



ENHANCING REMOTE EXAMINATION PLATFORMS WITH MACHINE LEARNING IN THE COVID-19 ERA

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ABSTRACT

Exams are very important in student's life because it decides their carrier and future. Due to covid-19 there were great impact of this virus on different areas includes education. For keeping every one safe from this virus physical classes and regular exams are not possible. But due to technologies students are in touch with education in online mode and they can be able to give exams in online mode without break. Machine learning play very important role here that shift from traditional education system to online education. During lockdown, it also possible to take exams by using machine learning. In this paper introduction of online examination system, its different methods, literature survey, proposed system architecture and Examination Cycle in LEMS (Lockdown Exam Management System) is discussed.

KEYWORDS: Machine learning, examination systems, COVID-19, online exams, student authentication, digital education

1. INTRODUCTION

From Jan 2019, due to fastly spreading Covid -19 it turns many people to work online from office life [1]. From different colleges to schools, whole education sector is influenced & lots of offline education & learning must now take place online [2]. Today, online education and learning have taken over as the most preferred method for both professors and students [3]. Study every aspect of online exam approach has never been crucial, & makes it an urgent issue that need to be resolved [4]. Many academics are working in this region in previous years [5]. Meanwhile, machine learning & artificial intelligence play very important role that can handle large amount of data that are generated online daily [6]. Machine learning is the study from human behavior to solve simple to complex problem. It revolutionizes real world application & makes system more intelligent. Machine learning is used to solve problems, acquire knowledge, learning from data & predict from historical data. By using machine learning, time & efforts of human can be saved that why life of human will get easier from different perspective [7]. Offline classes are not possible due to this virus threats. Students' health & safety was priority. Educational organization cancel physical education and conduction of exam is challenging task. E learning, Online exam, Online education is the solution for continuous



learning [8]. Exams & education is conducted in online mode due this online exam & education student are able to complete their courses without break. Here contribution of machine learning model predicts student academic performance [9].

2. LITERATURE REVIEW / RELATED WORK

Author Asmat Ara Shaikh et al. [2022] examines the transformative impact of Artificial Intelligence (AI) and Machine Learning (ML) on education, particularly in the context of the COVID-19 pandemic, which necessitated a shift to remote learning. It analyzes findings from ten international journals, highlighting how AI and ML enhance personalized learning experiences, improve student engagement, and streamline educational processes through adaptive learning systems and automated assessments. The study underscores the advantages of these technologies, including increased flexibility and accessibility, but also acknowledges challenges such as the skills gap among educators and difficulties students face in navigating online learning environments. The paper concludes by emphasizing the potential of AI and ML to revolutionize education in the future, calling for continued research and investment in these areas to maximize their benefits and address existing barriers. The research paper discusses the significant impact of Artificial Intelligence (AI) and Machine Learning (ML) on the educational landscape, particularly in response to challenges posed by the COVID-19 pandemic. The paper concludes emphasizing the transformative potential of AI and ML in the future of education, underlining the importance of ongoing research and development in this field. It advocates for further exploration of these technologies to maximize their benefits and address the challenges faced in educational environments. Overall, the research articulates a clear vision for the integration of AI and ML in education, highlighting existing progress while also calling attention to the areas that require improvement for future advancements [10].

Author Seker, S. et al. [2023] analyzes the impact of the COVID-19 pandemic on online education sales in Turkey, utilizing machine learning techniques for forecasting. The study employs three machine learning algorithms—Support

Vector Machine (SVM), Multi-Layer Perceptron (MLP), and Long/Short Term Memory (LSTM)—to assess sales data from an online education platform, achieving accuracy rates of 91.43% for SVM, 92.02% for MLP, and 96% for LSTM. By comparing these methods, the research underscores the value of data-driven decision-making in sales forecasting, particularly amidst the uncertainties generated by the pandemic. Furthermore, it presents implications for educational institutions in adapting to market changes, suggesting the potential development of hybrid forecasting models for enhanced precision in future predictions [11].

Author Yulita, I.N. [2023] “Educational Innovation Faced with COVID-19: Deep Learning for Online Exam Cheating Detection” by Yulita et al. explores the challenges posed by the COVID-19 pandemic on the educational sector, specifically focusing on the shift to online examinations and the subsequent

increase in academic dishonesty. The authors propose a deep learning-based system that utilizes human activity recognition (HAR) through webcam videos to detect cheating during online exams. The study reports an F1-score reliability of 84.52% for the system, which has been developed into a web-based application in the Indonesian language, making it accessible for local educators. The research highlights the necessity for innovative educational tools to maintain academic integrity in a rapidly changing educational landscape. This paper also highlights some key finding such as shift to online learning, Deep learning solutions, Webcam Monitoring, Educational Technology Advancement [12]. Author Indy Mankitho et al. [2021] investigates the predictors of student satisfaction with emergency remote learning (ERL) during the COVID-19 pandemic at a self-funded university in Hong Kong. The study involved 425 undergraduate students and employed machine learning techniques alongside traditional regression methods to analyze data collected through a structured questionnaire. Results indicated that overall student satisfaction with ERL was neutral, with preferences leaning towards face-to-face learning. Key predictors identified included students’ preference for traditional learning environments, the perceived efforts of instructors, and the appropriateness of modified assessment methods. The study suggests the need for improving the quality of assessments and interactive learning to enhance satisfaction in ERL. In this paper, it Highlights some key finding such as technical competence, Instructor efforts, assessment clarity, machine learning insights [13].

Author Swetha Sree Cheeti et al. [2021] aims to explore the emotional responses of individuals regarding the shift in education due to the COVID-19 pandemic, as reflected in tweets. With the educational landscape dramatically altered by the pandemic, the authors gathered over 90,000 tweets related to education from Twitter. They employed Natural Language Toolkit (NLTK) functionalities and a Naïve Bayes Classifier to analyze the sentiments expressed in these tweets. The findings indicate a significant prevalence of negative sentiments regarding remote education, highlighting the challenges faced by students, educators, and families during the pandemic. The study underscores the importance of understanding public sentiment to enhance educational practices and support during such unprecedented times. In this paper, it Highlights some key finding such as significant data collection, negative sentiment predominance, social media as a reflection of public opinion, global implications [14].

**Examination Cycle in LEMS
(Lockdown Exam Management System)**

- LEMS cycle has four steps
1. Pre-Examination Phase
 2. Examination Phase
 3. Post Examination Phase

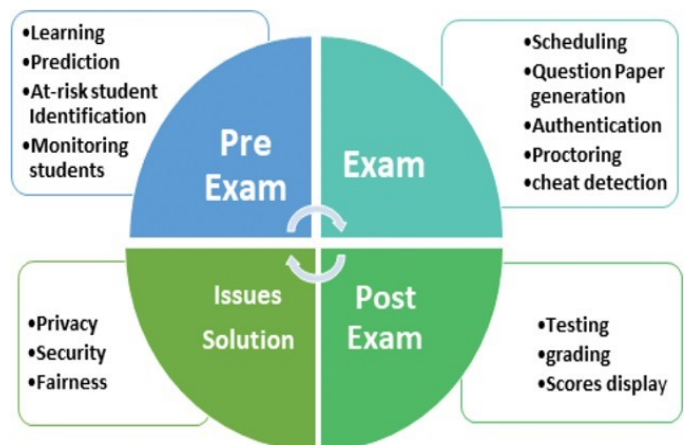


Fig.1 Exam Cycle in LEMS

The lockdown exam management system (LEMS) operates through a four-step cycle designed to ensure the smooth conduct of exams during the pandemic. The first step, the **Pre-Examination Phase**, involves preparation activities such as scheduling exams, authenticating students, and setting up the necessary technology for online assessments. The second step, the **Examination Phase**, focuses on the actual conduction of assessments, which includes monitoring students during the exam, ensuring fairness, and preventing cheating. In the **Post-Examination Phase**, the focus shifts to grading the exams, where machine learning techniques are often used to ensure accuracy and integrity in the evaluation process. This phase also includes verifying the results and providing feedback while maintaining a high standard of exam security and fairness [15].

Proposed System architecture for Online Examination system

Online examination can be done by two types first one is to conduct MCQ type exam and second one is the Descriptive type exam. Teacher can add or delete questions in the exam & automatically it will get evaluated. Student & teacher login page is there. After the students get registered in the system automatically data will get generated in the database. For creation & evaluation of online exam only authenticate teachers get access to the system. If teacher is not register and authenticate then they will not get access to the student database and they will not be able to create & evaluate the

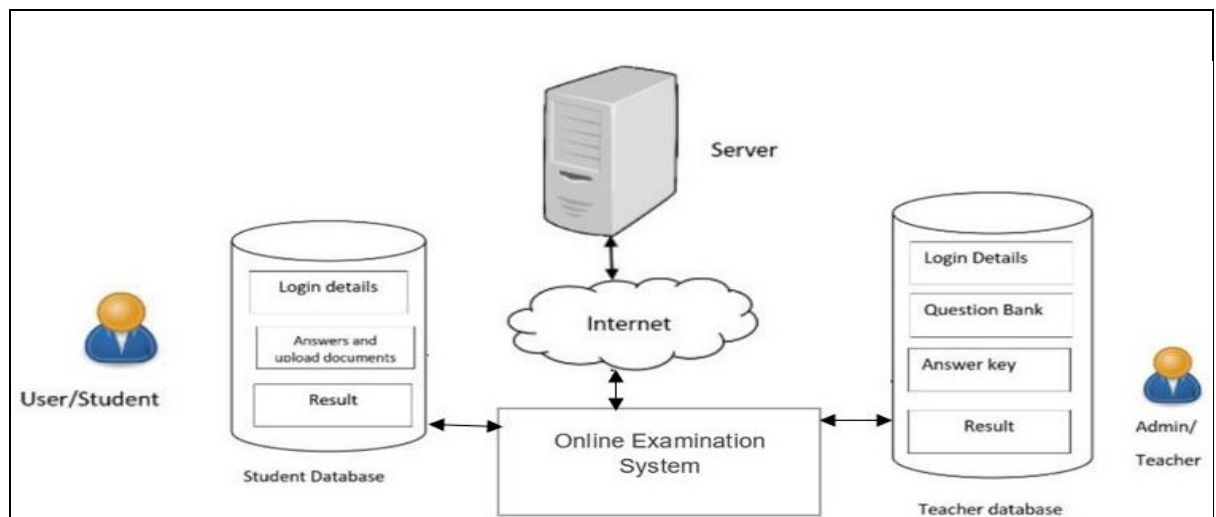


Fig.2 System Architecture for Online Examination system

test. When teacher login into the system then teacher can choose the exam either subjective or objective and teacher can able to see score of the students from already attempted exam. When student will get login then they can see attempted exam & already scheduled exams [16].

3. CONCLUSION

The study concludes by emphasizing how important machine learning was in transforming the online testing platform through the COVID-19 pandemic. The foundation for the suggested architecture, which incorporates machine learning technologies to improve the security, effectiveness, and equality of online exams, is laid by a thorough literature review that looks at current solutions and their shortcomings. With the launch of the Lock down Examination Management System (LEMS), a new method for overseeing the exam cycle is presented,



guaranteeing smooth exam administration via a digital platform that is well-organized. This study shows how using ML not just solves the problems associated with remote assessments but also opens the door for future online test systems that are more reliable and scalable..

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