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The Appropriation of Digital Technologies by University Students During the COVID-19 Pandemic: Towards A Pedagogical Approach to Digital Transformation in Response to Future Pandemics

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Abstract

Concerns about the effectiveness of E-learning in education during the COVID-19 pandemic attracted substantial scholarly attention worldwide. Most of the studies identified the pandemic as a double-edged sword necessitating further scholarly debates. Even though these studies are instrumental in contextualising this topical issue, there is a disconcerting absence of such empirical studies in countries associated with vertical inequality, mostly those in the Global South. Cognisant of the contextual nature of technology and how actors and their interests intersect to shape how such technologies in their contexts maybe appropriated, this study assessed the effectiveness of E-learning during the COVID-19 pandemic, using the case study of a public university. It deployed the model of technology appropriation framework, the social justice theory, and qualitative interviews with 35 undergraduate students across faculties at the university. The findings indicated that just like in other higher education institutions (HEIs) in developing countries, the adoption of E-learning amid the COVID-19 lockdown acted as a double-edged sword. On one hand, online learning provided opportunities for some students, such as the convenience of learning at one's own pace and enhanced performance. On the other hand, empirical evidence demonstrates prevailing several challenges such as the digital gap among students, lack of ICT resources and lack of motivation and skills, inter alia. Thus, technical issues such as network, data and computer malfunctions, hindered the effective use of E-learning during the COVID-19 lockdown. While there are similarities on the challenges of E-learning between those documented in various parts of the world, it is important to acknowledge the differences based on local peculiarities. Going forward, we noted the need to adopt the 21st century pedagogical skills that promote collaboration, critical thinking and inclusivity, in teaching and learning in higher education.

Keywords: *E-learning; COVID-19; Global South; Pedagogy*

Introduction

The uptake of electronic learning (E-learning) became ubiquitous amid the COVID-19 pandemic, and beyond. It offers unique educational opportunities as it enhances learning and instruction through innovation in the academic circles. As Maatuk et al (2022) capture it aptly, e-learning "is commonly used by most universities in several developing countries" (p. 22). In this article, we define it as the delivery of learning and instruction through Information and Communication Technologies (ICTs) and other digital resources (Kaisara & Bwalya, 2021). Web-based education and computer-assisted teaching and learning are some of the examples of E-learning (Lara et al. 2020; Aljawarneh, 2020). The adoption of E-learning in higher education institutions (HEIs) is not a new development. Hither to, many international institutions of learning integrated the use of Information and Communication Technologies (ICTs), as part of teaching and learning to increase teacher-student engagement (see El Omari et al, 2023; Bordoloi & Das, 2021; Munro, 2018). Comparable to global trends, most African countries adopted E-learning to expand the sphere of education in the academia (see Edem & Jibril, 2022; Kaisara & Bwalya, 2021; Eze et al, 2021).

In Namibia, for instance, there were determined efforts by the Ministry of Higher Education and Innovation to make ICTs integral teaching and learning tools at all levels of education (Kaisara & Bwalya, 2021; Woyo et al, 2020). While the Namibian government developed its ICT for education policy in 2005, research on the perceptions on students' preparedness remain limited. With the outbreak of COVID-19, the Namibian Ministry of Higher Education, Training and Innovation encouraged HEIs to massively expand and utilise E-learning platforms (NUST, 2020). In response to the disruptions presented by COVID-19 on educational activities, HEIs rescheduled their academic calendars to allow stakeholders to smoothly transition from face to face to face to face to an online learning environment. In preparation for the remote classes, the institutions granted staff and students the opportunity to familiarise themselves with online learning tools and materials.

While we acknowledge that the effectiveness of e-learning during the COVID-19 pandemic attracted scholarly attention worldwide particularly within the HEIs settings (see El Omari et al, 2023; Edem & Jibril, 2022; Maatuk et al, 2022), there is an increasing acknowledgement that Information Communication Technologies (ICTs) are double-edged swords. On one hand, they "increase the effectiveness of knowledge and skills by enabling access to a massive amount of data, enhances collaboration on learning-teaching relationships" (Maatuk et al, 2022, p. 23). This has been quite laudable within the context of the pandemic, which necessitated observing social distancing. On the other hand, they widen the gap between the 'haves' and 'have nots' among students, particularly exposing those in the Global South to digital divide. This assertion corroborates other studies which demonstrate that the majority of HEIs in developing countries are confronted with the challenges of implementing E-learning due to poor internet connection and inadequate ICT resources (Saleem et al, 2022; Kaisara & Bwalya, 2021; Lara et al. 2020). Furthermore, many students were faced with challenges to fully adopt to the online learning environment, especially those who had just transitioned from secondary school to university at the beginning of the year- they had not fully familiarised themselves with the operations of university life. University students in Namibia, like elsewhere in countries associated with pervasive vertical inequality, "the rollout of e-learning has been received with both optimism and trepidation" (Kaisara & Bwalya, 2021, p. 309). Among the challenges that students faced included lack of access to the internet, limited or no access at all, and inadequate use of other ICT resources such as computers and laptops *inter alia* (El Omari et al, 2023; Saleem et al, 2022).

To arrest the situation, the Namibia Student Financial Assistant Fund (NSFAF), a government agent, sponsored N$ 10 000 per student (only for continuing NSFAF holder students) for non-tuition fees to ensure that the students were equipped with internet connectivity and all the enabling devices such as laptops (Market Watch, 2020). E-learning challenges still abound for first-year students who were not yet

registered beneficiaries of the fund as they were yet to sign the contract with NSFAF (Market Watch, 2020). This presumably left many of them in dire situations- of having to depend on what their families could afford for them (it is also important to note that a lot of families suffered during this time, as their loved ones lost jobs as a result of the pandemic).

There is a dearth of empirical studies in Namibia in particular and Africa in general, on the effectiveness of E-learning in HEIs during the COVID-19 pandemic. Most extant studies on the effectiveness of E-learning in Namibia (see Boer & Asinon, 2022; Muzira, 2021; Angula & Mutelo, 2020) focused on high schools, and yet little is known about this scholarly issue within the HEIs settings. This study seeks to undertake Kaisara and Bwalya's (2021); Woyo et al (2020) pertinent challenge that the scholarship particularly focusing on the effectiveness of E-learning and its supplementary ICT tools in the pandemic and contemporary periods are disconcertingly scarce in Namibia, hence the importance of this study. Thus, the paper adds to the few extant literature in Namibia by reporting on students' practical experiences with E-learning in HEIs during the COVID-19 pandemic. In order to plug this scholarly lacuna, we went down the memory lane to investigate the level of preparedness of first year students from a public university, in terms of adopting and accessing E-learning during the COVID-19 induced lockdown; and to highlight the opportunities and challenges presented by the pandemic in the context of online learning. Following this introduction, the paper presents the review of the literature, followed by the theoretical framework. The research methodology, presentation and discussion of findings sections are also discussed in the subsequent sections of this paper.

Literature Review

COVID-19 completely changed the lives of many people in various ways, and, on the education front, the effects were detrimental as a result of the near- total closure of educational institutions, including HEIs (Mustafa, 2020). Statistics confirmed that approximately, 9.8 million African students experienced interruptions in their studies, as result of the closure of HEIs during the onset of the pandemic (Tamrat & Teferra, 2020). Similarly, online learning proved to be a cumbersome execution in a continent where internet access is still a luxury that is available to only 24 percent of the population, and yet again, low connectivity, high costs and frequent power interruptions are serious challenges (Tamrat & Teferra, 2020). Furthermore, lack of technological access, as well as the lack of reliable and fast internet access can be barriers to students from disadvantaged families, as they cannot afford to access online learning (Mustafa, 2020). With the closure of many HEIs, including libraries, the situation made it more difficult for students to keep up with online learning without internet connectivity at home. It is undeniable that students from low socio-economic backgrounds certainly found it difficult to migrate to online learning, as early as planned by various institutions, because of the challenges presented above. Students with low or no socio-economic capacity to afford mobile networks were most susceptible to falling behind or meeting additional obstacles in the field of online learning.

Evidently, E-learning changed not only the students' learning approach to education, but instructors' too, owing to rapid and more transformative delivery models of education. In most higher education institutions around the world, e-learning became a progressively popular modern approach to teaching and learning, even post the pandemic. For instance, some institutions like the University of KwaZulu-Natal in South Africa, the Namibia University of Science and Technology (NUST) in Namibia, and many others, still use the hybrid approach to teaching and learning; face to face lectures, as well as online learning forums to promote student-lecturer participation e.g. Microsoft Teams and Moodle. Asynchronous learning- learning that does not occur simultaneously or at the same location but is a web-based (CBT) version based on CD-ROM or network-based learning, has become the norm. To the advantage of the students, they can access learning materials at their own pace and at any time, and could revisit, e.g. audio material, hence adaptive learning (Takalani, Tarus et al., 2015). Notwithstanding the

challenges associated with the technologies needed, online learning can be of great benefit, as it provides an opportunity for education. The fundamental benefits of E-learning are mainly the cost-effectiveness, accessibility, time and place-based flexibility (Bordoloi & Das, 2021). It enables learning to take place when both the lecturer and the students are spatially and temporally separated.

Bhuasiri et al. (as cited in Olutola & Olatoye, 2015) argue that e-learning in developing countries is still in its early stages and early adoption, and the countries face unique challenges from the developed countries. HEIs in developing countries face various challenges in implementing e-learning technologies, one of which is internet technologies. Andersson and Grönlund (as cited in Mwakyusa & Mwalyagile, 2016) note that the challenges also relate to the characteristics of individuals (lecturers and students) in terms of e-learning motivation, technical confidence in the use of ICT systems, and academic confidence in the self-efficacy of lecturers or students, among other things. Common challenges relate to technology-access to computers, the Learning Management System (LMS) and its usability, internet connectivity efficiency and limited bandwidth. The cost of accessing such technologies appears to be a major hindrance, especially in developing countries. Moreso, most information systems are not designed for environments in developing countries, so it is costly to adapt to suit African software and interface design requirements (Adedoyin and Soykan, 2020).

Adedoyin and Soykan (2020) note that online learning in its entirety relies on technical devices and the internet, therefore, lecturers and students with weak internet connectivity are likely to be denied access to online learning. The reliance of online learning on technical equipment and the availability of equipment are a major challenge for institutions, faculties and students. For example, some students may have outdated technical devices and connectivity issues that may deny them access to online learning.

Digital competence, which is referred to as a group of skills, knowledge and attitudes needed when using ICT and digital devices to perform responsibilities, such as problem solving, information management, collaboration with respect to effectiveness, efficiency and ethics, pose as a challenge to online learning (Ferrari, as cited in Adedoyin & Soykan, 2020). Therefore, students and faculties with minimal digital competence may find it challenging to make full use of online learning platforms and resources, for example, there are students who do not know how to navigate the e-learning platforms, despite efforts from the institutions to assist them in this regard. Tarus et al., (2015) highlighted some of the obstacles identified during the application of e-learning in Kenya, such as the lack of affordable and sufficient internet bandwidth, financial constraints, lack of technical e-learning skills and e-learning content creation, lack of operational e-learning policies, lack of ICT and e-learning infrastructure, and lack of e-learning enthusiasm.

In a study conducted by Mwakyusa and Mwalyagile (2016) in Tanzanian higher learning institutions, obstacles to e-learning were identified and these included limited access to technology, limited bandwidth, computers and internet technology, ICT competence and unreliable electricity, among others. Other challenges include support barriers in terms of insufficient technical and managerial support, cost barriers such as technology, high internet rates and insufficient funds, institutional issues such as knowledge management, lack of ICT systems for research development, resistance to change, lack of institutional e-learning policies and curriculum design challenges in terms of availability.

Online assessments have presented more challenges than opportunities- mostly cheating and plagiarism, more especially in the wake of artificial intelligence tools like ChatGPT. During the pandemic, many institutions were forced to administer assessments online, where instructors are restricted to proxy supervision of students, making it difficult to regulate and control cheating (Arkorful & Abaidoo, 2015). The biggest university on the continent, the University of South Africa, has allegedly been grappling with student cheating during examinations, moreso since 2020 when they began online

examination (Wicks, 2023; Cloete, 2023). Essentially, online learning, especially assessments, has proved not so difficulty within the social sciences and humanities disciplines, but has been incompatible practical- based sciences including medicine, engineering, journalism and computer science- those programmes that are performed in specialised laboratories or require specialised software and equipment (Mapudzi, Chikandiwa & Muteeri, 2021). In this view, the adoption of online learning becomes ineffective for the science-based courses.

Theoretical Underpinnings

This study draws insights from two perspectives described below, the model of technology appropriation, as well as the social justice theory.

The Model of Technology Appropriation

This study draws from the model of technology appropriation (MTA), as propounded by Carroll et al. (2002). The model was employed in an explanatory sense to appreciate ICTs as part of the social context in which they operate. This has been aptly articulated by Munoriyarwa et al. (2021), that technology appropriation "is how people adopt and adapt technology to fit into their political, economic, social, and organisational contexts and working practices" (p. 5). Technology appropriation entails building a relationship between technology and its users. This model builds on four concepts that are central to inform the study. First, is the customisation of technology, which occurs when technology is introduced, thereby allowing users to devise it in productive ways or vice versa. Just like Venkatesh and Davis' framework of technology acceptance model, it posits that when users are offered a new ICT innovation, some critical aspects impact their judgement about when and how they will use it (Scherer, 2019). In this case, university students can use E-learning tools to either achieve positive or negative ends in education. Second, MTA posits that technology can undertake multiple and sometimes intersecting roles beyond foreseen circumstances by the developers of the technology (Munoriyarwa et al., 2021). Third, it is through the appropriation of technology that institutional roles and structures can be adjusted, in this case, methods of instruction, delivery and learning (Janneck, 2009). Last, in extant literature, technology appropriation is always perceived to be positive (see Munoriyarwa et al, 2021; Janneck, 2009; Baillette & Kimble, 2008). For instance, Janneck (2009) aptly corroborates that "appropriation can be an individual as well as a cooperative activity, with groups of users discussing and negotiating terms of usage. For groupware use in cooperative working and learning scenarios" (n. p). It is also important to note that for technology adoption and integration to be effective, the circumstance of its introduction into such adoption context is key.

The MTA enabled us to appreciate the contextual nature of technology (E-learning and ICT tools) and how actors (students and HEIs) and their interests overlap to shape how such technologies in their contexts may be appropriated. In this case, the model accounts for an array of appropriation capabilities of E-learning usage in higher education contexts in the Global South where students are confronted with resource and capacity constraint challenges such as limited internet access and digital competence. As technologies expand in the field of ICTs, exploring their effectiveness during crises such as the COVID-19 induced lockdown becomes imperative,hence the relevance of the MTA in this study. Notwithstanding the above, the ideal promises of ICTs (such as E-learning) in HEIs continue to be disputed by the existing scholarship (see Alammary et al, 2022; Ndibalema, 2022; Kaisara & Bwalya, 2021; Andrews, 2011). Arguably, there is an ongoing debate among scholars, in finding answers to an array of questions that still surround the effectiveness of E-learning during the pandemic (see Alammary et al, 2022; Ndibalema, 2022; Kaisara & Bwalya, 2021; Andrews, 2011).

Social Justice Theory

Nancy Fraser's *Scales of Justice: Reimagining Political Space in a Globalizing World* (2009) remains relevant in discussions around societal issues- identity, politics, education, to mention a few. For this study, we explore the usefulness of the theory of social justice for contextualising, comprehending, and critiquing the structures that (re)produce injustices in the contemporary digital society. Fraser highlights the need to understand the philosophical conceptions of justice in two distinct but interconnected ways: distributive justice- the perspective of a fair distribution of resources), as well as recognition justice- the need to recognise the differences among social identities and groups). Fraser further highlights two related forms of injustice: maldistribution and misrecognition. Fraser's theory has also been employed in studies intended to highlight and address the inherent social injustices in higher education, especially in the context of the digital divide. The theory advocates for participation by all, in all spheres of the society- "all adults should participate meaningfully in society." (Vincent, 2020). From the perspective of the theory, this is achievable when resources are redistributed (financial and non-financial), when groups and individuals are recognised, as well as providing spaces for identity representations (Vincent, 2020). This aligns with this study which advocates for the appropriation of digital technologies in teaching and learning in higher education spaces, as propounded by the MTA model described above. The study further lays bare, the challenges experienced by students in their efforts to access education during the COVID-19 pandemic which further aggravated the already existing inequalities in the digital spaces- the digital divide. From a pedagogical perspective, the various challenges experienced by some students led them into becoming passive participants (and therefore not being recognised) in their teaching and learning, due to the lack of enabling resources like devices, internet and data- this contrasts the constructivist theory which emphasises the need for students to actively co-create and engage with information and knowledge (O'Connor, 2022).

Methodology

To gain a better understanding and in-depth insights into the perceptions of students regarding their experiences of e-learning, this exploratory study employed a qualitative approach. The empirical data were drawn from online qualitative surveys from both male and female students across faculties at the respective university. The institution has four Faculties comprising more than 13 000 enrolled students on full-time, part-time and distance education mode of study, at the time of the study. It is imperative to highlight that the data for this study were collected in the midst of the pandemic, this was necessary to understand the students' lived experiences. Convenience and snowball sampling techniques were used to recruit 35 students who were geographically dispersed due to the COVID-19 lockdown restrictions. The prevailing circumstances at the time of the study made it difficult to reach the participants as they were off campus and accessing teaching and learning online. Therefore, snowball sampling was also employed to obtain referrals from key informants. Data were analysed using thematic analysis, which involves systematic procedures such familiarisation with data, coding, identifying themes, reviewing and naming the themes (Flick, 2020). In this case, coding afforded us the opportunity to categorise data, which were pertinent to the research questions. Such classification of data did not only help to identify themes, "but also enabled detailed comparison and classification prior to the subsequent analytical steps" (Vaismoradi et al., 2016, p. 103). For ethical considerations, informed consent forms were administered, while privacy and confidentiality of all participants were observed, among others.

Presentation and Analysis of the Findings

Students' level of preparedness in adopting and accessing of E-learning during the pandemic

Leaning on the lenses of the model of technology appropriation, the findings demonstrate student's impressions regarding the transition from face-to-face to E-learning. In this case, their experiences point to the predicaments in coping with E-learning and lack of motivation, as discussed in themes below. The lack of face-to-face interaction with lecturers and the heavy reliance on E-learning demanded concerted investments in technology by both the university and students' families. Thus, the model of technology appropriation enabled us to appreciate the contextual nature of E-learning and ICT tools and how students' interests intersect to shape how such technologies in their contexts maybe appropriated. Munoriyarwa et al (2021) rightly assert that for technology adoption and integration to be effective, the circumstance of its introduction into such adoption context is key.

Predicaments in coping with E-learning

The student's impressions regarding the transition from face-to-face to E-learning clearly indicated that they encountered difficulties to learn and cope with the online environment. For most of them, the transition was exhausting and discouraging, given their diverse socio-economic backgrounds. For a start, some of them did not have conducive private rooms or areas to enable them to attend classes online without disturbances, as they shared their spaces with the larger families. The following are some of the descriptions of the students' experiences of E-learning:

A necessary evil, within the context of corona, online learning is a terrible medium of learning. It is difficult to change one's mind-set from a home set environment to a learning environment when they both take place in the same place…

It's hectic, it has been so difficult to cope with all of it in one environment. House dramas, side hustles, school it's all so exhausting.

Although, online learning affords students a blend of education, family and work as indicated above, it may be difficult to strike a balance between the three in one environment, especially during the times of the pandemic (Olutola & Olatoye, 2015).

It has been hectic moving to online because it has made it hard to understand and catch up with all the distractions at home..

Very negatively, as I am finding it difficult to cope with online classes…

The study found that despite the disparity in the year of study, student's experiences were consistent among all levels of study. One can assume that students have had to make personal changes to their everyday lives in order to adapt to the situation, however, students found it difficult to adjust to the new normal.

Students not motivated to engage with E-learning

Motivation is a driving factor for actions, willingness, and goals. Motivation, simply put or defined, is the reason one must do something. Data collected from the students revealed that some of them felt discouraged and demotivated to learn. The responses were uniform across students from various

faculties. For some students, they felt the adoption of E-learning during the COVID-19 lockdown was not conducive to their learning experience, as noted herein:

Terrible scenario…I am demotivated to do online classes.

I don't like the transition, I am so demotivated to learn

Complicated, I am seriously not learning, I am demotivated…

In a bad way, I feel demotivated and not learning more…

It has reduced the quality of learning for me …

For many students, online learning was a new mode of learning. Students felt frustrated and unmotivated to learn. These findings are consistent with Tarus et al (2015) who also noted some challenges with E-learning motivation to learn in an online environment.

Opportunities and challenges presented by the COVID-19 pandemic

Among other things, students indicated that they enjoyed convenient learning and self-confidence, despite the challenges that they faced. Within the context of learning, some students, on the other hand, acknowledged that they were not affected by the lockdown measures. Our findings indicate that these students afforded the requisite ICT tools to access E-learning. This implies that not all students were confronted with online learning difficulties. The findings demonstrated that some students had positive perspectives in the adoption of E-learning:

I get to do my academic work from the comfort of my home….

I am able to learn on my own pace…

Online learning helps students attend classes from anywhere in the country….

I have Wi-Fi at home, so I am not affected....

I have access to both Wi-Fi and a laptop. I am able to access E-learning at any time…

Students' self- confidence in online leaning was reported as among the opportunities presented by the pandemic within the context of teaching and learning. In this study, self-confidence is defined as "one's belief in his/her ability to perform best, capacity to maximise self-faith, and believing in self-worth, and serves as a crucial determinant of academic performance" (Li et al, 2023, n. p). In this case, self-confidence enables students not only to acquire knowledge, but meet their objectives in E-learning. There are confirmations that self-confidence enables students to welcome new challenges and cultivate the zeal to independent learning (Li et al, 2023). Some students concurred that E-learning does not only afford them a convenient and versatile learning experience, but also encourages them to take responsibility for their learning and build self-confidence, as well as self-knowledge, as indicated below:

Online classes make students more comfortable in terms of responding to questions asked by the lecturer, some students have fear when in class, but at home their more comfortable.

Online learning has improved my self-learning skills, the ability to self-study.

Consistent with the model of technology appropriation are study findings in which the customisation of E-learning (as a mode of instruction and learning) afforded students the opportunity to use it in productive ways. In this case, students across faculties used E-learning to achieve positive ends such as convenient learning, to build self-confidence and improved performance. For Munoriyarwa et al (2021), and Janneck (2009), technology appropriation is always perceived to be positive in learning scenarios at both individual and team levels. On the other hand, an array of appropriation constraints of E-learning usage among students were also evident. In this case, the students were confronted with resource and capacity constraint challenges such as lack of ICT tools and incompetency, technical obstacles, learning difficulties and effects on performance, *inter alia*. The challenges presented in this study are not unique to the given case, but indicative of E-learning in the Global South.

Alongside the opportunities were also some challenges encountered. Among them included the lack of ICT tools, as well as ICT incompetency. While we acknowledge that ICT tools are key in assessing the effectiveness or failure of the E-learning system, our findings indicate that some students lacked the ICT devices such as laptops and data packages or portable Wi-Fi to access online learning. This was worsened by the capability to afford such resources, which is beyond the reach of many. The study findings reveal a digital gap between students who could not afford and access internet technologies, and those with limited access. Thus, the level of family income determines the possibilities of Internet access and consequently, the use of technology (Torres-Diaz & Duart, 2015). Below are some of the sentiments shared by the respondents:

I couldn't attend online lessons due to data shortage.... I don't have a laptop at the moment, still waiting to receive one. The institution didn't play positive role in ensuring that every student has access to this online session. So, it was just the matter of catching up here and there.

I don't not like it because online classes require students to have data and ICT tools which many students cannot afford at home and the school is not providing either for its students.

I could not attend classes because I don't have a functional PC and data, since these have become a weekly expense for me. Worse still, I have not yet signed a contract with …… (name withheld) to get funds and laptop like others.

What is evident from the above assertions is that E-learning services cannot be delivered without the cooperation of students, university authorities, as well as government agencies mandated to provide student funding. Certain ICT resources are required for the smooth online delivery of classes.

The above sentiments indicate that students with lack, or no internet access were denied access to online learning. Extant literature demonstrates that lack of technology access or good internet connectivity is a barrier to continued learning (Kaisara & Bwalya, 2021; Lara et al. 2020; Adedoyin & Soykan, 2020). In addition, the lack of ICT expertise also adds to the key challenges for e-learning in HEIs in developing countries (Tarus et al., 2015). Confirmation of ICT incompetency was pronounced among students who were not techno savvy and not well versed with the use of online learning platforms such as *Microsoft Teams, Google Classroom*, or *ZOOM*, as noted below:

Online classes have many challenges for me, I didn't receive enough training on how to use Teams and other forms of online learning platforms.

E-learning is only convenient for students who have the knowledge of using the online platforms for effective learning.

The above suggests that the online learning orientation offered to the students by the university was not sufficient for them to fully grasp the concepts of learning in an online-learning environment.

Buzzetto et al., (2018) rightly assert that HEIs are challenged to meet the needs of students with varying levels of technical preparation, with information and digital literacy gaps that have been shown to hinder student progress.

As indicated earlier, online learning is mostly reliant on electronic devices and the internet (Adedoyin & Soykan, 2020), which made it difficult for students without adequate resources to access E-learning. Similarly, online learning proved to be a cumbersome execution in a country and continent where internet access is available to only 24% of the population, and yet again, low connectivity, high costs of electric power are serious challenges (Tamrat & Teferra, 2020). Evidence indicates that the lack of technological access, as well as that of reliable and fast internet access, were some of the barriers experienced by students from disadvantaged families, as they could not afford to access online learning:

I struggle a lot with internet connection at home…

I have challenges with my laptops functions and network problems at times

Empirical evidence indicates that technical issues such as network problems and computer malfunctions hinder the effectiveness of the use of ICTs as tools of E-learning. The cost of accessing technology choices such as computers and Learning Management Systems and its usability, internet connectivity efficiency and limited bandwidth, appears to be a crucial hindrance factor, especially in developing countries where most institutions of higher education cannot afford it (Mwakyusa & Mwalyagile, 2016). Additionally, online learning is however not that easy in a continent where internet access is available to a small population, while low connectivity, high costs and frequent power interruptions, are also serious challenges (Tamrat & Teferra, 2020).

The challenges highlighted above further presented some ripple effects on student performance. The findings revealed that most students, regardless of the varied approaches to learning across faculties, found it difficult to learn and cope with online learning. Assessments were often completed online, where instructors are restricted to proxy supervision of students, making it difficult to observe physical instructor-student connection (Arkorful & Abaidoo, 2015). This was highlighted by some of the respondent, who said:

There has been no longer a connection with lecturers and when a certain topic is not understood, there was no one to elaborate further on it.

It has made learning very difficult and slowed down the availability of supervision.

While the above might indicate a lack of in-depth understanding of course content owing to instructor-student physical disconnection, some students confirmed that the pandemic negatively affected their academic performances, resulting in students obtaining lower grades:

I am drained, demotivated, tired. My grades are not as good as they used to be, it's stressing.

My average marks have since dropped since online classes…

With the above responses in mind, the provision of student supportive online learning (by relevant stakeholders such as the university and higher education authorities) was necessary to help students to achieve their learning goals. These are likely to alleviate learning difficulties and enhance students' academic performance (Saleem et al, 2022).

Bridging the gap between theoretical and practical learning

The foregoing discussion indicates that E-learning presented both opportunities and challenges amid the COVID-19 pandemic. It was convenient, and time saving, for some students, while others faced various predicaments in coping with E-learning, owing to insufficient ICT resources coupled with interrupted internet connection. With the absence of face-face communication, scenarios of instructor-student disconnection in online communication were pronounced by some of the students who noted the following.

Attending online lessons is not an obvious thing because of data shortage…

Doing group presentations online is challenging at times because not all team members are able to have access to the internet at the same time…

I struggle a lot with internet connection at home…

While some of the respondents found online learning to be effective, to some extent within the theoretical context, however, this has not been consistent with practical learning. Even though they were still in the infancy stages of their study programmes, some students from faculties like the Applied Health Sciences and Engineering required practical coursework at times, as noted below:

For theoretical learning, it is manageable. For practical learning, it is a problem as there is no scope in articulating appropriately the pragmatics involved that are necessary in the grasping of concepts…

Theoretical learning is most effective, as compared to practical learning where we need to be on the ground to carry out practical lessons…

As indicated above, in some instances, students were expected to attend classes to carry out practical work, despite the COVID-19 movement restrictions. In this case, online learning could not be effectively applied in programmes that involve practical work- like health sciences, engineering, journalism, etc.

Discussion of Key Findings

It is a fact that the transition from face-to-face to online learning only took place in an attempt to save the students' lives and reduce the spread of COVID-19 virus. Similarly, optimistic attitude in the appropriation of ICT tools for E-learning was likely to determine the students' preparedness for the then "new normal". However, it is on this basis that students encountered challenges such as lack of motivation and insufficient skills, which saw the slow adoption of E-learning. Adding on to literature (see El Omari et al, 2023; Edem & Jibril, 2022; Maatuk et al, 2022), the findings of this study acknowledge that the adoption of E-learning during the COVID-19 lockdown acted as a double-edged sword. On hand, online learning provided opportunities for some students, such as the convenience of learning at one's own pace and enhanced performance. Consistent with this study's findings is Ndibalema's (2022) assertion that the pandemic,

"… paved the way to online learning opportunities in HEIs in several ways, such as introducing independent learning skills, problem-solving, online resources searching skills and technological communication" (p. 609).

Examining the integration of E-learning during the peak of COVID-19 pandemic in India, Bordoloi et al. (2021) concluded that online learning promotes self-directed learning among students, which is part of the 21st century indispensable skills in education. Despite the handful of opportunities presented in adopting E-learning amid the outbreak of COVID-19 pandemic, empirical evidence demonstrates that there were several challenges at hand, such as digital gap among students, lack of ICT resources and lack of motivation and skills, to mention a few. While there are similarities on the challenges of E-learning between those documented in various parts of the world, it is important to acknowledge the differences based on local peculiarities. In this case, structural issues, such as slow internet connection, data issues and computer malfunctions, hindered the effective use of E-learning among the students.

Despite being one of the eight countries in Africa classified as an upper-middle-income country, Namibia's economy is still characterised by vertical inequality in education, as the number of students that continue to higher education remains at a low estimate of 19% (see The Borgen Project, 2020). Although the Namibian government provides financial grants to disadvantaged students in HEIs through the National Student Financial Aid Scheme (NSFAS), the approach overlooks the wide-ranging hardships faced by families from all backgrounds and economic status (*The Namibian*, 2018, September 18). Furthermore, the findings indicate that most of the students used their mobile phones to access E-learning, as they did not have laptops and computers to access E-learning. The study also found that online learning may not be applied effectively in practical studies that require at most, physical and practical coursework. In a way, these obstacles negatively impacted student agency in meaningfully maximising their learning outcomes. In terms of internet accessibility, we found that most of the students made use of personal data to access E-learning. This in a way posed connectivity challenges, because in most instances, attending an hour-long lecture online can be very expensive for those who would not be connected to WIFI.

The lack of face-to-face interaction with lecturers, as well as the heavy reliance on E-learning use during the pandemic demanded concerted investments in technology by the university and students' families. In this case, the model of technology appropriation enabled us to appreciate the contextual nature of E-learning and ICT tools and how students' interests intersect to shape how such technologies in their contexts maybe appropriated. For technology adoption and its integration to be effective, the circumstance of its introduction into such adoption context is key (Munoriyarwa et al, 2021).

Towards a Pedagogical Approach to Digital Transformation, Post-COVID-19

The findings of this study have clearly highlighted some of the challenges of engaging with E-learning during the pandemic- some of the challenges had implications on the students' performance and wellbeing. The lessons learnt are imperative, particularly for the post-pandemic, as well as for responding to future pandemics. What emerged from the findings include digital access and literacy issues? In this century, the role of digital transformation and the 4IR cannot be ignored. The COVID-19 pandemic exposed how many higher educational institutions struggled with the adoption and utilisation of the digital learning tools during the forced transition. The pandemic further laid bare, how the Global South is still battling with access to technology, as well as bandwidth, as a major concern.

When the pandemic came onboard, the continent was already behind in terms of meeting its sustainable development goals (SDGs). In contributing to fulfilling SDGs number 4 (quality education) and 10 (reduced inequalities), this study thus advocates for the need for measures to safeguard equitable access to digital educational resources, to close the "maldistribution" and "misrecognition" gaps. Indeed, the traditional teaching and learning approaches are proving to be inadequate for the 21st century student, hence, the necessity for effective 21st pedagogical practices to increase student engagement. Keeping students connected and engaged has become imperative in teaching and learning. However, the various tools available to engage students have not been effectively employed for many reasons- limited

knowledge about the existence of the tools, lack of skills on the part of the lecturers, some lecturers being conservative and not willing to adapt, among other things.

The remote learning that took place during the pandemic prompted a pedagogical shift. Post the pandemic, some higher education institutions have adopted the hybrid learning system, which implies the need to focus on "creating interactive and engaging learning experiences that promote student engagement and learning" (Gumede, Beharry-Ramraj, Nzimande & Ramson, 2023, p. 148). This echoes the sentiment that despite the effectiveness of the conventional teaching methods in some instances, they also fall short in limiting student engagement, critical thinking, as well as creativity- the soft skills that are becoming more and more essential in the corporate world (Lee-Post and Hapke, 2017).

The call for lecturers to change the teaching and learning pedagogies, in order to support the students' diverse learning needs, cannot be ignored. Evidently, the blended classroom has become more common in most higher education institutions: students attend classes physically, while also having the opportunity to interact face to face with their lecture facilitators. In the same way, learning does not end in the classroom- many institutions have invested in online learning management systems (LMS) which allow students to access teaching and learning materials, participate in online discussions, as well as completing assessments. The blended classroom creates a more customisable and flexible learning experience. With this kind of approach- the flipped classroom, learning moves from being teacher to student-centred. In student-centred learning, the 21st century lecturer is a facilitator whose role is to guide students in constructing their skills and knowledge through various active learning activities (Gibbs, 1999). In contrast to the teacher- centred approach which emphasises rote learning and conformity, the student-centred approach promotes the development of skills like problem-solving, collaboration, student autonomy, as well as critical thinking (Gumede, Beharry-Ramraj, Nzimande & Ramson, 2023). In this context, the digital technologies provide the platforms that enable both the facilitators and students to access a vast array of information that is presented in different formats, as well as ways that go beyond time and location- the flexibility that is sought by the contemporary student. In a nutshell, the point we raise is that the 21st century classroom should strive to integrate teaching pedagogies that promote active engagement of students.

Conclusion

This study offers a unique contribution in many ways. Firstly, it conducted in a country and continent characterised by vertical inequality that impedes the smooth flow of E-learning appropriation amid times of global crisis as such the COVID-19 pandemic. Thus, the study provides a distinctive research site to tease out contextual dynamics in the adoption of E-learning in higher education during the COVID-19 lockdown. Secondly, the established the level of preparedness of undergraduate students, in terms of adopting and accessing E-learning during the COVID-19 induced lockdown. Thirdly, we highlighted the opportunities and challenges presented by the COVID-19 pandemic in the context of online learning in the Global South context. While it is generally acknowledged that E-learning affords students a convenient learning experience, it also encourages students to take responsibility for their learning and build self-confidence and self-knowledge. Essentially, we argued that to ensure the effectiveness of E-learning, it is imperative for HEIs to make it more accessible by providing the needful equipment such as ICT tools and internet access, so that no student is left behind- consistent with the social justice theory unpacked earlier. Accentuating the similarities and differences on the effectiveness of E-learning among students during the COVID-19 lockdown in other parts of the world, the study demonstrates that this phenomenon is context-driven. In the end, we emphasised the need to invest in the 21st century pedagogical approaches to teaching and learning in HEIs.

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