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Facilitators' Perceptions on Online Assessment in Public Higher Learning Institutions in Tanzania; A Case Study of the Institute of Accountancy Arusha (IAA)

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Abstract.
Reliance on computerised systems for both learning and conducting research in learning environments has been proven to be of great importance in saving time and money to the institutions, facilitators and students as well as the government in general. However, research on facilitators' perceptions of computer-assisted assessment is lacking. The study's goal was to look into facilitators' perspectives on the use of computer-assisted assessments in Tanzanian public higher learning institutions, using the Institute of Accountancy Arusha (IAA) as a case study. The study population was all 187 facilitators at IAA, through which a sample size of 97 participants was used for this study. The study employed a quantitative research approach and a descriptive research design to conduct the study. In data analysis, the study employed descriptive analysis to analyse data through mean, standard deviation, frequencies and percentages, where SPSS version 26 aided the data analysis process. The study found that the majority of respondents are unwilling to adopt online assessment at IAA due to technical, academic, and security concerns. Based on these findings, the study concluded that management support is critical in providing facilitators with appropriate knowledge on the benefits and needs of using online assessment in Tanzanian public higher learning institutions, as well as providing facilitators with appropriate technological and pedagogical know-how on how to best use different online assessment software to create appropriate online exams. Also, to use the most up-to-date versions of the online management system with all the appropriate plug-ins to support online assessment. Lastly, management should equip their institutions with appropriate online assessment software, hardware, and stable electricity.

Keywords: Facilitators' Perception, Learning Environment, Computer-Assisted Assessment, IAA, Public Higher Learning Institutions.

1.0.Introduction.

Due to the development of information and communication technologies (ICT), there has been a growth in various online tools that can be used for learning and research activities (Lubua, Semlambo, & Pretorius, 2017). Some of these technologies have gained wide-scale acceptance, such as the use of email, while others find some of these applications are less pervasive than perceived before, such as the use of video conferencing (e.g., Zoom) (Shraim, 2019). Computer-assisted examinations are becoming common. This term covers any kind of computer use in assessing the knowledge, skills, and abilities of individuals.

Computer-assisted assessment comprises several things, such as delivery, marking, and analysis of all or part of the student assessment process using standalone or networking systems and associated technologies (Semlambo, Almasi, & Liechuka., 2022). Various researchers have covered the area and show potential in using computer-assisted assessments with regard to various negative impacts that might have hindered this technology (Alruwais, 2018). The study described the findings on perceptions of implementing computer-assisted assessments in developing countries like Tanzania, where reliable IT facilities for such a process are still a challenge (Kihoza, Zlotnikova, Bada, & Kalegele, 2016).

Online examinations increase the possibility of scoring high marks and improve the quality of results, supporting deeper analysis. Moreover, they provide immediate feedback (results), which eliminates the miss-consumption of facilitators' bias among students. In comparison with paper-based examinations, online

examinations can significantly improve the efficiency of data management tasks such as marking, moderations, and storing of information, as well as large invigilating numbers of classes and students, thus reducing facilitators' workload (Shraim, 2019). Although the Institute of Accountancy Arusha (IAA) has started implementing online examinations, the facilitators's perspective remains unexplored for most of Tanzania's higher learning institutions. Therefore, this study aims to assess facilitators' perceptions of online assessments who have experience in setting, invigilating, and preparing results reports for online examinations or computer-assisted assessments. The findings of this study will assist the institution in gaining important and strategic aspects of why most public higher learning institutions are straggling to establish and run such systems.

2.0.Literature Review

Significant research has been conducted about the perception of facilitators toward online examination systems around the globe (Farzin, 2016; James, 2016). The most cited significance is immediate results on examinations, which help students reflect on their learning methods and ways to improve. Furthermore, shifting from traditional paper examinations to online examinations helps facilitators to save time, money, and effort on things like printing, invigilation, examination moderations, and marking, leaving them with more time to give meaningful feedback to their students (Dreher, Reiners, & Dreher, 2011).

Other benefits of online assessiment include liability, validity, and practicability, which are essential in academic environments. In addition, marking examinations using technology is more effective than paper-based (Shraim, 2019). Research done by Baleni (2015) showed that students are more confident with their exams marked on an online examination system as computers are free from normal human errors. Furthermore, research shows that students prefer the transparency and fairness of online examinations compared to paper-based examinations. (Iannone & Simpson, 2013). However, it must be acknowledged that such systems are not reliable for certain kinds of examinations; they can only be reliable for examinations such as multiple-choice questions, true and false, marching items, and short answers. (Farzin, 2016; Semlambo, Almasi, & Liechuka., 2022). Other advantages of online assessiment include reducing chances for cheating as students receive questions in a different order from each other. Also, each examinee can be given different questions chosen by the system randomly from the question pool of the examination module.

Findings from different researchers showed that there is high consignment with online assessiments related to difficultness as well as time and skills required to generate objective questions in the form of black-filling, multiple-choice, and short-answer questions (Kuikka, Kitola, & Laakso, 2014; Jamil, Tariqb, & Shami, 2012). Furthermore, researchers found that other facilitators object to online examinations due to their resistance to change from paper-based examinations. As a result, management's commitment to supporting facilitators in online examinations is critical, both technically and academically (Alruwais, 2018). The design of an online assessment must follow academic principles rather than just technological know-how.

Facilitators are reported to have security concerns in relation to online examinations for issues like students' communication with other students outside examination rooms during exam sessions and browsing for answers online (Anusha., Soujanya.T, & S.Vasavi, 2012; Al-Saleem & Ullah, 2014; Semlambo, Almasi, & Liechuka., 2022). Such security issues in online exams can be addressed through the use of specific software such as web block software like Securexam Browser and Respondeus Lock Down Browser. This software disables features such as screen capture, copy and paste, right-click menu options, browser options, toolbar options, and function keys while the examinations are in session. Other security concerns are related to candidate authentication during an online examination, which can be done with the help of software and hardware such as webcams, figure print scanners, and biometric face recognition. (Sarrayrih & Ilyas, 2013).

3.0.Methodology

The study employed a quantitative approach to obtain the facilitators' perspective on computer-assisted-assessment at the Institute of Accountancy Arusha (IAA). The study chose this methodology because quantitative approaches to technology adoption and acceptance have been proven reliable by researchers, such as Sotelo and Livingood (2018) and JoyBillane and PeterEnevoldsen (2021). The population of the study included all facilitators at IAA (assistant-lecturers, lecturers, senior lecturers, associate professors, and

professors), totalling 187. Through the Kothari formula that says n = N/1+N(e)2 (Kothar, 2004), a sample of 97 participants was obtained. The validity and reliability of data were assured. Participants' consent was considered before questionnaires were distributed. Furthermore, questionnaires were sent to experts to evaluate their reliability and validity in comparison to the study objective. The study employed descriptive analysis to analyse the collected data.

4.0.Findings and Discussion

Respondents had negative sentiments regarding the IAA's online assessment systems. Overall, four of the fifteen questionnaire items obtained positive mean replies, and eleven received negative responses (Table 1). These evaluations are based on an approximate five-point Likert scale, with a midpoint mean value of 3 representing a neutral stance, a mean value above this representing a positive position, and a mean value below this representing a negative one.

The majority of respondents do not prefer online exams because of the difficulties they face during the setting of such exams (mean 2.80). Furthermore, for the case of security concerns, question randomisation was found to be effective in reducing students' cheating habits (mean of 3.97). Facilitators who gave negative replies, on the other hand, were most concerned about the institutions' ability to provide reliable security features for online examinations, such as facial recognition, fingerprint scanners, and reliable identity cards to candidates during online assessment sessions (mean 2.10). Furthermore, the Institute does not provide reliable means of power (stable electricity, UPS, and electrical generators) (mean 2.13) as well as facilitators' consignment on the appropriability of online examinations for some of the modules (mean 2.13).

Table 1; Facilitators' Perceptions on Online Examinations at IAA.

SN	Proposition	SDA %	DA %	NS %	A %	SA %	Mean
Participants Technical Concern							
1.1	It is easier to formulate online examinations than paper-based examinations.	6.7	33.3	40.0	13.3	6.7	2.80
1.2	The Institute provides technical support and training to all facilitators of online examinations in all modules.	3.3	3.3	26.7	60.0	6.7	2.63
1.3	I could easily access all the hardware and software required to formulate an online examination as it was reliable, up-to-date, and could function smoothly.	10.0	43.3	30.0	10.0	6.7	2.60
1.4	The institution provides a reliable means of electricity to support online examination sessions in terms of backup generators, inventors, and reliable UPS.	20.0	60.0	6.7	13.3	0.0	2.13
1.5	I could set the accessibility of questions to students immediately after the online examination's commencement.	3.3	6.7	20.0	50.0	20.0	3.77
1.6	I use a question bank to support randomisations of questions and make online examinations more effective.	16.7	40.0	20.0	13.3	10.0	2.60
Academic Contribution Concern							

SN	Proposition	SDA %	DA %	NS %	A %	SA %	Mean
SN	**Proposition**	**SDA %**	**DA %**	**NS %**	**A %**	**SA %**	
2.1	Immediate feedback on online examinations helped my students get a deeper understanding of the subject.	6.7	6.7	26.7	33.3	26.7	3.67
2.5	Online examinations facilitate more adoptive learning approach than paper-based examinations.	6.7	6.7	36.7	30.0	26.0	2.50
2.3	Online exams are appropriate for any module.	36.7	33.3	13.3	13.3	3.3	2.13
2.4	Online exams are appropriate to test learners' levels of knowledge.	3.3	23.3	43.3	30.0	0.0	3.97
2.5	Online exams are fairer than paper-based exams.	16.7	36.7	36.7	3.3	6.7	2.47
	1. Participants Security Concern						
3.1	Randomisation of questions reduces cheating habits among students.	0.0	3.3	36.7	33.3	26.7	3.97
3.2	Accessibility of online examinations is limited only to the session and venue, and the exam cannot be accessed anywhere else.	36.7	30.0	10.0	10.7	6.7	2.27
3.3	I appropriately locked all the screen capture, copy and paste, right-click menu options, browser options, toolbar options, and function key options during online examination sessions.	26.7	33.3	30.0	3.3	6.7	2.30
3.4	To make online examinations secure, the Institute uses technologies such as fingerprint scanners, facial recognition and provides a high level of security credentials to students.	40.0	30.0	10.0	20.0	0.0	2.10

Note: SDA: Strongly disagree, DA: Disagree, NS: Neither agree Nor disagree, A: Agree, SA: Strongly agree.

Source: Researchers (2022)

4.1. Participants Technical Concern

For the implementation of online assessment to be effective, reliable IT infrastructure is required. Table 1 demonstrates that 53.3% of participants were concerned about the dependability of online test technology. The present IT infrastructure of the IAA may be unable to manage the increasing number of students taking online assessments. About 80% of all participants were concerned about the Institute's electrical capability to enable online assessment. Sluggish computers, slow loading, bad network access, frequent power outages, and unsteady power generators can all interrupt exams. When one of these technological difficulties occurs, exams must be postponed, which is unpleasant and upsetting for students (Topal, 2016; Ahmed et al., 2021). Alsadoon (2017), Dreher, Reiners, and Dreher (2011), and Farahat (2012) are among the researchers who support these claims. The infrastructure of higher education should be enhanced, and labs should be adequately stocked with equipment to enable online assessment (Uchenna, 2012). Online assessment success

depends on institutional support, which includes providing appropriate exam conditions, making administrative procedures simple, and allocating the necessary financial resources for infrastructure upgrades.

Another time-saving benefit of online assessment, according to some, is the construction of banks of reusable multiple-choice questions that can be conveniently stored and reviewed for use with future cohorts. However, respondents had poor responses to this assumption (mean = 2.60). To limit the potential for cheating and memorisation, test items must be refreshed frequently. Quality assurance criteria for online test questions should include ensuring that question design is linked with course learning outcomes. For example, staff will need technical and pedagogical abilities as well as help to develop multiple-choice questions and feedback. However, most participants struggled with formulating appropriate questions for online exams (mean = 2.80), which might be a result of poor technical and pedagogical support to facilitators, as shown in Table 1 (mean = 2.63). Randomising questions from a question bank, on the other hand, would result in some students receiving relatively simple questions and others receiving more challenging ones. This discovery is in line with what other studies have discovered (Farzin, 2016; Alsadoon, 2017). As a result, adaptive testing is required to ensure that online exam questions accurately assess the same intended learning outcomes for all students and are of equal difficulty. Different question types are selected from a question bank, and algorithmic tools are used to assign them to levels of difficulty (Jordan, 2016).

4.2.Academic Contribution Concern

From a theoretical point of view, many studies have found that the fast response time is one of the most important educational benefits of online assessiments (Hodgson & Pang, 2012; Kuikka, Kitola, & Laakso, 2014). As seen in Table 1, 60% of respondents agreed or strongly agreed that quick feedback in online tests helps learners get a deeper understanding of the subject. However, some of the online examinations utilised at IAA are exclusively summative and do not give formative feedback. Immediate feedback can help pupils rectify misunderstandings and enhance their learning abilities (Dreher, Reiners, & Dreher, 2011). It is vital to offer learners timely and relevant feedback on both summative and formative assessments (Hodgson & Pang, 2012; Kuikka, Kitola, & Laakso, 2014). Online assessments are also seen as a summative evaluation for learning rather than a tool for boosting learning by offering restricted and real-time feedback. The difficulty in providing students with timely, relevant, and in-depth feedback stems from the significant effort required to train academic staff and assist them in producing quality feedback. This may include using a more innovative and efficient method such as audio, video, or written feedback (Cavanaugh & Song, 2014), according to the report. An online assessment is more than simply a tool for grading; it's also a part of the learning process.

Researchers such as Chua (2012) and Kuikka, Kitola, and Laakso (2014) concluded that modern technologies allow examinees to be exposed to video, audio, or simulations before completing various types of questions related to the multimedia, making online exams more interesting than older approaches. However, 70% of all participants oppose this scenario at IAA, which means not all modules can be supported with online examinations (mean = 2.13). Also, 56% of all participants disagree and strongly disagree that online exams provide a more adaptive learning approach than traditional paper-based exams. Digital learning that fits the demands of tech-savvy pupils is likely to be preferred. Academic staff must move away from traditional classroom methods and embrace new methods of integrating emerging technologies into the teaching and learning environment. Online assessment is part of an online learning approach that has become mainstream for many public institutions in the world, but most public higher learning institutions in Tanzania, including IAA, have been slow to fully embrace online learning. It takes time, money, and effort to build the infrastructure, skills, attitudes, and policies that make this strategy possible. Institutional support is essential to enhance the online learning approach's long-term development (Semlambo, Almasi, & Liechuka, 2022).

Table 1 reveals that only 30% of all respondents agree or strongly agree that online assessments may be utilised to assess a learner's comprehension level. Multiple-choice questions in the online assessment are regularly chastised for just measuring factual knowledge rather than comprehension. A student who is unclear about the proper response might just guess. Other researchers, such as Hodgson and Pang, 2012 and Cook and Jenkins (2010), have found the same thing; therefore, multiple-choice items should be mixed in

with other questions in an online assessment. Question types should include short essays and writing projects that demonstrate learners' understanding of the topic and critical thinking. When preparing for online assessments, creating non-objective questions to measure students' in-depth comprehension is a major difficulty (Cook & Jenkins, 2010). Based on the research by Kuikka, Kitola, and Laakso (2014), a lot of work needs to be done to train staff both technically and pedagogically so that they can make better multiple-choice questions and other types of questions that test the course's intended learning outcomes.

The versatility of testing to fit the different demands of learners is a key characteristic of an online assessment. However, adaptive testing, in which the following question is automatically altered by the programme based on each student's performance on previous portions of the assessment, can be used to test learners' level of understanding for individual students. Thus, more than half of the participants (53.4%) believed that online examinations are not fair compared to traditional paper-based examinations. The explanation for the general poor impression (mean = 2.47) might be that participants did not completely grasp the idea of adaptive testing because the assessments they were used to at IAA were in the traditional style. Several online test functions are available in Moodle and other software packages. This emphasises the need to maintain a consistent Moodle version and install all relevant plug-ins, such as assignment feedback and Adaptive Quiz, which allow facilitators to build exams that accurately assess the ability to do a test for each candidate (Hasan, 2016). In addition, different test software should be connected with Moodle to expand its capabilities or any leavening management system (LMS). Finally, personnel should be educated to generate adaptive test questions to make online tests more efficient.

In terms of time, effort, and money, especially in big classes, the completely automated procedure can eliminate or simplify printing, grading, results analysis, invigilation, and staff labour. This conclusion is consistent with the findings of numerous other studies (Dreher et al., 2011; Baleni, 2015). However, before using online assessment technology to minimise staff effort, it is required to transition from a paper-based to a digital approach to pedagogy and learning, which is a time-consuming and costly process, especially at the start (Jamil et al., 2012; Kuikka et al., 2014).

4.3.Participants Security Concern

A high level of security is required for any online assessment. Table 1 shows that participants are evenly split on whether online examinations are more secure than traditional exams in terms of test materials and outcomes. Similar conclusions were reached by Rasouli, Rahbania, and Attaran (2016) and Kuikka, Kitola, and Laakso (2014). Exam management systems like Moodle provide monitoring features that observe and record actions, including login, logout, exam access, question navigation, and replies which protect data from unauthorised access. The materials for each test are safely saved in a database on a server that is only accessible to authorised individuals. Maintaining the confidentiality and network security of online tests is crucial in order to avoid the exploitation of question banks and other data, which should be kept in a highly secure and encrypted manner. Further to this, 60% of all participants could not manage to appropriately lock all the screen capture, copy and paste, right-click menu options, browser options, toolbar options, and function key options during online examination sessions at IAA. This can result in an increase in cheating habits as students can copy materials from any browser and search engine to aid their exam performance.

Authentication of examinees is another critical feature of security, according to nearly two-thirds of all participants (item 3.4). For this reason, simply requiring a user name and password is insufficient. To enable invigilation and authentication, detection technologies such as cameras, biometric keystroke analysis, and other sophisticated software are available, allowing the system to verify students' identities and certify their achievements. However, unlike the usual setting of a classroom in the actual presence of a human invigilator, remote students generally take examinations in uncontrolled contexts such as their homes or public areas, making identity identification and monitoring more challenging for blended students. Public higher learning institutions in Tanzania, as a result, require real-time invigilation to show and sustain integrity. Students may take examinations in whatever place they want since remote proctoring software monitors their mouse movements, as well as their head and eye movements, to identify cheating attempts. However, at IAA, all of these features are not currently applied to online assessment, and access to online examinations is limited to the examination rooms, which increases cheating habits and reduces online assessment reliability (item 3.2).

Although Moodle does not have completely functional facilities for dealing with cheating and plagiarism, it does offer a variety of choices for randomising multiple-choice questions and shuffling responses, reducing unethical behaviour. Table 1 reveals that 60% of participants believed that using random questions from a bank made cheating less likely during online assessments than on paper, which is in accordance with Semlambo, Almasi and Liechuka (2022).

5.0. Conclusion and Recommendations.

Participants thought online examinations were less accessible than paper-based exams since IAA's only online exams are summative assessments delivered in computer laboratories. The rapid growth and dissemination of online and remote education are significant. Tanzania's educational environment is evolving, with most higher education institutions in various stages of using online assessment (Mathew, Alkawaz, & Johar, 2018). If more institutions use this method, it will be important to look at how flexible online assessment can be while still taking into account academic contributions, technological challenges, and security aspects of related infrastructure improvements.

This study looked at a facilitators's perception of such assessments. The study defined numerous areas, such as participant technical competence, in which factors such as familiarity and use of software, hardware, and other technologies involved with online assessment, such as a steady and dependable power supply, were assessed. Such subcategories may annoy facilitators as well as students, preventing them from taking and accepting online assessments. The category, on the other hand, puts light on the worry and tension that online exams can create for facilitators in the appropriate formulation of multiple-choice questions. A contribution to academia was another category. When compared to paper-based tests, facilitators agreed that online assessment provides some advantages, such as rapid feedback, support for a more adaptable learning strategy, and fairness. However, most participants are uncertain about their full commitment to online assessment due to a lack of knowledge about the benefits of online assessment, technological know-how and a preference for traditional paper-based assessment. While online exams are acceptable and beneficial in providing a more dependable and effective learning method, the study's convincing data suggests that security in online assessments should be a major focus because there are various methods for students to cheat using the internet and other online tools. As a result, most facilitators at IAA have not fully accepted online assessment, which results in a failure to fully adopt the technology by the Institute.

Based on the findings and literature, this study recommends that when preparing for online assessments, non-objective questions be considered to measure students' in-depth comprehension, which is a major challenge. Facilitators should be educated to generate adaptive test questions to make online assessments more efficient. There is also the need to maintain a consistent Moodle version and install all relevant plug-ins, such as assignment feedback and Adaptive Quiz, which allow facilitators to build exams that accurately assess each test-ability taker. Lastly, different test software should be connected with Moodle to expand its capabilities.

Furthermore, online examinations may be made more successful by making them genuine, trustworthy, safe, and adaptable in order to encourage higher learning institutions' facilitators and ensure compliance with learning outcomes. Institutional support is required for successful implementation, which includes facilitating administrative procedures, providing necessary financial support, improving infrastructure, building academic staff capacity, providing guidance as well as technical and pedagogical support, as well as creating suitable conditions for conducting online examinations through the use of software such as Securexam and Respondent Lock Down. Furthermore, the report recommends the formation of a special committee to oversee the Institute's online tests. According to this report, the institution's long-term planning should include an online test approach. Finally, the report recommends that the Tanzanian government, through the ministry of education, emphasise shifting away from paper-based assessments and toward online examinations. This would save higher education institutions money on exam moderation, invigilation, and marking while also giving facilitators more time to research and advise. Also eliminates bias complaints from students by marking exams by hand. More research should be done to identify facilitators' opinions on online exams and online learning in Tanzania's higher learning institutions' collaboration with different technologies that may be utilised to enhance this process. Furthermore, the study proposes more research to

be conducted to analyse adoptive methods that can be used to solve some of the modules that are perceived by the teacher not to be able to be assessed online, like modules with calculations.

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