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Abstract: In this paper, the overview of the main points related to electronic exam platforms during covid-19 has been presented. The research community emphasizes that investigating electronic exams during the covid-19 pandemic is vital among education institutions worldwide. We intend to develop such a system in our next article.

Keywords: Electronic Exam, Covid-19, Web-Based Expert System.

I. INTRODUCTION

Due to the extreme effects of the pandemic Covid-19 on school teaching and learning practices, this study explored certain constraints and challenges faced by pupils, instructors, and parents in learning [1]. The government’s national lockdown forced closing institutions such as schools, hospitals, and most workplaces [2]. People have been pushed to work from home, while students have adopted e-learning as their new norm. As a result, the government and other relevant agencies must present new instructional mechanisms to eliminate face-to-face contact in a traditional classroom. Without students and instructors being physically present at the same location, the reliability, justice, and smooth execution of online exams in e-learning are crucial, particularly in critical circumstances like natural disasters (e.g. Covid-19 pandemic etc.) [2, 3]. Technical progress has led to a reconsideration of the tools used in educational institutions’ evaluation and the re-formation of many tests and standards. Upgrading the quality of tests chosen in schools contributes to creating favourable innovation conditions—creativity and fulfilling students’ requirements and needs. In [4], the authors pointed out that the tests are basic pillars in the educational process. The exam content is the main criterion to ensure the quality of education for students. It provides data to determine the student’s level of competence, the teacher and the curriculum, and the extent of the educational process’s success in achieving its objectives and performance evaluation. The importance of electronic examinations appears as an alternative to the traditional paper exams and a necessity imposed by the reality in which we live in light of the pandemic resulting from the emerging coronavirus (Covid-19). Due to these exams’ characteristics, it makes them a better alternative. It is deemed the best and most appropriate way to evaluate students’ level without harming them, their families, and the society in which they live [5].

However, most of the tests are still handled manually. This leads to time consumption, resource wastage, purchasing and storing paper records, typos and duplication of data, as well as increasing the burden. The work multiplied by the number of subjects that each teacher must evaluate during the school class leads to delayed evaluation. This causes the students not to obtain the exam score and not knowing the correct answer. Providing some digital platforms allow holding electronic exams or using free digital platforms (including google forms or Microsoft forms), or even using ready-made
software that can be deployed and respond remotely, including the course lab and others [6]. However, these tools have ready-made templates, fixed models, presenting tests, restricting assessment methods, and developing questions. Hence, this research will build an expert system.

II. RELATED WORK

Regarding previous studies in the field of information technology and e-learning, the researchers have found a lack of studies linking expert systems and written tests, especially during the Corona pandemic in particular. The authors in [2] [7, 8] were concerned to provide the foundations for rethinking and adapting traditional educational exams development models according to the Web-Based Expert System. A framework for analysing verifiability in traditional and electronic exams has been introduced by [9]. Meanwhile, in [10], an expert system has been developed to predict student performance in an initial computer science course. The researchers in [11] focused on the e-learning process among students who are familiar with web-based technology. They also found solutions to improve self-study skills. Moreover, an individual exam module has been developed in [12]. The questions were categorised according to cognitive levels, item difficulty and item discrimination automatically, where difficulty levels have been calculated. During the pandemic, the procedures pursued, implementation of problems perceived, met, and addressed for conducting online examinations were recorded in [13-16], as shown in Figure 4, under the subheadings of preparation for online exams, instructor and student instruction, online exam behaviour, and integrating challenges and solutions. They expect that by documenting the processes, challenges, and brainstorming ideas for overcoming anticipated challenges within given resources and other constraints, academic institutions in similar environments can gain insight into the processes, challenges, and brainstorming ideas for overcoming anticipated challenges within given resources and other constraints. The study sample representatives of students and employees who took electronic exams in higher institutions were asked to describe the patterns in the relationship between the availability of the criteria and protection of implementing the electronic exams and the implementation process’s progress [16, 17]. The Addie model was employed in the methodology segment to build an electronic exam framework emphasising the expert system. This study aimed to discover the performance of the design process.

![Fig. 1. Process Flow Chart in Conduct of Online Examination [11]](image-url)
III. TOOLS UTILIZED IN ELECTRONIC EXAMS IMPLEMENTATION

So far, we presented the tools that have been proposed and developed as part of a research. However, it is equally important to highlight the existing tools that have been used in the selected studies for the implementation of proposed techniques and tools. Different programming languages have been used in the selected studies for the implementation of proposed techniques/tool as given in Sr. # 1 to 6 of Table 10. The languages like Python and MATLAB are highly supported for the implementation of ML and AI techniques. Therefore, these languages are mostly utilized to implement ML/ AI based approaches. For example, Das et al. [21] performed implementation of proposed AI based technique with Python where NLTK library is utilized for NLP operations. In another study, Atoum et al. [22] proposed ML based technique for cheating prevention where implementation (e.g. feature extraction, classification etc.) is carried out in MATLAB. On the other hand, implementation languages like PHP, Java and C# were mostly utilized in the selected studies for the development of a complete system/tool. For example, online exam assessment tool (ExamWizard) is implemented in [23] with PHP. In another study [24], online exam management system is implemented in Java. Several databases and storage platforms were utilized. MYSQL and Firebase cloud have been frequently utilized for storage purposes. In addition to storage platforms, there exist several special purpose tools that have been utilized in the selected studies to achieve particular objectives.

IV. THE EXPERT SYSTEM MAIN COMPONENTS

An Expert System uses human knowledge captured in a computer to solve problems that ordinarily require human expertise. The expert system may also be defined as an intelligent computer program that uses knowledge and inference procedures to solve difficult enough problems to acquire significant human expertise for their solutions. There are several main components in the expert system: user interface, expert system database, knowledge acquisition facility, and inference mechanism. The inference is the process of generating information from known or assumed facts. The inference is a logical conclusion or an implication based on available information. In the expert system, the inference process is performed in a module called the inference engine [20].

V. IMPORTANT FACTORS WITH RESPECT TO ONLINE EXAMS ATTRIBUTES

In this regard, we have identified four important online exams adoption factors as follows:

1) Network Infrastructure
2) Hardware Requirements
3) Implementation Complexity
4) Training Requirements

VI. CONCLUSION

In this paper, the overview of the main points related to electronic exam platform during covid-19 by using web expert system the research community emphasizes that investigating electronic exam during the covid-19 pandemic is vital among education institutions worldwide. Web expert system for educational applications: Developing of electronic exam platform during covid-19 pandemic will be presented in our next article.

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