Equipping Library Users with Digital Literacy Skills as a Solution to COVID-19 and Other Similar Disasters: Lessons from Mzumbe University Library

Witness Josephat
Mzumbe University
BSc Library and Information Management Student
witnessjosephat8@gmail.com

Goodluck Mosha
Mzumbe University Library
Department of Library & Information Science Management
gooockluck.mosha@mu.ac.tz gmosha@mzumbe.ac.tz

Peter Siyao
Mzumbe University Library
Department of Library &Information Science Management
posiyao@mzumbe.ac.tz

Abstract

The need for equipping students in Higher Learning Institutions with Digital Literacy Skills (DLS) is considered one of the measures that can enable academic libraries to deliver library services during the time of the COVID-19 pandemic and beyond. This study aims at answering the following question: What types of digital literacy skills and tools were used by academic libraries during the COVID-19 closure of the universities. It also aims at analysing the way digital literacy skills could be used to support library services during the COVID-19 pandemic and beyond. Similarly, it examines barriers which inhibited the deployment of digital literacy skills during its outbreak. The study adopted a case study design while using a mixed approach to data collection. A total of 46 respondents were drawn from the population using both census sampling and purposive sampling techniques. Data were collected using interview–guides, questionnaires and documentary reviews. Qualitative data were analysed using content analysis while quantitative data were analysed using Microsoft Excel Spreadsheet. The findings indicated that academic library is required to cooperate with faculties and schools by deploying the following digital tools: e-learning platforms, increasing the use of social media, conducting webinars, updating the library website, encouraging the use of library e-resources and improving the library virtual reference services. The following barriers were strongly mentioned as inhibitors of equipping respondents with digital literacy skills: poor internet connectivity, family income status,

lack of comprehensive training on digital literacy skills, attitudes of lecturers towards digital literacy skills and lack of teleworking culture among librarians, students and lecturers. It was also noted that the deployment of digital literacy skills was worsened by an acute shortage of funding and resources. The study concludes that for libraries to effectively deliver library services both librarians and users must possess the necessary digital literacy skills. The ICT infrastructure, on the other hand, must be improved to enable libraries to apply digital literacy tools and facilities in the delivery of library services. The need to overhaul library training programmes adding a course on digital literacy skills and deployment of other emerging technologies in the delivery of library services. This study is anticipated to provide insights into the conditions of academic libraries during the COVID-19 pandemic. The study findings will be an eye opener to academic libraries that they have to undergo rapid transformations which will enable them to stay relevant and able to provide services during the pandemic and similar disasters.

Keywords: COVID-19 pandemic, digital literacy skills, academic libraries, digital skills competencies, library emerging technologies, digital competency, Digital knowledge,

Introduction

COVID-19 was first noticed in Wuhan which is the capital city of Hubei Province in the Peoples Republic of China in December 2019. This pandemic is caused by the SARS-CoV-2 virus (COVID-19) through contact when people breathe in air contaminated by droplets and small airborne particles containing the virus (WHO, 2020). The pandemic spread rapidly across the world to the extent that as of March 31, 2020, it was noted to have led to more than 800,000 total confirmed cases and 40,000 deaths (Ke, Romero-Severson & Hengartner, (2020). Globally, students in Higher Learning Institutions (HLIs) were adversely affected by the COVID-19 pandemic. The records indicate that the education sector was second to the health sector in the list of the most affected sectors. In Tanzania, on 17th March 2020, all educational institutions were closed down because of the COVID-19 pandemic. This was a prime time for both students and lecturers because the teaching and learning activities had gained high momentum. Following this closure, lecturers were not able to continue with teaching activities except for only very few intrepid lecturers or, those lecturers who were digitally proficient managed to continue doing so through online platforms.

The COVID-19 pandemic brought changes in the mode of teaching. Educational institutions started to consider providing education remotely using online platforms (Martzoukou, 2020). De Giusti (2020) adds that COVID-19 stimulated innovation within the education sector including libraries. The innovations were witnessed by the development of distance learning solutions which comprised several digital learning management systems including e-learning platforms. To help institutions overcome this unexpected disaster, UNESCO started working with ministries of education across nations to ensure the continued learning of students using different alternative modes of delivery and supporting them in various ways with technical help (UNESCO, 2020). Academic libraries were also required to be at the forefront of supporting the provision of online learning resources, online services and training. Libraries were supposed to position librarians in supporting students and staff to develop information and digital literacy skills via online courses, tutorials, workshops and e-consultations (Martzoukou, 2020). The rationale behind this is that digital literacy can affect the output of learning outcomes on students' academic achievement (Yustika & Iswati, 2020).

Digital literacy skills are essential skills required in accessing, managing, understanding, integrating, communicating, evaluating and creating information safely and appropriately through digital devices and networked technologies for participation in education, health, economic and social life (Law, Woo, & Wong, 2018). It has been acknowledged that the level of digital literacy in Tanzania HLIs is low because of several factors. The factors include poor Internet infrastructure, low bandwidth, lack of support from ICT experts and lack of user training (Kavuta &Nyamanga, 2018). Despite their low level of use, few institutions in Tanzania have implemented virtual learning environments which are related to digital literacy (Sife *et al*., 2007). However, with these current efforts, the library intends to use virtual learning environments to run information literacy courses, as well as implement mandatory information literacy courses for both undergraduate and postgraduate students (Lwehabura, 2018). There is a need to equip library users with digital literacy to enable them to undertake online courses. For example, the use of video conferencing thus allows sharing of quality information during the COVID-19 pandemic and other similar disasters to satisfy their needs even in the period of institution closure is of particular importance.

Digital literacy skills are a great tool for enhancing social, educational as well as economic development. Advancements in ICT and the use of digital literacy skills can improve economic opportunities for the poor, increase the delivery of services to the underserved, improve management and benefit social change (Emiri, 2017). The outbreak of the COVID-19 pandemic proved to be challenging for students, lecturers and the management of the HLIs. The pandemic disrupted the smooth operations of day-to-day of education sector particularly when such institutions were required to close down their operations. The lockdown resulted in the isolation of users from their institutional learning resources, particularly library printing services. Many academic libraries started thinking of ways they could remain relevant by providing their services remotely.

Adoteyi (2020) notes that academic libraries in Africa and Tanzania, in particular, were compelled to move their services online despite having unready infrastructure. A great desire to use technology is to provide easier, larger and more diverse access to learning resources in overcoming the problem of distance between students and lecturers and to facilitate increased interaction and collaboration in online classes to become of paramount importance. Yustika and Iswati (2020) posted that digital literacy skills are of paramount importance to students as they help them to undertake online programmes and courses. However, there is a gap in knowledge since some of the students are illiterate in using digital devices and they lack such devices as computers to use for undertaking online programmes and courses, especially during the COVID-19 lockdown. This study was, therefore, conducted to examine how Mzumbe University (MU) is equipping library users with digital literacy skills during the COVID-19 lockdown and other similar disasters. In specific terms, the present study sought to:

i.   establish the levels of MU students' knowledge of the COVID-19 pandemic.
ii. establish levels of digital literacy skills for students at the MU library.
iii. find out digital literacy skills that are used by MU library users during the COVID-19 closure of the University.
iv. establish the way digital literacy skills could be used to support learning during the COVID-19 pandemic and beyond.
v.   find out barriers inhibiting the use of digital literacy skills at the MU library.

Literature Review

A brief history of the COVID-19 pandemic
COVID-19 which seems to be an ongoing global pandemic was first identified in 2019. The World Health Organisation (WHO) declared COVID-19 a Public Health Emergency of International Concern on 30 January 2020 and a pandemic on 11ᵗʰ March as a global pandemic (Nash, 2020; Tejedor *et al.*, 2020). The spread of COVID-19 caused 61 countries in Africa, Asia, Europe, the Middle East, North America and South America to announce or implement school and university closures (UNESCO, 2020; Bao, 2020). The virus spread in different ways including close contact with the affected person and via small droplets produced by coughing and sneezing. Some symptoms of COVID-19 include fever, cough, fatigue and shortness of breath (WHO, 2020). The great challenge with COVID-19 is the lack of specific antiviral treatment, although the spread of the virus can be reduced through preventive measures such as hand washing with soap and tap water, covering the mouth when coughing and sneezing, distancing from other people as well as wearing a facemask in public settings (Nash, 2020). The study conducted by Lobo and Dhuri (2021) shows the positive impact of the COVID-19 pandemic in increasing the digital literacy skills of librarians since they improved their technology-savvy skills, upgraded their digital knowledge and communicated with the students via virtual conferencing applications, the situation which led to wider use of social networking sites to interact with the users.

COVID-19 and the higher learning institutions
The COVID-19 pandemic has created an unpredictable situation in higher learning institutions where the majority of universities across the globe started planning to offer fast and efficient services by implementing online learning. The study conducted by Bado (2020) states that for the students to concentrate on online learning in class, teaching shall be broken up to allow the adoption of modern teaching methods where body language and facial expressions are restricted. According to UNESCO (2020), higher education institutions took measures to continue with their academic programmes, mostly moving to e-learning and remote teaching. Several studies revealed that higher learning institutions faced numerous limitations such as digital inequalities, lack of reliable internet access, low readiness and technological competence among instructors and students and limited availability of digital solutions (Ndibalema, 2022). On the other hand, Egielewa et al., (2022) add that universities had both students and

lecturers who lack confidence in embracing digital tools in study and learning, which resulted in low acceptance of online learning technology.

COVID-19 in developed countries

Unlike Africa and other developing countries, most developed countries already had in place digital education infrastructure and policies which facilitated teaching and learning during the COVID-19 pandemic (Paudel, 2021). According to (Lavonen, & Salmela-Aro, 2022) such nations as Estonia, Netherlands and Finland had excellent digital education and learning infrastructure which made them smoothly switch to easier virtual pedagogy compared to the rest of the world. Agasisti and Sonchin (2020) note that only a few countries undertook unique initiatives for their transition to online learning during times of lockdown. In South Asia, the pandemic forced governments to rely heavily on technology to deliver lessons to students. Hybrid learning was opened up and webinars were set up ready to replace face-to-face teaching (Ranawana, 2021).

COVID-19 in Africa

According to Hub (2020), the COVID-19 pandemic spread throughout the African continent in February 2020 with South Africa being a terribly affected country whereby at the time reporting 311,000 cases were reported. Most countries moved quickly in response to the spread of the pandemic by closing schools at an early stage. Furthermore, Hub (2020) ascertained that although the virus is recognised as a significant challenge to their countries and in education, some people think that COVID-19 represents a very significant opportunity due to the recognition that technology will play an important role in the future of education in Africa.

In South Africa, all universities were put on lockdown and required to embark on remote teaching activities. The report shows that despite levels of development in South Africa, some of the universities were not ready in terms of infrastructure, financial and human resources (Mbambo-Thata, 2020).

In East Africa, learning institutions were closed down. at the same time, governments implemented various precautionary measures as creating awareness about the virus and the way to prevent it. These included such measures as sanitisation, quarantining the infected people, lockdown of church activities and social distancing. Despite all these efforts, the transmission continued since most of the people neglected some of the preventive measures. For example, social distancing could not be observed during social practices including funerals and

mass services (Takele, 2020). Opali (2022) reported that in Kenya, in particular, schools were fully closed as a result of the pandemic. Schools and other institutions started using online tutorial platforms. The impact in Kenya was large in hardship areas and rural schools where there was little or no access to computers, mobile phones and internet connectivity.

The state of COVID-19 in Tanzania

On 16ᵗʰ March 2020, the Ministry of Health in Tanzania announced the first case of COVID-19. A patient happened to be a female traveller who departed to Belgium and she further visited Denmark and Sweden. On 15ᵗʰ March 2020, she flew back to Tanzania and arrived at the Kilimanjaro International Airport (KIA). When the victim was screened for COVID-19, she showed none of the symptoms but after a day she decided to surrender for medical tests and found that she was affected by COVID-19 (Tarimo & Wu, 2020). On March 19ᵗʰ 2020, the Tanzania government ordered all colleges and universities to cancel all face-to-face classes, including teaching and learning activities to prevent the spread of the virus. Like many other universities in Africa, the universities in Tanzania faced much impact because of COVID-19 since they were caught unprepared and could not easily switch to technology-enhanced teaching and learning.

In Tanzania, the current status of the spread of the pandemic is unknown; however, more cases are expected to rise from time to time due to the nature of the disease and lack of seriousness among the citizens in adhering to the precautionary measures as advised by health experts. According to a press release by the Minister for Health, Community Development, Gender, Elderly and Children, there were 509 confirmed cases and 21 deaths from Covid-19 in May 2020 (URT, 2020; Mgema & Komba 2020). This being the case the Ministry of Education, Science and Technology mandated higher learning institutions to think of how they could adopt ICTs, particularly digital literacy skills in delivering educational programmes.

The role of university libraries in supporting teaching and learning during COVID-19

University libraries are supposed to collaborate with teaching staff in promoting the use of digital platforms by creating and adding more content to the digital platforms. Such digital platforms will be designed to disseminate information for teaching and learning as well as those which enable users to take precautionary measures against COVID-19 (Chisita, 2020). Another critical role which needs to

be played by libraries and librarians as stated by Falt and Das (2020) is liaising with publishers and e-database owners by making agreements for opening up materials to their universities as a way of bridging the digital divide. Subscription to e-resources remote access tools or information discovery tool/software is another expected role to be played by academic libraries.

Digital literacy skills and access to library resources

Incorporating digital literacy into the educational system aims at providing students with the necessary skills to live and survive in a digitally oriented-world (Audrinn & Audrin, 2022). Digital literacy skills enable students to use digital tools and platforms to enrich their educational experience and improve them for society and lifelong learning (Lwehabura, 2018). In this information technology age, Tanzanian graduates need to develop the skills required for independent information searching, evaluating and utilising all available sources of information.

The development of technology can increase student engagement, enhance independent learning, increase opportunities to practice skills and strengthen knowledge and understanding by accessing learning resources (Stahl, 2015, JISC, 2016). For a student to be successful in learning; there is a need for digital skills. The skills include communicating in different media, collaboration such as sharing digital resources with others, self-presentation and organisation, intensive reading and creative expressions in different media. Similarly, Portillo *et al.,* (2020) discussed digital communication skills (e.g. chat, forums, video conferences and e-mails) that most people usually use regardless of their profession. These digital skills are more related and needed to prove students' performance. Students must be well equipped with these skills to enable them to perform effectively both within and outside their institutions. These skills are acquired through such informal means as colleagues, trial and error and sometimes through assistance from friends (Emiri, 2017). Although the research conducted by Uvarova and Pobol (2021) in eastern partnership countries ascertained that countries faced the outbreak of the pandemic with low digital literacy but lack of digital literacy does not prevent people from using social media mainly by using cellular phones.

Contributions of digital literacy skills in teaching during COVID-19

Digital literacy enables students to interact and enhance participation during classroom learning. Digital literacy increases learners' effectiveness, improves performance and increases learners' competence. In this case, classes with online

learning in terms of average produce stronger learning outcomes than face-to-face classes since students tend to express themselves more in writing rather than in oral presentations hence online learning is most preferred by learners (Underwood 2009; Ukwoma & Lwundu, 2016). Despite the eruption of the COVID-19 pandemic, the adoption of technology and the provision of online teaching, learning, assessment and research collaborative activities across universities were high and were not newly undiscovered for universities across the globe (Martzoukou, 2020). Many countries including Tanzania are racing to utilise technology in support of remote learning and online learning during the COVID-19 pandemic period and other such instances. Having digital literacy, it is possible to provide learners with various learning resources since technologies are used to facilitate learning including texts, hypertexts, audio, videos and computer animations. Additionally, digital literacy enables students to interact with each other via computers and enhances the learning processes within and outside the institution (Wema, 2021; Farrelly *et al.*, 2018). However, success in the digital learning process requires digital skills, availability of the infrastructures and internet accessibility.

Barriers to the application of digital literacy skills during COVID-19 in HLIs
Efforts of equipping students with digital literacy skills in developing countries face several challenges as pointed out by Semerci and Semerci (2021), Ouahidi (2020), Becta (2004), Cartile (2020), Sangster *et al.*, (2020); Zhu and Liu(2020) and (Mpungose(2020) and Hoq (2020). Their investigations came up with the following barriers: poor internet accessibility, unavailability of laptops, lack of training, extra workload and prolonged screen exposure, lack of quiet environment at home, inadequate technological infrastructures such as mobile phones, lack of technical knowledge and skills, fear of technology and lack of interest about technology (technophobia) and physical defects such as eye defect. These barriers can be addressed when students become aware of the importance of digital literacy in learning systems.

Technology Acceptance Model (TAM)
To explore the extent to which students were equipped with digital literacy skills, this study adopted the Technology Acceptance Model (TAM) which includes three important variables referred to as Perceived Usefulness of Using Digital Literacy Skills (PU-DLS), Perceived Ease of Use of Digital Literacy Skills (PEU –DLS), Attitudes Towards Digital Literacy Skills (AT-DLS) and the Intention of having Digital Literacy Skill (I-DLS).
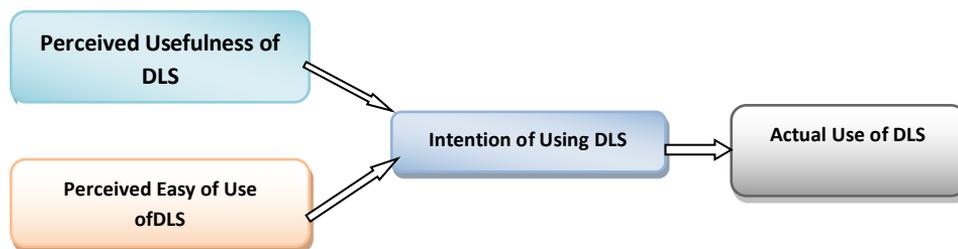
Figure 1: Technical Acceptance Model

Source: Modified Davis (1989) Technical Acceptance Model

Perceived Usefulness (PU) refers to how much a student believes that digital literacy skills will enable him/her to access library digital resources during and after the COVID-19 pandemic. Perceived Ease of Use (PEU), in this study, refers to the extent to which a student believes that having digital literacy skills will enable him/her to access the library online services with minimal effort during and after the COVID-19 pandemic. Attitude and Digital Literacy Skills: The model assumes that a better attitude could increase the willingness of a student to acquire digital literacy skills for accessing online digital library resources during and after the COVID-19 pandemic. The Intention of Using Digital Literacy Skills: This shows the attitude towards using digital platforms and tools. It is concerned with the user's evaluation of the desirability of employing digital literacy skills. It is also a measure of the likelihood of the person using digital literacy skills as enablers in accessing online library services during the COVID-19 pandemic.

Methodology

This study used a mixed research approach with a case study method. A case study design was opted because it is reliable in studying a single case about a particular area especially when there is a unique or interesting story to be extracted to give the most complete picture that cannot be obtained by other methods (Schoch, 2020). A total of 46 third-year 2022 students pursuing library programmes were found using Census Sampling Technique (CSP). This is a technique which attempts to gather information about every member of the population (Rodda, Campbell, & Fritts, 2001). Additionally, a total of four (4) students and two (2) IT staff were purposively selected to participate in this study and they were interviewed.

The qualitative data gathered from the in-depth interviews were analysed thematically using content analysis. The contents analysis method involves a detailed and systematic assessment of the content of a particular body of material

to identify patterns. The method helped to classify and organise unorganised data to give them a scientific shape. In this study, a Microsoft Excel Spreadsheet was used to analyse quantitative data. This programme was used because it offers great and easy ways to extort data, reduces the time required to evaluate data and reduces errors involved in coding data for quantitative data. At the same time, such descriptive statistics as frequencies and percentages were generated.

Results and Discussion

Respondents' levels of knowledge on the COVID-19 pandemic

The findings revealed that 21 (45.7%) of the respondents had average knowledge of the COVID-19 pandemic and 5(10.9%) had poor knowledge of COVID-19. Two percent (2.2%) declared that they did not know much about the COVID-19 Pandemic whereas 19 (41.3%) respondents had above-average knowledge of the COVID-19 pandemic. These findings are similar to that of Lobo and Dhuri (2021) who showed a positive impact of the COVID-19 pandemic in increasing the digital literacy skills of library users.
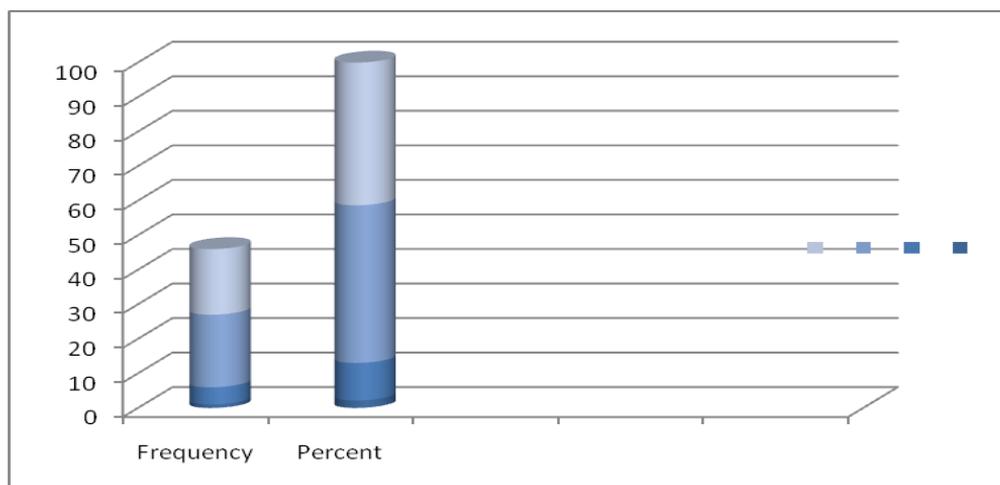

Figure 2: Respondents' knowledge of COVID-19 (n=46)

Source: Field Data (2022)

These findings underscore the importance of addressing knowledge gaps and ensuring accurate information reaches the population. Efforts shall be made to provide educational resources, raise awareness and combat misinformation to ensure a well-informed population capable of making informed decisions regarding the COVID-19 pandemic.

Level of knowledge on the symptoms of COVID-19

The respondents were asked about their level of knowledge regarding the symptoms of COVID-19. The levels of knowledge established by the respondents indicate that half of the respondents (23.50%) of the respondents possessed average knowledge of the symptoms of the COVID-19 pandemic. A total of 8 (17.4%) of the respondents had very high knowledge of the pandemic. A total of 12 (26.1%) of the respondents had above-average knowledge whereas 3 (6.5%) had very low knowledge of the symptoms of the COVID-19 pandemic (See Figure 3 below).
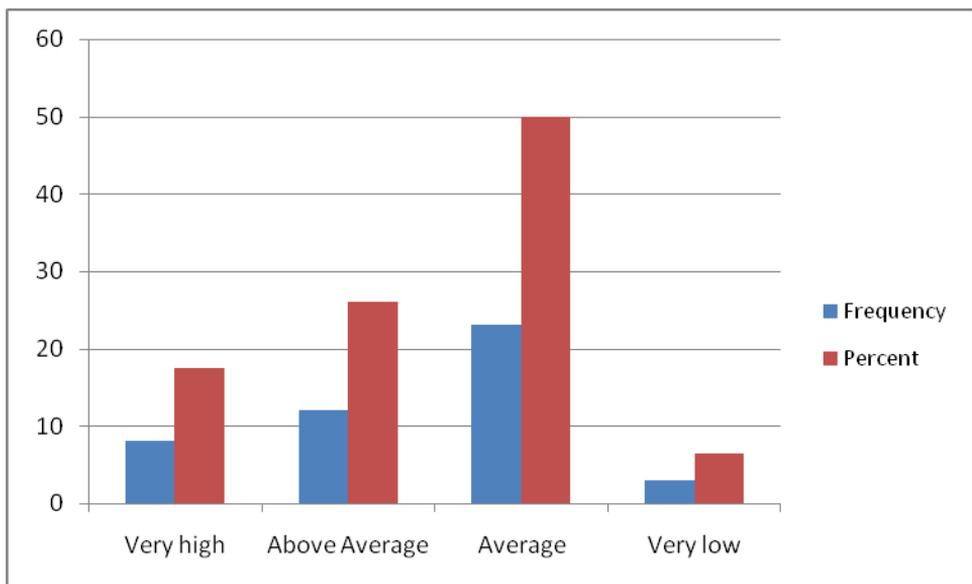

Figure 3: Respondents' knowledge of symptoms of COVID-19 (n=46)

Source: Field Data (2022)

The findings imply that most of the respondents had knowledge about the symptoms of the COVID-19 pandemic. This is a very interesting story because this level of knowledge may be very useful especially when it comes to the issue of taking precautionary measures. Knowledgeable people can easily be influenced to change their behaviours towards the COVID-19 pandemic.

Respondents' level of digital literacy skills

The study intended to establish the level of digital literacy skills of the respondents. The findings summarised in Table 1 reveal that less than half 22, (47.8%) of the respondents had a good level of information or literacy skills. A

total of 21 (45.7%) of respondents were computer literate. Slightly more than half (25; 54.3%) of the respondents had the ability to share digital content, 16 (34.8%) had the ability in using ICT to process and retrieve information and 21(45.7%) were able to use the e-learning platform. Furthermore, 24 (52.2%) of the respondents had online safety skills whereas 16 (34.8%) of the respondents had the ability to use online communication programmes.

Table 1: Level of digital skills (n=46)

Category of Responses	Excellent		Good		Average		Poor		Total	
	F	%	F	%	F	%	F	%	F	%
Information Literacy Skills	12	26.1	22	47.8	12	26.1	0	0	46	100
Computer literacy	10	21.7	21	45.7	14	30.4	1	2.2	46	100
Online Safety skills	4	8.7	12	26.1	24	52.2	6	13	46	100
Sharing digital content	7	15.2	25	54.3	12	26.1	2	4.3	46	100
Using online communication programmes	11	23.9	15	32.6	16	34.8	4	8.7	46	100
Using ICT to process and retrieve information	10	21.7	16	34.8	14	30.4	6	13	46	100
Using E-learning platform	8	17.4	21	45.7	15	32.6	2	4.3	46	100

Source: Field Data (2022)

The results suggest that the majority of the respondents were able to share digital content because they had above-average digital literacy skills. Additionally, these findings are supported by the TAM model which assumes that users' attitudes towards the usage of digital literacy skills depend on the acceptance of the technology and its perceived usefulness. Furthermore, an interview with one library staff yielded the following responses:

> *"… Digital literacy skills are very important as they can enable information seekers to locate the right information at the right time, to access information remotely and help to evaluate information, especially in this digital era of information explosion and sharing of information in different media".*

The implications of the above findings are significant. The study reveals that a notable proportion of the respondents lack adequate digital literacy skills, which can hinder their participation in the digital world and limit their access to various

opportunities. The results emphasize the importance of addressing digital literacy gaps through targeted interventions, training programs and educational initiatives.

Respondents' levels of digital literacy skills

The second research objective of this study dwells on describing relevant digital skills used by Mzumbe University library users and the digital skills needed to exploit library digital resources during the COVID-19 pandemic.

Relevant digital skills used by library users

The respondents were asked to indicate the level of digital literacy skills they possess. The findings summarised in Table 2 indicate that 19 (41.3%) respondents could engage in online discussions, 21(45.7%) could use web search engines, 17(37%) could use online databases and 18(39.1%) could somehow use video conferencing. The findings show that most of the respondents had skills in using web search engines.

Table 2: Relevant digital skills used by library users (Sample n=46)

Category of Responses	High		Moderate		Low		None		Total	
	F	%	F	%	F	%	F	%	F	%
Online discussions	8	17.4	12	26.1	46	100	19	41.3	46	100
Web search engines	21	45.7	21	45.7	46	100	4	8.7	46	100
Ability to use databases	17	37	17	37	46	100	12	26.1	46	100
Social networking	16	34.8	17	37	46	100	12	26.1	46	100
Video conferencing	6	13.0	12	26.1	46	100	12	26.1	46	100
Internet security	8	17.4	15	32.6	46	100	18	39.1	46	100
Website design	9	19.6	21	45.7	46	100	11	23.9	46	100

Source: Field Data (2022)

The implications of the above findings are twofold. First, the study highlights the need for targeted interventions and training programmes to enhance digital literacy skills related to online databases and video conferencing. Providing individuals with the necessary knowledge and resources to effectively use online databases can empower them to access accurate and reliable information for research and decision-making purposes. Similarly, improving proficiency in video

conferencing can enable individuals to effectively communicate and collaborate in remote settings, facilitating virtual meetings, online learning and remote work opportunities. Second, the findings emphasize the importance of continuous digital skills development and lifelong learning. As technology rapidly evolves, individuals must stay updated and adaptable to new digital tools and platforms. Ongoing education and training programmes can equip students with the skills needed to navigate the digital landscape effectively, fostering digital inclusion and participation. This is in line with a study by Lwehabura (2018) who reported that there is a need of developing students' ability in searching, evaluating and utilising online sources of information.

Digital skills needed to exploit online resources

The respondents were requested to rate their digital skills level in exploiting online resources (See Table 3). The findings show that 15 (32.6%) respondents had skills in the use of the e-learning platforms, 16 (34.8%) had skills in online discussion and online charting, 21 (45.7%) had skills in downloading online files whereas half (23.50.0%) of respondents had skills in internet literacy. Furthermore, less than half 21, (45.7%) of respondents had information search skills, 22 (47.8%) had good skills in the use of Google Scholar for their studies, 20 (43.5%) had average skills in using commercial subject databases, 20 (43.5%) were poor in the use of Skype to keep in touch with people and 14 (30.4%) were good in filtering large numbers of search results quickly. Similarly, 14 (30.4%) were poor in filtering large numbers of search results quickly, 19 (41.3%) were good at using advanced search options to limit the searches and 16 (34.8%) had good skills in choosing the right tool to find information.

Table 3: Digital skills needed to exploit online resources (n=46)

Category of responses	Excellent		Good		Average		Poor		Total	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
The ability to use the e-learning platform	9	19.6	15	32.6	15	32.6	7	15.2	46	100
Taking part in an online discussion group and chatting	4	8.7	16	34.8	16	34.8	10	21.7	46	100
Downloading files from the internet or WWW	21	45.7	15	32.6	8	17.4	2	4.3	46	100

Statement										
Internet literacy	8	17.4	23	50	14	30.4	1	2.2	46	100
Information search skills	21	45.7	18	39.1	7	15.2	0	0	46	100
Use Google Scholar for your studies	18	39.1	22	47.8	6	13	0	0	46	100
Ability to use commercial subject databases	6	13	13	28.3	20	43.5	7	15.2	46	100
Used Skype to keep in touch with people	2	4.3	5	10.9	19	41.3	20	43.5	46	100
Filtering large numbers of search results quickly	5	10.9	14	30.4	13	28.3	14	30.4	46	100
Using advanced search options to limit your search	7	15.2	19	41.3	14	30.4	6	13	46	100
Choosing the right tool to find information	11	23.9	16	34.8	14	30.4	5	10.9	46	100

Source: Field Data (2022)

These findings indicate that about half of the respondents had digital skills that would enable them to exploit online resources for a large number of students. Perceived ease of use had a relation to perceived usefulness which consequently students to increase their ability to exploit online resources by believing that the use of digital literacy skills makes them free from using efforts.

Furthermore, researchers held an in-depth interview with the second library staff who had the following remarks:

> *"… the most important digital skill imparted to library users at our library to exploit online resources remotely during COVID-19 was to make sure that every enrolled student in the University can use the digital platforms. This was possible by conducting information literacy programmes involving teaching the library users searching techniques such as simple search and advanced search to provide awareness to students. Also, provision of such credentials as username and password to enable accessing information in the library subscribed databases".*

The support of digital literacy skills to learning in HLI's

The establishment of the way digital literacy skills could support learning is one of the objectives mentioned by the researchers in this study. In determining how

digital literacy skills support the learning of MU students, the researcher provided questions and options of answers to be selected to the questions by the respondents, to extract information related to the support of digital literacy skills as follows:

The extent to which students use technology to develop digital literacy skills

The results show that 22(47.8%) respondents used the technology frequently, 18 (39.1%) used it sometimes, 4 (8.7%) of the respondents never used it and 2(4.3%) always used technology to develop their digital literacy skills (See Figure4). The findings imply that slightly less than half of the respondents frequently used technology to develop digital literacy skills. Perhaps, this is because orientations about digital literacy programmes were frequently conducted at the University. These findings are in congruence with that of Stahl (2015) and JISC (2016) in which it was reported that the development of technology increases student engagement, enhances independent learning and opportunities to practice skills and strengthens knowledge and understanding by accessing learning resources.
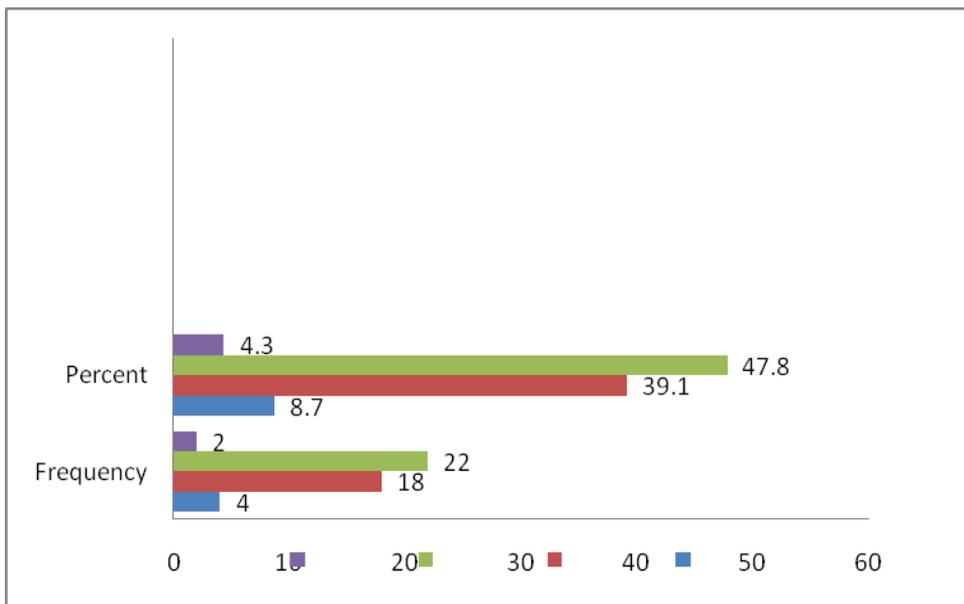

Figure 4: The use of technology to develop digital literacy skills (n=46)
Source: Field Data (2022)

In one of the interviews with a librarian, the following comments were captured:

> *Students are encouraged to use the created short video clips (uploaded YouTube tutorials) which contain content to enable them to acquire information and skills.*

> *Also, there are some links and addresses whereby clicking the link sends the user directly to a place to ask a librarian for a help.*

Distribution of respondents' level of skills in Internet usage

Respondents were asked to rank their level of skills on internet usage (See Figure 5). The findings indicate that a total of 5 (10.9%) respondents said that they were very skillful in Internet usage, 34(73.9%) said they were skillful and 7(15.2) said they were a novice.
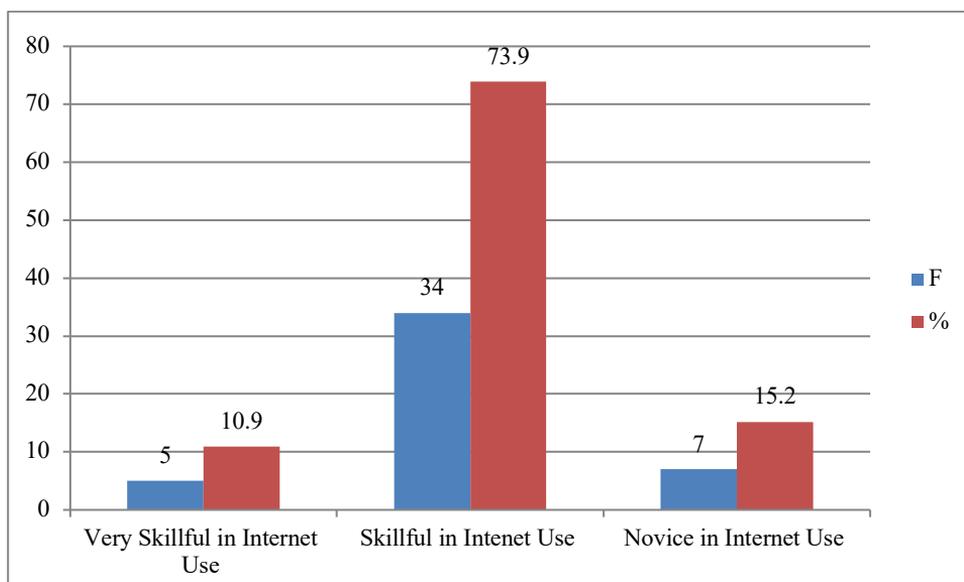
Figure 5: Level of skills in Internet usage (n=46)
Source: Field Data (2022)

The distribution of skill levels in Internet usage in the findings has one major implication. The library needs to recognize the varying skill levels among its target user base. This understanding can inform the design and delivery of digital products, services and platforms to ensure usability and meet the needs of different skill levels. In summary, the findings highlight the diversity of skill levels in Internet usage among the respondents. Recognising the existing gaps and addressing them through targeted interventions can lead to a more inclusive and digitally empowered society.

Barriers inhibiting the use of digital literacy skills

Possessing digital literacy skills is a difficult task as it requires knowledge and skills in application. Therefore, the researcher considered it necessary to find out whether respondents get difficulty with digital literacy skills (See Table 4). The

findings indicate that the most commonly reported barrier inhibiting the use of digital literacy skills is information explosion, with 18 respondents (39.1%) identifying it as a challenge. Information explosion refers to the overwhelming abundance of information available in digital formats, making it difficult for individuals to filter, process and make sense of the vast amount of data. This barrier suggests that respondents may struggle with information overload, affecting their ability to effectively locate, evaluate and utilize relevant digital information.

Technophobia is another significant barrier, as reported by 17 respondents (37%). Technophobia refers to the fear or anxiety associated with using technology or digital devices. It suggests that a considerable proportion of the respondents may experience discomfort or lack confidence when engaging with digital technologies, hindering their ability to develop and apply digital literacy skills. Overcoming technophobia requires support, training and familiarity with digital tools to build confidence and competence in using technology effectively.

The economic status of individuals emerged as a barrier for 8 respondents (17.4%). Economic status refers to financial limitations that may prevent individuals from accessing necessary digital resources, such as computers, internet connectivity, or software applications. Limited financial resources can impede the development of digital literacy skills and restrict individuals' participation in the digital world. This finding highlights the importance of addressing digital inequalities and ensuring equitable access to digital tools and resources.

Lastly, lack of training was identified as a barrier by 7 respondents (15.2%). This suggests that a significant portion of the participants may not have received sufficient training or educational opportunities to develop and enhance their digital literacy skills. Lack of training can limit individual's ability to effectively navigate digital platforms, utilize digital tools and leverage technology for various purposes. The findings emphasize the need for comprehensive and accessible digital literacy training programs that cater to individuals' diverse needs and skill levels.

Table 4: Barriers inhibiting digital literacy skills (n=46)

Category of Responses	Strongly Agree		Agree		Disagree		Strongly Disagree	
	F	%	F	%	F	%	F	%
Poor internet accessibility	6	13.0	12	26.1	15	32.6	13	28.3
Lack of training	7	15.2	10	21.7	19	41.3	10	21.7
Technophobia	14	30.4	17	37	12	26.1	3	6.5

Category of Responses	Strongly Agree		Agree		Disagree		Strongly Disagree	
	F	%	F	%	F	%	F	%
Information explosion	16	34.8	18	39.1	8	17.4	4	8.7
Poor literacy skills among lecturers	2	4.3	15	32.6	17	37	12	26.1
Miss-information	5	10.9	11	23.9	16	34.8	14	30.4
Inadequate/lack of power	1	2.2	12	26.1	19	41.3	14	30.4
Family economic status	8	17.4	16	34.8	18	39.1	4	8.7
Lecturers' attitude toward digital literacy skills	5	10.9	13	28.3	16	34.8	12	26.1

Source: Field Data (2022)

These findings are contrary to the study conducted by Semerci and Semerci (2021). The authors reported that inadequate technological infrastructure, lack of technical knowledge and skills and inability to access the internet where poor internet connectivity or low bandwidth may hinder users to use digital literacy, inability to cooperate over the internet, the absence of people using technology in the environment, the use of too many foreign words as the major barriers which hindered the use digital literacy skills. An in-depth interview with the library staff yielded the following remarks:

> *"… Sometimes it is difficult to promote digital literacy to students due to low internet accessibility, especially during the period of imparting digital literacy skills, fear of students about technology, sometimes poor attendance of students to orientation programmes relating to digital literacy and lack of staff interest in the use of digital facilities".*

The implications of the above findings are multifaceted. Firstly, addressing information explosion requires strategies and techniques to enhance individuals' information literacy skills. Providing training and support in information management, critical evaluation of sources and effective search strategies can help individuals navigate the overwhelming digital information landscape.

Secondly, addressing technophobia is crucial for promoting digital inclusion. Initiatives that focus on building digital confidence, reducing anxiety and fostering a positive attitude towards technology can empower individuals to overcome their fears and engage actively in digital environments. This can be achieved through user-friendly interfaces, user-centred design and inclusive digital learning opportunities.

Thirdly, the impact of economic status on digital literacy highlights the need for policies and initiatives that bridge the digital divide. Efforts should be made to ensure affordable access to digital infrastructure and resources, particularly for marginalized or economically disadvantaged individuals. Promoting digital inclusion through community centers, public libraries and subsidized internet connectivity can help mitigate the economic barriers hindering the development of digital literacy skills.

Lastly, addressing the lack of training requires the establishment of comprehensive digital literacy programs that cater to individuals' specific needs and skill levels. These programs should be accessible, ongoing and tailored to different age groups, professions and digital literacy levels. Collaboration between educational institutions, libraries, community organisations and government agencies can contribute to the effective implementation of such

Conclusions

The outbreak of COVID-19 posed many challenges with regard to the provision of services in academic libraries all over the world, including those in Tanzania. In this context, university libraries in Tanzania started responding boldly by looking for alternative ways in which both students and staff could continue accessing library services which included the efforts of initiating more subscriptions to additional digital databases to supplement those available under the COTUL. Furthermore, the team was also appointed to improve the library website by adding lib guides, chart services and email contacts of subject librarians for easy provision of library services through an online platform.

Recommendations

This study recommends the followings:

i. There is a dire need for educational policymakers to consider mainstreaming issues related to Digital Literacy Skills in curriculum development. This can be done by creating a compulsory course on Digital Literacy Skills for all students in Tanzanian higher learning institutions.

ii. The Ministry of Health should continue to emphasise increasing social and health security during the COVID-19 pandemic and focus on digital literacy for citizens. This might enable students to acquire online services while they are at home and expand the quality of education as well as broaden online engagement.

iii. Library management should organise orientation programmes and seminars to educate students and create awareness of digital literacy and

its importance. It will be of particular importance if library management concentrates on offering digital literacy training frequently to library users to enable them to access and use resources within and off campus.

iv. Tanzania Communications Regulatory Authority (TCRA) should conduct training for students on the correct use of social networks to help them select the right information from the networks. This will help students become change agents for encouraging others to do the same.

v. Libraries in Tanzania need to review their library policies to accommodate new practices and new circumstances to serve the patrons and abide by social-distancing standards because COVID-19 has left us all in a state of shock. Libraries must develop Standard Operating Procedures (SOPs) for staff and library users to abide by social distancing standards during and after the COVID-19 pandemic.

vi. It also seems important to increase or re-prioritise library budgets to increase the e-resources and e-services. Libraries need to invest in getting new technologies, infrastructure, systems and staff development to be able to serve their users in emerging online environments.

vii. Capacity building for both patrons and librarians is key to ensuring that library service provision is not disrupted.

References

Adotey, S. K. (2020 June). What will higher education in Africa look like after COVID-19? *World. economic forum.* Available at:

https://shorturl.at/qsx56

Agasisti, T., & Soncin, M. (2021). Higher education in troubled times: on the impact of Covid-19 in Italy. *Studies in Higher Education,* 46(1), 86-95.

Audrin, C., & Audrin, B. (2022). Key factors in digital literacy in learning and education: A systematic literature review using text mining. *Educ Inf Technol* 27, 7395–7419 (2022). https://doi.org/10.1007/s10639-021-10832-5

Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Hum Behav&Emerg Tech.* 2020; 2:113–115. https://doi.org/10.1002/hbe2.191

Cartile, A. (2020). Barriers to digital literacy: Learning to program. Proceedings 2020 Canadian Engineering Education Association (CEEA-ACEG20) Conference (p. 170-176). Kanada: Concordia and McGill Universities

Chisita, C. T. (2020). Libraries amid the coronavirus (COVID-19): Researchers' experiences in dealing with the vexatious infodemic. *Library Hi Tech News,* Vol. 37 No. 6, available at: https://doi.org/10.1108/lhtn-03-2020-0022.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology.*MIS Quarterly*, Vol.13No.3, pp.319-340.

De Giusti, A. (2020). Book review: Policy brief: Education during COVID-19 and beyond. *RevistaIberoamericana de TecnologíaEnEducación y EducaciónEnTecnología*, (26), 110-111.

Egielewa, P., Idogho, P. O., Iyalomhe, F. O., & Cirella, G. T. (2022). COVID-19 and digitized education: Analysis of online learning in Nigerian higher education. *E-learning and Digital Media*, 19(1), 19-35.

Emiri, O. T. (2017). Digital literacy skills among librarians in university libraries in the 21st century in Edo and Delta states, Nigeria. *International Journal of Library and Information Services (IJLIS)*, *6*(1), 37-52.

Falt, E., & Das, P. (2020), "COVID-19 put a brake to academic activity, but digital libraries can ensure continuity", *The Print*.

Hub, E. (2020). The effect of Covid-19 on education in Africa and its Implications for the use use of technology: A survey of the experience and opinions of educators and Technology Specialists. *EdTech Hub*.

JISC. (2016). "Responding to learners guide 2", available at: www.jisc.ac.uk/media/documents/ publications/lxp2.pdf (accessed 14 September 2022)

Kavuta, K. D., & Nyamanga, S. (2018). The factors affecting the implementation of students' records management system to higher learning institutions in Tanzania: A case of the Institute of Accountancy, Arusha. *International Journal of Scientific and Technology Research* 7(2): 150–156.

Lavonen, J., & Salmela-Aro, K. (2022). Experiences of moving quickly to distance teaching and learning at all levels of education in Finland. Primary and secondary education during Covid-19: *Disruptions to educational opportunity during a pandemic*, 105-123.

Lwehabura, M. J. (2018). An assessment of information literacy skills among first-year postgraduate students at the Sokoine University of Agriculture Tanzania. *Journal of Librarianship and Information Science*, *50*(4), 427-434.

Martzoukou, K. (2021). Academic libraries in COVID-19: a renewed mission for digital literacy. *Library Management, 42*(4/5), 266-276.

Mbambo-Thata, B. (2020). Responding to COVID-19 in an African university: The case of the National University of Lesotho library. *Digital Library Perspectives.*

Mgema, J. M., & Komba, C. K. (2020). Social-economic effects of the COVID-19 Pandemic on the performance of Co-operative Societies in Tanzania. *Journal of Co-operative and Business Studies (JCBS), 5*(2).

Nash, C. (2020). Report on digital literacy in academic meetings during the 2020 COVID-19 lockdown. *Challenges, 11*(2), 20.

Ndibalema, P. (2022). Constraints of transition to online distance learning in higher education institutions during COVID-19 in developing countries: A systematic review. *E-Learning and Digital Media,* 19(6), 595-618.

Opali, O. (2022, April, 06). School closures hit hard in Africa, report says. China Daily. Available at:

https://global.chinadaily.com.cn/a/202204/06/WS624cf52ca310fd2b29e5540b.html

Ouahidi, L. M. (2020). Constraints on developing digital literacy skills in higher education. *International Journal of Linguistics, Literature and Translation (IJLLT).*

Paudel, P. (2021). Online education: Benefits, challenges and strategies during and after COVID-19 in higher education. *International Journal on Studies in Education* 3(2): 70–85.

Portillo, J., Garay, U., Tejada, E., & Bilbao, N. (2020). Self-perception of the digital competence of educators during the COVID-19 pandemic: A cross-analysis of different educational stages. *Sustainability, 12*(23), 10128.

Ranawana, K. (2021, September 22). Time to build upon the COVID dividend in South Asia education. Available at: https://economynext.com/time-to-build-upon-the-covid-dividend-in-south-asia-education-86343/

Rodda, G. H., Campbell III, E. W., & Fritts, T. H. (2001). A high validity census technique for herpetofauna assemblages. *Herpetological Review, 32*(1), 24.

Semerci, Ç., & Semerci, N. (2021). Developing the digital literacy barriers (DILBAR) Scale: A validity and Reliability Study. *Bartın University Journal of Faculty of Education*, 10(3), 471-481.

https://doi.org/10.14686/buefad.934504

Stahl, J. (2015), "Digital technology: Supporting the language and literacy development of ELLs", *Mount Royal Undergraduate Education Review*, Vol. 1 No. 3.

Takele, R. (2020). Stochastic modelling for predicting COVID-19 prevalence in East Africa Countries. *Infectious Disease Modelling*, *5*, 598-607.

Tarimo, C. S., & Wu, J. (2020). The first confirmed case of COVID-19 in Tanzania: recommendations based on lesson learned from China. *Tropical medicine and health*, *48*(1), 1-3.

Tejedor, S., Cervi, L., Pérez-Escoda, A., & Jumbo, F. T. (2020). Digital literacy and higher education during COVID-19 lockdown: Spain, Italy and Ecuador. *Publications*,8(4),48.

Underwood, J. (2009).The impact of digital technology*:* a review of the evidence of the impact of digital technologies on formal education, Beta, Coventry.

UNESCO. (2020). "The response of higher education to COVID-19 higher education in Africa: challenges and solutions through ICT, online training, distance education and digital inclusion", UNESCO.,

URT. (2020). *Situation Report of Corona Virus (COVID-19) in Tanzania*, a Press release issued by Tanzanian Prime Minister, Dar es Salaam.

Uvarova, O., & Pobol, A. (2021). SMEs' digital transformation in the EaP countries in COVID-19 Time: Challenges and Digital Solutions.

Wema, E. F. (2021). Developing information literacy courses for students through virtual learning environments in Tanzania: Prospects and challenges. *IFLA Journal*, 03400352211018231.

WHO. (2020). Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.

Yustika, G. P., & Iswati, S. (2020). Digital online education: A short Review. *Dinamika Pendidikan*, *15*(1), 66-76.