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Review Paper of Electronic Exam Platform during Covid-19

Mansour Jud Fathi Ali[1], Omar Ismael Al-Sanjary[2], Asma Ali Budalal[3]

[1]Master's degree program in the Faculty of Information Sciences & Engineering, Management & Science University, 40100 Shah Alam, Malaysia.

[2]Assoc. Prof. Dr in Faculty of Information Sciences & Engineering, Management & Science University, 40100 Shah Alam, Malaysia.

[3]Dr in the Faculty of Electrical and Electronic Technology Benghazi- Libya.

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 t

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.

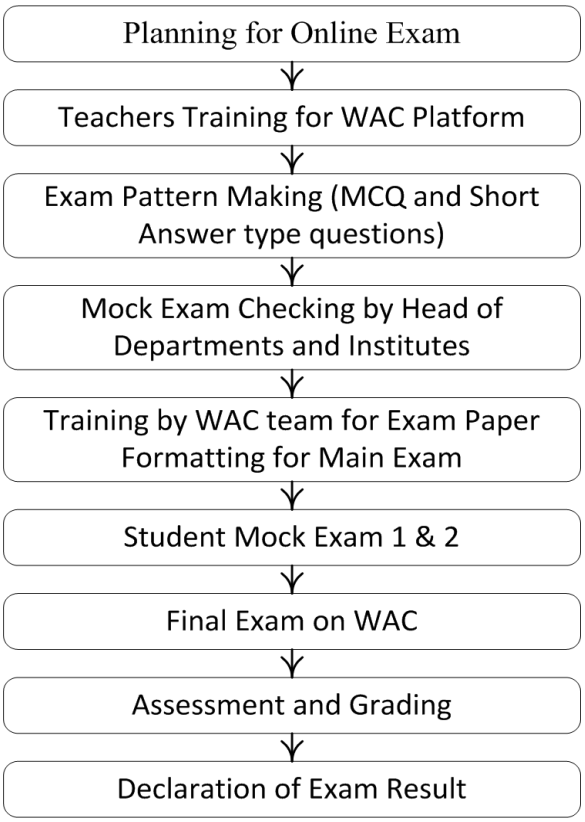

Fig. 1. Process Flow Chart in Conduct of Online Examination [11]

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 innthe 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 technique/ 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, classifcation 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 SYSTE 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 identied 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.

REFERENCES

[1] S. Dhawan: Online learning: A panacea in the time of COVID-19 crisis. Journal of Educational Technology Systems 49(1), 5-22 (2020). DOI: https://doi.org/10.1177/0047239520934018

[2] A. W. Muzaffar, M. Tahir, M. W. Anwar, Q. Chaudry, S. R. Mir, Y. Rasheed, Y: A Systematic Review of Online Exams Solutions in E-Learning: Techniques, Tools, and Global Adoption. IEEE Access 9(1), 32689-32712 (2021).

[3] N. N. Stella, B. K. Madhu: Expert system as tools for efficient teaching and learning process in educational system in Nigeria, First Step. International Journal on Future Revolution in Computer Science & Communication Engineering 3(12), 165-168 (2017).

[4] T. Rajala, E. Kaila, R. Lindén, E. Kurvinen, E. Lokkila, M. J Laakso, T. Salakoski, "Automatically assessed electronic exams in programming courses," In Proceedings of the Australasian computer science week multiconference, pp. 1-8, 2016.

[5] Y. Purnama, I. Ismail, D. Noviandri, Y. Hendriyani, P. T. Nguyen, I. P. A. Darmawan: Expert System in Detecting Children's Intelligence using Certainty Factor. Journal of Critical Reviews 7(1), 52-55 (2020). DOI: https://doi.org/10.22159/jcr.07.01.09

[6] A. Al-Dahab, M. A. Al-Husayni: The effect of an expert system as an input to an educational program in designing balanced written tests according to Bloom's knowledge levels of faculty members. Scientific Journal of Research and Studies in Sports Education 40(2), 153-175 (2020).

[7] Y. Atoum, L. Chen, A. X. Liu, S. D. Hsu, X. Liu: Automated online exam proctoring. IEEE Transactions on Multimedia 19(7), 1609-1624 (2017). DOI: https://doi.org/10.1109/TMM.2017.2656064

[8] J. Dreier, R. Giustolisi, A. Kassem, P. Lafourcade, G. Lenzini, "A framework for analyzing verifiability in traditional and electronic exams", In International Conference on Information Security Practice and Experience, Springer, Cham, pp. 514-529, 2015.

[9] M. Kuehn, J. Estad, J. Straub, T. Stokke, S. Kerlin, "An expert system for the prediction of student performance in an initial computer science course" In 2017 IEEE International Conference on Electro Information Technology (EIT), pp. 1-6, 2017.

[10] R. Radha, K. Mahalakshmi, V. S. Kumar, A. R. Saravanakumar: E-Learning during lockdown of Covid-19 pandemic: A global perspective. International journal of control and automation 13(4), 1088-1099 (2020).

[11] A. R. Yadav, K. N. Talati, R. K. Gurjwar: Leveraging Technology Platform for Timely Conducting Online University-Level Examinations Amid COVID-19 Pandemic: An Experiential Narrative by Engineering Faculty from Western India. Advances in Social Science, Education and Humanities Research 486(1), 533-538 (2020).

[12] I. Simsek, M. E. Balaban, H. Ergin: The Use of Expert Systems in Individualized Online Exams. Turkish Online Journal of Educational Technology-TOJET 18(2), 116-127 (2019).

[13] R. H. Saeed, Master dissertation, Dept. of Computer Education and Instruction Technology, Near East University, North Cyprus, 2019.

[14] A. Hassan: Electronic exams in light of the contemporary challenges of university education. Al-Sebt Specialized Center for Research and Scientific Publishing 202 (2020).

[15] F. M. Elbahri, O. I. Al-Sanjary, M. A. Ali, Z. A. Naif, O. A. Ibrahim, M. N. Mohammed: Difference comparison of SAP, Oracle, and Microsoft solutions based on cloud ERP systems: A review. IEEE 15(1), 65-70 (2019). DOI: https://doi.org/10.1109/CSPA.2019.8695976

[16] F. M. Elbahri, O. I. Al-Sanjary, M. A. Ali, O. A. Ibrahim: Technical Comparison of Cloud Enterprise Resource Planning Using Web Systems. IEEE 7(1), 90-95 (2019). DOI: https://doi.org/10.1109/ICSPC47137.2019.9067997

[17] S. Emhmed, O. I. Al-Sanjary, A. A. Jaharadak, S. H. Aldulaimi, M. HazimAlkawaz: Technical and Organizational Facilitating Conditions—The Antecedent Factors and Impact on the Intention to Use ERP System in Libyan Universities. IEEE 17(1), 41-46 (2021). DOI: https://doi.org/10.1109/CSPA52141.2021.9377305

[18] M. N. Mohammed, W. M. A. W. Radzuan, S. Al-Zubaidi, M. A. Ali, O. I. Al-Sanjary, L. Raya: Study on rfid based book tracking and library information system. IEEE 15(1), 235-238 (2019). DOI: https://doi.org/10.1109/CSPA. 2019.8696005

[19] Y. Timakova, K. A. Bakon: Bloom'S Taxonomy-Based Examination Question Paper Generation System. International Journal of Information System and Engineering 6(2), 76-92 (2019).

[20] Das, B. Sharma, S. S. Rautaray, and M. Pandey, ``An examination system automation using natural language processing," in Proc. Int. Conf.Commun. Electron. Syst. (ICCES), Jul. 2019, pp. 10641069.

[21] K. Garg, K. Verma, K. Patidar, N. Tejra, and K. Patidar, ``Convolutional neural network based virtual exam controller," in Proc. 4th Int. Conf. Intell Comput. Control Syst. (ICICCS), May 2020, pp. 895899.

[22] D. Vomvyras, A. Andreatos, and C. Douligeris, ``Exam wizard: A novel eassessment system," in Proc. 4th South-East Eur. Design Autom., Comput. Eng., Comput. Netw. Social Media Conf. (SEEDA-CECNSM), Sep. 2019,pp. 16.

[23] F. Al-Hawari, M. Alshawabkeh, H. Althawbih, and O. Abu Nawas, ``Integratedand secureWeb-based examination management system," Comput. Appl. Eng. Educ., vol. 27, no. 4, pp. 9941014, 2019.