

## **APPLICATION OF ICT TOOLS IN VIRTUAL LEARNING AMIDST COVID-19 PANDEMIC: ITS CHALLENGES AND PROSPECTS**

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### ***Abstract***

*Information and communication technologies (ICT) had proven inevitable in all aspects of life. The use of ICT in this pandemic period has fundamentally changed the practices and procedures of nearly all forms of endeavour within education, business and governance etc. The use of Information and Communication Technology (ICT) tools in Virtual Learning in response to Covid-19 pandemic has no doubt come to play a major role in the New Normal and the use of ICT has continued to grow in Nigeria in recent time. Information and Communication Technology despite its numerous advantages in education has its downsides. This paper therefore examines the strength and weakness of the application of ICT tools in educational sector via virtual learning in Nigeria. The authors reviewed relevant literature that critically examined ICT to virtual learning in the realm of making life meaningful again for the majority of the people particularly the students. The findings shows that ICT is very essentials in achieving the goal of learning in Nigeria amidst Covid-19 pandemic. However, as important as ICT is in achieving the set objectives of virtual learning, challenges cannot be ruled out in terms of Resistance to change from traditional pedagogical methods to more innovative, technology-based teaching and learning methods, by both students and teachers; worst still, students from under-served low income communities will be left out and unable to access learning during this period. The researcher therefore recommends among others, greater adoption and use of ICT in virtual learning and full participation among students and teachers. The paper concludes that for ICT to serve as a tool for enhancing educational sector via virtual learning in Nigeria, the following should be taken into consideration: the government should make available free internet facilities in every part of the country, provision of computers and android phones to staff and students for effective learning and teaching.*

**Key words:** Information and Communication Technology, Virtual Learning

## **Introduction**

Information and Communication Technology (ICT) has revolutionized the global society as well as transformed countries and technological systems. It has made significant impact in Education, government, business and the world at large with its applications. It has changed the way societies work, do business, learn, train and entertain. It is imperative to understand and underline the major roles played by Information Technology (IT) in driving and shaping societies today and in determining its future. ICT is one of the modern science and technology which has brought tremendous changes in education. Application of information and communication technology (ICT) in Virtual Learning has revolutionized the traditional concept of teaching from a class room to an intellectual information center connoting the concept of an e-learning.

According to (UNESCO 2002 as cited in UI-Amin, 2013), information and communication technology (ICT) may be regarded as the combination of ‘Informatics technology’ with other related technology, specifically communication technology. The various kinds of ICT products available and having relevance to education, such as virtual learning, teleconferencing, email, audio conferencing, television lessons, radio broadcasts, interactive radio counselling, interactive voice response system, etc. have been used in education for different purposes. The field of education has been affected by ICTs, which have undoubtedly affected teaching, and learning in this Covid-19 pandemic. ICTs have the potential to innovate, accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Al-Ansari, 2006).

ICT has greatly impacted and enhanced global socialization and interactions. In fact information technology has taken over nearly every aspect of our daily lives from commerce (buying and selling) to leisure and even culture. Today, mobile phones, desktop computers, hand held devices, emails and the use of Internet has become a central part of our culture and society. These technologies play a vital role in our day to day operations (Oji-Okoro, 2006 as cited in Arugu & Chigozie, 2016)

ICT could also be described as a range of equipment (hardware: personal computers, scanners and digital cameras) and computer programs (software: database programs & multimedia programs), & the telecommunications infrastructures (phones, faxes, modems, video conferencing equipment and web cameras) that allow us to access, retrieve, store, organize, manipulate, present, send material and communicate locally, nationally & globally through digital media (Dunmill & Arslanagic 2006 as cited in Lakshmikant & Jyoti , 2014).

ICT can be applied practically in almost every area of our lives; they shape our private lives and our work. The place of ICT tools in virtual learning amidst covid-19 cannot be over stressed as well as it's significant in ensuring an effective learning. However, its applications are not without challenges. The objective of this paper is to examine the application of ICT tools in virtual learning amidst covid-19 pandemic: its challenges and prospects.

## **HISTORICAL OVERVIEW OF CORONAVIRUS (COVID-19)**

On 31 December 2019, the World Health Organization (WHO) was formally notified about a cluster of cases of pneumonia in Wuhan City, home to 11 million people and the cultural and

economic hub of central China. By 5 January, 59 cases were known and none had been fatal. Ten days later, WHO was aware of 282 confirmed cases, of which four were in Japan, South Korea and Thailand. There had been six deaths in Wuhan, 51 people were severely ill and 12 were in a critical condition. The virus responsible was isolated on 7 January and its genome shared on 12 January. The cause of the severe acute respiratory syndrome that became known as COVID-19 was a novel coronavirus, SARS-CoV-2. The rest is history, albeit history that is constantly being rewritten: as of 03 July 2020, 10 845 275 cases of COVID-19 (in accordance with the applied case definitions and testing strategies in the affected countries) have been reported, including 521 113 deaths. (Chaplin, 2020)

The COVID-19 pandemic in Nigeria is part of the worldwide pandemic of coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first confirmed case in Nigeria was announced on 27 February 2020, when an Italian citizen in Lagos tested positive for the virus. On 9 March 2020, a second case of the virus was reported in Ewekoro, Ogun State, and a Nigerian citizen who had contact with the Italian citizen. On 28 January, the Federal government of Nigeria assured citizens of the country of its readiness to strengthen surveillance at five international airports in the country to prevent the spread of coronavirus. The government announced the airports as Enugu, Lagos, Rivers, Kano and the FCT. The Nigeria Centre for Disease Control also announced same day that they had already set up coronavirus group and was ready to activate its incident system if any case emerged in Nigeria.<sup>[7]</sup>

On 31 January, following the developments of COVID-19 pandemic in mainland China and other countries worldwide, the federal government of Nigeria set up a Coronavirus Preparedness Group to mitigate the impact of the virus if it eventually spreads to the country. On the same day, the World Health Organization listed Nigeria among other 13 African countries identified as high-risk for the spread of the virus. On 26 February, a Chinese citizen presented himself to the Lagos State government on suspicion of being infected with coronavirus. He was admitted at Reddington Hospital and was released the following day after testing negative. On 27 February, Nigeria confirmed its first case in Lagos State, an Italian citizen who works in Nigeria had returned on 25 February from Milan, Italy through the Murtala Muhammed International Airport, fell ill on 26 February and was transferred to Lagos State biosecurity facilities for isolation and testing ([www.wikipedia.org](http://www.wikipedia.org))

## **Conceptual Clarification**

### **Information and Communication Technology (ICT)**

ICT as seen by different scholars is a term that encompasses several activities involving the acquisition, storage, processing and dissemination of information through the use of appropriate software and hardware designed facilities for that purpose. ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computer and network hardware and software, satellite systems and so on, as well as the various services and applications associated with them, such as videoconferencing and distance learning (Arugu & Chigozie, 2016).

ICT refers to all the technology used to handle telecommunications, broadcast media, intelligent building management systems, audiovisual processing and transmission systems, and network-based control and monitoring functions. Although ICT is often considered an extended synonym for information technology (IT), its scope is broader. Information technology (IT) is the use of computers to store, retrieve, transmit, and manipulate data, or information, often in the context of a business or other enterprise. IT system is generally an information system, a communications system or, more specifically speaking, a computer system – including all hardware, software and peripheral equipment – operated by a limited group of users. The term is commonly used as a synonym for computers and computer networks, but it also encompasses other information distribution technologies such as television and telephones. IT is considered to be a subset of information and communications technology (ICT). ICT encompasses both the internet-enabled sphere as well as the mobile one powered by wireless networks.

ICT incorporates electronic technologies and techniques used to manage information and knowledge, including information-handling tools used to produce, store, and process, distribute and exchange information (Joshi & Meza, 2013). ICT is an extensional term for information technology (IT) that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals) and computers, as well as necessary enterprise software, middleware, storage and audiovisual systems that enable users to access, store, transmit and manipulate information. The term ICT is also used to refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system (Nureni, 2014).

According to (Ratheeswari, 2018), ICT refers to the computer and internet connections used to handle and communicate information for learning purpose. It is the technologies that provide access to information through telecommunication.

## **Virtual Learning**

Virtual learning is a system of delivering learning materials to students via the web or recorded audio and video lectures. This system includes assessment, students direct participation, student tracking, collaboration and communication tools. Virtual learning environment allows participants to learn or acquire knowledge in a collaborative, co-operative learning activities and interactions. Virtual learning environment includes a course syllabus, pre-requisites registration, skilful mentor or instructor, and distant learning applications (Fu, 2013 as cited in Monisha & Ananta 2017). This normally includes materials such as copies of lectures in the form of text, audio/video presentations and the supporting visual presentations. (Gurol, Kayisli & Basal, 2010). Virtual classroom includes different types of communication system, multi-dimensional communication process, threaded discussions, chat – rooms, twitter, Skype, wikis, blogs, 3D visual learning spaces in reading. Such type of reading needs collaboration and co-operation of students to share the information among each other.

Virtual learning is a learning experience that is enhanced through utilizing computers and the internet both outside and inside the facilities of the educational organization. The instruction most commonly takes place in an online environment. The teaching activities are carried out online whereby the teacher and learners are physically separated (in terms of place, time, or both). Virtual learning could also be referred as Distance learning conducted in a virtual learning environment with electronic study content designed for self-paced (asynchronous) or live web-

conferencing (synchronous) online teaching and tutoring. Specifically, virtual learning uses computer software, the Internet or both to deliver instruction to students. This minimizes or eliminates the need for teachers and students to share a classroom. (Racheva, 2017)

### **Virtual Learning comes in several forms:**

Virtual learning has many forms and related terms. These seem very similar but represent different aspects of learning and teaching and can help us understand the essence of “virtual learning.” Here are the most commonly used ones:

*Computer-Based:* Instruction is not provided by a teacher; instead, instruction is provided by software installed on a local computer or server. This software can frequently customize the material to suit the specific needs of each student.

*Internet-Based:* This is similar to computer-based instruction, but in this case, the software that provides the instruction is delivered through the Web and stored on a remote server.

*Remote Teacher Online:* Instruction is provided by a teacher, but that teacher is not physically present with the student. Instead, the teacher interacts with the student via the Internet, through such media as online video, online forums, e-mail and instant messaging.

*Blended Learning:* This combines traditional face-to-face instruction, directed by a teacher, with computer-based, Internet-based or remote teacher online instruction. In effect, instruction comes from two sources: a traditional classroom teacher, and at least one of the forms of virtual learning described above. This type of learning combines virtual and traditional forms of teaching. The learning content should be digitalized and made available online. Thus, learners are able to control the learning process in terms of time, place, tempo, and method of learning

*Facilitated Virtual Learning:* This is computer-based, Internet-based or remote teacher online instruction that is supplemented by a human “facilitator.” This facilitator does not direct the student’s instruction, but rather assists the student’s learning process by providing tutoring or additional supervision. The facilitator may be present with the learner or communicating remotely via the Web or other forms of electronic communication.

Similar forms of virtual learning are sometimes grouped into broader categories:

*Online Learning:* This is any form of instruction that takes place over the Internet. It includes Internet-based instruction; remote teacher online instruction; and blended learning and facilitated virtual learning that involves these two virtual learning methods. It excludes computer-based learning.

*Full-Time Online:* This is online learning with no regular face-to-face instruction or facilitation. It is Internet-based and remote teacher online learning only, though it may include some occasional interaction with human teachers and facilitators (Beek, 2011).

### **Coronaviruses (COVID-19)**

Coronaviruses are a large family of zoonotic viruses that cause illness ranging from the common cold to severe respiratory diseases. Zoonotic means these viruses are able to be transmitted from animals to humans. There are several coronaviruses known to be circulating in different animal populations that have not yet infected humans. COVID-19 is the most recent to make the jump to human infection. Common signs of COVID-19 infection are similar to the common cold and include respiratory symptoms such as dry cough, fever, shortness of breath, and breathing difficulties. In more severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure, and death. The COVID-19 infection is spread from one person to others via droplets produced from the respiratory system of infected people, often during coughing or sneezing. According to current data, time from exposure to onset of symptoms is usually between two and 14 days, with an average of five days (McLeod, 2020).

### **Theoretical Framework**

The quality of online education depends on the proper use of digital technologies in accordance with modern educational theories on that, this study is anchored on behaviorism and social constructivism theory.

*Behaviorism Theory:* Behaviorism examines how students behave while learning. It focuses on how learners respond to certain stimuli. When the teacher repeats the stimuli, they can observe, control, and modify the learner's individual behavior. Learners do what they are instructed to do and are only prepared to reproduce basic facts and automatically perform tasks. Behaviorism does not examine the mind or cognitive processes. In virtual learning behaviorism can be applied through step-by-step video tutorials, game-based activities, regular and constructive feedback, quizzes, etc.

*Social Constructivism:* Teaching and learning are explained as complex interactive social phenomena that take place between teachers and students. Learning activities focus on experience sharing, teamwork, and collaborative learning. Social constructivism finds perfect application in group discussions, brainstorming, problem-based learning, and small group activities. A great environment for these types of activities is the virtual classroom for live online teaching with interactive tools like collaborative web-conferencing, an online whiteboard, breakout rooms, screen sharing, etc. (Racheva, 2017)

### **ICT AND VIRTUAL LEARNING**

In recent days; educators, scholars, students are mostly using internet as the ICT assisted learning tools. Personal computers and the Internet have revolutionized the entire society. Today, we are living in knowledge based global world where there is a rapid advancement of science and technology (Almekhlafi, 2006). Recently, Facebook, Twitter, YouTube, Skype or technology used for distance learning within at minimum time and at maximum lowest cost and other online communications media have allowed billions of people around the world to share ideas in a matter of seconds, mostly at a very low cost. These advances in computer technology are as remarkable as they are familiar. But most people are not aware of how computers and Internet technology are transforming the way students learn. This emerging education paradigm is often called "virtual learning, and it has the potential to improve student achievement, educational access and schools' cost-effectiveness. Specifically, virtual learning using computer software, the

Internet or both to deliver instruction to students. This minimizes or eliminates the need for teachers and students to share a classroom. These virtual learning processes are operating through ICT for making learning meaningful and high retention(Beek, 2011).

The field of education has been affected by ICTs, which have undoubtedly affected teaching, learning and research (Yusuf, 2005). ICTs have the potential to accelerate, enrich, and deepen skills, to motivate and engage students, to help relate school experience to work practices, create economic viability for tomorrow's workers, as well as strengthening teaching and helping schools change (Davis and Tearle, 1999 as cited by Yusuf, 2005). In a rapidly changing world, basic education is essential for an individual to be able to access and apply information. The use of ICT in educational settings, by itself acts as a catalyst for change in this domain. ICTs by their very nature are tools that encourage and support independent learning. Students using ICTs for learning purposes become immersed in the process of learning and as many students use computers as information sources and cognitive tools (Reeves & Jonassen, 1996), the influence of the technology on supporting how students learn will continue to increase.

## **CHALLENGES OF ICT APPLICATION IN VIRTUAL LEARNING**

In the wake of the pandemic, schools around the world have had to face the almost immediate rise of the fully virtual classroom. This sudden arrival has not only amplified existing digital challenges, but presented a host of new challenges to school management, educators, parents and students alike. Below are some of the challenges:

*Cost of Data:*To be able to participate in online learning and teaching, both the students and their teachers will need to subscribe to a data plan which is very expensive. If the classes require that video and audio files to be used, it then means that a lot of money will be spent during the period depending on the duration as well.

*Access to Computer:* This is another great challenge, some students don't have a computer of their own. When it comes to virtual learning, this is the first thing to be considered. When a student or teacher don't have access to the computer, how then can they go online? Even the option of mobile phones may not work here because some don't have android phones.

*Unstable Power Supply:* To be able to connect to the internet, you will also need a powered computer or a charged phone and every Nigerian knows the challenges being faced with Power Holding Company of Nigeria (formerly NEPA) you can imagine buying a computer or phone and then running generator on top of everything. The thought of this alone is enough to be discouraged or shut down the plan of engaging in any virtual learning or teaching.

*Poor Economy:*Poverty is another monster that have found fertile soils in Nigeria. Coming to virtual teaching and learning, students from poor homes may not be able to attend these classes. It will also be hard for them to obtain the logistics needed for the classes. So if the government gives a go ahead order for virtual learning for schools then, students from these social-economic classes will lose out. Most students may not benefit from this technology because students from struggling families can hardly afford simple devices and may likely not have the internet at home.

*Lack of Technical Know-How:* Some students and teachers are also not computer literate. Even if these people know how to boot and shut down a computer, how many of them know how to navigate through the learning platform to be able to access the internet? The saying that practice makes perfect is not out of place but this is something that may require some training before it kicks off. They must be able to use a variety of search engines and be comfortable navigating on the internet.

*Lack of Interest:* As the saying goes, you can take a horse to the stream but you can't force it to drink water. There are certain things about traditional face-to-face classrooms that virtual ones don't have. For instance, companionship, friendship and team spirit which these students have built over the years as classmates in traditional face-to-face classrooms cannot be found in virtual ones. The Truth is that most at times, these students go to school because it provides them with the opportunity to meet and relate with their friends. This opportunity is lacking in virtual learning. The result here is that these students easily get bored with virtual learning when they face their computers. (Okey-Kalu, 2020).

*Students struggling with isolation:* Students need social interaction with their peers and virtual learning means that many may feel isolated at home and cut off from their friends.

*Not Being Able to Read Non-Verbal Cues:* Virtual classrooms for instance, are the closest to physical classrooms in the digital world. However, they are not yet a perfect replacement. When teaching in traditional face-to-face class, teachers can see learners' faces, notice non-verbal cues and gauge their level of engagement in real time. Then, they can make adjustments to the way (and the pace at which) they deliver the lecture in order to make sure they are getting through to a large majority, if not *all*, of the learners taking the class. In a virtual classroom, teachers cannot see the learners. While some will always participate more than others, you cannot observe non-verbal cues. The teachers cannot tell whether the lack of participation by a learner is due to their being introverted, being highly focused on observing rather than participating or not being engaged properly.

*Distracted Learners:* It can be challenging to keep students engaged and focused in a physical classroom and this is equally the same in the virtual setting in the case of using zoom. Many students learning in virtual classrooms do so from home. While it sounds like a great option, these students are most times in their pyjamas, have a hot cup of coffee next to them and study from the comfort of their living room it does require a great deal of self-discipline. Some of our lecturers have shared stories about how learners sometimes take personal calls during the class, go to the kitchen to grab a bite while the lecture is in full swing and so on (Sattar, 2018).

*Academics and students resistance from traditional to technological era:* Resistance to change from traditional pedagogical methods to more innovative, technology-based teaching and learning methods, by both students and academics. Sometimes, the resistance is so strong and they only start this process when they are forced to do so. Unfortunately, today there are some teachers who don't know how to access an email neither how to take advantage of the internet to improve research

*Accessibility to Technology:* Before any online program can succeed, it must have students who are able to access the online learning environment. Lack of access whether for economical or



logistics reasons will exclude otherwise eligible students from the course. This is a significant issue in rural and lower socio-economic neighborhoods. Furthermore, if students cannot afford the technology the institution employs, they are lost as customers. This is a limitation of online programs that rely on Internet access.

*Limitations of Technology:* User friendly and reliable technology is critical to a successful online program. However, even the most sophisticated technology is not 100% reliable. For example, the server which hosts the program could crash and cut all participants off from the class; a networked computer could go down; individual PCs can have numerous problems which could limit students' access; finally, the Internet connection could fail, or the institution hosting the connection could become bogged down with users and either slow down, or fail all together. In situations like these, the technology is neither seamless nor reliable and it can detract from the learning experience.

*Lack of Essential Online Qualities:* If facilitators are not properly trained in online delivery and methodologies, the success of the virtual learning will be compromised. An instructor must be able to communicate well in writing and in the language in which the course is offered. Learning will be weakened if its facilitators are not adequately prepared to function in the Virtual Classroom. An online instructor must be able to compensate for lack of physical presence by creating a supportive environment in the Virtual Classroom where all students feel comfortable participating and especially where students know that their instructor is accessible. Failure to do this can alienate the class both from each other and from the instructor. (Wei, 2020)

*Online learning is open to manipulation:* Where students are being tested, the tendency to cheat is always there unlike the traditional face-to-face method that the students can be monitored or supervised.

### **Empirical evidence of problems militating against the use of ICT in Virtual Learning**

A study conducted by (Yun and Opheim 2010 as cited in Arugu & Chigozie, 2016). On the Challenges of Information and Communication Technology Application for national development affirms that, despite its increasing importance, most Nigerian faces the problem of access and applicability of ICT facilities. And among other things are, power blackouts, the high cost of connectivity, and lack of ICTs skills ranked highest, while interconnectivity ranked second, and poor infrastructure, urban-rural digital divide, lack of basic education, obsolete equipment, and high cost of equipment were also mentioned. See the table below,

Table 1: Problems militating against the use of ICT facilities

Problems of ICT facilities	Frequency	Percentage
Frequency power blackout	102	83.83%
High cost of connectivity	102	83.83%
Lack of ICT Skills	102	83.83%
Poor telecommunication infrastructure	98	81.67%
Obsolete equipment	74	61.67%
High cost of equipment	55	45.83%
Lack of basic education	75	62.50%
Urban rural digital divide	96	80%
Interconnectivity problem	100	83.33%

Source: Arugu and Chigozie 2016

## Strengths of Virtual Learning

The Virtual Learning is an e-learning concept whose definition and prime objective is to enable the educators and the students to impart and perceive education online, principally over the Internet. It allows both to communicate, interact and work together with one another remotely from any location, without actually being physically present face-to-face, via webinars, audio and video conferences, web presentations, live streaming, text chats, Learning Management System (LMS) and online training courses.

This according (Racheva, 2017), students can learn at their own time and phase. It allows for Long distance learning. It enhances collaboration and communication, it allows real-time teaching and learning. It gives room for effective and efficient time management. It gives students and teacher a worldwide exposure. Accessed to everyone equally from anywhere and at any time. It gives room for synergy and allows a dynamic interaction between the lecturers and students and among the students themselves. It introduces students and educators to education technology. It allows for level playing field as no discriminating factors such as age, dress, physical appearance, disabilities, race and gender are largely absent. Instead, the focus of attention is clearly on the content of the discussion and the individual's ability to respond and contribute thoughtfully and intelligently to the material at hand.

## PROSPECTS OF VIRTUAL LEARNING

- It has the potential to transform the way we teach and learn across the globe. It can raise standards, and widen participation in lifelong learning.
- E-learning has the potentials to open up a world of learning unavailable in most corners of the world, while at the same time empowering learners with the information technology awareness and skills crucial to succeed.
- The introduction of virtual learning brings about the integration of information technology in education which will be furthered accelerated while e-learning will eventually become an integral component of school education (Cathy & Farah, 2020).

- Creative and Innovative teaching and learning: - With E-learning, teaching and learning in the New Normal could be more creative and innovative in this 21st century global knowledge society.
- E-learning engage learners with more active learning process, people in group or individual irrespective of their age could take responsibility for what and how they learn, achieving their personal goals as self-directed lifelong learners.
- Global reach - Learners regardless of where they are receive the same message and are able to engage other learners and practitioners globally
- Speed of delivery - Learners benefit from learning when required, learners are able to access the lecture materials at the right time.
- Dynamism - Learners progress at the pace that suits them best, at the time that suits them best while getting the information that they need.
- E-learning achieve better value: - Education leaders, lecturers and teachers could develop innovative ways of deploying their resources, exploiting e-learning alongside with other teaching methods to improve quality and economies of scale (Fredrick, 2015).
- It has come to stay and more applications will continue to emerge.
- An opportunity to collaborate with classmates and teachers from around the world.
- E-learning offer flexibility: - A more responsive education system would adapt to the needs of all learners, wherever and however they need to learn.
- Collaboration - Learners are able to meet in a virtual space with other members and practitioner experts to discuss issues, answer questions and even participate in simulations without having to leave their home.

## CONCLUSION

Information and Communication Technology (ICT) no doubt is one of the modern science and technology which has brought tremendous changes in education amidst this COVID-19 pandemic. It has also revolutionized the global society as well as transformed countries and technological systems. It has changed the way societies work, do business, learn, train and entertain. The Application of ICT in Virtual Learning has indeed changed the traditional concept of teaching from a class room to an intellectual information center connoting the concept of an e-learning. E-learning has given education a new dimension, taking classroom learning to the next level through the creation of virtual communities of learners and teachers who interact online. The challenge today is to reduce as much as possible the negative impact this pandemic will have on learning and schooling and build on this experience to get back on a path of faster improvement in learning pending when things come back to normal. As education systems cope with this crisis, they must also be thinking of how they can recover stronger, with a renewed sense of responsibility of all actors and with a better understanding and sense of urgency of the need to close the gap in ensuring that all students have the same chances for a quality education.

## RECOMMENDATION

Based on the challenges of ICT application in virtual learning as identified above, the study recommends as follows:

- Government should make available for teaching and learning free wifi data in order to ensure the success of e-learning succeeds in Nigeria.
- Government should provide the required tools for virtual learning. These tools include lap top computers, android phones and modem for students and teachers alike. In situations where government cannot provide for the teachers, soft loans should be made available for them to access and acquire the required tools.
- The government should improve on the power supply situation in Nigeria. Because power is a critical factor in virtual learning.
- Government improve on the economic situation in the country by creating employment, improve on infrastructures and create enabling environment for small businesses to thrive in the country, thereby reducing the rate of poverty.
- Teachers and students need to be trained on the use of the various tools and processes of virtual learning. Many teachers are not ICT compliant. The same goes for students. Training will therefore bridge this obvious gap.
- Teachers should avoid the virtual learning from being boring, create a friendly environment while teaching to bring back the students to feel as if they were in the traditional face-to-face classrooms and that will arose their interest in the case of using zoom.
- The teachers should encourage the learners to participate and open up clear lines of communication, so if someone has a question, he or she will be free to ask.
- The teachers must ensure they provide quality online delivery. The teacher must be able to communicate well in writing and in the language in which the course is offered. Learning will be weakened if the teachers are not adequately prepared to function in the virtual learning.

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