



Distance Learning and Challenges of Technologies by Students in Uganda

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ABSTRACT: This study was conducted to examine the challenges students face in Uganda when it comes to distance learning. Uganda is a developing country and this has put a strain on the resources available to students in terms of access to technology. Therefore, this study looks to understand the challenges that students in Uganda have experienced in the shift to distance learning and the strategies that students have used to cope. A non-probability sampling technique of snowball was used to identify initial participants who meet the research criteria. In all, thirty (30) students across all levels of education in Kampala district were selected. The results showed that the majority of students reported experiencing some form of challenges related to distance learning. The most commonly reported challenges were technical problems with the learning platform and lack of access to the internet. The results of this study can inform policy decisions to better equip students and teachers for effective teaching-learning program across various educational institutions.

KEYWORDS: Distance Learning, Online Learning, Technologies

INTRODUCTION

In the era of rapidly evolving digital technologies, education systems across the globe are transitioning from traditional classroom settings to virtual learning environments. This transformation has been expedited by recent global events, notably the COVID-19 pandemic, which resulted in widespread school closures worldwide (UNESCO, 2021). According to UNESCO (2021), at the peak of school closures during the COVID-19 pandemic, around 1.5 billion learners were affected globally, prompting education institutions to rapidly shift to distance learning as an alternative education delivery mechanism. However, this shift has not come without challenges, particularly for developing countries like Uganda where the adaptation to digital learning tools and platforms has been marked by significant obstacles.

Uganda, a low-income country currently facing several socio-economic challenges, has had to find ways to deliver education to its large student population remotely amidst the disruption caused by the COVID-19 pandemic (World Bank, 2022). However, limitations in access to digital devices, stable internet connection, and insufficient training for both students and teachers in the use of digital tools, have resulted in a decline in the quality of education provided in the country (Scott, 2021).

Even before the advent of the pandemic, the nation struggled to bridge the digital divide between urban and rural areas, contributing to educational disparities. According to Bwehaire (2021), nearly 40% of the Ugandan population has access to internet services; however, the distribution skews significantly in favour of urban populations. This inequality is further exacerbated in remote, rural regions where access to electricity is limited, impeding internet access and the use of e-learning tools. The same study reveals that while the government of Uganda has rolled out e-learning initiatives, most schools in rural parts of the country have not been able to benefit due to inadequate infrastructure, outdated technologies, and a lack of necessary skills among students and teachers to effectively engage in distance learning.

Given these circumstances, this research aims to explore the multifaceted challenges posed by distance learning in Uganda, and the role of technology, as well as recommendations for policy initiatives, training programs, and investment strategies to support more effective distance education systems in the future.

The central objectives of this study are to gain a deeper understanding of the digital divide in Uganda by focusing on the specific demographics hindered by insufficient access to technology for distance learning. Furthermore, the study identifies the main



challenges that students are facing in engaging with distance learning technologies and develops a framework for understanding these issues within the context of both urban and rural educational settings. The study aims to contribute to the literature on distance learning and digital inequities in diverse educational contexts, by analysing the obstacles students in Uganda encounter in participating in distance education and adding to the existing body of knowledge on global educational disparities. Importantly, this study highlights potential solutions and policy recommendations to effectively support students in their distance learning endeavours.

LITERATURE REVIEW

On 1st December 2019, an index case in the pandemic of the respiratory syndrome COVID-19 was registered in Wuhan, China (Spiteri et al., 2020). This pandemic greatly compromised the functionality of academic institutions mostly in third world countries. Strict restrictions or standard operating procedures (SOPs) were recommended by the World Health Organization (WHO), and implemented by different countries. Among these was a restriction on social gatherings hence the closing of schools. This left no alternative other than distance learning since there was no prediction of when the pandemic would end.

According to (Natela Doghonadze, 2020), distance learning is a phenomenon an electronic tutor conveys/holds classes with his/her learners remotely through educational technologies. In countries like Uganda, google platforms like Google Meets, Google Classrooms, hang-ups, Viber, and other podiums like Zoom, and WhatsApp, were adopted by institutions that couldn't implement learning management systems (LMS) instantaneously (Kaan Kaya, 2022). The major concern at this point was the preparedness of academic institutions and students to operate remotely.

Historically, In the 20th century (1920), radios were purposely for educational purposes and were licensed followed by television broadcasting in 1950 in the United States of America. Britain established the Open University in 1971, and this was followed by starting to use computer networks for education purposes in the 1980s (Omar M. Mahasneh, 2021). From this point onwards distance learning has evolved to a point of development of learning management systems (LMS) platforms like Moodle, and ALMS, among other educational technologies accessed globally (Gürhan Durak, 2020). These are tailored to class material or lesson delivery, assessments (several forms of assessment modes are supported for example; - assessment of learning, assessment as learning and assessment for learning), student learning monitoring, and assignment auto-grading, among others.

In March 2020, several countries experienced physical education temporary closure in response to the standard operating procedure call made by the World Health Organization (WHO) in pursuit of limiting social gatherings and bound the coronavirus novel virus spread (Kizito Omona, 2021). This was due to the rampant contracting of and spread of COVID-19. African students were greatly hit by school closure, and this manifested in for example an estimate of 20% of young school girls getting pregnant only from Eastern Uganda regions.

According to (Edeh Michael Onyema, 2020), over a billion students' learning was disrupted by the novel coronavirus caused school closures in over 100 countries worldwide. Furthermore, gaps in terms of operation flexibility in not only health, manufacturing, and transport but also the education sector were greatly exposed which left education facilities longing for electronic measures to survive. The agitation concentrated by schools' temporary closure left no alternative other than devising electronic or ICT-augmented mechanisms for formal learning continuity hence distance learning (Alla Belousova, 2022). It should be noted that distance learning has been practised for a while by some academic institutions. This technology employs data mining (DM), big data analytics (BDA), machine learning (ML), and deep learning (DL) models to deliver, monitor, and evaluate student learning (EZE, 2020). However, the implementation, and maintenance costs coupled with technical usability in institutions update limits its adaptability as well as full utilization.

Fahmida, (2022) assessed students' traits on digital learning platforms showed that out of 409 learners in Bangladesh, 13.7% could not academically focus, and perform to their expectations given the novel coronavirus tension while 54% spent their time on social media. In a study propelled from Slovenia, 30,383 learners from 62 countries were investigated. Results showed that computer illiteracy coupled with anxiety about high study material volumes readily availed online, root-caused performance decline in the newly transitioned to distance learning methodology (Aleksander Aristovnik, 2020).

Similarly, Amanor-Mfoafo, (2020) conducted a study in Ghana to assess the vigilance of parents to assist their children in the range of primary one to six. It was discovered that high socio-economic parent was informed and perhaps ready to guide their children through electronic learning practices. The opposite was found prevalent and very true with relatively low socio-economic parents hence affecting pupils' learning outputs.



Distance learning as found more vital than ever with the striking of the novel coronavirus pandemic, is not perfect and hence erodes drawbacks. From September 2020 to February 2021, a university student study estimated 41% anxiety prevalence among learners (Shefali Liyanage, 2022). To be specific, Asia sustained 33%, Europe had 51%, and the USA exhibited 56% anxiety prevalence among distance learning students. Moving forward gender-wise, females presented with 43% anxiety prevalence, and males with 39% apprehension pervasiveness. These varying anxiety levels are rooted in several factors inter-play ranging from the social, political, and economic burden imposed on families in hard-to-survive situations.

In reference to a study to assess the perception of American undergraduate students on the adoption of distance learning using semi-structured interviews revealed that students initially had a negative perception of distance learning (Omar M. Mahasneh, 2021). In their view, this had worsened the learning quality, and rather amplified stress, panic, and pressure on learners. Furthermore, students' class engagement, and retention in Universities, and schools also significantly dropped. Similarly, a study in Turkey to establish student's opinions by effectiveness comparison of face-to-face and distance learning, results portrayed that face-to-face methodology was a prevalent choice as compared to distance learning. Excuses ranging from financial constraints to poor network connectivity dependent on the remoteness of internet service providers deterred learners' interest in distance learning (Kaan Kaya, 2022).

Using a thematic analysis for identity, and interpretation of student's responses, Fatima, (2020) investigated the experiences of students on the emergence of remote teaching (ERT) commonly identified as distance learning. Results indicated that distance learning was compromised by factors like lack of: - attention, concentration, motivation, time and task management, and interpersonal relationships, especially in the Eastern.

According to Gürhan, (2020) Institutions that utilized platforms like Microsoft Teams had a greater experience in learning as compared to other platforms. However, this is dependent on the computer literacy levels, electronic devices processing power, internet connectivity, and service providers', Sahbaz Ahmet, (2020) launched a study in Bosnia Herzegovina to investigate views and evaluations of students about distance education. The results showed that 90% of the respondents were against distance learning but were strong supporters of the face-to-face learning methodology. This indicated the loss of interest in distance learning which is the seemingly "new normal" learning methodology of course with considerations of several factors that negate its credibility.

Problem Statements

The adoption of distance learning in Uganda has significantly increased, especially in the wake of global challenges that necessitate remote educational models. However, the effective implementation of these programs is often hindered by various technological challenges faced by students. These challenges include limited access to reliable internet connectivity, lack of adequate computing devices, and insufficient technological literacy among students and educators. Additionally, the variations in technology infrastructure across different regions of Uganda exacerbate the inequality in educational access and quality. In the digital interconnected world, distance learning offers higher education opportunities beyond traditional classroom settings. However, the limitations associated with technological infrastructure and its effective use among students, particularly in developing countries like Uganda, have arisen. This study explores the effectiveness and constraints of distance learning technologies among students in a Ugandan context.

The primary aim is to explore the challenges and experiences of distance learning technologies for Ugandan students. Key research questions guiding this study include:

1. What are the challenges faced by students in adopting distance learning technologies in Uganda?
2. How do these challenges affect students' engagement and academic performance?
3. What are the possible solutions or improvements to enhance distance learning and accessibility amongst students in Uganda?

METHODOLOGY

A qualitative exploratory approach was adopted to gather in-depth insights from participants. In-depth interviews were conducted with undergraduate students from various universities across Uganda. Purposive and snowball sampling were used. Purposive sampling is a non-probability sampling technique where the researcher selects the study participants based on predefined criteria. According to Patton, (2022) & Rennekamp (2015), this method is suitable when the researcher has a clear idea about whom they need to interview. It ensured that the participants were relevant to the study and provided insights from a homogeneous group of individuals to achieve an in-depth understanding of the problem at hand. The criterion for the selection was the university without functional distance and online learning system before the year 2020.



Similarly, Snowball sampling is useful in identifying and sampling members of a population when it is possible to provide a complete summary and list of the population in advance. Given that students undertaking distance learning may not be readily definable and identified within the confines of traditional educational spaces, this sampling technique proved an effective method of selection. By targeting initial participants and then following up on their recommended peers, the process spurs a chain of contacts which eases access to other respondents. In both cases, the sample selection techniques allowed the researcher to not only tailor the data collected to address the research problem but also achieve a diversity of perspectives and experiences, which is crucial in a comprehensive understanding of the challenges of accessing and engaging in distance learning in Uganda.

In-depth individual interviews were conducted with 30 selected students over two months. Participants were encouraged to share their experiences and perceptions regarding distance learning, specifically focusing on the challenges they encountered with the technology used. Interviews were digitally recorded, transcribed verbatim, and followed by individual debriefing sessions to ensure the accuracy and validity of the collected data.

Transcribed interviews were analyzed thematically. Data analysis started concurrently with data collection to allow for iterative data refinement. A coding process was initiated, involving the identification and categorization of key themes emerging from the participants' responses. These themes were then consolidated and interpreted within the broader context of distance learning and technology challenges.

RESULT AND DISCUSSIONS

The findings focus on the experience of students about distance learning. Also, the researchers analyze the most difficult aspect of students' experience in the adoption of technologies in distance learning. Attention is also given to the assessment of learners and possible ways of using technology in distance education in Uganda.

Students Experience and Challenges in Distance Education

What are the challenges faced by students in adopting distance learning technologies in Uganda?

Based on the survey data presented in this paper, it seems that students' experiences towards the challenging period or distance to learning are mixed. Here are some insights based on different aspects of technology adoption. When asked about the experiences and challenges?

"I would like to have my classes in a real-time situation, but there are challenges of the internet and at times my smartphone freezes"

"We continued online but there are internet issues and a lack of devices to connect with our facilitators",

"We tried studying online via Zoom but it was expensive, so we gave up",

"I would like to study online, but it is somehow difficult for me because I have not studied online before now"

The interview conducted elucidates various problems faced during distance education. Students faced difficulties in learning and experienced a lack of concentration, unwillingness to learn, desire to go to school, inability to learn online, and limited comprehension. It was also gathered that facilitators encountered issues such as limited opportunities, difficulties in planning, implementing and evaluating learning, and issues related to internet usage and network problems (Olaniyan & Uzorka 2024). Many students reside in areas with poor or no internet connectivity, making it difficult to access online learning resources (Sserwadda, 2020). Students cited challenges in operating computers, using virtual meeting software, and submitting assignments online (Mugume, 2021). The lack of physical presence and face-to-face interactions made it difficult for students to stay motivated and engaged in online learning (Nsubuga, 2021). Students also highlighted difficulties in communicating with facilitators and classmates due to slow or unreliable internet connectivity (Kajumba, 2021). Some students from low-income households could not afford the cost of devices, internet access, and learning materials (Kakande, 2020).

Participants highlighted several challenges associated with adopting distance learning technologies in Uganda, emphasizing issues primarily related to internet connectivity and the affordability and functionality of necessary devices. Many expressed a preference for real-time classes but encountered barriers such as unstable internet connections and smartphones that would freeze, disrupting the learning process. Additionally, the cost of data and the lack of suitable devices made it difficult for some students to effectively engage with online platforms like Zoom, leading to a discontinuation of their efforts. These experiences reflect significant obstacles in accessing and utilizing digital education tools, impacting students' ability to participate fully in online learning environments. Another major challenge highlighted by the study is that many students, particularly those from less privileged backgrounds, have



not been exposed to technology in a way that would prepare them for a sudden shift to online learning. This gap in skills leads to difficulties in navigating online systems, understanding how to participate in virtual classrooms, and even accessing and submitting assignments online. Students are ill-equipped to use digital platforms for learning due to the lack of exposure and training, particularly in rural and economically disadvantaged areas (Akongo & Mensah, 2021). This impedes their ability to navigate online systems, participate in virtual classes, and manage homework submissions online.

The challenges faced in distance learning in Uganda, such as limited access to technology and unreliable internet services, are common across many developing countries. In regions like Sub-Saharan Africa and parts of Asia, similar issues hinder the effectiveness of e-learning systems. For example, a study in India highlighted that a significant number of students lacked access to smart devices and stable internet connections, leading to disruptions in their learning process during the COVID-19 pandemic (Sharma & Kaur, 2020). Similarly, in regions of Africa, the lack of infrastructure for internet and electricity poses severe limitations on the ability of students to engage with digital learning platforms effectively (Adeyinka & Mutula, 2021). These shared challenges underscore the global nature of the digital divide, emphasizing the need for robust solutions that can enhance the accessibility and reliability of distance education in less economically developed settings.

“We partially continued online but the problem came in when it came to practical and illustrative subjects like Math and Technical drawing”,

‘Changing of the syllabus that is used in school to fit our environment, curriculum to be changed so that the subjects are more practical.’

“I want them to change our learning culture. i.e more engaging”

“I would like to study online theoretically and then practically go to the Laboratory”

Students believed that the curriculum and syllabus had to be changed or restructured in order to fit in with the current situation. Because students were used to teachers' centred, theoretical way of study rather than hands-on learning that gives room for more practical exercise. Therefore, doing this in distance learning could be a challenging moment for the learners. However, the statement is in line with Nurhattati, (2023) that changes to the curriculum or syllabus were needed to fit passions, and for students to adapt to the changing nature of education due to the pandemic or any challenges to teaching and learning. Similarly, the shifting from face-to-face to online learning required alterations in the curriculum. The essence of these changes in the curriculum design was to adapt to the conditions caused by the pandemic (Yong Zhao & Jim Watterston, 2021).

Nevertheless, the transition from face-to-face to distance learning with technology has required a new approach to teaching and learning. Theoretical learning can be achieved through various online platforms where teachers deliver lectures, share notes, and conduct discussions. This can be done through synchronous (live classes on Zoom, Microsoft Teams and other related platforms) or asynchronous (recorded lessons or reading materials shared on learning management systems like Google Classroom and related platforms) methods. However, according to students' experiences, practical learning during distance or online learning can be more challenging, but not impossible. Teachers can demonstrate experiments or techniques via live or recorded video. Students can then replicate these at home if resources allow (Fakuade & Akinkuolie, 2022).

How do these challenges affect students' engagement and academic performance?

Moreover, the experience of students in Uganda cannot be overemphasized, apart from their mixed experience, students also identify how they have been affected academically.

“As of now, I am not able to continue with my academics because we are at home”,

“I had to stop school because I couldn't afford to join the online class because I was in the village”

“The communication gap between students and their teachers”

“Our teachers prefer to teach face-to-face than online”

“Some teachers face difficulties in planning, implementing and evaluating learning, and issues related to internet usage and network problems”

The responses from participants vividly highlight the significant challenges that hamper students' engagement and academic performance in remote learning environments. Students expressed those economic constraints and geographical limitations, such as being in remote areas without access to online learning resources, have forced some to pause their education entirely. Others pointed



out the communication hurdles that arise in virtual settings, where interactions between students and teachers are less frequent and effective compared to face-to-face learning. This communication gap is compounded by some teachers' preference for traditional classroom settings over online formats, alongside their struggles with planning and evaluating learning processes remotely. Additionally, technical issues like inconsistent internet access further disrupts the educational experience. These factors collectively lead to decreased student engagement and hinder academic progress, underscoring the need for more inclusive and adaptable educational strategies. These align with the findings in the study of Olaniyan & Fakuade (2023) on university students' level of competency and availability of the use of ICT in Uganda. It aligns with the study of Adeyinka & Mutula (2021).

Possible solutions or improvements for students to enhance distance learning and accessibility in Uganda

Assessing learning activities was one of the major challenges in distance learning in Uganda. When the participants asked: What are possible solutions to enhance your study and assessment?

“ We need free internet access and smartphones or computers ”

“Provision of data for internet so that we can facilitate our class online”

“Provision of computer centres with internet in the remote areas”

“Through the WhatsApp group, we listen to our facilitators' voice notes and our assignment is being sent to us.”

“They upload the results on the E-learning platform portal”

Although, participants expressed a significant need for improvements in the infrastructure and resources available to them. They further expressed the importance of having free internet access, as well as necessary devices like smartphones or computers, which are essential for participating in online education effectively. Furthermore, there was a call for the provision of data bundles to facilitate uninterrupted online classes, suggesting that consistent internet access remains a barrier for many. Another critical suggestion was the establishment of computer centres equipped with internet services in remote areas, which would greatly aid students who reside in locations with limited private access to technology. These enhancements would not only improve the accessibility and quality of distance learning but also ensure that all students have equal opportunities to succeed in their educational endeavours.

The challenges of accessing learning activities in Ugandan distance learning programs are predominantly centred around technological access and communication effectiveness. Participants in the program have proposed several practical solutions to enhance their study experiences and monitor their academic progress more efficiently. One common method already in use involves utilizing WhatsApp groups for communication, where assignments are distributed, and instructions are provided via voice notes from facilitators. The concern of accessibility is in consonant with the study of Fakuade 2021 who posited that the use of social media platforms enhances students' learning outcomes. Additionally, academic results are made available through an e-learning platform portal, which serves as a centralized location for students to access their performance outcomes. These existing measures leverage widely used communication platforms and online systems to maintain a continuous flow of information between students and educators.

Hence, to address these pervasive challenges, various strategies have been implemented or proposed in different countries. For instance, in Brazil, the government has initiated programs to distribute tablets and subsidize internet costs for students in rural and low-income areas to facilitate their participation in online education (Gonzalez, 2021). Meanwhile, in Kenya, partnerships between educational institutions and mobile network operators have led to the provision of subsidized data packages for students, ensuring they can access educational content at lower costs (Njenga, 2021). These initiatives mirror some of the solutions suggested by students in Uganda, such as the provision of free internet access and the establishment of community computer centres. By examining these comparative international efforts, it becomes clear that while the challenges may be similar across developing countries, the approaches to overcoming them can offer valuable insights and frameworks for enhancing distance education globally.

CONCLUSION

Online learning with the adoption of technologies in distance learning presented various challenges for students including signal quality, managing online lectures, understanding material, and communicating with lecturers. There were also important concerns related to the accessibility of required resources. The study also reveals both theoretical and practical implications that are critical for improving educational strategies in similar contexts. Theoretically, the findings contribute to the broader discourse on the digital divide in education, highlighting how inadequate technological infrastructure and limited digital literacy significantly hinder the



effectiveness of distance learning, especially in developing countries. This aligns with theories that emphasize the need for equitable access to educational resources as a fundamental aspect of educational justice (Adeyinka & Mutula, 2021). Practically, the study underscores the urgent need for targeted interventions that address these gaps, such as improving internet connectivity and providing affordable digital devices to students in underprivileged areas, like the initiatives observed in Brazil and Kenya where governments and institutions have facilitated better access to technology for educational purposes (Gonzalez, 2021; Njenga, 2021). Moreover, the specific challenges identified such as the need for real-time classes, reliable internet, and functional devices point to a significant disconnect between the current educational offerings and the actual needs of the students. This practical insight demands a reevaluation of educational policies to incorporate more inclusive and adaptable learning environments that cater to diverse student backgrounds and technological capabilities. The suggestions from students for more hands-on and engaging learning experiences indicate a critical need to redesign curricula that blend theoretical and practical learning effectively, even in remote settings. These practical considerations are crucial for policymakers and educational institutions aiming to enhance distance learning frameworks not only in Uganda but in similar contexts globally, ensuring that distance education remains a viable and effective mode of learning despite the prevailing technological challenges (Kawesa, 2021; Arnold, 2020).

RECOMMENDATIONS

It is therefore recommended that learning institutions need to plan effectively to deal with these realities. Similarly, the study offers significant insights that can be practically applied by practitioners in the field to address real-life educational problems. From the results, educational policymakers and institutions can identify specific barriers such as inadequate internet access, lack of technological devices, and insufficient digital literacy that critically hinder student engagement and learning. These findings can guide targeted interventions, such as the distribution of learning devices or the establishment of community internet hubs, which could mitigate these barriers (Ssewakiryanga, 2020; Mugume, 2021).

Furthermore, practitioners can use these insights to develop more inclusive educational practices that cater to diverse student needs. For example, the study suggests the necessity for training programs for both students and teachers to enhance their technological proficiency, an approach that can improve the overall effectiveness of distance learning (Kajumba, 2021). By understanding the specific challenges faced in different regions, educators can tailor their teaching strategies to be more flexible and accessible, ensuring that students, regardless of their geographical or economic conditions, have equitable access to education. These strategies are not only applicable in Uganda but can also be adapted to similar contexts globally, where students face comparable challenges (Sharma & Kaur, 2020; Adeyinka & Mutula, 2021).

Suggestion for further study

By detailing the specific hurdles that students face, such as limited internet access, inadequate devices, and a lack of technological literacy, this research provides a foundational understanding of the obstacles to implementing effective online education in developing countries. Future studies can build on this by exploring targeted solutions that address these barriers, such as government or NGO interventions to provide technological resources, or training programs to improve digital literacy among students and educators. Additionally, comparative studies could be conducted to assess the effectiveness of different strategies across multiple regions, offering a broader perspective on what works and what does not in the context of global education disparities. This type of follow-up research could lead to more customized educational policies and practices that better serve the needs of students in low-resource settings.

Author Declarations: The authors declare that this paper has been composed solely by all the authors and that it has not been submitted, in whole or in part, in any platform.

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