections. Supervised learning technique employed to forecast individual learner result forecastion based on psychological well-being problems. Unlabeled data approach algorithm employed to find the educational patterns. Association (or relation) is probably the better known and most familiar and straightforward data science technique. Here, we make a simple correlation between two or more items, often of the same type to detect patterns.

In our study Association Learning Algorithm Eclat Algorithmis employed to forecast the relationship between learner's mental problems and performance using the educational data-set. Naïve bayes algorithm employed to forecast individual learner results based on psychological well-being problems.

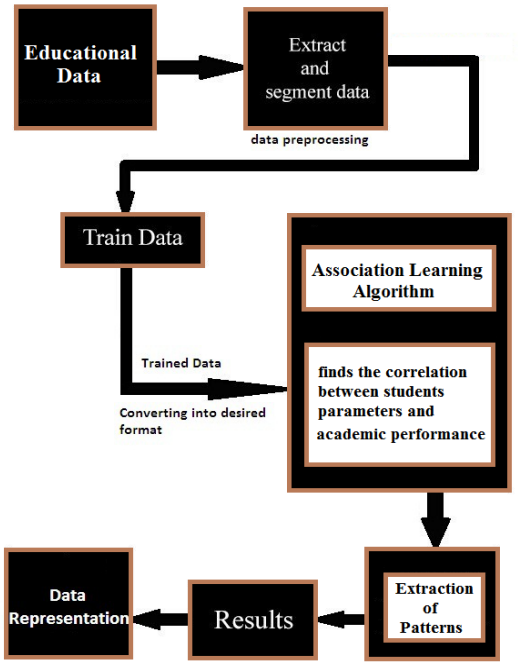

Fig: 2 – Methodology Diagram

5. EXPERIMENT RESULTS

*5.1 Eclat Algorithm:*Performance Factor

Data Structure – array based

Memory Utilization – depends on the data set [less

for small datasets]
No.of.scans - single scan required
Execution time - execution time depends on producing candidates

No of Instances (records)	Execution Time (milli Secs)
Around 2k	557
Around 1k	495
Around 500 records	365
100 records	245

5.2 Naïve Bayes Algorithm: Here we build a real time application useful for the society. This project build using Microsoft technologies. Educational datasets trained using Naive Bayes algorithm and we got very good results. The Naive Bayes algorithm has been implemented to handle dynamic datasets, with the logic written as a custom library. The model achieves an accuracy of about 78% and requires roughly 2500 milliseconds to generate predictions.

Constraint	NB Algorithm
Accuracy	88%
Time (milli secs)	2606
Correctly Classified (precision)	88%
Incorrectly Classified (Recall)	12%

Table 1: NB Accuracy

6. CONCLUSION

Student mental well-being plays a crucial role in daily life. Learners, in particular, are highly vulnerable, facing various psychological challenges due to multiple factors. Such issues can negatively influence both their mental and physical health. Increasing dependence on electronic devices has further added to the concern. This research applies machine learning methods to analyze the impact of psychological problems on students' academic performance.Various parameters are used to identify the relationship between gadget usage and students' academic performance, with effective algorithms applied to predict learning trends.

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