



Challenges of E-Learning during the COVID-19 Lockdown: A Survey of Undergraduate Students at Mwalimu Nyerere Memorial Academy, Tanzania

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ABSTRACT

The COVID-19 pandemic led to immediate lockdowns and the closure of educational institutions globally. This caused a rapid shift to online learning platforms. The sudden transition to e-learning posed challenges for students and higher education institutions, particularly in developing countries with limited e-learning systems. This study examined undergraduate students' barriers to effectively accessing and using e-learning during lockdown at Mwalimu Nyerere Memorial Academy, Tanzania. A survey of 378 randomly selected students identified multiple challenges. These included insufficient access to digital devices, unstable internet connectivity, lack of skills in using online platforms, limited engaging localised content, reduced motivation for self-regulated learning, and institutional unpreparedness regarding IT infrastructure, educator capabilities, technical support and student mentorship. These constraints significantly hindered academic experience and performance during remote learning. The findings highlight e-learning access challenges undergraduate students face when traditional education is disrupted. They indicate an urgent need for supportive policies, resource mobilisation, and partnerships to build equitable e-learning access and continuity capabilities. The targeted strategies to improve access, infrastructure, content, faculty, and student support are vital to facilitating smooth online learning adoption and mitigating barriers, particularly in public universities serving marginalised communities. Focused efforts to strengthen inclusive e-learning ecosystems can enable developing country institutions to use technologies resiliently to advance academic opportunities during crises with minimal disruption. These insights can inform evidence-based interventions to promote e-learning readiness, continuity and equity in developing nations amid contingencies.

Keywords: e-learning; COVID-19; challenges; undergraduate students; Tanzania

Introduction

The rapid spread of the highly contagious COVID-19 virus in early 2020 resulted in nationwide lockdowns, the closure of educational institutions, and the suspension of conventional classroom teaching worldwide as part of containment efforts (UNESCO, 2021a). In Tanzania, after the first cases were reported in March 2020, a partial lockdown was imposed from April 2020, leading to an abrupt shutdown of in-person instruction activities in higher education institutions (Ministry of Education and Vocational Training [MoEVT], 2020). With little time to prepare, universities and colleges had to rapidly shift from traditional face-to-face instruction models to fully online platforms to maintain the continuity of academic operations and programs during prolonged lockdowns (Mhlanga & Moloi, 2020).

E-learning, defined as the application of diverse digital technologies, educational media, and platforms to deliver teaching, facilitate learning, and enable collaboration (Sangrà et al., 2012), emerged as the sole means of instruction during campus closures. While e-learning has brought tremendous transformation in higher education even before the pandemic by enabling learner-centric, location-independent, and flexible learning at scale, its efficacy and adoption depend heavily on access to robust technology infrastructure, capabilities, resources, and support systems (Rasheed et al., 2020). These preconditions have been lacklustre in many developing nations where e-learning ecosystems are still evolving (UNESCO, 2021b; Mailizar et al., 2021). The hurried online shift challenged ill-prepared students and educational institutions for large-scale e-learning, significantly impacting disadvantaged learners (Mhlanga & Moloi, 2020).

Many higher learning institutions (HLIs) worldwide responded to these disruptions by transitioning to online learning models, such as e-learning platforms and virtual classrooms, to sustain education while adhering to lockdown restrictions (Basilaia & Kvavadze, 2020). However, the effectiveness and suitability of e-learning across diverse socio-economic, cultural, and geographic contexts have been subjects of extensive debate (Chaubey & Bhattacharya, 2021; Dube, 2020). Therefore, understanding the students' e-learning challenges during COVID-19 lockdowns is crucial to inform evidence-based improvements in educational practices, policies, and emergency preparedness strategies.

In Tanzania, like many other developing nations, the impact of the COVID-19 pandemic on education systems has been profound and unprecedented (Kimanthi & MEMBER, 2021). Although the Tanzanian government implemented few official lockdown restrictions or social distancing policies, individual learning institutions implemented various measures to mitigate virus transmission and ensure the continuity of education services (Dube, 2020). For example, the Mwalimu Nyerere Memorial Academy (MNMA), a renowned higher education institution in Tanzania, swiftly implemented remote e-learning platforms and virtual classrooms for all undergraduate programs and courses to sustain learning and maintain academic standards during the crisis.

However, transitioning from conventional classroom-based learning to online platforms during a global health emergency presented MNMA's leadership, faculty, and students with unique adaptability challenges. Barriers such as lack of devices, internet connectivity, digital skills, and support systems have disproportionately affected underprivileged students during the pandemic (UNESCO, 2021b). Understanding these barriers deeper can inform policy interventions and resource mobilisation strategies to equitably build institutional and learner capabilities to leverage e-learning during crises. As Mhlanga and Mloi (2020) emphasise, the struggles faced by marginalised students during emergency remote learning underscore long-standing equity gaps that must be addressed.

While studies have examined the pandemic's influence on HLIs globally (Aristovnik et al., 2020; Marinoni et al., 2020), there is limited research on the e-learning experiences by MNMA undergraduate students during the pandemic in Tanzania. This study addresses this gap by investigating the e-learning challenges undergraduate students faced at MNMA during the COVID-19 lockdown.

Research Context

The abrupt switch to online learning during the pandemic has been widely studied across developed and a few developing nations (Sintema, 2020; Aristovnik et al., 2020). However, research focusing specifically on Tanzania remains scarce, despite the unique challenges students and higher education institutions face. While past studies have examined e-learning readiness among students at various Tanzanian universities (Mumbo et al., 2018; Ng'umbi & Gachago, 2020), few have investigated students' experiences after the emergency remote teaching deployment during lockdowns. Understanding real-time barriers undergraduate students face at MNMA is essential for adopting remote instruction in case of similar potential future crises.

The current research was undertaken with undergraduate students at the MNMA, a public HLI situated along the Indian Ocean coast in Tanzania. In response to the COVID-19 pandemic, the Tanzanian authorities enforced a nationwide lockdown in April 2020, necessitating the closure of all educational institutions, including universities (Ministry of Education, 2020). Like many higher learning institutions globally, the Academy quickly transitioned to online education delivery without existing e-learning infrastructure. This sudden shift to emergency remote learning presented numerous difficulties for students across the Academy's campuses - Kivukoni, Karume, and Pemba. Nevertheless, empirical investigations into e-learning challenges amidst the COVID-19 lockdown remain scarce, particularly within the Tanzanian higher education context. Therefore, this study seeks to address this gap by surveying undergraduate students at the Academy regarding their experiences with emergency remote education. The findings will inform recommendations to improve access, quality, and inclusion in online learning at this institution and other Tanzanian higher learning institutions.

Objectives

This study investigated the key e-learning challenges undergraduate students faced at the Mwalimu Nyerere Memorial Academy in Tanzania in effectively accessing education through e-learning platforms during the COVID-19 pandemic and lockdown period. Specifically, the study aimed:

1. To identify key e-learning challenges MNMA undergraduate students face during the COVID-19 lockdown.
2. To search for the most appropriate solutions to the e-learning challenges raised by MNMA undergraduate students.

Research questions

This study is geared to answering the following research questions:

1. What are the key e-learning challenges MNMA undergraduate students face during the COVID-19 lockdown?
2. What are the most appropriate solutions to the e-learning challenges raised by MNMA undergraduate students?

Significance of the study

The COVID-19 pandemic caused significant disruptions to education systems worldwide, necessitating a rapid shift to remote learning (United Nations, 2020). Wealthier countries with robust technological infrastructure were able to transition to online education, but this proved challenging for less affluent nations lacking adequate resources (World Bank, 2021). Recent studies conducted in Sub-Saharan Africa demonstrate how the crisis exacerbated existing inequities in access to education. Students from low-income communities encountered numerous barriers to participating in distance learning modalities (Atieno, 2020; Sanga, 2022). Consequently, this study offers vital context-specific insights into the unique obstacles and challenges encountered by undergraduate students at the MNMA in Tanzania during the crisis-prompted rapid adoption of e-learning platforms. While previous research has analysed national-level trends, few studies have focused on the on-the-ground realities and access issues faced explicitly by students in under-resourced public

HLLs settings (Mosha, 2021). As Sanga (2022) notes, public HLLs serve disadvantaged students from lower socio-economic strata and are likely to confront more significant infrastructure and capability constraints than private HLLs. Therefore, investigating the e-learning challenges of students in these contexts can uncover critical equity concerns.

This study employed a survey methodology to evaluate key e-learning challenges, including technological access, digital literacy, study environments, and institutional support influencing undergraduate students' capacity to engage in online learning meaningfully. The findings provide empirical evidence to enable targeted strategies and recommendations to successfully improve capabilities, infrastructure, resources, learner support systems and cross-sectoral collaborations required to leverage e-learning platforms during emergency transitions. Overall, the study fills a significant gap in the literature and can help find context-appropriate solutions to promote academic continuity and equal access to quality higher education during interruptions.

Literature Review

In March 2020, the World Health Organization (WHO) declared a novel coronavirus that causes COVID-19 as a pandemic (WHO, 2020). WHO also recommended that countries worldwide implement stringent restrictions on human mobility to impede viral transmission. Such limitations, including social distancing protocols, necessitated that people remain at home while working or learning remotely (WHO, 2020). With academic institutions closed, and instruction shifted online, demand escalated for alternative teaching and learning modalities, precipitating the surge of online education (UNESCO, 2020).

While online learning expanded rapidly, this transition was not equitable worldwide. Wealthier nations with advanced technological infrastructure and capabilities made the shift more smoothly than less developed regions (Reimers et al., 2020). Specifically, countries in Sub-Saharan Africa faced significant hurdles in implementing remote learning due to limited access to electricity, internet connectivity, devices, and digital skills among the population (Atieno, 2020; Sanga, 2022). These existing inequities in technological resources and e-readiness led to a learning crisis and a widening of educational disparities during the pandemic (König et al., 2020).

HLLs in Sub-Saharan Africa encountered numerous obstacles in transitioning to emergency remote teaching. Public institutions catering to disadvantaged students faced more significant limitations than private universities (Mosha, 2021; Sanga, 2022). Specifically, students reported barriers to access, including lack of devices, unreliable internet connectivity, unaffordable data costs, absence of study spaces at home, and insufficient digital skills for online learning (Atieno, 2020; Mosha, 2021).

Furthermore, the academic staff were not adequately prepared or supported to rapidly switch to remote instructional formats (Kurgat et al., 2021). Universities lack the institutional capacity to train faculty in online pedagogies and offer guidance on selecting appropriate technologies and instructional strategies (Tarus et al., 2015). This created challenges for maintaining academic standards and the quality of teaching and learning during the crisis (Mhlanga & Moloji, 2020).

Targeted interventions are vital to enhancing students' and faculty's online learning capabilities at Sub-Saharan African public universities to promote equity and quality during disruption. Recommended strategies include improving access to devices and connectivity through public-private partnerships, subsidised internet data bundles, computer labs and digital equipment loans (Sanga, 2022; UNESCO, 2020). Building students' digital literacy skills and online pedagogical competencies of faculty through training and support programs is also essential (Kurgat et al., 2021; Mosha, 2021).

Institutional capacity for e-learning needs strengthening through updated ICT policies, quality assurance frameworks, instructional design support, and partnerships (Tarus et al., 2015; Mhlanga & Moloji, 2020). Cross-sectoral collaboration between governments, mobile providers, NGOs and other stakeholders can facilitate coordinated solutions to equip students and faculty for continuity of learning during emergencies (Reimers et al., 2020). Further research should explore the long-term impacts of emergency remote learning and evidence-based strategies tailored to the needs of under-resourced higher education systems.

Methodology

This study utilised a survey design to investigate the challenges encountered by undergraduate students at Mwalimu Nyerere Memorial Academy in Tanzania when engaging in e-learning during the COVID-19 lockdown restrictions. A questionnaire created with Google Forms was employed to survey students remotely. Before distributing the entire questionnaire, a pilot survey was conducted with a small sample of 5 undergraduate students using the Google Meet videoconferencing platform. This pilot testing identified crucial challenges students experienced with online learning to inform the design of the final questionnaire. The last questionnaire link was subsequently shared with the selected sample of undergraduate students at the MNMA via class representatives' WhatsApp groups, hence, facilitating fast data collection.

Research Participants

A survey was conducted with 150 undergraduate students at Mwalimu Nyerere Memorial Academy in Tanzania to investigate the challenges faced by students in adapting to online learning during the COVID-19 lockdown period. The participants comprised undergraduate students pursuing various degree programs and in different years of study. There were 85 male and 65 female participants aged 18 to 25 years. The students represented diverse socio-economic backgrounds, including low, middle and high-income families. Data was collected in July 2022 as a post-COVID-19 lockdown analysis.

During the lockdown, undergraduate teaching and learning activities transitioned fully online, with students attending classes virtually via Zoom, Google Meet, WhatsApp, and email. The survey aimed to understand the experiences and perspectives of undergraduate students at the Academy regarding the challenges posed by the sudden shift to e-learning during the pandemic lockdown. Identifying these challenges could inform interventions by the Academy to better support students in adapting to online education delivery modes.

Research instrument

A questionnaire was developed as part of a survey to examine the challenges experienced by undergraduate students at Mwalimu Nyerere Memorial Academy in Tanzania in adapting to online learning during the COVID-19 lockdown period. The questionnaire had three sections. Section one gathered demographic data about the participants, including age, gender, academic year, and socio-economic status. Section two comprised ten closed-ended items to assess students' difficulties with e-learning during the lockdown, such as technology access, home learning environment, communication with instructors, and motivation levels. Section three included an open-ended prompt for students to offer suggestions to improve the online learning experience amid the pandemic. The questionnaire was distributed to 150 undergraduate students at the Academy and took around 15 minutes to complete. All 150 completed questionnaires were submitted after seven days. Of the respondents, 110 provided additional qualitative feedback and recommendations in the open-ended section three. Analysis of the quantitative closed-ended responses and qualitative open-ended data delivered insights into the obstacles and frustrations experienced by students as they rapidly transitioned to online learning due to the COVID-19 restrictions. These findings inform potential interventions by the Academy to better support virtual teaching and learning in crises necessitating the suspension of in-person education.

Data analysis

The closed-ended questionnaire responses were entered into Microsoft Excel 365, and frequencies tallied for each of the ten questionnaire items about challenges faced by undergraduate students accessing online education during the COVID-19 lockdown. This enabled the identification of the most prevalent challenges reported by students in adapting to remote learning modalities. Additionally, 110 students provided optional open-ended comments and suggestions for enhancing the online learning experience. These responses were reviewed using thematic analysis and categorised based on emergent issues and recommendations. The quantitative frequency analysis combined with the qualitative thematic coding synthesized insights into the challenges encountered by undergraduate students after a sudden shift to online delivery due to pandemic lockdown measures.

Results

Respondents profile

As Table 1 shows, 78(52%) were male, and 72(48%) were female undergraduate students enrolled in human resource management, social studies, gender and development, the economics of development, and education programs in the Academy. The respondents ranged from 20 to 30 years old; the majority (64%) were between 20 and 25 years. The total number of undergraduate students who participated in the survey was 150 (100% response rate).

Table 1 – Respondents Profile (n = 150)

Demographics	Value	N	Frequency (%)
Gender	Male	78	52
	Female	72	48
Age	20-30	150	100
Cluster	Undergraduate	150	100

Key e-learning challenges during the COVID-19 lockdown at MNMA

Analysis of the closed-ended questionnaire responses revealed critical challenges faced by undergraduate students at MNMA in adapting to online learning during the COVID-19 lockdown. As shown in Table 2, limited internet connectivity was the most frequently reported challenge, indicated by 31% of respondents. This highlights issues with access to reliable broadband connections and bandwidth to support online learning. The second most reported challenge was the lack of skills for online learning, reported by 23% of undergraduate students. This suggests that many learners lack experience and confidence in using e-learning platforms and tools. On the other hand, 12% of respondents indicated that some lecturers did not provide teaching during the lockdown. This implies issues with lecturers' readiness and availability to deliver online instruction.

On the other hand, 9% mentioned insufficient financial resources to purchase mobile internet data as a difficulty. This demonstrates the economic barriers for low-income students accessing online education. Moreover, another 9% also reported having to borrow smartphones from others due to a lack of personal devices. This again reflects gaps in technology access and infrastructure.

Overall, the quantitative findings reveal that undergraduate students faced significant obstacles in transitioning to e-learning during the pandemic lockdown, including technological constraints, skill gaps, and lack of guidance - highlighting areas for the Academy to address in building institutional capacity to support online teaching and learning, especially in crises.

Table 2 - Key challenges of online learning (n = 150)

No.	Items	N	Frequency (%)
1	I had a limited internet connection.	46	31
2	I faced interruptions while learning at home.	5	3
3	Some lecturers did not even teach.	12	8
4	I did not have a smartphone.	8	5
5	I had no money to recharge my phone credits.	13	9
6	There was a lack of proper guidance from the lecturers.	10	7
7	I did not trust the relevance of shared content from colleagues	14	9
8	I had no idea where to access e-learning materials.	2	1
9	I had limited skills for attending online learning.	35	23
10	It was hard to access online classes (e.g., through Zoom).	5	3
TOTAL		150	100

How to address the challenges

The third section of the questionnaire required undergraduate students at MNMA to provide open-ended suggestions for improving their online learning experience in case similar pandemics happen. As shown in Table 3, most undergraduate students (62%) mentioned the need to improve internet connectivity to facilitate access and participation in remote education. This emphasises the need to address technological limitations and infrastructure deficits hampering effective e-learning, particularly in crisis contexts necessitating a sudden shift to virtual platforms. Thirty (around 7%) students recommended conducting the e-learning authoring course for academic staff members to enrich their skills in developing engaging online content and activities. This implies a perceived pedagogical gap in lecturers' readiness for emergency remote teaching.

A smaller proportion (6%) of respondents suggested the need to orient undergraduate students on leveraging social media for academic purposes. This highlights the necessity to build digital literacy capabilities among less experienced students with online learning tools. Similarly, 5% of respondents proposed the introduction of incentives for lecturers who would be teaching under challenging pandemic conditions. This suggestion points to the need for institutional policies that motivate and support lecturers who adapt to e-learning under duress. Overall, the findings identify professional development for online teaching, improving technology access, and student digital skills training as key measures learners recommend enhancing remote learning and resilience considering potential future crises.

Table 3 - How to solve the challenges (n=110)

No.	Items	N	Frequency (%)
1	Run e-learning course authoring for lecturers	30	27
2	Improving the internet connectivity	68	62
3	Orienting undergraduate students on the use of social media in learning	7	6
4	Introduce lecturers' incentive package in teaching difficult time	5	5
TOTAL		110	100

5. Discussion

The COVID-19 public health emergency compelled educational institutions worldwide to shut down physical campuses and rapidly shift to online learning modes. However, this sudden transition to e-learning with limited preparation was ridden with challenges, especially for students from disadvantaged backgrounds studying in HLIs in low-resource developing regions, as substantiated by this study. The findings demonstrate that the

significant barriers reported by undergraduate students at the MNMA in adopting e-learning solutions during the COVID-19 lockdown in Tanzania were limited internet connection, limited skills for attending online learning, lack of money to recharge phone credits, lack of trust in the relevance of shared content from colleagues, lack of proper guidance from the lecturers. The abrupt shift online without sufficient infrastructure, resources, and capabilities to enable equitable access to e-learning led to suboptimal learning outcomes and academic performance issues as per the students' self-reported perceptions.

The constraints faced align with challenges of e-learning adoption in other developing country contexts, including device and connectivity gaps; skill limitations; lack of localised, interactive content; and absence of institutional support mechanisms, as noted in earlier studies analysing barriers faced by students and educators during the pandemic (Mailizar et al., 2020; Mhlanga & Moloji, 2020; UNESCO, 2021b). However, the accelerated switch from face-to-face models to fully online platforms due to the unforeseen public health crisis exacerbated these barriers manifold, even in public universities, which were likely less prepared with e-learning infrastructure compared to private institutions.

The findings of this study demonstrate an urgent need for developing countries to reform policies, mobilised resources, and foster partnerships to build capabilities in e-learning and bridge digital divides in access to technology, connectivity, educator readiness, content and student support systems as recommended in several reports (COL, 2020; UNESCO, 2021a). Targeted efforts are essential to equip learners and institutions to leverage e-learning tools effectively to minimize disruption and inequities when traditional education systems are disrupted, especially among disadvantaged student groups.

Conclusion and Recommendations

This study investigating undergraduate student experiences found that the sudden transition to online learning during campus closures in Tanzania due to the COVID-19 pandemic presented multifaceted challenges for students from HLIs, particularly regarding technology access, connectivity, digital skills, content, and support. These constraints severely impacted their learning experiences and performance when face-to student-centred was disrupted.

While the small sample size presents contextualised findings, the study provides valuable insights into on-ground e-learning barriers hindering learning amidst the pandemic in a typical public university in a developing country. Further research across contexts using mixed methods could enrich perspectives. The findings underscore the need for developing countries to formulate strategies, policies, and partnerships to ensure equitable, meaningful online learning continuity during crises. Although e-learning holds potential, concerted efforts are critical to building digitally inclusive student-centred ecosystems to mitigate learning losses when conventional systems are disrupted. Targeted reforms could turn the pandemic into an opportunity to strengthen e-learning infrastructure readiness.

In conclusion, the targeted measures are needed to enhance access, training, redesign, and support channels, especially for disadvantaged students (Hodges et al., 2020; Rasheed et al., 2020). Context-specific solutions are vital, considering resource constraints and learning culture (Ali, 2020). Collaborative mobilisation of capabilities by government, communities and institutions is critical for resilient e-learning ecosystems (Mailizar et al., 2021). Equitable access to meaningful learning must guide education systems (UNESCO, 2021b).

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