

Contribution of Education Technology to Continuation of Teaching and Learning during CoVID-19 Disruption

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ABSTRACT

Covid-19 pandemic brought about unprecedented challenge to in person learning in secondary schools all over the world. This disruption affected between 1.2 -1.5 billion learners. To ensure that access to secondary education continued, learning in secondary schools transited to e-learning. It was realized that continuing to deny learners opportunity to continue with their education would be catastrophic. It would lead to dropouts and other undesirable outputs. In this desktop study, the researchers sought to consolidate from various literature published in order to find out how education technology contributed to teaching and learning in secondary schools in developed and developing countries. Literature shows that immediately world health organization declared Covid-19 as pandemic, developed countries such as United Kingdom switched their learning systems from in person to digital. Literature also shows that during the period, there was very high demand for e-learning platforms in developing countries such as Bangladesh. Most of the developing countries did not possess a ready e- learning system to cater for majority of learners in secondary schools and therefore were not prepared for this disruption. After preparations they adopted e-learning through platforms such as radio and television. Literature highlights that during the adoption of e-learning systems in both developing and developed countries several challenges were experienced such as lack of infrastructure. The study recommended that developing countries should put in place e-learning systems in secondary schools to be used alongside in person learning so that whenever there is a challenge like what was and is being witnessed during Covid 19 disruption they can quickly switch to e-learning.

Keywords: *education technology, digital education, e-learning and covid-19, online learning, disruption*

1.0 Introduction

Emergence of Covid-19 in early 2021 contributed to massive disruption of face to face teaching and learning in secondary schools all over the world (UNESCO, 2020). In person learning could not go on as it was suspended to control the spread of the corona virus which was killing people in their thousands especially in countries like Italy (World Health

Organization, 2020). This disruption affected between 1.2-1.5 billion learners all over the World.

Because of significance of secondary education to socio economic development of various countries, education authorities in most countries sought for a way out of the quagmire. Majority of the countries in the world have invested heavily in secondary education due to its importance and allowing teaching and learning to cease until the disease is eradicated could result in unprecedented losses. Therefore there was need to have secondary education continue through some other reliable system (Cathy and Lalani, 2020).

There was need for a rapid education response and therefore there was a need to quickly switch to educational technology or provide remote learning, distance learning, online learning to help solve the problem brought about by COVID-19. According to Mwila and Mhagama (2020) education technology exists to help solve educational problems. COVID-19 disruption of teaching and learning was therefore a problem which educational technology could be used to solve so that teaching and learning in secondary schools could continue could continue albeit remotely. Without some intervention the future of these learners would be destroyed. Through education technology, teachers could continue to facilitate learning through various channels such as radio, television, social media such as face book, WhatsApp, and twitter among others. These channels would allow teachers to interact with learners who had now shifted to their homes (Starkey et. al., 2021).

Munoz-Najar (2021) explains that World Education Technology an organization working under United Nations worked with ministries of education in member countries to provide technological assistance to countries so that they could roll out virtual learning. It is not the first time educational institutions were using educational technology to facilitate school activities. Educational technology which is defined as application of scientific processes in solving educational problems has been in existence for many years. It involves application of various media such as broadcast technology to solve education problems. At this juncture it is worthy to note that the use of educational technology in solving education problems had not been taken so passionately until this pandemic emerged. This shows that education technology can be very beneficial during normal and during crisis.

According to Zhang and Aikman (2007) information and technology which are the main enablers of education technology have been developing very quickly in recent years and have opened new directions in the area of education. The authors emphasize that education has to

go with technological change to cope with the current world changes. Education has not been left behind it too has been impacted with information and communication technology.

The current study which is a desktop study seeks to find answers from literature on what role educational technology played during Covid-19 disruption. Specifically the study seeks to find answers to questions such as how educational technology was deployed to support teachers roles, how education technology was used to support learning and identify any challenges which were experienced. Lessons drawn from the study in form of recommendations should help educational actors to make educational technology more effective in future.

2. Contribution of Education Technology to Teaching and Learning

The following section discusses ways in which education technology supported teaching and learning in secondary schools during Covid-19 pandemic. Onyango and Tangi (2020) indicate that the major role of a teacher is to facilitate learning. This is a process which is facilitated through effective communication which traditionally involves face to face interaction. Emergence of covid-19 which resulted in secondary schools being closed could not allow this face to face interaction to go on. So how was educational technology used to support teaching and learning during the closure of secondary schools?

There was partial and complete closure of schools, this led to the rise of e- learning. This means that schools shifted to online platform. Cathy and Lalani (2020) indicates that in countries such as South Korea, China, Singapore, USA, UK, France and Denmark secondary schools were closed immediately in March, 2020. Learning in secondary schools in these countries immediately shifted to online platform. Cathy and learning observes that prior to COVID-19 outbreak, most of the developed countries had invested heavily in educational technology. It is estimated that the investment in educational technology was worth \$18.66 billion by 2019.

It is further observed that during the onset of covid-19, demand in e-learning was massive until the suppliers could not match the demand. In countries such as India, there was a huge demand for education technology. Learners requiring the platform to continue with their learning were so huge. In China about 250000 students were initially involved. In China online learning platforms such as Ten cent were extensively used to deliver learning materials to both teachers and students. In Singapore Lark, an online learning platform which is a collaborative suite began offering teachers and students unlimited video conferencing time and auto translation. Ding talk an online learning platform also supported large scale learning. It

tapped into Alibaba cloud technology to deploy more than 100000 new cloud servers in just a short period to support online learning in China. This was rapidly expands within a short period to meet the demand (Munoz-Najar, 2021).

In USA secondary education is decentralized. In order to roll out online learning, the school districts formed partnerships in order to benefit from economies of scale. These partnerships were unique. In districts such as Los Angeles, various school districts came together and agreed on how they would use educational technology to continue with teaching and learning in their districts (Cathy and Lalani, 2020).

Similarly, Prestridge and Cervera (2021) explains further how technology supported teaching and learning by arguing that that through educational technology teachers were able to teach at a distance. Educational technology enabled a synchronous and synchronous communication with classes and groups of learners. It also enabled teachers to access to learning materials and interactive collaborative materials.

This shows that education technology was able to play its role effectively by allowing students to participate in learning. It allowed teachers to engage learners in productive learning process. Education technology is supposed to connect teachers to learners if used remotely. This connection enables teachers to communicate with learners this allows interaction and hence learning. In some countries through technology learners collaborated. Learners also learnt to use digital equipment such as smart phones. They were able to use applications such as WhatsApp and Twitter to form their own study groups. This is good for their future as some of the competencies gained during this period could be used in future to establish small scale enterprises. This happened in countries such as Kazakhstan and others which deployed educational technology. In Kazakhstan, secondary school teachers were required to prepare content and disseminate it online. Media such as TV and social media solutions were used. Some countries which had partial closures used a blended program which involved face to face learning and some technology (Munoz-Najar, 2021).

It is also significant to note that during the crisis, some governments enhanced their support for teachers. In Nigeria, the government introduced coaching program for teachers. This enabled the teachers to support each other through collaborations and partnerships. In Estonia hotlines were established to support teachers who needed support. This was done through information technology foundation for education they were able to solve all problems related to use of technology in teaching (Baron et al., 2021).

Countries in Africa were also affected by COVID-19 disruption. After a call by UNESCO for African countries to ensure that learning in secondary schools was not disrupted by Covid-19 outbreak, Ministry of Education in Tanzania launched e-learning platform. This was done through media such as radio and Television. Programs were distributed to various public and private media in the country. This was done so as reach as many students as possible who were scattered all over the country. These programs were prepared by Tanzania Institute of Education (TIE). Speaking about the lessons a student in Tanzania had this to say: ` we have normal lessons from 7.45am to 2.00pm and have a break at 1.00am and 12 pm. All of this is done through online learning`. The programs involved all the subjects which are offered in secondary education curriculum. Some private schools in Tanzania developed their own programs and used the same support teaching and learning in their schools during the covid-19 disruption (UNESCO, 2020).

In Kenya, Kenya Institute of education also developed programs which were aired over radio and television. Parents were encouraged to ensure their children participated in this program especially those students were due to sit for their final examinations. Private schools in Kenya also tapped into educational technology and used it to continue learning. This enabled the schools to complete the syllabus on time. Some of the private schools which used technology expect do well in forth coming national examinations as compared to their colleagues who never deployed this innovation (Njenga, 2020).

3.0 Challenges Experienced

This section discusses challenges which were experienced. The first challenge which was experience is availability of infrastructure to support use of education technology. Schools that required computers to support the technology did not have adequate computers some even lacked a single computer to help them participate in the program. In some countries internet availability was a problem especially in rural areas and therefore learners in this areas could not fully participate in on line learning. In some areas where there was internet the signal was so weak and therefore very slow. This made it hard for teachers and students to participate. High cost of acquisition and maintenance of ICT equipment such TV screens, Ipads was a barrier that constrained adoption of education technology during COVID-19 education crisis. Another problem was lack of stable electricity in some areas during the period, irregular power supply made the situation dire (Baron et al., 2021).

Readiness was another problem. Transition from in person learning to virtual learning was a night mare in some countries. In fact it was a shock to many teachers and learners. This was experienced in many ways for example in some countries teachers lacked ICT skills, others could not produce content to be aired and some could not operate the equipment used due to technological illiteracy while on the other hand there was no adequate time to procure ICT devices for effective use of technology during the crisis. This made it the situation difficult for teachers and learners (Ngwacho, 2021; Njenga, 2020).

4.0 Conclusion

This section presents information about the conclusion of the study. The study sought to find out from literature on how education technology contributed to teaching and learning during COVID 19-Pandemic. Literature shows that education technology contributed to continuation of teaching and learning in secondary schools as it enabled the teachers to access their secondary school students through various channels such as tv, radio among others. This enabled the teachers to engage learners through online chats, live discussions. Teachers were able to give assignments through these channels and even mark the assignments and give feedback. Demand for e learning resources increased rapidly this is good for the future of teaching and learning in secondary schools.

In some countries the crisis led to enhanced partnerships between school districts in USA in building teacher capacity this is good for the teaching profession. The crisis enabled teachers and students to learn to use ICT resources such as phones in learning this has contributed to adoption of ICT in self-learning. This has made majority of the learners to be independent and learn on their own. In a long run, it will reduce overdependence on teachers by secondary school students all over the world if it is effectively blended (Baron et al., 2021).

Availability infrastructure is a major factor which also affected the utilization of education technology during COVID 19 crisis. This is to say that with the absence of software and hardware teachers and learners could not take part effectively in online teaching and learning. The study shows that there was a digital inequality between developing and developed countries. Schools in developed countries switched immediately while those ones in developing countries could not due to numerous challenges related to infrastructure.

5.0 Recommendations

Based on the conclusions, this study recommends that there is need to gradually grow infrastructure that supports education technology such as internet connectivity, electricity, acquisition of necessary hardware and software. Governments in developing countries need to acquire hard ware and software to support education technology. There is need to invest more in technology especially in improving teacher effectiveness. There is need to equip teachers with necessary skills so that they can comfortably use technology. This will enable teachers to access right materials and come up with innovative ways of engaging learners during the use of educational technology, for example, during live discussions. There is need for countries to join initiatives such as technology for teaching this will benefit their teachers. COVID-19 crisis in education called for full adoption of education technology in secondary schools, this could not work effectively due to some of the challenges mentioned above. Most of the programs were more centralized; Tanzania and Kenya are good examples. The radio and TV programs aired by some local radio and TV channels followed a certain schedule. Teachers and learners had to learn how to divide their time. There is need to decentralize these programs so that flexibility can be achieved. There is need to adopt blended teaching and learning where face to face teaching is used alongside technology and this would prepare schools for other crises such as COVID -19. There is need for researchers in educational technology to come up with systems which will incorporate instructional design principles and principles of teaching such as respect for diverse talents rather than treating learners uniformly.

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