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ICT BASED EXAMINATION REFORMS

Rakesh Kumar Giri

Associate Professor, Department of Computer Science & Engineering, Saisha Institutions,Chennai, India
Email: rakeshgiriap@gmail.com

ABSTRACT:

This paper looks into how important new technologies are for holding exams. E-examinations, which use electronic gadgets like computers, the internet, and mobile phones, are gaining worldwide acceptance for testing. Technology itself comes from a Latin word meaning materials, tools, and a method for solving real-world issues. Incorporating technology has modernized, improved reliability, broadened reach, and increased efficiency in all areas of education. These technological advantages are particularly noticeable in how e-examinations are conducted globally. Educational institutions trying out e-examinations are being forward-thinking by using a scientific method to tackle the issues found in traditional exams. The entire way we assess and examine has been reshaped by using information and communication technology (ICT) in education. This paper explores the various ICT tools used for these purposes, highlighting their impact on how effective, efficient, and practical education is. Compared to old methods, ICT tools offer several advantages, such as digital assessment software, automatic grading systems, and online testing platforms. These tools ensure greater accuracy and reduce the administrative burden on educators, while also allowing for testing from afar, instant feedback, and personalized learning. Online testing platforms, with their advanced proctoring features, offer flexible and secure testing settings, letting students take exams from anywhere while maintaining academic honesty. Digital assessment software offers a comprehensive way to gauge students' knowledge and skills, catering to different learning styles with formats like multiple-choice, short answers, and essays. In short, ICT technologies present groundbreaking opportunities for evaluating and assessing students in an educational setting promoting accuracy, speed, and inclusivity. As technology keeps advancing, these tools are going to play an increasingly significant role in shaping educational assessment and how effectively it meets the evolving needs of both teachers and learners. Historically, education has been viewed as a means to foster national progress and global cooperation. A nation's advancement is heavily influenced by the caliber of its education system. The advancement of a knowledge-based society is directly tied to the quality of education provided. Within the entire educational framework, assessment is crucial for the teaching and learning journey. Exams serve as a way to gauge what students have absorbed and retained during their studies, and they are an integral part of our educational structure. With the digital revolution, traditional media has given way to digital platforms and information and communication technology (ICT), and nearly every facet of human activity is now influenced by new computer technologies. It's undeniable that ICT holds immense promise for spreading knowledge, facilitating effective learning, and creating more efficient

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educational services. ICT has opened up new possibilities in education by improving access to resources and enhancing interaction. Regarding the examination system, universities and Public Service Commissions are transitioning from manual methods to computer technologies or ICT. This shift in how exams are managed will reduce human involvement by using ICT, as the technology offers benefits like efficient data storage, rapid retrieval, and consistent, tireless work. Global shifts in education and the growing demands of ICT have also significantly altered the ICT landscape and how it's used in education. ICT offers numerous opportunities to enhance the entire examination process. The move towards online applications for regular, entrance, and competitive exams, along with conducting these exams online, has made the system much simpler and more economical. for the examining bodies. Then again, this shift is also presenting a heap of difficulties for the young folks in rural areas who aren't exactly tech wizards. This paper is all about looking at the upsides and downsides of bringing technology into how we do exams. It also dives into the issues students run into when trying to get used to taking tests that are done online.

Keywords: ICT, Examination, Assessment, Artificial Intelligence, Quality Education, LMS, IT

I.INTRODUCTION

Technology can be described as a product in the sense that it is the end result of the systematic application of scientific knowledge in addressing human learning problem which include problems related to examination. The concept “new technology” is an indication that technology is not stagnant , but keeps bringing new ideas, knowledge, inventions and skills that should be applied. This is the explanation for the fact that developed countries are always developing and improving the ideas. The new technologies have given birth to the current usage of the new technology based examinations powered by the computers and other Information Technology (IT) products including electronic gadgets, microcomputers, mainframes, the Internet and mobile phones, etc. E-Examination is an end-to-end electronic assessment processes in which the Information and Communication Technology(ICT) is used for the presentation of the assessment activities and the recording of responses from the various students. This includes the end-to-end assessment process from the perspective of tutors, learners, learning establishments, awarding and regulating bodies, and the general public.

Technology can further be described as a process because it involves various series of actions that could lead in achieving a successful conduct of E-examinations. This includes functions connected with the management, organizations of human and non-human resources for the overall conduct of e-examinations. The e-examination is a welcome innovation because the conventional examination is plagued with several pitfalls such as examination leakages, impersonations, inadequate supervisors, demand for gratification by markers so that results can be influenced, bribe taking by supervisors or invigilators, and the most devastating of these is the delay and/or in many cases, non-release or delay of examination results especially where there are large classes or public examinations.

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The adoption of e-examination has more radical implications and challenges than mere changing the mode of examination. It can affect the entire structure of the education and probably change its patterns of work for staff and students.

Education has always been conceived as a tool to promote national development as well as international understanding. Education is a key factor determining a nation's progress. The quality of knowledge society depends on the quality of education. In the whole educational system, Evaluation plays an important role in the process of teaching and learning. Examination is an instrument to test what the student has learned and retained in his mind during course of study. Examination are integrated part of our educational system. With the technological revolution, the electric media is replaced by the digital media or ICT and virtually every aspect of human behavior or activity is in some way or another dependent on the new computer technologies. It is a fact that, ICT has great potential for knowledge dissemination, effective learning and the development of more efficient education services. ICT has opened new avenues in education by way of increased accessibility of resources and better interaction processes. In the case of Examination system, all the universities and school education boards are under a process of change from manual to computer technologies / ICT. This change in the examination system will minimize human intervention by adopting ICT since the technology promises compact storage, speedy retrieval of data and untiring diligent work. Global reforms in education and challenging ICT demands have also made a remarkable shift in the structure of ICT environment and the utilization of ICT in education. ICT is having lot of possibilities in improving the whole examination system. Trend of seeking online applications for regular, entrance /competitive examinations and conducting on-line examinations have made the system very simple and cost effective for the examining bodies. But, on the other hand, this change is also bringing lot of challenges to the rural youth of the country who are not that much technological. The present paper, focus on the possibilities and challenges of integrating ICT in examination system. The paper also focuses on the problems related with the ICT based examination system adoption by the students.

Over the last few decades, advancements in Information and Communication Technology have caused massive disruptions to everybody across virtually everything concerning education landscape. The examination process is perhaps the most significant domain influenced by these advancements. Historically, exams have been paper-driven and hand-scored answer sheets, with fixed test formats. Unfortunately, these (and other) methods get you only so far: it is difficult to scale most of them. This however presents a challenge for examination and assessment practices that ICT tools have the potential to resolve. The term Information and Communication Technologies covers a large number of tools, technology such as online exam platforms, digital question banks which will be used to enable tech driven e-portfolios, LMS Learning management system, adaptive testing technologies etc. The use of these tools could change the way that assessments are constructed, delivered and scored. With the help of an online examination platform, tests can be arranged remotely for a large number of students. Automated grading systems help our teachers to alleviate some of the grunt work in their field and establish conformity and neutrality in judging student

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performance. It allows the creation and management of repositories with assessment items, that can be updated effectively appropriated to Learning outcomes. It allows students, e-portfolios to reflection and document the journey of learning that has taken place during a course compared to traditional assessment. Centralized assessment LMS consolidate various evaluation tools into a single platform that stream lines the process for formative(ongoing) and summative(applied). These technologies use adaptive testing, which means the questions adapt in difficulty level based on how well you know your specific content area; it could provide a more completely individualized experience and one that is broader to directly measure an individual's learning progression.

While there are obvious benefits, the introduction of ICT in examinations and assessments comes with its own set of difficulties. However, technicalities like poor internet connection or lack of infrastructure may jeopardize the functionality of these utilities. The major challenges with online assessments are security issues regarding cheating and risks of leakage of questions, as data. When technology divides branch and digital, the gap in access to tech works against providing this relatively improved rank of education. Furthermore, lack of professional development and familiarity/fear about using technology by teachers/institute can also hamper ICT based assessment adoption. In this paper, we like to investigate how ICT tools can be used as part of examination and assessment processes. The study will analyze benefits and challenges of applying these tools, referencing existing literature as well as case studies and empirical data. The contribution of this research to the ever-occurring discourse on how technology can improve education in terms of quality and effectiveness lies with providing a complete overview about the use and possible use case scenarios for current implementations.

II.LITERATURE REVIEW

Information and Communication Technologies for education has been the subject of in-depth research, and many studies have demonstrated how revolutionary technology can be. Studies show that information and communication technologies can greatly enhance the precision, effectiveness, and usability of evaluations. For instance, digital platforms give a wider range of students' access to exams, and automated grading systems and adaptive testing technologies provide accurate and rapid feedback.

III.METHODOLOGY

Using a mixed-methods approach, this study combines qualitative interviews with instructors and students with quantitative survey data. A review of existing research and case studies from institutions that have effectively included ICT tools into their evaluation procedures are also included in the study.

ICT TOOLS IN ASSESSMENT

A number of ICT tools have been extensively used to update assessment and examination procedures:

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PLATFORMS FOR ONLINE EXAMINATIONS

These platforms provide scalable and safe test administration options. Exam integrity and efficiency are improved by features including time management, randomized question distribution, and automated proctoring (Brown & Knight, 1994).

- **Digital Question Banks:** Teachers can generate, save, and organize a variety of questions using these repositories. They make it easier to create thorough, varied evaluations that are quickly updated to meet the demands of the most recent curriculum (Sim et al., 2004).

- **E-Portfolios:** These online portfolios give students the ability to record and analyze their learning over time. They can be applied to formative and summative evaluations and offer a comprehensive picture of students' development (Conole & Oliver, 2007).

- **Learning Management Systems (LMS):** LMS provide a centralized platform for controlling every facet of the assessment process by integrating many assessment technologies. They offer analytics to monitor student performance and facilitate a variety of assessment formats, such as assignments, quizzes, and peer reviews (Walker & Handley, 2016).

- **Adaptive Testing Technologies**: These tools use algorithms to tailor assessments to individual student abilities. By adjusting the difficulty level of questions based on student responses, adaptive tests provide a more accurate measure of student knowledge and skills (Redecker & Johannessen, 2013).

IV.DISCUSSION

While there are many advantages to using ICT technologies in exams and assessments, there are also significant drawbacks. To tackle these obstacles, a concentrated endeavor is needed to enhance the technology framework, guarantee fair accessibility, and offer sufficient training to teachers. Additionally, it's important to investigate how cutting-edge technology like block chain and artificial intelligence might improve evaluation procedures.

ICT's ADVANTAGES FOR ASSESSMENT

Several studies demonstrate how ICT tools can improve educational evaluations' accessibility, accuracy, and efficiency in a transformative way.

Efficiency and Time Savings: The time and effort needed to assess student performance are greatly decreased by automated grading methods, like those used in online test platforms. Sim, Holifield, and Brown (2004) claim that because computerized assessments can handle a lot of test results quickly, teachers can concentrate on more difficult assignments that call for human judgment.

Accuracy and Consistency: By reducing human mistake in grading, ICT technologies produce assessments that are more

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objective and consistent. According to Walker and Handley (2016), automated solutions guarantee that every student is assessed

using the same standards by eliminating the unpredictability that comes with manual grading.

Inclusivity and Accessibility: Students with impairments and those who live far away can access digital assessment platforms more easily. Online tests can be made more inclusive by including accessibility tools like screen readers and changeable text sizes, according to Redecker and Johannessen (2013). Furthermore, geographical obstacles to education are diminished by online platforms that allow students to take tests from any location.

Instantaneous Feedback and Improved Learning: Real-time feedback is made possible by ICT technologies, and this is essential for efficient learning. According to Conole and Oliver (2007), prompt feedback enables students to comprehend their errors and enhances their performance on ensuing tests. Personalized feedback from adaptive testing systems, which modify the questions' difficulty level according to students' answers, can improve learning outcomes.

DIFFICULTIES IN USING ICT FOR ASSESSMENT

Notwithstanding the many advantages, there are a number of obstacles to overcome when integrating ICT into testing and evaluation:

Technical Issues: The reliance on stable internet connections and robust technological infrastructure can be a significant barrier. Institutions must invest in reliable technology to ensure smooth operation of online assessments (Sim et al., 2004).

Security Concerns: Ensuring the integrity and security of online assessments is critical. Issues such as cheating, data breaches, and unauthorized access must be addressed to maintain the credibility of digital assessments (Redecker & Johannessen, 2013).

Digital Divide: Disparities in access to technology can exacerbate educational inequalities. Students from disadvantaged backgrounds may lack the necessary devices or internet connectivity to participate in online assessments (Conole & Oliver, 2007).

Resistance to Change: Educators and institutions may be reluctant to adopt new technologies due to lack of familiarity or fear of change. Effective training and support are essential to encourage the adoption of ICT tools in assessment (Walker & Handley, 2016). Because they are unfamiliar with new technology or are afraid of change, educators and institutions may be hesitant to accept them. Adopting ICT technologies for evaluation requires effective training and support (Walker & Handley, 2016).

PROS AND CONS OF E-EXAMINATION AND PAPER BASED EXAMINATION

Security of Examination Paper: It is not possible to set different exam paper for different student and there are chances of leakage of exam paper while passing it to different examination centers in case of paper based exam but Online exam provides flexibility and

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security for question paper as each student can get random questions of same exam pattern.

Result Processing: In case of paper based exam overheads associated with verification of answers and result processing are huge and prone to errors whereas Online Examination Results are instant and accurate.

Examination Center: In case of traditional exam, management of examination includes classroom infrastructure, question paper, answer sheets whereas in Online Exam can be conducted where candidate can appear for it from remote examination centers with web camera surveillance technique. So hundreds or thousands of students can appear for it from various locations.

Logistic: Logistic cost is high in case of Paper Based Exam whereas minimal cost is low in case of online examinations

Subjective Questions: Online Exam can have limitations for subjective exams like drawing, diagrams whereas no such limitations for paper based exam.

Per Examination Cost: Due to flexibility of online examination cost per candidate can be around Rs. 50 to Rs. 150 including examination center cost where as Paper based exam would cost more than Rs300 to Rs.400 per candidate.

Supervisor: Online Exam can be managed in auto surveillance mode where web camera connected to the system would take snapshot of the student appearing for the exam. This would ensure that same student is appearing for the exam and system is able to keep track on student during exam whereas in case of paper based examination, for each designated set of students supervisor is required.

V.FUTURE TRENDS AND INNOVATIONS

ICT in evaluation has a bright future because of a number of new developments that are expected to further transform the industry, including:

Artificial Intelligence (AI): AI-powered solutions include automatic grading, individualized learning suggestions, and advanced analytics. According to Redecker and Johannessen (2013), artificial intelligence (AI) has the potential to improve assessment efficiency and accuracy while also offering deeper insights into student performance.

Blockchain Technology: This allows for the transparent and safe management of credentials and academic records. It can lower the possibility of fraud by ensuring the validity and verifiability of assessment outcomes (Walker & Handley, 2016).

Augmented Reality (AR) and Virtual Reality (VR): These technologies provide engaging and interactive evaluation experiences. According to Conole and Oliver (2007), evaluation methods that are more interesting and useful can be achieved by simulating real-world settings with VR and AR.

Advanced Data Analytics: Detailed insights into student performance and learning

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patternscan be obtained through enhanced data analytics. Teachers can utilize this information tomodify their lesson plans and evaluation strategies to better suit the requirements of their students (Brown & Knight, 1994)

PHASES OF EXAMINATION PROCESS

The complete examination process comprises the preparation phase of the examination including

Step 1: General examination planning

Step 2: Recording of course and examination data

Step 3: Carrying out time and room planning.

Enrolment and admission for the examination include:

Step 4:Student enrolment for examinations

Step 5:Generation of registers for the exam registration

Step 6:Verification of prerequisites for admission to examination.

The core part of the examination process chain is the examination itself

Processing the examination results comprises:

Step 8:Assessment and recording of the examination results
Step 9: Storage of data in the database.
Step10: Automated generation of mark information

Step11:Supplying additional information for examinees through administrators

Step 12: Creating reports, lists and certificates.

Finally, there are several permanent tasks such as

Step13:Coordinating examination tasks between the examination office and the lecturers

Step 14: Maintenance of relevant software systems.

VI.BENEFITS AND CHALLENGES

Today the development of electronic assessment tools and the use of electronic examinations have left behind their initial stage. Admittedly, many critical challenges had to be met on the way: the tremendous efforts that were necessary for the development of electronic exams or for the initial creation of a pool of questions through the lecturers, the insufficient familiarity of users with the new procedures, malfunctioning hardware components or operating systems or a failure in Internet access, legal security requirements that had to be met, in sufficient flexibility of examination regulations or attempts at manipulation and fraud. Therefore, the development of a methodologically sound and juridical stable electronic exam scenario demanded overcoming many barriers. Meanwhile a consolidation with regard to electronic

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examinations has been accomplished in many although not in all respects.

VII.OBSTACLES RELATED TO THE TRANSFER OF EXAMINATION SCENARIO

Some of the potential obstacles related to the transfer of examination procedures from a paper based scenario into a computer-based environment are as follows:

Organization of on-screen examination setting : Planning of simultaneous and of delayed exams, room planning with regard to PC pools and the number of available PC workstations, instruction of staff, establishing test centers, etc.

Conceptual design and methodology of exams: Design of examinations and planning of the exam process (generation of test item pools, designing exams along available question types, securing consistent levels of difficulty, etc.), computer-based preparation of the examination (conception and carrying out of practice exams and tests for the purpose of exercising, etc.)

Examination technology and tools: guaranteeing an interference-free and fraud-protected examination process, considering test tool-based intolerance against orthographic or other minor mistakes in the automatic exam correction process, etc.

Judicial requirements: setting up reliable authorization procedures, guaranteeing verifiability of results, adding the new exam forms to formal curriculum and exams regulations, etc.

Electronic examinations lead to significant changes in almost all aspects of the organization of examinations. Benefits and downsides will be reconsidered and weighed out against each other on the basis of the four dimensions of the electronic examination process depicted above. A main reason for adopting electronic examinations is the possibility to process a significantly larger amount of examinations; this possibility is of paramount importance for teachers and administrators. Examiners expect a reduction of workload regarding the preparation of exams and the correction process as well as considering administrative tasks such as the digital collection and announcement of examination results. Furthermore, potential sources of error are reduced. Problems with the legibility of handwritten exam answers do not apply in the context of digital data processing. Even the administrative processing of exam results is facilitated since media breaks are avoided within a comprehensive electronic environment. Although only a fraction of exam questions is suited for an automatic correction (i.e. multiple choice, long menu etc.), and although some questions require manual (post-)correction through the examiner, the facilitation of exam corrections generally saves time and increases the correction quality even of complex questions through computer-based pre-correction procedures.

From the students' viewpoint, there are even more benefits of electronic examinations such as new forms of self- contained knowledge diagnostics represented by digital practice exams (for the purpose of exercising) and periodic course-accompanying electronic tests. Self-contained knowledge diagnostics can also be fostered through supplying exemplary solutions to students' incorrect exam answers. Moreover, the (partial) automatic correction of tests

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leads to an increase in objectivity of examination marks. Additionally, the notification on results immediately after the end of the exam is highly welcome among students as an effective means of feedback.

VIII.CONCLUSION

An examination serves as a tool to evaluate what the student has understood and remembered throughout their study period. Examinations are an essential component of our educational system. With the technological revolution, electric media has now been replaced by digital media or ICT, and nearly every aspect and activity of human behavior is somehow linked to the latest computer technologies. ICT has broadened educational horizons by enhancing resource accessibility and improving interaction methods. In the scenario of the Examination system, all universities and Public Service Commissions are shifting from paper-based methods to computer technologies / ICT. This alteration in the testing system will aid in reducing human involvement through the use of ICT, as the technology assures efficient storage along with rapid data access and meticulous effort. Therefore, reforming the examination system through ICT is quite beneficial for attaining transparency, reliability, and efficiency in the current system. ICT tools significantly contribute to the modernization of examination and assessment methods by enhancing accessibility, accuracy, and speed. Nonetheless, addressing the associated challenges and embracing new technology is essential to achieve these benefits. Future research should continue exploring innovative strategies and effective methods for incorporating ICT into assessment to maximize its efficient use in enhancing educational outcomes.

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