Online Assessment and Examinations practices at the eCampus of Maseno University in Response to COVID 19 lockdown

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Abstract
The COVID-19 pandemic resulted in an increasing demand for online learning and led to the demand for the offer of online assessment at Maseno university. Prior to the COVID19 pandemic the institution had put in place measures for formative assessment using the institutional online learning platform while the summative assessment and exams was carried out on campus. This study therefore examines the lecturer's perspective on the practices that were put in place for online assessment during the COVID 19 lock down period so as to establish the consideration needed for successful implementation of online assessment and examinations. A questionnaire was administered to 42 heads of department and departmental exams coordinators who were tasked with implementing the measures for uploading the online exams and monitoring the assessments on the Learning Management system. The results of the study suggest that the implementation of online assessment and exams largely depends on ensuring the appropriate environment to ensure validity, reliability and security of the online assessments. The study further established the need for facilitating administrative procedures, improving infrastructure required for online exams and building the technical and pedagogical capacity of academic staff.
Key Words: Online examinations, lecturer's perspectives, Proctoring software

Introduction
During the COVID-19 pandemic, the closure of education institutions had a significant impact on learner-teacher interaction. This also impacted assessment of learners and of learning. In response to the lockdown measures implemented as a result of COVID-19 outbreak, universities have shifted to teaching and administering examinations online. A typical strategy put in place by many universities was to use the Online proctoring software to conduct exams. These tools can monitor students while attending the exam from home by recording live video of students taking the exam and perhaps the surrounding environment. Some of the systems use an artificial intelligence biometric system while others use a live proctor who watches the student during the exam using a webcam (Slusky, 2020; Halaweh, 2021) . The instructors are now required to adapt to the requirements of online courses which includes online approaches of assessment. This transition to online assessment presents instructors with new dynamics and therefore the instructors require pedagogical and technical support, and opportunities for instructor development (King & Boyatt, 2014) . There are certain considerations that need to be made before teaching and learning can take place in an online space, especially for instructors who are used to face-to-face environments to enable them effectively and efficiently teach and assess learners in the online space. These include relevant research and literature, suggestions from practice and pragmatic strategies for teaching and assessing students in the online environments and pedagogical development opportunities (Weleschuk, Dyjur, & Kelly, 2019).

Literature Review
Increased growth of online education has created an additional issue of devising effective proctoring for remotely-administered online examinations (Mitra & Gofman, 2016) . The inclusion of online assessment and bring-your-own-device models have offered alternatives to the large-scale examination rooms with paper-and-pencil invigilated examinations. Emerging issues with online exams are security, reliability , validity as well as the inclusion of innovative pedagogies and assessment approaches where examinations are considered necessary (Butler-Henderson & Crawford, 2020). Instructors worry about academic misconduct, students cheating, plagiarism, or otherwise getting unfair advantages over their peers (Abubakar & Adeshola, 2019; Dermo, 2014; Mellar et al. 2018). The security of online learning involves the management of the learners' profiles, authentication, authorization of access to exams and learning resources, and the examination process. It includes user behavior monitoring, which may trigger flags of fraud attempts. It also controls confidentiality, integrity, and availability of data which resides in databases and in transit within the networks, and can control enforcement of Digital Rights Management (DRM), etc (Slusky, 2020) . Measures of ensuring academic integrity are built into the Learning Management System, these include; randomization of questions, varying numbers, or blocking access to other course content during the assessment period (Tsai, 2016).

Securing integrity in online assessment is conceptually different to traditional approaches, with research indicating that categories of academic misconduct and their definitions need to be reconsidered for the digital age (Evering & Moorman, 2012). A longitudinal study sought to compare traditional exams against an online exam that was monitored in real-time by a remote proctor using a webcam. The findings of the study revealed that the student performance in both online and face to face contexts were comparable (Beust, Duchatelle, & Cauchard, 2018) . According to Beust et al., 2018, it was observed that delays were recorded in online exams where students were expected to draw diagrams, some students raised privacy concerns while another 5%

experienced technical challenges. The Findings of the study noted that approximately 70% of the students indicated that remote monitoring made it difficult to cheat while 80% noted that they would write an online exam again if given a chance and a further 90% were satisfied and prefer to accept the technical requirements of the online examination to having to travel to take up exams. Findings by Lilley et. al., 2016 reveal that learners taking up a proctored online exam felt supported and worry less something that allowed them to concentrate on their exam. The student also indicated that the remote live invigilation enhanced the credibility of their course (Lilley, Meere, & Barker, 2016).

Three Australian universities participated in a study to establish the student and Instructor perceptions of academic integrity in the transition to online exams (Reedy, Pfitzner, Rook, & Ellis, 2021) . The study established that the students identified the key cheating behaviors as; accessing resources, collusion, and impersonation. The instructors identified similar cheating behaviors in addition to contract cheating. Regarding access to resources, some exams permitted the access to resources but the scope was not clearly defined, so the students were confused about what resources were permitted in online exams, and they individually interpreted what resources they could access and what constituted cheating in the case of closed book exams and open book exams. The lack of clarity in examination instructions about what resources could be used contributed to confusion about what constituted cheating (Reedy, Pfitzner, Rook, & Ellis, 2021).

For instructors who would have wished to prevent learners from accessing resources, the alternative should have been the use of Lockdown browsers, however some lecturers noted that this was not permitted. Student noted the ineffectiveness of the use of lockdown browsers in an age where they have access to multiple digital devices. The study revealed that most students and staff perceived that one of the main ways of cheating in online exams was through collusion as it was "easy to share answers and communicate with other students" through physical contact or using telecommunications. Regarding impersonation, it was observed by both staff and students that the use of a proctoring application could be an effective strategy to counter impersonation. Contract cheating was identified by instructors from the three Australian universities as one of the cheating approaches that could have occurred among the learners. Some lecturers believed that "contract cheating is easier" as students have the "opportunity to purchase a response." The increased possibility of contract cheating was perceived by staff to potentially occur when students have the time to engage in contract cheating by having "questions in advance" (Reedy, Pfitzner, Rook, & Ellis, 2021) . When contract cheating is involved in an assignment or a test, the instructor is deprived of a valuable tool to evaluate the student's knowledge and score his or her performance reliably (Bretag, 2019).

Online Assessment and exams at Maseno University
The eCampus is at the focal point of mainstreaming eLearning for the programmes offered by Maseno University and has taken the pivotal role of improving the lecturers' productivity, efficiency and effectiveness especially in teaching high enrolment courses to on-campus students. Prior to the COVID-19 lock down the eCampus was in the process of exploring the use of online exams using a proctoring software for students taking up maseno University programmes and were unable to travel to the university campuses to take up final semester exams. A survey was carried out among this group of learners and it was established that 75% of the learners taking up their programme through the eCampus were in favor of the use of online examination approach. During the COVID-19 lock down, the eCampus was tasked to implement online online assessment and exams for all university programmes, due to the the lock-down. To ensure the policy implications of this roll out was adequately addressed, the university formed a committee which included the eCampus administrative and technical team as well as representatives from the academic division and the Deans and Heads of department of various schools. The committee proceeded to carry out benchmarking visits to other HEIs carrying out online assessments, the findings reinforced earlier recommendations by the eCampus in the use of a proctored system for the online exams. An extensive market survey of existing online exam proctoring systems resulted in the university settling on the use of the Respondus Lockdown browser and monitor. The online exams were implemented using the Moodle Quiz tool.

The ecampus then proceeded to scaling up the Moodle hosting package to allow the site manage high concurrency (3,000 concurrent users) and integrate the Moodle site to the Respondus Lockdown browser and monitor so that quizzes are set up and configured to use the application. When using the application to access a Moodle quiz, the learner were not be able to print, copy, go to another URL, access other applications, or close the quiz until it is submitted for grading. Some assessments did not require the use of the application. Lecturer capacity building workshops were organized in cohorts based on schools and faculties where the lecturers were trained by curriculum experts from the school of education on the how to develop online assessments while the technical team from the eCampus trained them on the implementation of the same on the Moodle Platform as well as the use of the proctoring application. The scope of the training included creating the exams into XML files for upload into Moodle Quiz tool, enabling the Respondus lockdown browser and monitor for a given quiz once the XML file with the exams questions have been uploaded. The instructors were further trained on reviewing and interpreting the online exams data from the Respondus Monitor. The lecturer training also

included the steps of grading the online exams and extracting reports on the learner exam data for further processing.

Learner preparations for online exams included setting up an online Mock examination space on the Moodle platform that allowed the learners to take up the mock exam using the Lockdown Browser and Monitor. The learners were provided with tutorials on the installation of the lockdown browser and the computer configuration required before proceeding with the online examinations. The LMS data on the Mock established that about 6,000 students were able to successfully complete the Mock exams. The Mock exams also presented the eCampus an opportunity to test that the upgraded infrastructure is able to sustain the concurrency of 3,000 users. The university projected about 15,000 students were to take up the online exams. The LMS statistics indicated that 46.7% of the students did the online exams and other forms of assessment.

Research design and Methodology
The study sought to investigate the online assessment and examination practices at the eCampus of Maseno University during the COVID-19 lockdown. A descriptive, survey research design was chosen to investigate the perceptions of lecturers in the use of and digital skills relating to online assessments and exams. The instrument used in the study used a scale, based on the work of Hillier (2014), consisting of items and rankings. The scale covered six major themes: (i) affective factors, (ii) pedagogy (iii) validity, (iv) reliability, (v) practicality, (vi) security (Hillier, 2014) . The study population was the heads of department and the departmental exam coordinators, the online survey was sent to all 42 lecturers by email, 39 responded which represents a 92% response rate.

Discussion
The purpose of this descriptive, survey research study was to:
1. determine the perceptions of lecturers regarding the effectiveness of online assessment and examinations in terms of pedagogy, validity, reliability, affective factors, practicality and security
2. Determine the main challenges to the implementation of online assessments and examinations at the eCampus of Maseno university.
3. Identify essential considerations needed for the successful implementation of online assessment and examinations

Lecturer Self -Assessment of Digitial Skills
About 86.6% rated themselves as having good to excellent computer skills while 13.3% rated themselves as having adequate computer skills. On teaching Online, 33.3% rated themselves as adequate while 60% rated themselves as good and 6.7% excellent. In addition, the use of Teaching using technology (including using software tools to teach some concepts of your courses e.g. simulations) was rate generally high at 66.7% as good and 6.7% as excellent. 20% of the instructors rated themselves as inadequately skilled in uploading Online examinations. Supporting learners taking exams online remains critical but there is still need to support 26.7% who rated their skills as inadequate. Lastly on Marking Exams Online 26.7% need further training.

Lecturer's Self-Assessment of Digital Skills	Inadequate	Adequate	Good	Excellent
Computer literacy	0%	13.3%	73.3%	13.3%
Teaching Online	0%	33.3%	60%	6.7%
Teaching using technology (including using software tools to teach some concepts of your courses e,g. simulations)	0%	26.7%	66.7%	6.7%
Uploading exams Online	20%	33.3%	33.3%	13.3%
Supporting learners taking exams online and assessments	26.7%	26.7%	33.3%	13.3%
Marking Exams Online and assessments	26.7%	20%	33.3%	20%

Pedagogy					
	Strongly Agree	Agree	Not Sure	Disagree	Strongly disagree
Immediate feedback in online exams helps learners to get a deeper understanding of the subject.	46.7%	33.33%	20%	0%	0%
Using cutting-edge technology in online exams enables students to take a new learning approach online learning.	46.7%	40%	13.33%	0%	0%
Online exams facilitate a more adaptive learning approach than paper-based ones.	40%	33.33%	20%	6.7%	0%
Validity					
	Strongly	Agree	Not Sure	Disagree	Strongly

	Agree				disagree
Online exams are appropriate for any subject area.	26.7%	40%	20%	6.7%	6.7%
Online exams are appropriate to test learners' level of knowledge.	26.7%	60%	0%	13.3%	0%
Online exams facilitate more authentic assessment than traditional methods through integration of multimedia, simulations, etc	13.3%	40%	26.7%	13.3%	6.7%

Reliability

	Strongly Agree	Agree	Not Sure	Disagree	Strongly disagree
Marking online exams automatically is more accurate than paper based marking.	46.7%	26.7%	6.7%	20%	0%
Online exams are fairer than paper-based exams.	13.3%	40%	33.33%	6.7%	6.7%
The technology used in online exams is reliable.	20%	33.3%	26.7%	20%	0%

Affective Factors

	Strongly Agree	Agree	Not Sure	Disagree	Strongly disagree
Online examinations reduce stress and exam anxiety	13.3%	26.7%	33.3%	26.7%	0%
Using online exams allows learners to focus and concentrate more on the questions	13.3%	20%	46.7%	13.3%	6.7%
Learners feel more comfortable doing an online exam than a paper based one.	20%	26.7%	40%	6.7%	6.7%

Practicality

	Strongly Agree	Agree	Not Sure	Disagree	Strongly disagree
Online exams are more efficient in terms of time, effort and money spent.	46.7%	40%	0%	13.3%	0%
Creating a question bank of reusable MCQs, allows easy storage and review	66.7%	33.3%	0%	0%	0%
Online exams are more accessible than paper-based exams.	40%	13.3%	40%	0%	6.7%

Security

	Strongly Agree	Agree	Not Sure	Disagree	Strongly disagree
Test materials and results of online exams are more secure than traditional methods.	40%	33.3%	20%	6.7%	0%
The technology used in online exams is sufficiently effective in dealing with cheating and plagiarism.	20%	20%	46.7%	6.7%	6.7%
Using randomised questions from a bank means that cheating during online exams is less likely than for paper-based ones	33.3%	46.7%	6.7%	13.3%	0%

Pedagogy

The research noted that 80% of the respondents were in agreement to the benefit afforded by online exams and assessment that offers immediate feedback to learners which in turn supports deeper understanding of the subject. The dimension of online exams and assessment providing learners with a possibility of using cutting-edge technology was strongly supported by the lecturers with 86.7% in agreement. Regarding adaptive learning which is a possibility afforded by the use of online assessment and exams, 73.3% were in agreement.

Validity

In order to establish whether the instructors perceive that online assessment and exams are appropriate for any subject area, 66.7% felt that it was appropriate while 6.7% were not sure and a similar percentage 6.7% felt it was not appropriate. Regarding if appropriate to test learners' level of knowledge, 86.7% agreed to this statement while 13.3% did not agree with this statement. In relation to online exams facilitating more authentic assessment than traditional methods through integration of multimedia, simulations, etc., 26.7% were not sure about this while 20.0% did not agree. Slightly more than half of respondents agreed to this statement 53.3%.

Reliability

73.4% of the lecturers surveyed felt that automatic marking is more accurate than paper-based marking while 20% did not agree, only 6.7% were not sure about this. 43.3% agree that online exams are fairer than paper-based exams while 13.4% disagree while 33.33% were not sure. On whether the technology used is reliable, Over half of participants (53.3%)agree while only 20% disagree. The results further indicate that 26.7% were not sure of the technology's reliability.

Affective Factors
40.0%) of the instructors perceive that online examinations reduce stress and exam anxiety while 26.7% do not agree to this. Similarly, 33.3% were not sure. On whether using online exams allows learners to focus and concentrate more on the questions 46.7% not sure, 33.3% agreed while 20.0% did not agreed to this statement. Almost half of respondents (46.7%) perceive that learners feel more comfortable doing online exams and assessment than a paper based one. Almost similar percentage (40%) were not sure and 13% did not agree.

Practicability
A large proportion of respondents (86.7%) perceive that online exams are more efficient in terms of time, effort and money spent while 13.3% do not agree. All respondents agree that creating a question bank of reusable MCQs, allows easy storage and review. On whether online exams are more accessible than paper-based exams more than half 53.3% of respondents agree while a negligible proportion (6.7%) do not agree. It emerged that 40.0% were not sure which was a huge proportion.

Security of Online Examination
73.3%   of the participants perceived that test materials and results of online exams are more secure than traditional methods while few 6.7% did not agree. 20% were not sure. In addition, 20% perceive that the technology used in online exams is sufficiently effective in dealing with cheating and plagiarism while 13% did not agree. Another 46.7% were not sure. 80% of the respondents agree that using randomized questions from a bank means that cheating during online exams is less likely compared to paper-based exams, 13.3% did not agree.

Challenges of Online Examination

In practice, it is the role of teaching staff to invigilate examinations.While online examination is auto invigilated. The challenges identified included:

1. Internet connectivity for learners remains weak. The respondents' mentioned that they ' once encountered network failure and had to reset the exam', while others reported of unstable internet especially on learner side.
2. Cheating by students is one of the issues that emerge as a challenge. The enviromental scannning was not adequately done leaving room for student to set up their examination environment ready for cheating while the instructor have no control.
3. Whereas system offers benefits, respondents mentioned that Staff need more training in preparation of online examination, converting exam for mass upload into the learning management system.

The main challenges to the implementation of online examinations at the eCampus of Maseno university are poor internet connectivity among learners, lack of guidelines on student environmental space for sitting examination and lastly, capacity for instructors to convert and upload online examination to online exam space given the quick implementation that needed to have been done to actualize the online exams and assessment during the COVID-19 lock down.

Needs for successful implementation of Online Examination

Lecturers cited that one of the critical areas is to build their capacity to set, design and upload assessments online. This should go hand in hand with editing system settings of the online assessments and exams so that they are available at the right time to the learners. Some lecturers felt that students need to be subjected to computer on campus instead of using individual devices. Some of the lecturers recommended that the online exams should be done in the lecture hall with invigilation if students are using their own devices to take up the online exams especially assessments and exams that are not using the proctoring application. The issues surrounding System security were also identified as critical to the lecturers in the use of online exams and assessments. Internet connectivity remains essential and therefore respondents mentioned that there is need to provide access to fast and reliable Internet to students and lecturers.

Conclusions and Recommendations

These findings offer valuable points of reference for the future implementation of online examinations and assessment given the   concerns expressed. It is therefore suggested that a holistic approach   should be considered, this should include creating an environment where the facilitating administrative procedures are in place to ensure the reliability and validity of the exams and assessments, improve the university infrastructure so as to make the online assessment more secure to mitigate any forms of cheating and academic staff capacity building i.e. both technical and pedagogy is essential for the successful implementation of online exams and assessment.

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