

Challenges and strategies for effective online examinations in higher education institutions: Insights from lecturers and students

¹Phumuzani Mpofu & ²Tatenda Thelma Machingauta

Abstract

Paper-based examinations are gradually being replaced as a reasonable number of Eswatini Higher Education Institutions (HEIs) have adopted online examinations. As a new phenomenon, the perspectives of both academic staff and learners had to be assessed. Hence, this study sought to assess the use of online examinations in the Kingdom of Eswatini HEIs. The research was qualitative in nature utilizing the Participatory Action Learning and Action Research (PALAR) design to unravel the impact of the pedagogical innovation as well as factors such as security and practicality to effect best action in the advancement of HEI in the country. Similarly, the Cultural Historical Activity Theory (CHAT) gave insight to the study. For comprehensive data collection, 15 learners and 10 academic staff from HEIs who use e-exams were purposively selected and interviewed. Generated data were analysed thematically; data were transcribed, coded, and categorised to come up with major patterns and perceptions as themes. Major findings revealed that online exams were easy to administer and mark, secured, flexible, promotes lifelong learning, and reduce risk associated with student travel. However, online examinations promoted malpractice among students. Other challenges on the administration of online examinations include: students and lecturers lack technological skills and poor internet connectivity. The results suggest training of lecturers and students on the use of online examinations, and investing in powerful technologies to support online examinations. With the emerging adoption of digital technology in the HEIs, it is necessary for policymakers to address academic misconduct by drafting relevant policies and procedures.

Keywords: *online-examination, pedagogy, PALAR, higher education institution*

Article History:

Received: April 24, 2024

Accepted: May 31, 2024

Revised: May 29, 2024

Published online: June 7, 2024

Suggested Citation:

Mpofu, P. & Machingauta, T.T. (2024). Challenges and strategies for effective online examinations in higher education institutions: Insights from lecturers and students. *International Journal of Educational Management and Development Studies*, 5 (2), 187-208. <https://doi.org/10.53378/353067>

About the authors:

¹Corresponding author. School of Human and Community Development University of Witwatersrand, South Africa. Email: mpofup89@gmail.com. <https://orcid.org/0000-0002-5671-9263>

²Department of Psychology, Faculty of social sciences, Midlands State University, Zimbabwe. <http://orcid.org/0009-0004-5045-7364>



1. Introduction

The education system experienced a paradigm shift during the period of the impetuous Covid-19 pandemic. Online teaching became an inevitable trend as higher education institutions (HEIs) were banned from holding traditional face to face classes (Liao et al., 2022; Babbar & Gupta, 2022; Coman et al., 2020; Mishra et al., 2020; Ndibalema, 2022) due to health and mobility restrictions. The traditional teaching and learning platform was replaced overnight by e-learning, where the students started taking part in the lectures, seated at their homes solely with the help of their mobile phones or laptops/desktops via internet connection (Gupta et al., 2023). As the learning became virtual, the introduction of e-examinations was embraced (Eltahir et al., 2022; Tan et al., 2021; Khan et al., 2021; Turnbull et al., 2021; Bashir et al., 2021; Dhawan, 2020) though with some reservations. With much convenience for the learners, Makgakga (2023) describes online examinations also known as take-home examinations (THE) as conducted at any place be it office, home, or the examination centre using technological devices such as computers and mobile phones.

A few years after Covid-19, paper-based examinations were gradually being replaced by e-exams in HEIs across the Kingdom of Eswatini. The widespread adoption of digital techniques was attributed to its time-saving nature, relative cost efficiency and the e-learning mantra, one can learn 'anywhere anytime' (Thambusamy & Singh, 2021; Waheeda et al., 2023). While Waheeda et al. (2023) argue that assessment is a vital component of the educational process and Bhebhe and Maphosa (2020) assert that it allows educators gauge the level of students' knowledge, several scholars were not convinced with the effectiveness of e-examinations (Itani et al., 2022; That SARANI et al., 2023; Cai, 2022; Montenegro-Rueda et al., 2021; Awad Ahmed et al., 2021; Khan & Khan, 2019; French et al., 2023; Lee et al., 2022). Several studies highlighted the effectiveness of online assessments during the Covid-19 pandemic (Mate & Weidenhofer, 2021; Butler-Henderson & Crawford, 2020) and years after the pandemic. However, there were several notable loopholes in the conduct of online assessments. Studies highlighted significant difficulties faced by developing countries including weak internet connectivity (Gupta et al., 2023; Mahlangu & Makwasha, 2023; Gul et al., 2022; Ndibalema, 2022; Zarei & Mohammadi, 2022), limited knowledge on ICT usage (Gupta et al., 2023; Mahlangu & Makwasha, 2023; Ndibalema, 2022; Zarei & Mohammadi, 2022), and cheating and plagiarism (Mahlangu & Makwasha, 2023). While the positive and

negative aspects of online education and assessments were presented and remained debated, the fact remains that online assessment is now part of any HEI. Hence, it is imperative for them to develop strategies and techniques on the effective implementation of online assessments.

This study assessed the use of online examinations in the Kingdom of Eswatini HEIs. Specifically, it evaluated the experiences of lecturers and students on the use of online examinations and identified the strategies adopted for the effective implementation of online examinations.

2. Literature review

2.1. Theoretical framework

The Cultural Historical Activity Theory (CHAT) theory gave insight to the study. CHAT is a social theory which is useful as a methodological framework for the vital task of studying practice-based learning in complex learning environments. It is an apparatus considering learning as occurring through practice, through collective activity, and mediated by culturally specific instruments (Qureshi, 2021).

The CHAT theory was adopted as it enables researchers to analyse complex and evolving professional practices and practitioners to engage in reflective research (Foot, 2014). This theory allows a subject (or actor), an object (a focal entity and/or a desired outcome), and the tools employed by the subject to act on the focal object or pursue a desired outcome. In this study, the CHAT helps identify the perceptions of students and educators as they might both face challenges with online examination. For example, the teachers have been used to the traditional way of running examinations that is, the paper-system as a tool, while a paradigm shift to online system has been introduced in HEIs. Invigilators have been used as tools to curb cheating and academic unfair practice by learners, however with the advent of online examinations new tools need to be put in place to reduce malpractice by learners. On the other hand, amidst the applauding of online exams for efficiency, the students have unraveled issues that need further exploration.

2.2. Teacher and student expectations of online examination

The traditional face-to-face teacher-student interaction got replaced overnight by e-learning, where the students started taking part in the lectures, seated at their homes solely with

the help of their mobile phones or laptops/desktops via internet connection (Gupta et al. 2023). The education system had no choice but to migrate to e-learning platforms without readiness and preparedness posing challenges for both students and lecturers. The study of Garga and Goel (2022) on the perceptions of lecturers and students on online examinations highlighted that online assessments had several benefits over traditional classroom exams, such as the ease of evaluation, reduced cost, time and instant feedback. Similarly, Boitshwarelo et al. (2017) provided evidence that online tests could be used to counteract high workloads of academics and particularly in the assessment and marking of large student groups, while providing students with immediate and quality feedback that contributes to their learning. On the student perspectives, Bhebhe and Maphosa (2020) posits that online assessments offer a chance for students to work effectively without considering distance, disability, or illnesses, though most vulnerable learners are also among those with poor digital skills. Furthermore, Makgakga (2023) found positive student perceptions that made online examinations pleasurable i.e. cost saving, saving on travel time, writing at one's own pace, and space, submitting answer sheets online, and offline.

While online education is expanding due to flexibility and accessibility, it also poses challenges as well. According to Makgakga (2023), difficulty using the invigilator App, noise pollution, network connectivity, and load shedding were the negative perceptions on the usefulness of online examinations. Similarly, Waheeda et al. (2023) disclosed that Maldivian HEIs faced technical difficulties, internet connections and students' lack of basic technological skills as observed by both the students and lectures. On the other hand, Mahlangu and Makwasha (2023) found that lack of internet access, computing devices and the digital skills to access and navigate online assessment platforms being the challenges of online assessments. While most of these studies focused on the challenges brought about by online learning and examination, the current research assessed the use of online examinations in HEIs in the Kingdom of Eswatini. Since the literature is dearth, this research seeks to add literature on online examinations as well as draw strategies that could improve the use of online examinations to enhance quality and credibility of online studies.

2.3. Effective implementation of online examinations

Previous research studies highlight strategies that could be adopted for the effective implementation of online examinations in the face of challenges such as cheating, accessibility

and technical issues. While the strategies adopted by teachers and schools to prevent academic misconduct are different (Liao et al., 2022), Garga and Goel (2022) advocated that schools should start from the design of examination methods. For example, methods such as randomization of questions, progressive assignments, immediate responses or oral presentations, and strategies for integrity (such as integrity policies, which promote a code of honour for students), emphasis on the nature of education, and de-emphasis on grades, will naturally reduce cheating. On the other hand, Bhebhe and Maphosa (2022) argued that the minimized amount of time to take exams, short answer or essay questions, shuffling of test questions, and plagiarism detection software are powerful strategies to curb cheating during online examinations. Meccawy et al. (2021) in their cross-sectional study to examine the perceptions of students and faculty of online assessment practices in HEI during Covid-19 pandemic found that there is a need for a multilevel approach to the problems of cheating and plagiarism, including raising student awareness and ethics, training teachers to detect cheating methods, and institutions activating their code of practice and applying severe sanctions on those who engage in such practices. In view of the previous literature, the current research assessed the strategies that could be adopted for the effective implementation of online examinations in HEIs.

3. Methodology

This study utilised the qualitative approach which allowed the researchers to get insight and access the feelings of the lecturers and students on the use of online examinations. According to Creswell and Creswell (2018), qualitative research can help one comprehend the participants' subjective interpretations of their experiences under circumstances. Participatory Action Learning and Action Research (PALAR) was used in this study, which Wood and Zuber-Skerritt (2013) denotes with 7Cs and 3Rs, as principles namely communication, commitment, compromise, collaboration, competence, critical self-reflection, and coaching operationalized by the concepts of relationship, reflection, and recognition. Hence, the study applied PALAR with students and academic staff to collaboratively produce transformative knowledge through research and learning.

3.1. Population, sample, and sampling procedure

According to Kumar (2019), the study population is a group of distinct species, such as humans, animals, or plants that have similar, shared traits. In this study the population comprised of lecturers and students in four Eswatini institutions of Higher Learning. The study used purposive sampling technique, a collection of various non-probability sampling methods. Rai and Thapa (2015) describe purposive sampling as judgemental, selective, or subjective sampling and dependent on the researcher's judgement in choosing the participants. Similarly, Robinson (2014) asserts that purposive sampling is an intentional selection of informants based on their ability to elucidate a specific theme, concept, or phenomenon. In this study, 15 students and 10 academic staff were selected with purpose since they were information-rich, available and had the ability to articulate opinions from a lived experience. Participants were selected from HEIs that are implementing online assessments in Eswatini.

3.2. Data collection methods

Semi-structured interviews were used to collect data from the academic staff. According to Smith (2014), semi-structured interviews attempt as much as possible to delve into the participants' social and psychological milieu. Kakilla (2021) adds that semi-structured interview can examine the discussions closely and confirm the participants' initial, superficial answers. The researchers tried to gather as much data as they could about the participants' perceptions on the use of online examinations. On the other hand, a focus group discussion, frequently seen as a time and money-effective means of gathering data from a variety of individuals (Scheelbeek et al., 2020), was used for the students. This focus group was made up of students from the four selected institutions. The researchers collaborated whereby one facilitated focus groups as well as the interviews with the other transcribing notes and recording the processes.

3.3. Data analysis

Qualitative data was generated; hence data was analysed thematically; transcribed, coded manually, and categorised to come up with major patterns and perceptions. Through this scrupulous procedure, overarching themes within the data patterns and trends were identified. Thematic analysis streamlined the data as recurring ideas were fused hence allowing for

comprehensible insightful narrative accounts. Common issues were identified as well as main themes summarising all the perceptions that were collected.

3.4. Ethical considerations

The study was carried out strictly in accordance with the ethical guidelines necessary for carrying out research. The researchers informed the participants about the study, what participation entailed, their autonomy as well as reassurance on how they could quit at any time. Confidentiality was ensured in that the participants' information and identity were protected as well as ensuring that the recording and documents kept not accessible to third parties. Another ethical consideration that governed the research is respect for participants. The researchers ensured that there was no awkward power dynamics in that they did not impose their perceptions and beliefs on the participants but treated them with dignity and fairness.

4. Results

The main purpose of this research was to assess the use of online examinations in Eswatini HEIs. The findings of the study are presented using code names to protect the identity of the participants. [L] represents perceptions expressed by lecturers whereas [S] represents perceptions by students. The results of the study questions were presented using thematic analysis.

4.1. Insights of lecturers and students on the use of online examinations

The study sought to find the perceptions of the lecturers and students on the use of online examinations. The themes that emerged are (a) easy to administer and mark, (b) security of examinations is improved, (c) online examinations are flexible, (d) online examinations can promote lifelong learning, (e) it reduces risk associated with traveling, (f) online examinations can promote malpractice among students (examination dishonest), (g) some students and lecturers lack technological skills and (h) poor internet connectivity emerged as a limitation.

Online examinations are easy to administer and mark. The lecturers and students felt that online examinations were easy to administer and mark. This is special so for the objective type of examinations.

Online examinations have reduced our workload as lecturers. All you must do, is setting the examination and giving it to a technician to upload it into the system. The system marks the examination as it is being written. [L3]

Online exams are quicker to administer as there is no preparing of the room and invigilation. [L1]

I think online exams are good because there is no printing of papers thereby promoting a green environment that is advocated by environmentalists. [L7]

From these excerpts, online exams have less work as one does not print papers or arrange venues as in traditional examinations, which presumes that online examinations are useful in this era.

Security of examinations is improved. The participants felt that online examinations improve the security of examinations. This happens only if the technicians can be trusted. Online examinations minimise the number of people handling the examinations. If it leaks, a few number of people are held accountable.

Security is not compromised as there is no need to secure the exams, for example, last year here in Eswatini examination papers for high schools leaked. The source for online exam is one unlike the physical exams which has many sources as papers are distributed to and from centres. [L4]

Secure platforms help in improving the security of examinations and using randomized question papers for each student. [L6]

From these excerpts participants felt that the use of online examinations can help reduce leakage of examinations. This is only possible if those few involved exercise a highly level of professionalism.

Online examinations are flexible. Both students and lecturers liked the flexibility of online examinations. They felt, they are user-friendly than the physical examinations. Some of the participants noted the following.

Online examinations are appreciated for their flexibility and convenience. Students can take exams from any location with internet access, saving time and resources on commuting time to exam centres. Lecturers also have the flexibility to design and schedule exams according to their conveniences. [S5] [S3]

Students find it convenient and beneficial for students to write examinations online because it accommodates everyone especially the working class as they will be able to write exams anywhere in the country without travelling or having to come to the institution. It is also true that online examinations promote diversity because we have students from across Africa to write exams. [L6]

Online examinations can promote lifelong learning. Online examinations help to promote lifelong learning among the working class and everyone.

Online examinations give everyone an opportunity to learn. Some employers can be impossible. Getting off to write physical examinations can be a problem to some students. However online examinations due to their flexibility can be taken anytime and anywhere. [L7]

Online examinations became a great option to everyone who wants to further his or her studies since there is no need to take a study leave from work.

Online examinations reduce risks and costs associated with traveling. Physical examinations need one to travel from home to examination centre putting one at unnecessary costs and risks of being involved in accidents.

Online examinations save us cost of traveling, accommodation, and risks of being involved in accidents while traveling to write physical examinations. [S8]

Though students need to buy data for the examination if they are not on Wi-Fi data cost is better than paying for transport and accommodation. [L9]

Both students and lecturers feel online examinations reduces costs incurred by the students.

Online examinations can promote malpractice among students. Both students and lecturers complained about students' dishonesty in online examinations. They cited that some students may hire another person to write the examination on their behalf while some students may use artificial intelligence. There is also evidence of copying from various sources even in questions that need application.

Online examinations is vulnerable to cheating and copying hence more people can easily acquire too many qualifications which they don't deserve or even receiving qualifications without basic knowledge needed in the industry. [S2]

I think lecturers would feel like online examinations are not effective enough to assess students academically since some students may even research during the examination using certain websites such as Artificial Intelligence. [S4]

With those examinations you might not be sure whether it is indeed the student writing or an imposter. [L8] [L4]

Though both students and lecturers cited some advantages that come with online examinations, they also pointed challenges of producing poor graduates due to various academic misconduct and dishonesty as well as using other people and AI to write the exam for them.

Some students and lecturers lack technological skills. The other challenge cited on the use of online examinations is the lack of technological skills on the part of the students and lecturers.

Students and lecturers may encounter technical challenges when conducting online examinations. Issues like internet connectivity problems and computer glitches can negatively impact the exam experience. [S5]

We both as lecturers and students encounter technical challenges when conducting online examinations. We sometimes face internet connectivity problems as well as computer glitches during examinations which is disturbing and cause panics, anxiety, and stress. [L6]

Technology can embarrass you. Sometimes we submit work that is not complete due to technophobia. [S11]

The participants clearly identified the need for lecturers and students to enhance their digital literacy specially on online learning and examinations.

Technical glitches, poor internet connectivity and load shedding. Most countries including Eswatini experience serious challenges in terms of internet connectivity and load shedding. This can jeopardise the smooth progress of online examinations. Internet connectivity is a serious issue in most rural areas.

There is untimely load shedding in our communities, such that you might find yourself without power in the middle of an exam which will disturb Wi-Fi connections which in turn hinders completion of examinations on time. [S12]

Some of us we stay in rural areas where there is serious internet connectivity. Sometimes I am forced to travel to town when there is an examination to be written. [S10]

Each student has a portal created for them but at times these portals are not updated and in some instances the system can be down and it's a big challenge for us, it is also frustrating. [S7]

The participants described online examinations as associated with unforeseen challenges that can disturb or hinder its successful completion, which are mostly technical in characteristics.

4.2. Strategies for effective implementation of online examinations

The second research question sought to find strategies that can be adopted for effective implementation of online examinations. The following themes emerged: (a) investing on powerful software to prevent malpractice, (b) setting application type of questions, (c) training both lecturers and students online learning, (d) institutions should use reliable internet service providers like star link, (e) open book examinations, (f) improving internet access in all parts of the country, and (g) investing alternative sources of electricity.

Investing on powerful software to prevent malpractice. With the challenges cited by both lecturers and students on the use of online examinations, buying powerful software was suggested. The software will minimise the probability of students copying or using impostors to write for them. Some of the participants had this to say:

Investing on specialised invigilation software with a camera system can help prevent students from copying or using other people to write for them. [L2]

We need more security on online examinations and applications that will continuously inspect the exam room where the student is writing. It will be advantageous to have software that guarantees examiners that students open the exam browser only. I believe it will promote effective assessment. [L1]

They should implement a strong authentication system to verify the identity of the exam takers. This can include multi- factor authentication methods like email verification, SMS verification or biometric authentication. In addition, access control should be enforced to prevent unauthorised access to the examination. [S5]

The participants emphasise the importance of beefing up security using software so that students find it difficult to cheat when writing online examinations.

Setting application type of questions and setting objective examinations. Most of the lecturers who participated in the study felt that setting application type of questions for subjective exams and giving jumbled objective exams will help minimise malpractice.

To deter students from colluding, randomized question banks have worked for us as an institution. You simply create a pool of questions and set the system to randomly select a set number of questions for each different which means that each student will get their own set in a different order meaning that number one for student A might appear as number ten for student B. [L5, L9]

It is also wise to set objective questions for the examinations to avoid students from consulting their browsers as they try to get sources and references for their essays. Objective questions will also be an advantage for me as they will be marked automatically hence give immediate feedback to the student. [L3]

Another effective way is setting application types of essay questions that will make it difficult for students to copy and paste. [L10]

The participants suggest that the examination structure can be enhanced to minimise copying in online examinations.

Training both lecturers and students online learning. Students and lecturers cited technical challenges when using online examinations. They suggested that institutions should first train students and lecturers online teaching and learning so that they can be fluid users of online facilities. This will minimise challenges when writing and marking online examinations.

We really need to move with the times but then the system was just introduced to us without orientation on how we operate the systems, we need coaching so that we can gain confidence. This will help reduce mistakes of sending incomplete work or deleting information before saving it. [S14]

I feel that the college just assumed that we are digitally oriented, yet not all of us can manoeuvre through the exam servers, at first, I panicked as there was no one to help me out with the logging in that I was failing, and the school tech-person's phone seemed engaged as I tried to reach out to him for help. I think if we get to be trained beforehand on the necessary technical skill required. [S9]

We need training on online platforms, I still face challenges with the marking of the essays, and you find that sometimes we might take longer before giving feedback. [L6]

Institutions should use reliable internet service providers like Star Link. One challenge noted from participants is the disruptions of examinations due to poor connectivity. They suggested that institutions should endeavour to use reliable internet service providers like Star Link in Eswatini.

It is disturbing to be cut in the middle of an examination because internet has failed at the server. I suggest institutions must choose reliable internet service providers. [S6]

I find it disturbing that I am forced to set a new examination because the system failed while students writing the examinations. Sometimes students are made to rewrite the same examination. This will promote copying. Investing on a powerful network service provider is ideal. [L7]

With the pressing issues on internet connectivity, the participants urged the need to use a reliable service provider. Examinations need not to be disrupted because of failed network.

Open book examinations. Some participants suggested the use of open book examinations. They felt book examinations are not prone to academic misconduct.

In our institution we use book examinations and objectives type of examinations to reduce the probability of students copying the examination. [L4]

Improving internet access in all parts of the country. Participants complained about poor internet connectivity in some parts of the country. This made it difficult for the online examinations to be administered smoothly. They suggested the Ministry of Information Communication and Technology ensure that all parts of the country are well connected.

They should ensure that the online examination platforms are built on a stable and reliable technology infrastructure which includes having sufficient server capacity, scalable resources, and measures to prevent technical glitches or system failures during the exams. [S9]

Internet service providers like MTN, SPTC should work with the ministry of information communication technology to install boosters in all parts of the country. [L10]

The government in partnership with relevant stakeholders is encouraged to install boosters all over the country to improve internet access.

Investing alternative sources of electricity. The other challenge that was raised was power cuts due to load shedding. Participants suggested alternative sources of electricity like solar systems and generators.

With continued power cuts due to load shedding I suggest institutions, government and individuals must invest into alternative sources of electricity like solar and using generators. [L1, L5]

5. Discussion

This study revealed that administration and marking of online examinations was easier, similar with the research findings of McGee (2013) on the concomitant decrease in resources, increased student to staff ratios and teaching assessment workloads, and Howe (2020) on the reduced workloads of marking and moderation. The use of online examinations reduced time spent on routine work as compared to the traditional paper and pen system. It also emerged from this study that the security of exams was improved, which was also noted by Qpercom (2021) that database encryption is used as a standard with online exams, and Alsalmi et al. (2022) that data could be stored in a single server. Unlike traditional examinations, Nkambule (2023) notes that in Eswatini, The Exams Council preliminary findings showed that the magnitude and extent of the leakage of examinations was not contained or confined to a particular centre or region, with several country-wide candidates suspected to have received contents of some question papers before the examination was written. This study argues that online assessment has higher and tighter security with only one person accountable if leakage occurs.

This study also indicated that online examinations were flexible, finding that resonates with Bhebhe and Maphosa (2020) who assert that online assessments provided an added flexibility in terms of timings, and offers a chance for students to work effectively without considering distance, disability, or illnesses. As it incorporates diversity, online exams are inclusive, non-discriminatory, efficient, and flexible. It was also revealed in this study that online examinations promoted long-life learning. As Satam (2023) noted, online learning has revolutionized education by breaking down barriers as it empowers learners to take control of

their education, promotes life-long learning and ensures that education is accessible to all regardless of their circumstances. It also emanated from this study that there is reduced risk associate with travelling, congruent with Al Rawashdeh et al. (2021) that e-learning allows to observe much flexible learning ways to go for classes with much reduced need for travel.

This study highlights that online examinations promoted malpractice among students. According to Garga and Goel (2022), there are five categories of cheating which include, impersonation, prohibited aids, collusion, plagiarism, and game systems. Bhebhe and Maphosa (2020) argue that a student provided password does not assure them answering their own examination at a remote site. For instance, Liao et al. (2022) highlights impersonation, pretending to be someone else's identity or taking the exam on someone else's behalf. In as much as it essential to find ways in which students cheat, it is paramount to delve into the root causes of this challenge to improve credibility, reliability and validity of online examinations. To address the challenge of malpractice, investing in powerful software and setting application type of questions emanated from this study. These are the similar recommendations of Garga and Goel (2022), who illuminated seven strategies that could be employed to tackle cheating on online exams, namely, examination method, integrity strategy, computer lock, identity verification tool, author identification, proctoring, and data analysis. Investing in powerful software to prevent malpractice emanated as a strategy that could be adopted for the effective implementation of online examinations. For example, students can participate in online exams at home using software such as Blackboard Learn and Lockdown Browser. All these solutions allow more reasonable and valid examinations because these have inbuilt features to prevent students from cheating during online assessments by using third party software (Ali & Dmour, 2021). Similarly, a number of proctoring solutions, including LMS add-ons (e.g., Respondus within Blackboard, Waevaer within Moodle), and other services (e.g., ProctorU), use video, keystrokes, fingerprints, and the like to identify the user during the test. Some of these software solutions provide algorithms that monitor eye movement and other motion to determine if the user is potentially utilizing "off screen" notes, while others track activity arising from the device such as use of internet browsers (McGee, 2013).

The results of the study showed that security of online exams is guaranteed as cases of leaking and malpractice are minimal as compared to traditional examinations. Setting application type of questions emerged as a strategy that could be adopted. Similar to Cheung

(2020), the use of long questions that require application of knowledge or reflection on personal experience for the assessment to avoid setting factual recall questions. Bhebhe and Maphosa (2020) also suggested ways of curbing cheating was the type of assessments that could be administered as well as setup of exams that is, algorithmic test banks, use of higher order questions and well as short answered or essay questions.

Some students and lecturers lacked technological skills, emerged as a negative perception from this study. This is the exact findings of Mahlangu and Makwasha (2023) highlighting that the adoption of online assessment is constrained by a lack of digital skills. These “digital natives” often lack capacity to trouble shoot or cope when technology fails to work as anticipated, or something varies slightly from expected. It is these students who appear to fare worse in these circumstances, possibly due to a lack of having to work out technology on their own and becoming over reliant on what they are “taught” at school (Mate & Weidenhofer, 2021). Similarly, Waheeda et al. (2023) found that some students lacked the required technological skills such as navigating through the systems used for assessments indicating that they needed training to familiarise themselves with online assessment platforms, test formats and the digital tool used. Hence, there is need to bridge the digital skills gap since there is no equity in terms of access and expertise on online exam tools.

The challenges on online examinations that emerged from this study including technical glitches, poor internet connectivity and load shedding emanated are congruent with Mate and Weidenhofer (2021). Waheeda et al. (2023) also reported technical difficulties such as compatibility of students’ computers/laptops with assessment software, and assessment design formats, electricity power failure, bandwidth issues when images and videos are embedded, inherent distrust for technology, and background noise. Hence, this study argues that lack of sustainable infrastructure impedes on the successful use of online examinations. It becomes a disadvantage, unfair and unequal for students from low socioeconomic backgrounds, with slow internet connectivity for timed examinations. Suggestion such as use of reliable internet service providers like Star Link, improving internet access in all parts of the country and investing in alternative sources of electricity emerged from this research. These were already raised in the study of Bashitialshaaer et al. (2021) that obstacles in the effective adoption of electronic examinations include power outages, unreliable internet access and the digital divide. For this, Mahlangu and Makwasha (2023) suggested that adoption and use of

online assessment consider technological factors (internet access, computing devices, and ICT infrastructure), organisational factors (institutional support), environmental factors (academic integrity), and individual factors (digital skills and user perceptions). Therefore, it is vital to prepare contingency plans in case of any hiccups, such as redundant server setups, backup power supply and alternative communication channels to address any disruption during the online examination.

6. Conclusion

The use of online examinations in HEIs has positive and negative implications. While online learning and examinations are becoming popular, HEIs need to embrace the revolution to move with the education 4.0 mantra. Based on the findings, this study concludes that the implementation of online examination requires institutional readiness and capacity. Hence, lecturers and students should be trained and oriented to equip them with the necessary skills to manoeuvre through online learning and assessments platforms. Similarly, HEIs need upgrade on infrastructure to meet required standards and partner with local telecommunication companies to enhance broadband access at reduced rates. With the emerging adoption of digital technology in the HEIs, it is necessary for policymakers to address academic misconduct by drafting relevant policies and procedures.

References

- Al Rawashdeh, A. Z., Mohammed, E. Y., Al Arab, A. R., Alara, M. & Al-Rawashdeh, B. (2021). Advantages and disadvantages of using e-learning in university education: Analyzing students' perspectives. *The Electronic Journal of e-Learning*, 19(2), 107-117.
- Ali, L., & al Dmour, N. A. H. H. (2021). The shift to online assessment due to covid-19: An empirical study of university students, behaviour and performance, in the region of UAE. *International Journal of Information and Education Technology*, 11(5), 220–228. <https://doi.org/10.18178/ijiet.2021.11.5.1515>
- Alsahhi, N. R., Qusef, A. D., Al-Qatawneh, S. S., & Eltahir, M. E. (2022). Students' perspective on online assessment during the covid-19 pandemic in higher education institutions.

- Information Sciences Letters an International Journal*, 11(1), 37-46.
<http://dx.doi.org/10.18576/isl/110106>
- Awad Ahmed, F. R., Ahmed, T. E., Saeed, R. A., Alhumyani, H., Abdel-Khalek, S., & Abu-Zinadah, H. (2021). Analysis and challenges of robust E-exams performance under COVID-19. *Results in physics*, 23, 103987. <https://doi.org/10.1016/j.rinp.2021.103987>
- Babbar, M., & Gupta, T. (2022). Response of educational institutions to COVID-19 pandemic: An inter-country comparison. *Policy Futures in Education*, 20(4), 469-491. <https://doi.org/10.1177/14782103211021937>
- Bashir, A., Bashir, S., Rana, K., Lambert, P. & Vernallis, A. (2021). Post-COVID-19 adaptations; the shifts towards online learning, hybrid course delivery and the implications for biosciences courses in the higher education setting. *Front. Educ.* 6, 711619. <https://doi.org/10.3389/feduc.2021.711619>
- Bashitialshaer, R., Alhendawi, M., & Avery, H. (2021). Obstacles to applying electronic exams amidst the covid-19 pandemic: an exploratory study in the Palestinian Universities in Gaza. *Information*. 12(6):256. <https://doi.org/10.3390/info12060256>
- Bhebhe, S & Maphosa, C. (2020). An exploration of online assessment in institutions of higher learning. In L. Naumovska (Ed), *The impact of Covid-19 on the international education system* (172-183). https://doi.org/10.51432/978-1-8381524-0-6_13
- Boitshwarelo, B., Reedy, A.K. & Billany, T. (2017). Envisioning the use of online tests in assessing twenty-first century learning: a literature review. *Research and Practice in Technology Enhanced Learning*. 12(16). <https://doi.org/10.1186/s41039-017-0055-7>
- Butler-Henderson, K. & Crawford, J. (2020). A systematic review of online examinations: A pedagogical innovation for scalable authentication and integrity. *Computers & Education*, 159, 104024. <https://doi.org/10.1016/j.compedu.2020.104024>
- Cai, Y. (2022). A study on the implementation of online assessments in college English teaching. *SHS Web of Conferences*, 140, 01006. <https://doi.org/10.1051/shsconf/202214001006>
- Cheung, C.K. (2020). Evaluation of academic integrity of online open book assessments implemented in an undergraduate medical radiation science course during covid-19 pandemic. *J Med Imaging Radiat Sci*, 51(4). <https://doi.org/10.1016/j.jmir.2020.09.009>

- Coman, C., Țîru, L.G., Meseșan-Schmitz, L., Stanciu, C. & Bularca, M.C. (2020). Online teaching and learning in higher education during the coronavirus pandemic: Students' perspective. *Sustainability*, 12, 10367. <https://doi.org/10.3390/su122410367>
- Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems*, 49(1), 5-22. <https://doi.org/10.1177/0047239520934018>
- Eltahir M.E., Alsalhi, N.R. & Al-Qatawneh, S.S. (2022). Implementation of E-exams during the COVID-19 pandemic: A quantitative study in higher education. *PLoS ONE*, 17(5), e0266940. <https://doi.org/10.1371/journal.pone.0266940>
- Foot, K.A. (2014). Cultural historical activity theory: Exploring a theory to inform practice and research. *Journal of human behaviour in the social environment*, 24(3), 329-347. <https://doi.org/10.1080/10911359.2013.831011>
- French, S., Dickerson, A. & Mulder, R.A. (2023). A review of the benefits and drawbacks of high-stakes final examinations in higher education. *High Educ.* <https://doi.org/10.1007/s10734-023-01148-z>
- Garga, M. & Goel, A. (2022). A systematic literature review on online assessment security: Current challenges and integrity strategies. *Computers & Security*, 113. <https://doi.org/10.1016/j.cose.2021.102544>
- Gul, S., Ullah, I., Aslam, S. & Eldin, S.M. (2022). Challenges of online learning in developing country under the impact of the pandemic situation: A case study of Pakistan. *International Journal of Research and Review*, 9(12), 443-456.
- Gupta, T., Shree A., Chanda P., Banerjee, A. (2023). Online assessment techniques adopted by the university teachers amidst COVID-19 pandemic: A case study. *Social Sciences & Humanities Open*, 8. <https://doi.org/10.1016/j.ssaho.2023.100579>
- Howe, E.L. (2020). Perceptions of e-assessment by students and lecturers. *International Journal of Education and Research*, 8(4).
- Itani, M., Itani, M., Kaddoura, S. & Al Husseiny, F. (2022). The impact of the Covid-19 pandemic on on-line examination: challenges and opportunities. *Global Journal of Engineering Education*, 24(2), 105-120.
- Khan, M.A., Vivek, V., Khojah, M., Nabi, M.K., Paul, M. & Minhaj, S.M. (2021). Learners' perspective towards e-exams during COVID-19 outbreak: Evidence from higher

- educational institutions of India and Saudi Arabia. *Int. J. Environ. Res. Public Health* 2021, 18, 6534. <https://doi.org/10.3390/ijerph18126534>
- Khan, S., & Khan, R.A. (2019). Online assessments: Exploring perspectives of university students. *Educ Inf Technol* 24, 661–677. <https://doi.org/10.1007/s10639-018-9797-0>
- Lee, V. W. Y., Lam, P. L. C., Lo, J. T. S., Lee, J. L. F., & Li, J. T. S. (2022). Rethinking online assessment from university students' perspective in COVID-19 pandemic. *Cogent Education*, 9(1). <https://doi.org/10.1080/2331186X.2022.2082079>
- Liao, A.Y.H., Hsieh, Y.Y., Yang, C.Y., & Hwang, M.S. (2022). Research on the trusted online examination. *International Journal of Network Security*, 24(3) 541-550. <https://doi.org/10.6633/IJNS.202205>
- Mahlangu, G. & Makwasha, L. (2023) Factors affecting the adoption and use of online assessment for learning at Polytechnics in Zimbabwe. *Cogent Education*, 10(1). <https://doi.org/10.1080/2331186X.2023.2177475>
- Makgaka, T. P. (2023). Undergraduate students' perceptions of the use of online examinations in an open and distance learning environment. *Unisa Press Journals*. <https://doi.org/10.25159/2663-5895/12541>
- Mate, K., & Weidenhofer, J. (2021). Considerations and strategies for effective online assessment with a focus on the biomedical sciences. *FASEB bio Advances*, 4(1), 9–21. <https://doi.org/10.1096/fba.2021-00075>
- Meccawy, Z., Meccawy, M. & Alsobhi, A. (2021). Assessment in 'survival mode': student and faculty perceptions of online assessment practices in HE during Covid-19 pandemic. *International Journal for Educational Integrity* (2021) 17(16). <https://doi.org/10.1007/s40979-021-00083-9>
- Mishra, L., Gupta, T., & Shree, A. (2020). Online teaching-learning in higher education during lockdown period of COVID-19 pandemic. *International journal of educational research open*, 1, 100012. <https://doi.org/10.1016/j.ijedro.2020.100012>
- Montenegro-Rueda, M.; Luque-de la Rosa, A.; Sarasola Sánchez-Serrano, J.L.; Fernández-Cerero, J. Assessment in Higher Education during the COVID-19 Pandemic: A Systematic Review. *Sustainability* 2021, 13, 10509. <https://doi.org/10.3390/su131910509>
- Ndibalema P. (2022). Constraints of transition to online distance learning in higher education institutions during COVID-19 in developing countries: A systematic review. *E-*

- Learning and Digital Media*, 19(6), 595–618.
<https://doi.org/10.1177/20427530221107510>
- Nkambule, S. (16 November, 2023). Leaked exams; form vs to re-write 4 subjects. *Observer*.
<http://new.observer.org.sz/details.php?id=21491>
- Qpercom (July, 6, 2023). Online exam security: What makes a remote exam secure? *Qpercom*.
<https://www.qpercom.com/online-exam-security/>
- Qureshi, S. P. (2021). Cultural historical activity theory for studying practice-based learning and change in medical education. *Adv Med Educ Pract*. 12: 923–935.
- Rai, N., & Thapa, B. (2015). A study on purposive sampling method in research. *Kathmandu: Kathmandu School of Law*, 5(1), 8-15.
- Robinson, R. S. (2014). Purposive sampling. In: Michalos, A.C. (Eds) *Encyclopedia of quality life and well-being research*. Springer, Dordrecht. https://doi.org/10.1007/978-94-007-0753-5_2337
- Satam, Y. (2023). The rise of online learning: Transforming education in the digital age.
<https://www.linkedin.com/pulse/rise-online-learning-transforming-education-digital-age-yashvi-satam>
- Scheelbeek, P. F., Hamza, Y. A., Schellenberg, J., & Hill, Z. (2020). Improving the use of focus group discussions in low income settings. *BMC medical research methodology*, 20, 1-10. <https://doi.org/10.1186/s12874-020-01168-8>
- Singh, J., Steele, K., & Singh, L. (2021). Combining the best of online and face-to-face learning: Hybrid and blended learning approach for covid-19, post vaccine, & post-pandemic world. *Journal of Educational Technology Systems*, 50(2), 140-171.
<https://doi.org/10.1177/00472395211047865>
- Tan, C. K., Chua, W. L., Vu, C. K., & Chang, J. P. (2021). High-stakes examinations during the COVID-19 pandemic: to proceed or not to proceed, that is the question. *Postgraduate medical journal*, 97(1149), 427–431.
<https://doi.org/10.1136/postgradmedj-2020-139241>
- Thambusamy, R. X. & Singh, P. (2021). Online assessment: how effectively do they measure student learning at the tertiary level? *The European Journal of Social and Behavioural Sciences EJSBS*, 30. <https://doi.org/10.15405/ejsbs.289>.
- Thathsarani, H., Ariyananda, D. K., Jayakody, C., Manoharan, K., Munasinghe, A. A. S. N., & Rathnayake, N. (2023). How successful the online assessment techniques in distance

- learning have been, in contributing to academic achievements of management undergraduates? *Education and information technologies*, 1–25. <https://doi.org/10.1007/s10639-023-11715-7>
- Turnbull, D., Chugh, R. & Luck, J. Transitioning to e-learning during the COVID-19 pandemic: How have higher education institutions responded to the challenge? *Educ Inf Technol* 26, 6401–6419 (2021). <https://doi.org/10.1007/s10639-021-10633-w>
- Waheeda, A., Muna, F., Shina, A. & Shaheeda, F. (2023). Benefits of online assessments in higher education institutions: lessons from covid-19 pandemic. *Journal of Business and Social Sciences*, 3.
- Waheeda, A., Shaheeda, F., Muna, F. & Shina, A. (2023) Online assessments in Maldivian higher education institutions: Challenges faced by students. *Issues in educational research*, 33(3).
- Wood, L. & Zuber-Skerrit, O. (2013). PALAR as a methodology for community engagement by faculties of education. *South African Journal of Education*, 33(4), 1-15.
- Zarei, S., & Mohammadi, S. (2022). Challenges of higher education related to e-learning in developing countries during COVID-19 spread: a review of the perspectives of students, instructors, policymakers, and ICT experts. *Environ Sci Pollut Res* 29, 85562–85568. <https://doi.org/10.1007/s11356-021-14647-2>