

E-Learning Readiness Assessment on Distance Learning: A Case of Tanzanian Higher Education Institutions

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ABSTRACT

The adoption of e-learning systems has been associated with various challenges to the users, particularly the higher learning institutions (HEI). During the COVID-19 pandemic, the majority of the HEIs were subjected to lockdowns that resulted in the stimulation of using e-learning to deliver learning materials and perform assessments. This adoption of e-learning technologies has been associated with several challenges that span from the unfamiliarity of the technologies to the implementation or usage challenges. This study employed a qualitative research method which involved conducting interviews with the lecturers, students, and ICT experts to gain an understanding of the key issues associated with the use of e-learning systems at Tanzanian HEIs. Among others, this study has identified the key distance learning alternatives, the challenges which are associated with the use of such techniques, and the impacts of using e-learning on HEIs.

KEYWORDS

COVID-19, E-Learning Systems, HEIs, ICT, Tanzania

1. INTRODUCTION

The proliferation of e-learning systems in developing countries opened up alternative platforms for teaching and learning. Since 1990, most developing countries have started to adopt e-learning technologies in learning institutions particularly in universities and other learning institutions (Naresh & Reddy, 2015). In Tanzania, for instance, the e-learning systems were initially adopted in the year 2000 where the University of Dar es Salaam (UDSM) and the Open University of Tanzania (OUT) were the champions in this movement (Lashayo & Gapar, 2017). It is nearly twenty years now since Higher Learning Institutions (HEI) in Tanzania were started adapting to e-learning systems as co-learning platforms.

An E-learning system in this context means exploiting technologies (web-technologies) to deliver learning or learning materials (Gerhard & Mayr, 2002). Higher Learning Institutions (HEI) means any institutions accredited by the National Council for Technical Education's (NACTE) or Tanzania Commission for Universities (TCU) to grant degree certificates. Adoption means accepting and

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using the e-learning system in HEI as a platform for learning and teaching (Maina & Nzuki, 2015). The scope of this study, therefore, is on the applicability of E-learning systems within the HEI of developing countries such as Tanzania especially in the situations where the technology is needed most, particularly during the Covid 19 pandemic.

The outbreak of Covid 19 disease was caused by viruses in the early year 2020 and later on announced by WHO as a pandemic disease (Allo, 2020). Among the measures taken by the majority of the countries to control its spread include upholding the lockdown of human activities, asking people to stay away from each other for up to two meters apart and washing hands frequently with clean water or using sanitisers to ensure that their hands are clean all the time. Among the aspects which were suspended in such lockdowns include traditional teaching and learning. In Tanzania, the government announced to close all HEIs with effect from March 17, 2020, to June 2020. In the education sector only, more than 1.2 billion students from 186 countries were out of school since this outbreak (WEFORUM, 2020). As a result, the use of e-learning seems like an ideal global solution for traditional teaching and learning.

Despite the existence of a vast majority of E-learning systems, their applications to the HEIs in Tanzania were very minimal. It is through this lockdown period where schools started to find the best way of using the E-learning systems to cover learning and teaching materials online. Previously, 46% of 33 public and private universities have managed to have e-learning systems in Tanzania (Lashayo&Gapar, 2017). Irrespective of this statistic, there were only a few circumstances of the HEI utilising such systems to deliver education during this difficult time of the Covid 19 pandemic. This means that there might be unprecedented issues that are still affecting the smooth adoption of E-learning systems that need to be addressed for future consumption. Objectives of this paper are to explore awareness of the key E-learning systems amongst Tanzanian HEI stakeholders, the extent to which ICT readiness is associated with the use of such systems, identifying the leading E-learning possibilities which experts expect to have been opted by the Tanzanian HEIs and identifying their user settings and issues which matters most on the successful applications in the pandemic time such as during the Covid19. Therefore, this article addresses the following main questions:

- Q1:** What is the awareness and understanding of stakeholders of HEIs in e-learning systems before and during the Covid 19 pandemic in Tanzania?
- Q2:** What are the practical applications of E-learning systems in HEIs during the Covid 19 pandemic in Tanzania?
- Q3:** What were the challenges to fully e-learning systems application in HEIs in Tanzania during the Covid 19 pandemic?
- Q4:** What are the negative impacts associated with the use of e-learning systems in HEIs?

The rest of this article is organised as follows: Section two discusses the leading distance learning application and systems which are more applicable to Tanzania followed by section three, which discuss the usage context of E-learning in Tanzania. Section four discusses the methodology which was used when conducting this study followed by section five, which presents the results and discussions. Section six is the conclusion of this article.

2. DISTANCE LEARNING APPLICATIONS

UNESCO list several applications which the lecturers, students and schools may use during the year 2020 pandemic time to offer school administration, learning for students and provision of social care and collaboration in the time of school pandemic closure (UNESCO, 2020). These include Mobile Phone Systems, Massive Open Online Courses (MOOC) and E-learning systems.

2.1 Mobile Phones Applications

Mobile Phone Systems, in this category it enlists mobile applications which are running on smart-mobile phones, typical examples include Cell-Ed, Eneza Education, Funzi, KaiOS, Ubongo, Ustad Mobile (UNESCO, 2020). Ustad Mobile, Cell-Ed have a facility that enables students to access content offline compared to the rest of mentioned mobile applications, however very few or none of them was able to be used by HEI.

2.2 Massive Open Online Course (MOOC)

Massive Open Online Course (MOOC) includes applications that were designed to provide learning content for a large group of users. Typical examples include Alison, Coursera, EdX, iCourse, Future Learn, Icourses, Udemy and XuetangX (UNESCO, 2020). These applications were limited to languages as many of them use English, Chinese, Portuguese, Spanish, French and Italian. None of them uses Swahili.

2.3 E-learning Systems

An E-learning system means exploitation of technologies (web-technologies) to deliver learning or learning materials (Gerhard & Mayr, 2002). It is a type of information system which is used in learning and teaching to create an environment in which students and lecturers can share learning materials online or offline. It tries to get rid of the limitation of distance, time and cost incurred by participating parties. Examples of these e-learning systems include Moodle, Google Classroom, ClassDogo, Edmodo and Webinar (UNESCO, 2020). Munguatosha et al (2011) reported that 78% of HEI in Tanzania adopted Moodle as a learning and teaching application. Moodle is used because of its free source and rich content (text, audio and video facility). Therefore, irrespective of the long list of applications announced by UNESCO, the majority of HEIs in Tanzania were sticking to Moodle as their official e-learning system.

3. E-LEARNING USAGE CONTEXTS

This section will review several approaches employed in different countries in combating the Covid 19 pandemic which has resulted in locking down on-campus traditional learning and teaching.

In South Korea, the national budget of the education sector was increased by 4% to cover the impact caused by the Covid 19 pandemic (WorldBank, 2020). The portion of the increased budget will be moved into the support of online education platforms and making zero-rating for public websites.

In China, e-learning systems were used in Higher Learning Institutions to disseminate learning and teaching materials to ensuring learning are in-disrupted. To support this several steps were taken including mobilizing the data provider to boost their internet connectivity services, upgrading their bandwidth. On top of that, more than 24,000 online courses were developed for HEI students, strengthening the online security of courses and provision of psycho-social support and specific to enhance Covid 19 understanding to students (WorldBank, 2020). On the other hand, Croatia and the Dominican Republic supported the use of e-learning platforms by providing free internet access (via SIM cards) to citizens with lower socio-economic status. They implemented that by providing freeWi-Fi hotspots to be available to students (WorldBank, 2020).

From the African perspective, Egypt, through her Ministry of Communication and IT, in collaboration with mobile data operators in the country made arrangements of ensuring that there is the availability of SIM cards at no cost for HEI students who are mainly using Edmodo as their official e-learning system (WorldBank, 2020). Kenya's Government arranged with Google and succeeded to provide a Google's Loan Balloon floating to rural and remotes areas from which students' communities can tap on data connectivity of 4G. Technically, a single balloon mounted provide connectivity around a radius of 80km (WorldBank, 2020) in the implementation processes. In the

Tanzanian context, the Covid 19 pandemic was formally announced and thereafter led to the closure of public and private-owned services including Higher Learning Institution on March 17, 2020, and later on re-open on June 1, 2020. The closure announcement was made public by Prime Minister, Hon. Kassim Majaliwa (Tanzaniaeducationcorp, 2020) before the President of the Republic of Tanzania announced re-opening on May 21, 2020. The number of universities that adopted e-learning systems as co-platform was 46% out of 33 universities (Lashayo & Gapar, 2017).

During Covid-19 pandemic, the Tanzanian data operators (Vodacom, Tigo, Zantel, Airtel to mention few) tried to reflect this situation to their subscribers by offering internet bundles in daily, weekly and monthly packages and charges. There was no formal negotiation between government and these data operators. However few HEI like University of Dar es salaam took an individual step to negotiate with these data operators in order to get discount prices for those internet bundles for their users (Mtebe, Fulgence & Gallagher, 2021). In terms of budget no formal addition budget was allocated to HEIs from government.

Few higher learning institutions attempted to use an effective online platform during the Covid 19 pandemic. The following are the initiatives taken by some of the Higher Education Institutions in the country.

3.1 The Institute of Accountancy Arusha

This public-owned institution was able to use the e-learning system (Moodle) in learning and teaching for postgraduate studies particularly thirteen Masters programmes (IAA-Prospectus, 2019). Undergraduate programmes were unable to capitalise on this platform, Hence nearly 221 out of 9000 students are using effectively Moodle platform for conducting virtual classes, distributing learning materials in audio, video and text. Apart from Moodle having rich features in learning but in this case, was integrating Zoom video technology.

3.2 The Institute of Finance Management

The Institute of Finance Management (IFM) is a public institution based in Dar es Salaam. After the closure of the colleges, various lecturers and students started to find alternatives to keep on providing teaching materials to students. However, the online teaching activities were only successful in the higher levels such as masters and postgraduate degrees. It was considered impossible to implement and use in the undergraduate programs because of the challenges such as poor financial capabilities to own smartphones and paying for data subscriptions. The use of the e-learning system was previously introduced to the IFM community but did not gain popularity until when the institute was re-opened. The lecturers have now started to upload materials online where students can now access through the customised system (IFM E-learning system).

3.3 Dar es Salaam Institute of Technology

Dar es Salaam Institute of Technology (DIT) is a public-owned institute established in 1997 and located in Dar es Salaam city centre, Ilala district. DIT has a vision of becoming the leading provider of high-quality engineering education, research and consultancy within Tanzania and the East African region. During the Covid 19 pandemic, this institute continues to disseminate learning materials to students of both undergraduate and post-graduate using a customised Moodle system, called Dar es Salaam Institute Technology Learning Platform (DIT-LP).

3.4 The University of Dar es Salaam

The University of Dar es Salaam (UDSM) is one of Africa's oldest universities, based in Dar es salaam, Tanzania. It is among the HEIs which enforced university-wide technology-enhanced teaching during and after Covid 19.

The E-learning resources which are mostly used at UDSM are lecture notes, Open Educational Resources (OER) and Massive Open Online Courses (MOOCs). The tools which are used include Zoom and Moodle with an addition of Postgraduate Management Information System (PGMIS) which is used for managing supervision of Postgraduate student research at the university (Mtebe, Fulgence & Gallagher, 2021). Such information are summarised in Figure 1.

4. RESEARCH METHODOLOGY

This study is mainly qualitative in which the primary data were collected through conducting interviews with the key people in the technology used in the HEI. The purposeful and convenient interviews were conducted with four HEI institutions (IAA, IFM, CBE, UDSM and DIT) students, lecturers and ICT supporting staff. The first aspect which researchers targeted was to understand the extent of awareness of the key E-learning systems in the context. This is important as it depicts whether the key people know the alternatives to traditional teaching and learning. The second aspect was to identify the extent to which ICT readiness of the HEI (and the country in general) supports the effective use of these E-learning systems. This involved assessing readiness issues such as the existing ICT, infrastructures, enthusiasm of the leaders, existing country regulations and education levels if they support E-learning use. The last aspect is on identifying the issues which need more attention to the stakeholders in Tanzania for smooth adoption of E-learning in the future. In this part, experts in technology adoption were interviewed on the issues at hand and their opinions were used as part of the contributions of this study.

5. RESULTS AND DISCUSSIONS

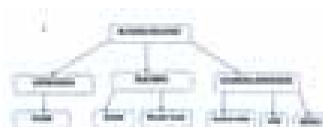
The results highlight various issues concerning the E-learning systems usage in Tanzanian HEIs during the Covid 19 pandemic. The discussion starts with the identified E-learning practices which are currently used in the context followed by the challenges which are faced by the stakeholders.

The E-learning awareness was identified by observing the investments which were made in the Tanzanian HEIs and how this technology has been adopted. The practical applications or practices were identified after interviewing the key users to see in which aspect they use various E-learning systems were identified by asking relevant questions to the stakeholders. The stakeholders were also asked to explain the challenges which they face when using E-learning as well as the negative impacts which they have faced. The key points were noted by a researcher and were then used to formulate justifications for discussions of the results of this study. The data collection started at Dar es Salaam, where IFM, DIT and UDSM are located before conducting interviews at IAA in the Arusha region.

5.1 E-Learning Practices

The current E-learning practices in Tanzania which are used include the effective use of the existing social media, development of customised E-learning systems, the use of online learning tools, effective use of smartphones.

Figure 1. Blended model of E-learning practices at UDSM (Mtebe, Fulgence & Gallagher, 2021)



5.1.1 The Use of Social Media

It has been observed that social media have effectively being used by HEI communities during this pandemic. Smart mobile phones were used to access learning material (notes, tutorials, assignment and quiz) which were provided in e-learning systems. The majority of lecturers were having smart mobile phones unlikely students. One lecturer said:

Few students were able to access material because they managed to have a smart mobile phone but the majority they didn't.

According to the report from the Tanzania Communications Regulatory Authority (TCRA), report 48.77 per cent of the mobile phone subscribers in Tanzania is using the internet (The-Citizen, 2019). Therefore, if you interpolate this figure to lecturer and student, the number may be less than 48.77 for students because most of them depend on a stipend (sponsorship) from the Higher Education Students' Loans Board (HESLB).

5.1.2 Customised E-Learning Systems

The finding shows that lecturers and students who are using e-learning systems, very few know another type of e-learning system apart from Moodle which to a greater extent are used in many HEIs. Examples of other types include Blackboard, Schoology, Edmodo and Docebo. One lecturer from IAA said that:

I do not use another system apart from Moodle.

Other finding reveals that few lecturers in HEI were able to utilise the full e-learning system for teaching. Very few lecturers were using it even before the Covid 19 pandemic while the majority were still on traditional learning system and even those lecturers who were using it for uploading lecture notes without caring number of students who were able to access material, therefore interactive sessions like video and audio conferencing has not been used before Covid 19. One IAA lecturer said:

I do not know even if Moodle has a facility to upload audio and video features.

This implies that the awareness of the e-learning alternatives amongst the stakeholders is still at the infancy stage.

On the use of the e-learning system for real-time interactions, this is still problematic since in some HEIs this tool is not supported by an e-learning system. This was proved by one lecturer of IFM who is also a member of the management team who said that:

I am only using this system to upload notes, assessments type including assignment, quiz but no real-time interaction.

5.1.3 Online Learning Tools

The current world is comprised of various tools which assist learning processes. Such tools provide a new experience to the students. Examples of online tools include Google Classroom, Coursera, Udemy and Lynda.com. Despite the existence of such tools, a few issues need to be sorted out before they are fully utilised by the stakeholders. For example, university students and lecturers have to agree and choose one of the tools that they will use throughout the course duration. However, this is challenging in the case where the university management does not support the tool since lecturers

have to cover the costs associated with the use of the application. In that case, the option which is likely to choose by the lecturers is to stick with the tools which are already installed and accessed within the institute's ICT infrastructures.

5.1.4 Effective Use of Mobile Phones

Mobile phones can be used strategically to improve the provision of educational services. The effective use of cameras, for example, can help students to take pictures of important images and use them for review purposes. Similarly, watches, text SMS, calls, calculators and other features can significantly help students and lecturers of the HEIs to improve the way they are sharing, communicating, organising and storing important materials.

However, while the use of mobile phones is associated with numerous advantages, it is still not permitted to use them in class in most of the lecture sessions as it tends to disrupt concentration. In that case, more research needs to be done to find out the best way of incorporating mobile phones into the HEI's educational strategy in Tanzania.

5.2 Challenges on Using E-Learning

The challenges which users (stakeholders) experiences most when using E-learning in Tanzania include lack of proper guidelines, Low access to Data bundles and Low ICT readiness, reduced confidentiality of assignment/quiz and free-riding for unauthorised students.

5.2.1 Lack of Proper Guidelines

E-learning usage in Tanzania operates without effective guidelines. There is an unclear policy that provides a framework for the usage of E-learning. Both the National ICT policy and National ICT implementation strategy do not outline explicitly how ICT facilities would be used better to deliver education through e-learning systems (National-ICT-Policy, 2016.p.6; National-ICT-Implementation-Strategy, 2017.p.8). On top of that National, Education policy is still silent on the use of e-learning systems as an alternative to traditional education in the pandemic situation (National-Education-Policy, 2014). This poses challenges to the HEIs in handling assessments and sharing information through online platforms. This study has identified that the Sokoine University of Tanzania, one of the most reputable universities mentioning for the first time, the policy that will see the students taking into consideration online learning and recognise its effectiveness (SUA-Guidelines, 2020). An interview with one of the lecturers on June 2021 at the Institute of Finance Management on the use of Plagiarism Checker tools commented that:

Yes we have access to the software is but we still can't use it for an official assessment of assignments of students because there is still no official guideline at the Institute.

This implies that there might be a couple of software which are existing out there but the lack of official guidelines and policies on how to use them at the institutional level is still a great challenge.

Besides, Security is another important area of concern when sharing information with the public. The disclosure of confidential information may lead to a lowering of the level of trust that citizens have in their Government (Lessig, 2009). In this regard, the Tanzanian Government Officials are restricted from using public social media to communicate and share confidential information. However, this step came when there were no other alternatives in place. As a result, some of the important meetings were discarded. The discussion with one of the lecturers who has also been appointed to hold the position of head of the department in one of the universities said:

We had to suspend some meetings because we were restricted to use Zoom to conduct our internal meetings.

Therefore, there is a need to consider establishing guidelines that can help people to use public platforms for sharing sensitive information.

5.2.2 Low Access to Data

This study has identified some circumstances which hinder the majority of undergraduate students to access data, and are eventually unable to use e-learning effectively. Due to the low financial levels of the majority of Tanzanians, most of the HEI students depend on sponsorships from HESLB. Unfortunately, this funding opportunity stopped at the time of closing the HEIs. As a result, students stayed at their homes without funds that could allow them to buy data bundles and access materials online. One of the IFM students said that:

I was worried if the online training had started officially because none of my family members has a Smartphone.

Such observation has shown that there are even a vast number of students who did not own smartphones that could allow them to get access to online materials. One IAA student said:

Only a few of us have smart-phone.

Also, the low financial capability amongst the students is among the biggest challenges. The cost of accessing the internet for Tanzanians is high for students. It eventually becomes difficult to access the materials online especially the video contents. One of the students commented that:

Live video conferencing/class use more data than usual which make us unable to match it every time live video conferencing/class is been conducted.

5.2.3 Low Readiness for E-Learning

Lecturers of the HEI were not ready for an e-learning system although the majority of training institutions had a system in place. Examples IFM, CBE, DIT and IAA they both had e-learning system and there were training conducted beforehand. One CBE lecturer commented:

We were given training on how to use e-learning system since 2019 but the majority of lecturers were reluctant on using it.

The reluctance of some lecturers or students to utilise E-learning systems was also experienced at IFM following the comment provided by one of the lecturers in the Department of Computer Science:

I only use E-learning platform to upload notes and assignments to students.

It was expected that this comment is unlikely to be raised by a lecturer from the technical department like Computer Science. This implies that there is a possibility of a couple of lecturers from other non-technical departments such as Social Protection, Insurance, Banking and Accountancy who use only few functionalities among the many of the E-learning systems. This implies that other functionalities are less explored by the users.

5.3 Negative Impacts of Using E-Learning

The use of E-learning is associated with various impacts on the delivery of educational services at Tanzanian HEIs. This study has identified two side effects which are associated with the use of e-learning in Tanzanian universities.

5.3.1 Compromise of Confidentiality of Assessment

The numbers of students who own smartphones are few due to low financial readiness. As a result, such students tend to use smart-phone owned by their colleagues to upload their assessments like assignments or quiz. This tends to compromise the confidentiality of assessment and the entire process of assessment because an assignment or quiz of one student should be opened to other students unless it is a group assignment.

One IAA student said that:

We are forced to use our colleague's smart-phone to upload our assignment or quiz.

In that case, if the handling of assignments keeps on being handled in this way, the quality of education is likely to be compromised significantly. Therefore, stakeholders have to come with an approach that takes into account this issue.

5.3.2 Free-Riding of Material Access to Unauthorized Students

Shared material through the e-learning system may be leaked to unauthorized students when there is a friendship between the registered students and non-registered students. In situations like this, if the registration process requires students to pay the tuition fee as a pre-requisite, they can share learning materials. This may even happen when one student decides to share learning material with other non-students. In this case, some students are likely to benefit from various learning materials by just *being close* to registered students. The summary of the findings and discussions of this research are summarised in Figure 2.

6. CONCLUSION AND FUTURE WORK

This study performed a qualitative analysis of the key e-learning tools and the challenges which faces the HEIs on using them using a case of Tanzania during the Covid 19 pandemic. The study employed interviews where various students, lecturers and ICT professionals were consulted and their opinions were incorporated into the study for more discussions and understanding. Also, this study has explored the impacts of adopting E-learning systems into the education system of Tanzanian HEIs and found that majority of HEIs were unprepared and incapable to match with the demand of using e-learning systems as an alternative to traditional teaching and learning especially on pandemic time, however, the Covid 19 pandemic in Tanzania was acting as a tester to practical e-learning settings. Future studies may concentrate on the deep understanding of each of the aspects which have been highlighted in this study to propose the guidelines or frameworks on how the issues can be addressed at the national levels.

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Figure 2. Distance learning readiness assessment status



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