A LITERATURE REVIEW ON QUESTION MANAGEMENT SYSTEMS IN ONLINE PROCTORING FOR ACADEMIC ASSESSMENTS

R.A.D.V.G Ranathunga, Prof. K.P Hewagamage

Master of Computer Science - University of Colombo School of Computing

In response to the COVID-19 pandemic in 2019, education shifted from onsite to online learning. Online education has advantages but also challenges, especially regarding academic integrity. Academic dishonesty, like collusion, impersonation, and file sharing, is a significant malpractice in online assessments. This study explores the role of quiz generation systems in combating academic dishonesty and improving prevention efforts. Existing systems lack student engagement and robust authentication. Current question generation systems fall short in ensuring a secure assessment environment, hampering student participation and proctoring during online exams. Through a comprehensive literature review, this research identifies shortcomings in existing question generation systems and emphasizes the need for improvement. By developing an innovative system to fill these gaps, the study aims to raise standards in online education, ensuring fairness and security in evaluation for students and institutions. This effort is a crucial step in preserving the authenticity and quality of education in the digital age.

* *R.A.D.V.G Ranathunga: vinuog8@gmail.com*

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INTRODUCTION

Until the year 2019, most education processes were conducted in onsite mode yet with the covid-19 outbreak which happened in the year 2019 education process has converted into distance and online education modes. There are so many advantages to distance and online education over traditional onsite education, but it also has problems that are not addressed in onsite education. One of the main issues in online examinations is conducting online assessments to prevent academic dishonesty. Academic dishonesty means Academic dishonesty is a behavior intended to mislead others into believing the academic work is original when it is not. (DAVIS, 2009) Amidst the shift to online assessments, a concerning number of academic dishonesty instances and malpractices have been observed. Students can share the answers through several social media applications which are known as "collusion". There are some occasions where other students take the examinations on behalf of other students based on paid or non-paid which is known as "contact cheating" or "ghosting". There are several applications that support file sharing. By using those applications students can share the overall assessments which is known as "file sharing" (KAKUL AGHA, 2023). The above-mentioned terms define some of the academic dishonesties that happen during online assessments. The quiz system's influence as a contributing factor to academic dishonesty cannot be overlooked. This study aims to explore the role of quiz generation systems in mitigating academic dishonesty and its potential to support prevention efforts.

METHODOLOGY

In this section, we outline the methodology employed for conducting the literature review. Due to the focus of this study on identifying the contribution of question management systems in reducing academic dishonesty, data collection and analysis phases were not conducted as they are typically reserved for empirical research. Initially, for this study, 50 papers were selected and out of the 50 most suitable 20 papers were selected to identify the research gap and design the proposed system. The background study has been conducted in two steps. In the first step, the knowledge related to academic dishonesty and malpractices was extracted. In the second step, the system implementations were examined. The set of papers was detached by reading the abstract and introduction in both stages. The two steps were carried out with the work remaining after the first filtering. In the first stage, the papers related to academic dishonesty were selected to understand academic dishonesty and how academic dishonesty happen during the online assessments. After that, as the second step, another set of papers selected regarding the studies carried out to understand what are measures and practices can be used in online examinations to prevent malpractices and cheating. In the second stage, the objective was to examine the systems and identify their scope. As the first piece of work general examination systems were studied and a set of papers were selected. The title of the research and the system architecture, design, and methodology were considered for selection. After the generic study, the selection criteria were narrowed down to the question bank and question paper generation studies since the proposed system is also to design a question pool where academic integrity can be met. For this selection, several factors were considered. The research title, methodology, system design and architecture, objectives, discussion, and conclusion were considered.
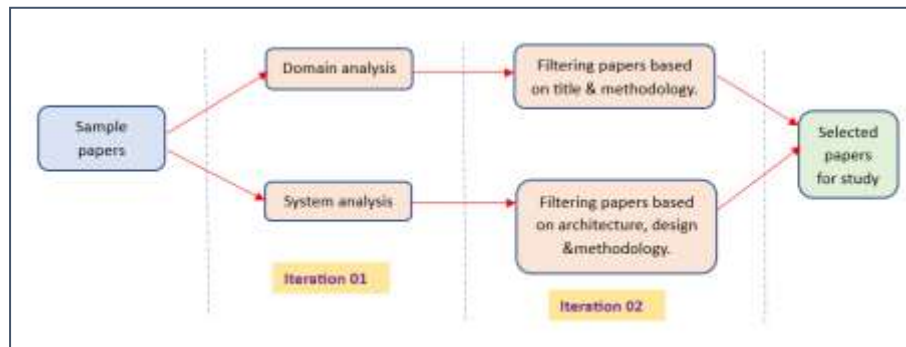
Figure 1 - This diagram shows the methodology used for literature review

RESULTS AND DISCUSSION

An automatic question paper generation system was proposed to achieve the objective of reducing the complexity of paper setting for academics by students at Mumbai University (KAPIL NAIK). The primary focus of this study was to reduce the complexity of the paper generation. The system was only designed to generate question papers. It produce a question paper in .doc format file as the output and doesn't facilitate a platform where students can attempt the assessments. The system is a desktop application and not a web based application. It generates the question paper according to blooms taxonomy. This system generate quiz within 25 seconds and support questions with MCQ (multiple choic questions), single/multiple option questions and short questions. Since the system is a desktop application students cannot engage and do the examinations hence it doesnot have strong relationship to prevent academic dishonesty in online assessments. If so it is a quiz generation application and uses a shuffling and randomization algorithm to generate quizes. The system has the potential to several papers based on the question pool which is preventing the duplication of the same set of questions where academic integrity is ensured.

Another study was also carried out to generate a question paper based on the machine learning approach which can be considered as the next step of the previous study. In this study question paper is also generated as an XML or .doc document. It features an automatic question paper generation process using a semantically tagged question repository. Here the specialty is the question pool can be created by adding questions as a .doc document. The system has the capability to scan the tags and find the questions. The system ensures authentication for teachers and administrators, with the admin having the authority to add departments and teacher staff. Which was not found in previous works. This study is also carried out to reduce the complexity of the quiz generation with ensuring the quality of the paper with having cognitive complexity (PROF. S. B. BHONDE). In the above studies, they used several methods to detect the question difficulty. A separate study was also conducted to find the difficulty of the questions by using reasoning. They did that study to overcome the lack of interpretability and controllability of previous difficulty measures. In this study they have used Artificial Intelligance reasonong and inferencing to generate quizes. The model have three stages for generating quizzes. They are deep question generation, difficulty controlable question generation and question rewriting. This is also a platform which provides only question generation purpose only. The aim of this study is to generate quizes with more interprtability and controllability (YI CHENG, 2021).

An adaptive question bank and question generation system was also implemented to overcome the difficulties in the traditional paper setting process and it also has similar features to the above systems. This system is also a desktop application and it has a special feature which is the generated answer script is password protected (PANKAJ DWIVEDI, 2021).. The existing system's algorithms were designed based on a random number or shuffling methods. The existing systems are desktop applications and students cannot interact with the systems. The system's primary objective was to mitigate the difficulties and problems related to paper setting and it does not provide any mechanism to mitigate academic dishonesty which is the primary objective of the proposed system. These systems have the potential to scan the questions in the Word documents and generate the final paper as a Word or XML document but the proposed system does not have that feature.
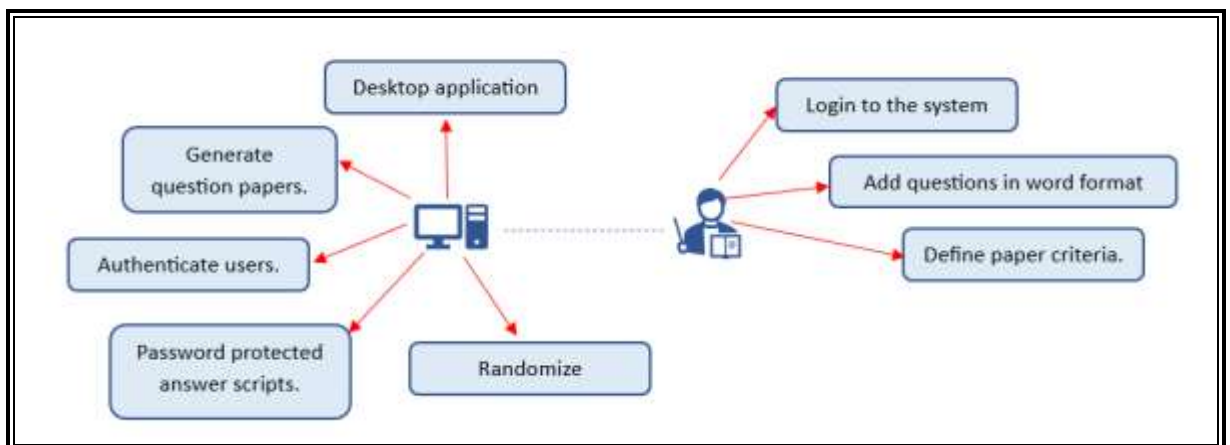

Figure 2 - This diagram shows the summary features of the existing systems

CONCLUSIONS

In the wake of the COVID-19 outbreak, distance and online education have experienced a surge in popularity, prompting numerous universities and institutes to transition to online assessments. While academic institutions have been receptive to online education, the adoption of online assessment methods has revealed certain vulnerabilities that raise concerns about upholding academic integrity. Notably, the existing question generation systems primarily aimed at simplifying the paper setting process lack the capacity to foster active student participation in the assessment process. Moreover, these systems predominantly function as desktop applications, rendering them inadequate for effective proctoring and monitoring to prevent academic malpractices.

In light of the aforementioned shortcomings observed in the current state of question generation systems, there exists a discernible research gap. The present study seeks to identify and address this gap by proposing a novel system that not only streamlines the question generation process but also ensures a secure and fair environment for online assessments. The envisioned platform is designed to actively engage students in the assessment process, promoting their involvement and contribution while also enhancing academic integrity.

An integral aspect lacking in the existing question generation systems is the incorporation of authentication and observation processes, which are pivotal in curbing dishonest practices during assessments. Previous studies have failed to introduce modifications to the question bank, a crucial step in mitigating academic dishonesty effectively. As a result, the proposed research aims to bridge this gap by developing an advanced system that integrates robust authentication mechanisms and incorporates observation protocols to bolster academic integrity during online assessments.

Conducting this literature survey serves as a critical initial step in identifying the shortcomings of current question generation systems and discerning the areas that require improvement. The insights gained from this survey will lay the foundation for the development of an innovative platform that addresses the existing research gap, fostering academic integrity and excellence in the realm of online assessments. By proactively examining and rectifying the limitations of previous approaches, the proposed system endeavors to elevate the standards of distance and online education, ensuring a more equitable and secure evaluation process for students and institutions alike.

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