

# Adoption Complexities of Technology Innovations in Education: Uganda's Covid-19 Experience

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## Abstract

**Purpose:** The purpose of this paper was to examine the adoption complexities amidst the abrupt emergent shift to technological innovations in education, caused by Covid-19 that led to fundamental transformations (like shock to human life, shattered businesses, feelings of uncertainty, school closures, reduced human contact, adoption of online learning among others). Specifically, this greatly frustrated the education sector more than ever before. The transformation was intended to mitigate the impact of Covid-19 pandemic, but also, as a means to transition into the 4<sup>th</sup> Industrial Revolution. **Design/Methodology/Approach:** A cross sectional qualitative approach was used to collect data purposively selected from primary, secondary, nursing, seminary and higher education institutions that were to undo the varying learning challenges amidst lockdown brought by the government to flatten the infection curve and reduce total fatalities from the contagious pandemic. Thematic, content and narrative analyses were adopted to make sense out of the generated data. **Findings:** The study revealed that different institutions had been affected in different ways ranging from minimal differentiated teaching, quality observance, skills possession and mastery, competency-based approaches, differentiated approaches, diminished team learning, costly internet connections, questionable infrastructure and students' inability to comprehend content delivered through technology assisted instruction. **Originality/Value:** The paper suggests that amidst these challenges, education institutions transitioned into stable blended learning environment. Therefore, it is about time that all education institutions revamped existing curricula to incorporate

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critical strategies into technology assisted teaching and learning to meet work skills of the future and to mitigate similar adversities.

## Keywords

Competency-Based Education, Differentiated Teaching, Technology Innovations

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## 1. Introduction

Covid-19 was declared a global pandemic on March 11, 2020 (WHO, 2020). As at that time, the global death toll had hit 4291, from 118,000 reported cases across 114 countries. Particularly, education institutions were some of the most hit-hard sectors worldwide. For example, schools for more than 168 million children globally, were completely closed for almost a full year (UNICEF, 2021). The same report shows that around 214 million children globally—or 1 in 7—had missed more than three-quarters of them in-person learning. In Uganda, more than 73,000 learning institutions were closed, affecting more than 15 million learners (Kaguhangire-Barifaijo, Namara & Rwemisi, 2021). By the time the lockdown was lifted, and businesses re-opened, majority of education institutions had no option but to adopt to technology-enabled learning strategies, including: Blackboard, Zoom, Skype, Webinars, video demonstrations and many other innovations. Contrarily, these developments came with a number of challenges: limited physical interaction, team discussions and differentiated instruction, as technology innovations took the Centre stage (Tumwesige, 2020; Sseb-wami, 2020).

Since the first case of Covid-19 in Africa in February 2020, the disease spread throughout the continent, and different governments put in place various measures to fight the pandemic. Most governments' responses included a widespread closure of schools at an early stage to reduce the spread of the virus. The impact on education was felt across all countries globally but more felt intensely on the African continent. Indeed, the trade-off between accomplishing the required curriculum of the education programs and saving lives from the coronavirus was felt. This was in conformity with a number of measures to flatten the infection curve and reduce total fatalities from the disease. These procedures were termed as standard operating procedures (SOPs) and were 34 in number. They were largely to confine people in their respective homes in form of a lock down and limit social gatherings so as to halt the spread of Covid-19. As the corona curve was causing havoc, the Ugandan government closed all teaching and learning institutions, schools, colleges and universities with their respective buildings which are proved to be among the high population concentration centers. The challenge facing schools is that apart from having many people and students on daily basis (both learners and instructors), there is a dynamic interactive exchange between external persons and those residing within school's physical

boundaries. This was feared to increase chances for the spreading of the deadly coronavirus infections. The complexity of having the education non-boarding institutions where the learners and teachers interact regularly with the local communities posed a threat of community transmissions of coronavirus which was likely to create a health crisis that Uganda's low economy was currently ill-prepared to handle, at the time.

School closures were a hard decision to take. As always the case, school activities mobilise many people: teachers, head teachers, students, parents, and other staff, making it, riskier. A number of learners, students and lecturers responded positively with huge adaptability to online learning. The adoption and appreciation of technological innovations by all users; students, teachers, parents, and service providers had never been as critical, especially with the recurrent demand to mitigate disasters, but also for learning to continue (UNESCO, 2020b). Yet, although many education institutions had shunned technology-assisted learning, with the tenacious Covid-19 pandemic that lasted close to three (3) years, there was no option but to adapt to technology innovations. In education institutions, technology innovations include: online courses, teaching aids, educational software, social networking tools, and other emerging technologies which altered the traditional classroom environment that many had got comfortable with, before the pandemic. This state of mind, made the usage of technology innovations quite cumbersome, despite the essential role it has played in delivering education to the students outside of school and has allowed learning to continue (UNESCO, 2020b).

This pandemic had created an unprecedented crisis in most of the sectors across Uganda especially in the education. With the already existing rural-urban divide in developing countries, in terms of infrastructure and social services, where the larger population lives in rural areas, the Covid-19 pandemic exacerbated the situation in the education sector, leaving a multitude of questions regarding quality, competency acquisition and participation. Yet, technology innovations are the only hope to enable continuity of learning and also minimize further spread of Covid-19. Puzzlingly, while these innovations have become handy in bridging the learning gap, they could potentially compromise strategies that promote skills' acquisition, thereby diminishing job skills due to limited physical interactions and practical experience, social groupings and joint activities. Technology innovations in education seem to have affected the changing roles and new skills for teachers in hybrid learning systems, but also could potentially limit human connections in varying magnitudes (Kaguhangire-Barifaijo et al., 2021).

The World Bank has endeavored to explore teacher competency frameworks, teacher networks, and communities of innovative teachers to support countries to empower teachers so as to avert the danger of losing competencies; it may not have taken heed of existing challenges in the developing countries, where such strategies may not lead to student learning improvement (Dee & Perez-Nunez, 2020). Similarly, even for students in higher education believed to be conversant

with the various technology applications, there has been unimaginable resistance. Hence, the combination of limited skills' development strategies, poor technology infrastructure, cost and resistance may continue to frustrate efforts of the educationists, thereby affecting the caliber of graduates at all levels, and in various ways. Prior crisis response studies have largely focused primarily on firm survival and adaptation efforts (Rapaccini et al., 2020). Relatedly, specific recent empirical studies on Covid-19 have tended to concentrate on its impact on the economy, oil price, stock volatility (Albulescu, 2020; Estrada et al., 2020), biosecurity risk management (Melly & Hanrahan, 2020) and on the expansion of the disease (Chinazzi et al., 2020), amongst others, yet not much is known about *adoption complexities of technology innovations in education focusing on Uganda's Covid-19 Experience*. Drawing from the Social Cognitive Theory (Bandura, 1976), this paper contributes to the body of knowledge by exploring the impact of technology usage on skills' acquisition of learners, four (4) objectives were formulated: 1) to explore challenges with the implementation of competency-based learning amidst technology assisted learning; 2) to determine specific competencies lost using innovative education systems; 3) to examine opportunities of technology-enabled adoption and; 4) to seek students' perceptions regarding on-line teaching and learning.

## 2. Theoretical Predictions

A qualitative research approach based on Social Cognitive Theory (Bandura, 1976) was adopted in this study. The theory holds that portions of an individual's knowledge acquisition can be directly related to observing how others do things, and that when people observe a model performing a behavior or practicing it successfully, they remember the sequence of events and use this information to guide their subsequent behaviours. This theory asserts that learning occurs in a social context with a dynamic and reciprocal interaction of the person, environment, and behavior.

The theory is underpinned by how social interaction leads to masterly, skills' acquisition, job-related expertise, but also, increase employment opportunities for the graduates. Consistent with the theoretical emphasis, not only do people learn new behaviors by trying them and succeed or fail; rather, the survival of humanity is dependent upon the replication of actions, acquired through; role modeling, demonstration, group discussions and quizzes, which this theory correlates with a person's perceived self-efficacy and behavioural change that in fact presumably stems from four sources: 1) performance accomplishments; 2) vicarious experience; 3) verbal persuasion and demonstration; and 4) physiological states. With each behavior being witnessed in the actor, it can change a person's way of understanding of phenomena (Bandura, 2011; McAlister, Perry, & Parcel, 2008).

Similarly, Horsburgh and Ippolito (2018), explain how the theory revolves around the process of knowledge acquisition or learning directly by observation

of models in order to gain mastery, job skills and practical experience, which students may not ably acquire through technology innovations, since these competences demand physical interaction as well as internships and placements, not feasible due to the pandemic. Equally, the theory espouses observation which includes: attention, retention, production and motivational process that allude to the absence of practical skills and insufficient time for such activities to enhance students' skills (Santrock, 2008). Importantly, self-efficacy is the optimistic self-belief in our competence or chances of successfully accomplishing a task and producing a favorable outcome which is certainly worth having, because as Henry Ford famously put it, "whether you believe you can or you cannot, you are right". And Gandhi perfectly understood the pivotal role that self-belief plays in our lives—thus, "Your beliefs become your thoughts—Your thoughts become your words—Your words become your actions—Your actions become your habits—Your habits become your values—therefore, your values become your destiny".

Consequently, Bandura's social cognitive theory provides a helpful framework for understanding how an individual learns via observation and modeling which may be affected by technology innovations adoption. The theory further guides the review of literature, regarding challenges with the implementation of competency-based learning amidst technology assisted learning, determining specific competencies lost using innovative education systems, examines opportunities of technology-enabled adoption and; lastly, students' perceptions regarding on-line teaching and learning.

### 3. Literature Review

The rapid development of online teaching with the use of technology has resulted in traditional learning styles to blend virtual convenience and combining competency-based education with online instruction which accommodates several kinds of learners in order learning to make sense (UNESCO, 2020a). On the other hand, uncertainties regarding staff and students' perception of emerging technology and the inadequate infrastructure add to the many concerns of education managers faced with the Covid-19 pandemic. Yet, with all the emerging innovations, there is no assurance of instructors' compliance, parents' cooperation, as well as learners' ability to meet the cost of on-line classes (Tumwesige, 2020). In order to secure the future of millions of young and expectant people, countries across the globe have variously intervened to ensure continuation of learning (Chirikov et al., 2020; AMREF, 2020). While numerous efforts were made by the Government, sustainability uncertainties soared even higher among stakeholders, whose normative agenda was being threatened by alteration of education calendars, new delivery approaches and a complex process of preparing institutions for sustainable delivery of quality education. Yet, despite increased stakeholders' uncertainties, society expected education institutions to provide lasting solutions to mitigate emerging disasters.

### **To explore challenges with the implementation of competency-based learning amidst technology assisted learning**

Competency-based education (CBE) is a reform that is taking root in all education institutions, and explains how learning is best measured by students demonstrating mastery of learning, rather than the number of hours spent in a classroom (Oroszi, 2020). The approach calls for a shift from a summative and primarily tests rote memorization skills to more regular and formative assessment which promotes learning development for learners at all levels, and tests higher-order skills, such as analysis, critical thinking and conceptual clarity. As an approach to teaching, learning, and assessment that focuses on the student's demonstration of learning outcomes and attaining proficiency in particular competencies in each subject, CBE is a methodology which empowers students and provides them with a meaningful and positive learning experience by placing the learner at the center and actively engages them in the learning process. Therefore, CBE emphasizes real-world applications of knowledge and skills and the authenticity of the learning experience that addresses fundamental shortcomings of the traditional model, because it helps students learn most effectively, to achieve greater equity, to foster deeper learning and creates a system of continuous improvement (Hodges et al., 2019). Hence, CBE is a major shift in the education setting, structures, and pedagogy that focuses on ensuring that all students succeed. CBE integrates higher order thinking skills, interdisciplinary approaches and problem-solving as these are essential to the modern world and workplace. Alongside social and emotional skills development and developing globally literacy and citizenship, the approach enables learners to be competent not only in the national context but also the international labour market (Gravina, 2017).

The concept of the innovation system stresses that the flow of technology and information among people, enterprises, and institutions is key to an innovative process. It contains the interactions between the actors needed in order to turn an idea into a process, product, or service on the market. Innovation in education means solving a real problem in a new, simple way to promote equitable learning. Innovation in education matches the scale of the solution to the scale of the challenge. For example, technology is causing massive changes in all sectors of the economy (Rainwater, 2016). These changes have been felt in the health sector, financial world, entertainment, and even government. The good news is that these changes will make the world a better place! One of the key sectors that has been affected by this disruption is education. These innovations are giving classrooms a new look and have changed the ways in which lessons are conducted. Here are the top six technology innovations that are causing major changes in education (Ordonez, 2014). The system of education in Uganda has a structure of seven (7) years of primary education, six (6) years of secondary education (divided into 4 years of lower secondary and 2 years of upper secondary school), and three (3) to five (5) years of post-secondary education. Students have a wide range of options between private and public education institutions

depending on their aptitude, ambitions and resources. Nonetheless, as instructors migrated from physical to online classes, (*which should also have an element of competency-based approach*), the focus on the primary concern, such as differentiated learning, individualized teaching, group work, that are believed to enhance learning, role plays, demonstrations, and out of “class activities”, that develop key competencies, etc. were lost. In physical interaction, instructors employ tailored approaches after identifying learners with different learning needs, but also exceptionalities that often demand superior strategies, that may not be applicable using technology assisted teaching.

#### **To determine specific competencies lost using innovative education systems**

##### ***Competency-Based Education (CBE)***

The extraordinary ripple effect of coronavirus, has forced education institutions to adopt innovative systems to ensure that learning would be minimally interrupted. Today’s education sector is in turmoil to create resilient systems, in order to return to a “normal state” after the longest disruption of learning ever, caused by the Covid-19 pandemic, with the purpose of re-envisioning equity, sustainability, coherence and adaptability (Adams, 2014; Johnston, 2018). Specifically, innovative education systems; are seeking partners to develop new programs and models, involve others in partnership decisions, but also, create the enabling conditions for school model variation to develop the school’s students want and deserve. Education systems are complex (Voogt et al., 2017). Getting all children in school and learning requires alignment across families, educators and decision makers. It requires shared goals, and national policies that put learning at the center stage. It also requires data collection and regular monitoring to help policymakers identify what’s working, who’s benefiting, and who’s being left behind. Hence, strong education systems are inclusive and gender-equitable. They support early learning and multi-lingual education, and foster innovations to extend education opportunities to the hardest-to-reach children and adolescents (Serdyukov, 2017).

Regardless the level of education, courses (call them subjects) of practical nature, the science-based and vocational training courses, that demand specific competencies, that traditionally were imparted through practical, demonstrations, laboratory experiments, field excursions, internships, school practice, agriculture etc. could not be conducted online. Yet, the accelerated promotion to cover the spill-over effect may not have permitted recovery of the lost content.

##### **To examine opportunities of technology-enabled adoption**

Competency-Based education has numerous benefits including: skills’ acquisition, cost savings, and flexibility (Hodges et al., 2019). A set of researchers compared the effects of virtual learning versus traditional learning to achieve competency-based clinical skills and found that the blending of both methods provided the best results, facilitating the knowledge transfer necessary for the rapid development of patient care and lifelong learning (Kelly & Columbus, 2016). One major benefit of competence-based education is flexibility because it



leads to increased matriculation. Yet, although online competency-based education provides a method to decrease failure in completion, the physical interaction has the potential to vary and differentiate learning strategies to meet the different needs of learners. Similarly, CBE offers students the opportunity to pursue affordable education and training using past experiences, skills, and knowledge to aid them in this endeavor (Irvine & Kevan, 2017).

### ***Technology Innovations in Education***

Technology enabled learning or online teaching has always existed and applicable by various institutions, and different arrangement that often depended on choice on the learners' choices. However, technology innovations were reinvigorated during scourge of Corona Virus Pandemic (Covid-19) at the turn of 2019 which forced many educational institutions reconsider alternative modes of instruction by moving from the traditional-physical interaction to online teaching which caught most users unaware. Before Covid-19 included, Blackboards, Big Data, Machine Learning, and the Internet of Things (IoT) were the biggest educational technology trends predominantly used in distance learning (Khavul & Bruton, 2012). With the emergence of Covid-19 pandemic that hit the globe and affected educational institutions, learning at all levels drastically changed to digital platforms so as to accommodate standard operating procedures (SOPs) as a strategy to curb further spread of corona virus. This resulted in the adoption of technology innovation trends, which focused on equitability, accessibility and participation by developing countries, as opposed to developed countries that focused the learning on connectivity, versatility, and student-centered approaches (Dee & Perez-Nunez, 2020).

The pandemic notwithstanding, technology assisted learning has coincided with the 4<sup>th</sup> Industrial Revolution, where, in order to fit into the global shift, countries have no option but to adopt to technology innovative systems in education, like in other sectors in the world, where Uganda, cannot be an exception.

### **To seek students' perceptions regarding on-line teaching and learning**

In order to master technology innovations, educators must have a grip of the latest most suitable technology innovation trends considered essential in education for effective teaching and training including: eLearning, video-assisted learning, block-chain technology, big data will get bigger, artificial intelligence (AI), learning analytics, gamification, immersive learning with VR and AR, TEAM-based programs and social media in learning (Kirkwood & Price, 2014). Yet, as a result of Covid-19 pandemic, technology has seeped into education and renewed its whole teaching and learning process, and has become an educational tool that not only increases the accessibility and convenience of education but also changes the learning behaviors and learners' desires for learning. However, even with its numerous benefits, its impact on competency-based endeavors needed to be explored.

Technology innovations in education enable teachers to create online courses where students can learn in their own space and at their own pace. According to Farell (2007), technology has made retention possible; allows students and



teachers to stay connected, discuss, share their opinions, but also, act upon situations collaboratively (Khavul & Bruton, 2012). Therefore, just like eLearning, technology innovations in education is a tool that features collaboration by enabling students to share and discuss, rather than being in a classroom and listening to teachers speak for 30 minutes. Therefore, the teachers are more accessible and act as mentors to help students develop their learning potentials and other capabilities under this approach. Fagerberg et al. (2012), argue, that technology innovations, just like “collaborative learning approaches” have the ability to bridge the gap between teachers and students and also help students explore other potentials. Therefore, technology innovations help how teachers teach, both online and offline without always appearing in a specific class at a specific time, because students can learn whenever and wherever, thereby changing the way students approach learning which makes learning more fun and exciting for students (Fagerberg et al., 2012). Consequently, when students feel engaged in learning, they learn better, remember better, and also apply knowledge better to real life, but also, technology makes education smarter, more effective, and satisfies learners’ needs more (Tierney et al., 2016).

Nonetheless, the rapid development of online teaching with the use of technology has resulted in traditional learning styles to blend virtual convenience and combining competency-based education with online instruction which accommodates several kinds of learners in order learning to make sense (UNESCO, 2020a). On the other hand, uncertainties regarding staff and students’ perception of emerging technology and the inadequate infrastructure add to the many concerns of education managers faced with the Covid-19 pandemic. Yet, with all the emerging innovations, there is no assurance of instructors’ compliance, parents’ cooperation, as well as learners’ ability to meet the cost of on-line classes (Tumwesige, 2020; UNESCO, 2020a). In order to secure the future of millions of young and expectant people, countries across the globe have variously intervened to ensure continuation of learning (Chirikov et al., 2020; WHO, 2020). While numerous efforts were made by the Government, sustainability uncertainties soared even higher among stakeholders, whose normative agenda was being threatened by alteration of education calendars, new delivery approaches and a complex process of preparing institutions for sustainable delivery of quality education. Yet, despite increased stakeholders’ uncertainties, society expected education institutions to provide lasting solutions to mitigate emerging disasters. This is because, universities are known to be not only the reservoirs of knowledge, through knowledge acquisition, distillation, and dissemination, but also consist of diverse professionals to address the various societal challenges.

#### 4. Methodology

The study adopted a case study and an existential phenomenology. Existential-phenomenology is a paradigm that blends the philosophy of existentialism with the methods of phenomenology (Valle & King, 1978). In existential phe-

nomenology, the human being is understood as essentially embodied, and the body “is a physical thing, an object that can be weighed, measured and described using purely physical or naturalistic terms. But it is also the source of subjective feelings, perceptions and sensations; it is the seat of subjectivity, the place where consciousness occurs. As such the body is a subject object, a unique being that can be experienced both from a first and a third person point of view” (Carel, 2011). For example, existential-phenomenological methods have been employed in research concerning the experiences of anxiety and depression (Fischer, 1978) which is closely associated with the study of Virtual learning experiences of university students during Covid-19 and its related predictors or outcomes. Further, secondary research using electronic databases, grey literature, reference harvesting, telephone interviews and discourse analysis with weighted, critical, balanced views on the most suitable way forward regarding education in the era of Covid-19, were used. Hence, given that different countries have come up with different strategies, the paper largely relied on existing research sourced through electronic databases, focusing on current literature on Covid-19 and the recent national and global updates on virtual learning. Other strategies included use of social media students’ views on the challenges of on-line classes. The paper relied more on recent studies that focused on emerging educational technology resulting from the Covid-19 global crisis as advocated by Chintalapudi et al. (2020). This methodology has been adopted by various researchers around the world as they attempt to find alternative modes of teaching and learning for a paradigm shift from the face-to-face method to online learning teaching as supported by UNICEF (2020).

Two higher education institutions, two seminaries, two secondary schools, two nursing schools, and four primary schools participated in the study. All the institutions that contributed to this paper had access to technology. This means, that majority of schools in the country have continued to be disadvantaged due to technology infrastructural challenges. Researchers followed up selected classes on line “WhatsApp discussion” forums of the students on a subject of debate entitled “*A Petition in Support of Online or Distance Learning*” from which a discourse and content analyses were done. The interpretation of the views was made to derive meanings regarding individual perspectives and experiences. Within this debate one of the Master’s degree classes at one of the higher education institutions had a discussion on their personal views based on their experiences with online classes during the Covid-19 period lockdown and post-lockdown period. Their critical viewpoints generated great insights for understanding what may work for university students in this period and similar situations in future, what may not work for them based on the raised challenges. Hence, in addition to content and thematic analyses, a narrative evaluation of the “WhatsApp” conversation was done. In fact, Creswell (2013) recommends these approaches to be used in purely qualitative findings, where a researcher interrogates documents, views and perhaps arguments without the subjects. Surprisingly, whereas the initial assumption was that all stakeholders in higher

education institutions embraced technology-assisted learning, even without reacting to the pandemic, majority of learners and facilitators remained adamant because they were not sufficiently grounded in the niceties of blended approach to teaching/learning, but also it was not sustainable due to the cost.

## 5. Findings and Discussion

Although existing literature on distance learning supports the view that more than any other distance media, the Internet and the web help overcome the barriers of time and space in teaching and learning, the lack of physical interaction may potentially diminish benefits that come along with competency-based education. *Therefore, Bandura's self-efficacy that played a major part in determining chances for success was not in vain.* In fact, some psychologists rate self-efficacy above talent in the recipe for success because one might be talented but with lack of self-efficacy, thus the talent may never be explored (Anderson and Braud, 2011). Consequently, self-efficacy comes from “mastery experiences”, “vicarious experiences”, “verbal persuasion”, “emotional and physiological states”, and “imaginal experiences”, which skills are “a must have” by these professionals. Considering that the different institutions faced different challenges, we present and discuss findings concurrently. Therefore, after data analysis, nine (9) critical themes were generated from the master transcript of the responses of the participants in line with *Adoption complexities of technology innovations in Education: Uganda's Covid-19 Experience*. These are presented and discussed below. After data analysis, 9 critical themes were generated from the master transcript of the responses of the participants in line with *Adoption complexities of technology innovations in Education: Uganda's Covid-19 Experience*. These are presented and discussed below.

### **Emerging theme 1: A petition in support of online or distance learning**

The participants in this study argued that physical classes meant that some of them were going to spend more than double what they would have spent before. The implication here was that they were not going to manage to pay for transport, meals and accommodation but fail to pay tuition, and of course never finish the course. It's against this background, and being stakeholders in the learning process, that they requested to engage the leadership in these institutions to consider some of them to continue with online classes or at least distance learning while those who can afford could resume with physical classes. Students' concerns about the mode of studying during the Covid-19 pandemic were articulated in the “petition” to support online and distance learning. The release of the revised timetables and internal memos indicating management resolutions on the rescheduling of exam the time table from November 2021 to July 2022 and the readjustment of teaching/learning schedules by combining some classes came with mixed feelings and expressions from the students. The petitioner had diverse proposals to resume physical classes with clear reasons including financial constraints especially for costs incurred in transport, meals, accommodation and general upkeep. The situation was worsened by the econo-

my that had been badly affected by Covid-19 pandemic.

A good number of students supported the proposal for online teaching/learning for these very arguments. This was stemming from the rising oil prices at the global level as one economic concern for the hiked transport which most of the upcountry students must meet if they had to study at the main campus physically through a face to face mode of teaching and learning. It was also recognized that businesses had drastically slowed down due to Covid-19 pandemic, a situation that worsens the fading diminishing individual earnings due to low economic activity during the lockdown. When combined together with other costs, the expenses to attend the course beyond the school fees and other functional fees became exorbitant to an extent of pushing some students out of the course. The arguments brought in a comparison between these forms of costs and costs of the internet incurred during online classes. From the debate, there was a consensus that the internet costs had proven to be expensive but much fairer than a sum-up of those other costs met in the physical class attendance. In one of the institutions, majority of students from far and wide, traveled long distances all over the country to study on the weekend.

In the two HEIs, a good number of students/participants originate from across national borders such as: Juba in South Sudan, from Rwanda, Tanzania, and Kenya etc. The strategy was to extend the frontiers of the country's catchment area to all East African Region and beyond. In this era of globalization and Internationalization of Higher Education, this would sound more logical to emphasize online mode of teaching and learning as a way of enabling easy access and ensure inclusivity of institutional programs to prospective interested learners. The issue of space and place should prove a less barrier in advanced technology era that we experience today. Subsequently, the Covid-19 pandemic and other emergences should rather reveal opportunities to innovative ideas and approaches to serve all clients of institutions of higher learning with consistency and ease.

#### **Viewpoint 2: The relevance of physical classes**

The findings indicated that while a number of students advocated for online classes, others stood firm on their initial reasons for physical classes. Some of the arguments were psychological, with some of the students sticking on their choices of the course as being physical class, claiming that their applications and selection of the course was premised on the social interaction and networking and that, that remained their stand and wish. Other students stood firm with physical classes advocacy holding that they were much more effective way of teaching and learning compared to online classes. They argued that online classes had a lot of interruptions specially to do with ineffective participation in classes and minimal contribution to the class open discussions due to interruptions in the home environment, or other environments where the students are located during class hours. With physical classes, the students say they felt more committed to learning through peer social support and guidance.

The interviewees asserted that background noise, limited internet intercon-

nectivity that was often intermittent, interruptions with family members, guests or those in the neighborhood were some exogenous factors that affected students' classroom concentration and participation. Tendencies and temptations to do a lot of multitasking of learning and family chores were also mentioned as interruptive and experiential by some of the students. Due to their inconsistency in class attendance and participation, some of the students had class recordings as fallback options. However, these recordings by their nature were lengthy and required a lot of time and attention as downloads from which the learners could obtain the information missed in the classroom interactive time. Some of the students argued that the use of the class lesson recordings had attested that they listened to these clips in bits and often failed to exhaust the folders (content). Majority ended up playing bits and pieces of these recordings selectively. The learners' views were collaborated in line with what was experienced in classroom where on several occasions there existed noisy backgrounds and limited audio-visual intermissions during classroom with limited students' engagement. By implication, issues of inequality among the learners at university level consistently featured in the online classes. While the infrastructural issue of internet connectivity featured prominently as a call for physical classes, it also became evident that not all participants were able to procure enough data to last them the entire days' session. This argument holds more weight in the Uganda Management Institute model of teaching that is designed in a modular way with sessions of same module covering 6 - 7 hours a day for weekend programs or 3.5 hours five days a week for weekday evening coupled with substantial downloadable materials for self-study, references, coursework's and follow-up research on the covered subject areas.

### **Emerging theme 3: Hybrid teaching and learning**

Among the students, there were those that stood in the middle of the road, with open mind on attending a hybrid of both physical and online classes. Some of those seemed to follow scholarly views of situational theories of management. They requested management to apply either physical or online classes depending on the situation prevailing at the time. This advocacy seemed to realize that the situation of uncertainties like the one of Covid-19 required a lot of flexibility and approaches to suit the circumstances at hand. As long as the overall goal of course completion was attained, it occurred that those students subscribing to these views were strong on achieving unitary ends than the choice of means to accomplish their studies. Accordingly, therefore, such students were suggestive that choices of teaching and learning strategies should be largely directed by management to the best of all students' interest. We found this argument reasonable because in such a case, university management takes rational decisions after examining, discussing and comparing alternative courses of action and the possible outcomes in view of the likely student's responses to these decisions. As members of academic management team and students (beneficiaries) in these institutions, we were able to appreciate the students' hybrid learning advocacy, but also gave us the opportunity to reflect on the management decisions in this

regard. The abrupt Covid-19 consecutive lockdowns, therefore prompted learning institutions to put in place strategies for business continuity among which were making consultation with the students on their willingness to switch to on-line classes through Zoom or Virtual Learning Environment platform, while the National Council for Higher Education (NCHE) devised other learning strategies. Hence, in line with the NCHE minimum standards for open distance and e-learning programs (NCHE, 2009) and the guidelines for adoption of emergent open and distance e-Learning (NCHE, 2020), guidelines for the Virtual Learning Environment (VLE) were designed, tested and approved. The guidelines required that universities' decision for online teaching and learning to ensure that the students readiness and consent were sought with verifiable evidence. This was intended to ensure inclusive teaching and learning process.

#### **Emerging theme 4: Clinical practice**

Prior to the pandemic, BTVET had already developed and implemented CBC in health training institutions. Health training institutions provide an integrated work based learning programs, aiming to combine a field of study with practice of work. This is done in form of clinical placements, internships, practicums and field work. Through this approach, employment prospects by developing skills relevant to occupation are improved, increase student confidence and provide a glimpse into the working world (Pavavimol, 2021). Skills sought by the employers include problem solving, teamwork, communication, information technology application, leadership, professionalism, lifelong learning and social responsibility. Conversely, although CBC puts more emphasis on acquisition of hands on competencies, the mentors too are overwhelmed with clinical routine activities coupled with big nurse/midwife patient ratios. In public institutions, learning space faces more constraints with regard to learner-teacher ratios. During the pandemic, it was difficult to mentor students in the clinical area since the number of students accessing the practicum sites was limited and this affected student, skills acquisition from the bedsides. Placing Trainees in the practicum training sites is a pedagogical practice to bridge the competency gap between the classroom and the clinical area. The purpose is that medical education must prepare trainees for effective practice (Frenk et al., 2010). Pavavimol (2021) also asserts that competent performance by health care professionals is expected by society. While there has been some pushback against online learning from medical students, in particular, universities have to re-educate students to expect a combination of skills-based and knowledge based approaches in education. Both trainers and students should be counseled to understand that society is changing and knowledge is not the only cornerstone of medical practice any more. WHO (2020) noted that nurses qualifying from training programs should be fit for practice. Therefore, the pedagogical practice of placing trainees in clinical practice is for purposes of demonstrating skills for competence. It is hoped that clinical placement attachments prepare students for mastery of competences for service delivery. In the absence of clinical attachment, employers believe that the preparation of nurses and midwives for practice is not adequate on registration.

### **Theme 5: Trainers' readiness to the new norm learning**

Traditionally, e-learning was not a preferred method of learning in health training institutions in Uganda. However, BTVET in 2012 adapted a blended e-learning program for midwifery diploma program with the help of African Medical and Research Foundation (AMREF) AMREF Uganda. Teaching and learning materials were developed in form of CDs which are supplied to learners. The learners are taught some advanced skills for two months in every semester and the examinations are conducted. This method cannot be used to teach certificate or direct diploma programs. The midwifery who are upgrading have prior skills which are upgraded and new ones added and a few midwives are enrolled on the program. The Uganda Upgrading eLearning Midwives project is a public-private partnership between AMREF Health Africa, the Ministry of Health, the Ministry of Education and Sports, the Uganda Nurses and Midwives Council, Uganda Nurses and Midwives Examination Board and collaborating training institutions that is funded by GlaxoSmithKline. The project was conceived after successful implementation of a similar project in Kenya.

### **Critical incidence 6: Barriers to e-Learning.**

Many factors potentially influenced the success of online learning program. According to Meng, Hao, & Tan (2021), several factors can impede e-learning such as administrative issues, social interaction, academic and technical skills, learner motivation, inadequate time and support for studies, costs and access to internet. Lack of technical skills in particular was found to be one of the major barriers met by educators when engaging with the development and implementation of online learning. Negative attitude among educators in engaging with new technologies is another barrier. On average, students assigned to the online instructional format withdraw from courses at a higher rate; this finding is not observed among the highest achieving students, suggesting lower-ability students may encounter barriers to persistence under new online learning models. Nevertheless, overall course performance is equivalent between treatment and control, suggesting the online model may be as effective as face-to-face instruction at a lower cost.

### **Emerging theme 7: Responsive curriculum**

Higher education institutions need to change their approach to suit the needs of the modern student, who has more options for their further education than at any time in the past. Today's student is more of a consumer than any time before, and institutions must be nimbler in developing new programs to meet student needs. Technology futurists have long predicted exponential growth in computing power that will eventually reach a point of singularity. In society, we have seen smart phones, social media, digital media, and cloud computing move from dream to mass adoption in an extremely short period of time. The average individual consciously or subconsciously expects products and services to fulfill a need and to adapt quickly to this changing world. Every institution employs a process for curriculum development and program approval. While there are variances depending on the institution size, structure, degree type, and accrediting



body, one common denominator is the length of the curriculum development and approval cycle. Put simply, it's very long. While traditional processes can be useful in assuring proper governance and quality controls, tradition becomes problematic for keeping pace with the rapidly-evolving demands of today's learners. A responsive curriculum addresses the changing needs of students, bridging the gap between universal knowledge and theories on one hand and contextual, continuously changing realities of everyday life and the world of work, on the other. Much curriculum tends to be static: It prescribes what students should notice and what they should think. *How can educators create curriculum that changes as students and teachers engage it—curriculum that engages students and all their varied observations and ideas?* In critical exploration, students encounter materials the teacher has chosen; at the same time, they actively develop their own observations of and thoughts about the materials, free from the influence of the teacher's ideas. One important benefit of this approach is that the students' observations can help direct the teacher's attention, illuminating aspects of the sources the teacher might not otherwise have fully appreciated, helping her to create a responsive curriculum by deepening her understanding of the themes she is teaching and of the ways learners at all levels can discover them. In this post, I'll share a specific example to show how this movement in critical exploration works. Though the example comes from history/social studies, the pattern of interaction among the materials, the students' observations, and the teachers' thinking and planning holds beyond it. *By looking closely at this example, we can better understand how student-centered teaching and learning can inform and enliven curriculum in any subject matter.*

#### **Critical theme 8: Learning centers/parallel disciplines**

A popular way to integrate the curriculum is to address a topic or theme through the lenses of several different subject areas. In an elementary classroom, students often experience this approach at learning centers. For example, for a theme such as "patterns," each learning center has an activity that allows the students to explore patterns from the perspective of one discipline—math, language, science, or social studies. As students move through the learning centers to complete the activities, they learn about the concept of patterns through the lenses of various disciplines. In the higher grades, students usually study a topic or theme in different classrooms. This may take the form of parallel disciplines; teachers sequence their content to match the content in other classrooms. Students often experience American literature and American history as parallel disciplines. They study a particular period of history and read literature from that period. For example, students read *The Red Badge of Courage* in English while studying the Civil War in history. Students usually must make the connections themselves.

#### **Emerging theme 9: Theme-based units**

Some educators go beyond sequencing content and plan collaboratively for a multidisciplinary unit. Educators define this more intensive way of working with

a theme as “theme-based.” Often three or more subject areas are involved in the study, and the unit ends with an integrated culminating activity. Units of several weeks’ duration may emerge from this process, and the whole school may be involved. A theme-based unit involving the whole school may be independent of the regular school schedule. At Fitch Street School in the District School Board of Niagara in Ontario, Ellie Phillips and four of her colleagues collaborated on a two-week, cross-grade curriculum unit on the Olympic Games. Curriculum planning required eight half-hour sessions. Teachers grouped students into five multiage classes representing grades 4, 5, 6, and 7. The multiage groups met for one hour daily for nine days. In these groups, students devised a performance task that they presented on the final day of the unit.

## 6. Conclusion

Inevitably, change is a difficult process to manage, even under “normal” circumstances. Hence, given the nature of the challenge schools were facing during the Covid-19 pandemic, there were likely to be hurdles to any implementation process no matter how well it may be planned by the education manager. Inadequate infrastructure, high costs of access, unreliable telecom and electricity services, weak policy regimes, inaccessibility to appropriate software and course-delivery platforms, shortage of skilled personnel to manage the resources and maintain new delivery modes, a technology-illiterate user group and lack of access to online scholarly materials might affect government’s efforts to introduce learning procedures compliant with Covid-19 SOPs. This change will reduce the attractiveness of many universities for expert faculty. For example, a faculty member may choose to teach at a small institution in a rural setting, yet collaborate on research with faculty in a large urban environment. Similarly, with the Coronavirus already having a massive impact on the global economy, existing attempts at funding higher education institutions through public and private funding, and other methods are going to have to be scaled up fast along with significant cost-cutting. This makes “finding new business models for college” among the most important innovations in decades. The coronavirus pandemic highlights the ongoing need for education to be the first line of defense in crisis, not the first casualty. The more than 15 million children out of school as a result of Covid-19 underline the need for a sustainable solution for education in emergencies through a dedicated resource pool. The digital divide in Uganda highlights the enormous inequality gap. The difficulty of accessing learning technologies and level of digital literacy skills between privileged and the deprived groups continues to widen the education gap. For the vast majority of learners living in rural Uganda, online learning is but a dream within a dream. The daily realities and struggles to access basic needs mean education is often not a priority. As a nation, the current state of technology infrastructure and access in Uganda only allows for electronic measures to serve a few and only provide basic programs, and cannot be comprehensive or long-term solutions.

Uganda cannot afford to continue to look from the sidelines. Talk and discussions on fully embracing ICT in education must be turned into action.

Policymakers must continue to seek long-term solutions that allow equitable education for all through consultation processes, learning and interaction with stakeholders. Policymakers should avoid short-term political and emergency-induced solutions that are often short-sighted and are not holistic. Similarly, schools and higher education institutions need to lead the shift to the new ways of teaching and learning. This demands that institutions ensure that teachers and faculty members develop the required digital literacy skills, develop effective pedagogical strategies, and develop peer collaborations and support to secure adequate technology and bandwidth. There is an opportunity to develop digital literacies and more equitable systems. It will require all education stakeholders to support efforts to transition from the traditional rote learning approach with very limited scope for the application of concepts to a more practical and interactive approach that supports critical thinking, creativity and lends itself to a learner-centred instructive approach and electronic learning. The Covid-19 pandemic represents a unique challenge to education and health care services. As the revolution of e-learning has begun, Health training institutions should develop e-learning materials to improve the teaching and learning experience and maximize the allotted time for strengthening skills training when a chance comes for students to appear physically in class and clinical sites. The education sector apparently will not have more money, so we cannot expect salaries to be more attractive for trainers or other resources to increase. The alternative is to restructure. Universities must be flexible in their approach to skills training if they are to keep up with employability needs, experts warn. Obviously, this model is oversimplified for dramatic effect. But the reality is not so far off. Many failed degree programs have their origins in a “build it and they will come” mentality and not consumer demand. Often, new programs are outdated, out-priced by competitors, and doomed for failure before they ever hit the market. Many current programs are failing to even break even, but fear of pulling the plug keeps them alive. Not only is this bad news for students disappointed in the lack of relevant program choices, but it’s a massive financial drain on our institutions.

## **7. Recommendations**

In order to prevent further damage, the government needs to continuously negotiate with all stakeholders to formulate implementable interventions at all levels of education management. The task force and Ministry of Health which informs the Presidential directives would benefit from collecting input from education managers using scientific data collection methods to make the directives feasible. Considering that there is no “One size fits all” intervention for learning continuity, all stakeholders should come on board to guide which intervention is feasible for which level of education, in order to provide lasting and tenable solutions for learning to continue. Considering that the success of e-learning sys-

tems will always depend on the willingness, acceptance and cognitive ability of students and change management strategies laid by education managers. Institutions should continue to sensitize, encourage and coach students, parents and teachers to embrace technology-assisted learning.

The sector needs to conduct a thorough situational analysis regarding challenges and factors influencing the usage of e-learning system during Covid-19 pandemic so that tested interventions like online teaching may be improved to become dependable options for countrywide delivery of teaching and learning services. In order to develop a framework for the provision of internet-supported ICT learning for continuity of learning, there is an urgent need for collaborative partnerships between a wide range of stakeholders at local and global levels including telecom service providers to offer special tariffs and bundle packages for learning purposes. Lastly, ensuring that the “new normal” turns Uganda into a stronger, unified and improved society rests heavily on academia. Institutions require agility, resilience, national solidarity and coherent, coordinated decisions to address the effects of Covid-19 pandemic on the economy and the education system. In order to support the continuity of learning during such situations of pandemics like Covid-19, strategies of the new normal need to be implemented with the significant change to the way learning is presently operating. Teachers must inevitably re-skill to step away from traditional teaching methods and embracing the use of technology. Such concept should be introduced and supported in the National Teachers’ Colleges (NTCs) in Uganda. Through the Teacher Training Education (TTE) priority on “leaving no one behind” requires investing in sustainable infrastructure, innovations in management and teaching practices in the NTCs that aim at producing competent primary school teachers that will implement competence based training (Atuhura, 2021). For that matter, there is need to adopt distance learning and virtual teaching methods as the new normal.

Distance learning strategies should be established to fully utilize the potential of teachers to respond to the current and future education crisis. ICT tools and educational practices aimed at facilitating and enhancing distance learning during and post Covid-19 pandemic should be introduced (Atuhura, 2021). This on the other hand requires training to equip teachers and learners with information technology skills that will ease instruction and ability to stay relevant and support the learners in implementation of competence based training. Covid-19 has brought about changes in the world that need to be embraced for the better. With the use of technology, there is need to maintain communication between teachers and learners. In Uganda, Enabel has provided support for this communication strategy in National Teacher Training Colleges by use of bulk SMS system. Schools can customize information to their staff and pupils in preparation for distance learning (Atuhura, 2021). However, with the economic challenges, availability of required gadgets for such communication, like laptops or smartphones and data, among others, may hinder implementation of this strategy. Therefore, the government, among its priorities should increase the budget for

education, reduce on taxes on gadgets like laptops or even provide them at subsidized prices.

There is need for collaborative efforts to build the potential for teachers. These can be done through knowledge-sharing events, where virtual meetings can be organized for teachers to learn how to use the different digital tools for lesson delivery such as tutorials on screen-casting, podcasting, video conferencing and E-books, among others. For example, Enabel introduced a series of such sessions, via Zoom video conferencing for teacher colleges and the numbers of participating teachers grew from 82 to 160 over a period of 2 months (Atuhura, 2021). The Covid-19 crisis reinvigorates the positioning of curriculum as an essential driver for social and educational inclusion as well as to ensure effective learning opportunities for all learners regardless of contexts, circumstances, capacities, affiliations and status (UNESCO, 2020c). The curriculum for CTB needs to be reviewed in the context of the crisis to address issues of inclusion and effective learning, capacities of instructors, affiliations and status in the primary education in Uganda. The pandemic reveals at the same time the strength and weakness of education systems in responding to the immediate threats to learning, while imagining the future and in laying foundations for lifelong learning, for learners to lead their lives and perform competently in the world of work in spite of diverse challenges of the present and future. The current weakness needs to be addressed in regard to provision of relevant competences and skills necessary for livelihood of the graduate of primary education.

### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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