

**AVAILABILITY AND UTILIZATION OF INFORMATION AND  
COMMUNICATION TECHNOLOGY FACILITIES IN  
MANAGEMENT OF ONLINE TEACHING AND LEARNING IN  
PUBLIC SENIOR SECONDARY SCHOOLS IN POST COVID-19  
ERA IN FEDERAL CAPITAL TERRITORY, ABUJA, NIGERIA**

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**Abstract**

*Information and Communication Technology (ICT) has become an enabler operation in many sectors of the economy in spite of the COVID -19 pandemic, which ravaged the world. Consequently, this resulted in the lockdown that necessitated the closure of institutions of learning; students and teachers were kept away from physical classroom interactions until online teaching and learning was brought in. This study investigated availability of ICT facilities and teachers' skills in the utilization of ICT facilities for online teaching. A Descriptive survey research design was employed with a sample of 351 respondents drawn from 4050 teachers in the 20 randomly sampled schools from the 58 public senior secondary schools in the FCT. The instrument titled 'Checklist and Teachers' Skills of ICT for Online Teaching in Senior Secondary Questionnaire (CT-SIOTSSQ)' was used for data collection. It had two sections; 'A' had checklist of ICT facilities and devices and 'B' had close-ended structured questionnaire on teachers' skills for the utilization of ICT. A simple percentage and the mean scores were used to analyze the data. The findings showed that ICT facilities are not adequately available and teachers do not have required skills for the utilization of ICT facilities for online teaching and learning in public secondary schools in the post COVID-19 in the FCT Abuja. The study concluded that online teaching in secondary schools would remain a challenge in the FCT in the post COVID-19 era. It was recommended that the Federal Capital Territory Administration (FCTA) through FCT Education Secretariate should declare a state of emergency in providing ICT facilities in public secondary schools and strengthen teachers' capacity in the utilization of the ICT facilities and devices for online teaching and learning in the post COVID-19 era.*

**Keywords:** *Information and Communication Technologies, Online teaching and learning, Post COVID -19.*

### **Introduction**

The sudden interruption of teaching and learning as well as other educational activities arising from the outbreak of corona virus in Wuhan City, China in December, 2019 and its spread to different countries of the world (Nigeria inclusive) resulted in global lockdown. The lockdown affected every aspect of the economy especially, the educational sector; as schools at all levels were totally shut down, teaching and learning were halted, students who were supposed to graduate could not and students who were supposed to gain admission at different levels of education were affected, among others. Though, some schools that had Information and Communication Technology (ICT) facilities were able to sustain teaching and learning during the lockdown, thereby imparting knowledge, skills and information to the students. Several schools, especially in underdeveloped and developing countries did not find it easy. According to UNICEF (United Nation, 2020) an estimated 40 per cent of the poorest countries failed to support learners at risk during the COVID-19 crisis. This situation may not be unconnected with the availability of ICT facilities in the developing countries which left many learners, especially the youngest and minority groups without digital skills to support online teaching and learning.

corroborated this assertion by admitting that while developed countries are able to carry out teaching and learning beyond the four walls of the classrooms during COVID-19 period, teaching and learning were halted due to non-availability of ICT facilities in many schools in underdeveloped countries.

Globally, there is a paradigm shift from the traditional methods of teaching and learning to online teaching and learning. Online teaching has catalyzed the pedagogical swing in how to teach and learn. Online teaching became more pronounced in the developing countries during the lockdown occasioned COVID-19. The paradigm shift in education requires huge application of ICT facilities and skills to facilitate the online teaching and learning.

Beyond COVID-19, online teaching and learning has become a necessity. ICT facilities facilitate teaching and learning outside the classroom walls thereby increasing access to education delivery. Xanthoula (2015) observed that the virtual classroom, a synchronous form of e-learning has been embraced by many organizations in their attempt to promote workforce and learning while

trying to cut travel time and costs associated with face-to-face instructor-led training.

Conceptually, ICT refers to a combination of devices and technology resources, which are used to manipulate and convey information (Kaware and Sain, 2019). United Nations Educational, Scientific and Cultural Organization (UNESCO) (2018) defined ICT as information handling tools - a varied set of goods, applications and services that are used to produce, store, process, distribute and exchange information. These information handling tools encompass both old and new ones which include radio, television and telephone (old tools) as well as computers, satellite, wireless technology and the internet. According to Tella (2016), it is a generic term that refers to technologies which are used for collecting, storing, editing and passing on information in various forms. In his view, personal computer is the best-known example of ICT facilities in education. The term multimedia is also frequently used as synonymous with ICT, multimedia in this case could be interpreted as a combination of data carriers, for example video, CDROM, floppy disc and Internet and software in which the possibility for an interactive approach is offered. Information and communication technology has become key tool for teaching and learning and has revolutionaries the impact on educational methodology globally.

Commenting on the need for ICT usage by school principals in the administration of the school system, Okpala (2016) noted that the use of ICT resources in the school system especially its utilization in the classroom teaching and learning reduces verbalization, stimulates self-activity, makes learning attractive and interesting, concretizes basic conceptual thinking, increases ability of retention as well as fosters creative imagination. ICT supports online teaching beyond a physical classroom.

Online teaching and learning are gradually gaining popularity in the developing countries. In the past decade, it has had a major impact on post-secondary education and the trend is on the increase. Online teaching takes place over the Internet, the Internet plays a significant role in the process of teaching and learning. It is often referred to as “e-learning” among other terms. However, online learning is just one type of “distance learning” the umbrella term for any learning that takes place across distance and not in a traditional classroom (Stern, nd).

Online teaching and learning depend highly on the availability of ICT facilities. It however noted that online teaching is technology mediated and digitally empowered learning that utilizes hardware (e.g., PCs, tablets, printer, digital camera, digital videos, scanner, overhead projector; OHP, and OHP screen), software (operating systems, cloud technologies, applications (apps), writing, editing, MS Office) and (CD textbooks that fall in the category of courseware, OERS, e-content) and others (e.g., USB drives, CD-ROM), whether from a distance or face-to-face classroom setting (PC helped learning), to empower teacher to student interactions. These resources drive and make online teaching functional (Eze, Chinedu-Eze & Bello, 2018).

Availability of ICT facilities is fundamental for online teaching. However, Ngwu (2015) observed that most ICT resources are not adequately available in secondary schools in Nigeria; according to Ngwu, this is hampering the effective and full utilization ICT resources for online teaching. Mavellas, Wellington and Furusa (2016) maintained that ICT has become an integral part of education world over but most schools are still lagging behind when it comes to the availability, adequacy and utilization of the facilities for teaching-learning purpose and administrative usage by school administrators. Okoboh (2016) did a study and reported that only 7.7% availability of ICT facilities in our public schools. (Egomo, Enyi & Tah, 2017; Ofodu, 2017; Ajayi, 2018) claimed that the availability of ICT tools in some school for effective school administration is relatively low, except for laptops, multimedia projectors and internet facilities. Chukwu (2019) equally admitted that the non-availability of ICT facilities in sufficient number in Nigerian across levels of educational institutions are limited.

Furthermore, where ICT facilities are available; teachers and students' competence and skills are required to drive online teaching and learning. Aside the manipulative ICT skills required by teachers in online teachers, the facilitator/teachers need to be open, concerned, flexible, and sincere. Therefore, an online teacher is expected to develop the skills to compensate for the lack of physical presence in the virtual classroom by creating a supportive environment where all students feel comfortable and participate. Online instructors should be willing to give individual attention to students who may need extra help. The instructor is to be sensitive, open and flexible; it is mandatory for learners to succeed in the online realm.

Specifically, teachers need basic skills of familiarity with Web browsers and an email programme, Web-based interactions such as email, discussion

boards, listservs, and chat rooms (Stem, nd). Proficiency in typing and word processing are also great assets in the hands of an online instructor. Their abilities and experiences in successful Internet searches, using a variety of search engines are essential. Therefore, the availability of ICT facilities and teachers' skills for the utilization of the facilities for online teaching and learning in the post covid-19 era are critical.

Online activities have taken over businesses in many sectors of the economy in the developing nations. The paradigm shift from physical to online activities in the developed and developing countries have revolutionized a number of industries. In education, online learning is catalyzing a pedagogical shift in how to teach and learn. There is a shift away from top-down teaching pedagogy and passive students to a more interactive, collaborative approach in which students and teachers co-create the learning process. The sudden appearance of COVID-19 which led to closedown of schools as means of curtailing the spread of the disease, has brought to bear the inevitability of creating classes on the web for a non-stop teaching and learning in the event of any emergency in the post COVID-19 era. Online teaching thrives where ICT facilities are available and teachers have the skills for their utilization.

The call for online teaching and learning have become indispensable in Nigeria especially the aftermath of the global COVID -19 pandemic, coupled with the rise in demand for education, partly precipitated by government policies, which has resulted in the increase in enrolment. These and many other issues have exacted pressure on educational facilities that traditional physical, face-to-face approach to teaching may no longer accommodate in the post covid-19 era. The global paradigm shift from relying on the traditional method to the online requires the availability of ICT facilities and teachers' skills to utilize the facilities for online teaching in the Federal Capital Territory (FCT) has brought a number of concerns in the sector.

Firstly, worrisome is the question of the availability of ICT facilities for online teaching and learning. The studies by Okoboh (2016), Egomo, Enyi and Tah (2017) and Chukwu (2019) established that there were near lack or absence of adequate ICT facilities in most public secondary schools in Nigeria that could facilitate online teaching. The situation of the availability of ICT facility in the FCT remains to be verified.

Secondly, and most disturbing is the teachers' over dependance and preference for the traditional physical face-to-face teaching and learning methods in the

FCT secondary schools. This is tempting to conclude that teachers are comfortable with the status-quo, hence there appears to be no quest for the acquisition of ICT prowess to function more effectively and efficiently in online teaching in the face of the global challenge. This is unacceptable in this era of globalization and ever-increasing emergency situations which have continued to threatened human physical operations. This has brought a wake call for digital initiatives where ICT has become a major facilitator in many sectors. This situation has raised concerns among stakeholders that have questioned the capacity of teachers' skill to deploy ICT facilities in the secondary schools for the online teaching in the post COVID -19 era.

Management of online teaching and learning in secondary schools depends much on the availability of ICT and teachers' expertise in the utilization of facilities in the FCT. The problem of this study therefore, is how available are the ICT facilities and where the facilities are available how skillful are the teachers in the utilization of the ICT facilities in online teaching in the public secondary schools in the post COVID -19 era in the FCT?

The objectives of the study are:

1. To find out availability of ICT facilities and devices for online teaching and learning in public secondary schools in the post COVID-19 era in Federal Capital Territory, Abuja.
2. To analyze teachers' skill in the use of ICT facilities and devices for online teaching and learning in public secondary schools in the post COVID-19 era in Federal Capital Territory, Abuja.

The following research questions were raised to guide the study;

1. How availability are the ICT facilities and devices for online teaching and learning in public secondary schools in the post COVID-19 in Federal Capital Territory, Abuja?
2. How skillful are teachers in the utilization of ICT facilities and devices for online teaching and learning in public secondary schools in the post COVID-19 in Federal Capital Territory, Abuja?

### **Method**

This study adopted a descriptive survey design. The design was chosen and considered suitable for the present study because it allows for data to be collected from respondents (teachers) who are the representative sample of the larger population. The population of this study consists 4050 teachers in the 58 senior secondary schools. In this study, 351 teachers were sampled from

the 20 selected public senior secondary schools across the six Area Councils in the FCT. A multi-stage technique was employed for the sample selection, schools were first stratified by Area, in every count of five school, one school was sampled. The number of schools sampled in an Area Council depended on the multiples of five, while Morgan and Krejcie table for determining sample size was used to sampled 351 teachers for the study.

A self-developed instrument titled 'Checklist and Teachers' Skills of ICT for Online Teaching in Senior Secondary Questionnaire' (CT-SIOTSSQ) was used for data collection. The instrument had two sections. Section 'A' consisted of checklist of ICT facilities and devices for online teaching, calibrated into available and not-available. Section 'B' consisted of 14 close-ended structured items on teachers' skills in the utilization of ICT facilities and devices for online teaching. The items were on a 4- point Likert type scale of Strongly Agree = 4, Agree = 3, Disagree = 2 and Strongly Disagree = 1.

The instrument was validated through peer reviewed by experts in Measurement and Evaluation (M&E) and Educational Technology in the Department of Educational Foundations, University of Abuja. The experts of Educational Technology focused on facilities and devices for online teaching. Experts in M&E were to ensure that the items were free from ambiguity and adequately measured and address the research questions for the study. The reliability of the instrument was determined through a pilot study in three public senior secondary school in the FCT which were isolated in the main study. checklist and the questionnaire were administered by the researcher, data generated from the pilot study were analyzed using split-half reliability method and the coefficient of Cronbach Alpha,  $\alpha$  0.73 was obtained. This was adjudged fit for the study. A coefficient value of  $\alpha$  0.6-0.7 indicates an acceptable level of reliability, and 0.8 or greater a very good for a study in social sciences (Ursachi, Alexandra, & Zait, 2015).

To collect data for the study, the researchers took permission from the school principals to personally administer 20 copies each of CT-SIOTSSQ in the 20 public secondary schools in the FCT. A good number of respondents were positively disposed in responding to the instruments, insignificant number of the respondents were resistive in responding to the instrument. This accounted for the rate of retrieval of 351 questionnaire representing 87.75 percent retrieval rate.

Data collected for the instrument were analyzed using simple percentages and mean ratings. The percentage was used to determine the availability of ICT facilities and devices for online teaching and learning, while statistical mean response rating was employed to analyzed teachers’ skills in the use of ICT facilities and devices for online teaching and learning. The decision rule was that 50 percent and above of availability score of ICT facilities and devices was considered adequate and otherwise below 50 percent was adjudged inadequate for online teaching and learning. On the other hand, a mean score response rating of 2.50 was accepted as adequate for a teacher to utilization of ICT facilities and devices for online teaching, mean response rating below 2.49 was rejected as not sufficient for online teaching and learning.

**Results**

**Table 1: Availability of ICT Facilities for Online Teaching and Learning in the FCT**

<b>N = 351</b>						
<b>S/ N</b>	<b>Facilities</b>	<b>Avail able</b>	<b>%</b>	<b>Not Avail able</b>	<b>%</b>	<b>Decision</b>
1	Internet Access	103	29.34	248	70.66	Not available
2	School email	135	38.46	216	61.54	Not available
3	School WhatsApp	121	34.47	230	65.53	Not available
4	Computers	212	60.40	239	68.09	Available
5	Radio	91	25.93	260	74.07	Not available
6	Cellular Phones	157	44.73	194	55.27	Not available
7	Personal Digital Assistants (PDAs)	0	0.00	351	100.00	Not available
8	Digital Audio Players (iPods, MP3 Players),	73	20.80	278	79.20	Not available
9	Digital camara	67	19.09	284	80.91	Available
10	PowerPoint	54	15.38	297	84.62	Available
11	Electronic bulletin boards	0	0.00	351	100	Not available
12	Electronic whiteboard	0	0.00	351	100	Not available
13	Video conference	0	0.00	351	100	Not available
<b>Sectional Average</b>			<b>18.58</b>		<b>81.42</b>	<b>Not available</b>

Data in table 1 present the availability of ICT facilities and devices for the online teaching and learning in post covid-19 era in the FCT, Abuja. The analysis revealed that 81.42 percent indicated that ICT facilities are not available with only 18.58 percent indicating availability of ICT facilities for online teaching. Detail of the analysis indicates that 60.40 percent respondents indicated availability of computers, 44.73 percent indicated that cellular



phones were available for online teaching. Furthermore, the percentages of School emails, school WhatsApp and internet access facility were placed at 38.46 percent, 34.47 percent and 29.34 percent respectively. Other basic ICT facilities such, Radio, Digital Audio Players (iPods, MP3 Players), Digital camara, PowerPoint recorded 25 -15 percent availability. In addition, ICT facilities like Personal Digital Assistants (PDAs), Electronic bulletin boards, electronic whiteboard and Video conference are not available in most schools.

**Table 2: Teachers' skills in the utilization of ICT facilities for online teaching and learning in FCT**

		N= 351					
S/N	Item	SA 4	A 3	D 2	SD 1	Mean	Decision
1	Conversant with computers and the Internet	54	75	120	102	2.23	Disagree
2	Acquainted with Web browsers and an email program.	44	85	107	115	2.17	Disagree
3	Knowledgeable with Web-based interactions such as email, discussion boards, listservs, and chat rooms.	33	92	99	127	2.09	Disagree
4	Proficiency with typing and word processing	94	87	77	93	2.52	Agree
5	Skillful in the use successful Internet searches using a variety of search engines	37	55	184	71	2.14	Disagree
6	Ability to use email and access the Web using a browser	88	97	90	76	2.56	Agree
7	I can download files from the Web and save them to your own computer	46	51	170	84	2.17	Disagree
8	Experienced in the use of Digital Audio Players (iPods, MP3 Players) for teaching	53	81	96	118	2.18	Disagree
9	Aware of Personal Digital Assistants (PDAs)	3	50	123	169	1.64	Disagree
10	I can download videos and share them the Web	51	59	110	131	2.09	Disagree

11	I can attach a document to an email message	40	61	161	89	2.15	Disagree
12	Acquisition of s information from e-books for teaching	46	61	83	161	1.98	Disagree
13	Designing appropriate lesson plans for online students	42	61	151	97	2.14	Disagree
14	Ability to troubleshoot minor technical issues	33	61	131	123	1.99	Disagree
<b>Grand Mean</b>						<b>2.15</b>	

Table 2 presents Teachers’ skills in the utilization of ICT facilities for online teaching and learning in post covid-19 era in the FCT. The result of the analysis showed that teachers did not have required ICT skills for the utilization of ICT facilities for online teaching as this recorded a section mean of 2. 15. Details of the analysis indicated that teachers’ ability to use email and access the Web using a browser and their Proficiency with typing and word processing recorded a mean of 2.56 and 2.52 respectively. Furthermore, teachers experience in the use of computers and the Internet, Digital Audio Players (iPods, MP3 Players), downloading files from the Web and save them in computer, attaching documents to an email message, skillfulness in the use successful Internet searches using a variety of search engines and designing appropriate lesson plans for online students had mean ratings between 2.09 and 20.23. Other teachers’ basic ICT skills required for online teaching and learning such as knowledge of Personal Digital Assistants (PDAs), ability to acquire information from e-books for teaching and troubleshoot minor technical issues were rated as low as between 1.64 and 1.99.

### **Discussion**

The study has established that only 18.58 percent ICT facilities were available for online teaching and learning in the FCT Abuja public secondary schools. This finding is significantly an improvement from the findings of Okoboh (2016) who reported only 7.7% availability of ICT facilities in public schools. To further the situation of ICT facility availability, Eze, Chinedu-Eze and Bello (2018) observed that availability and adequacy of ICT facilities are basic factors for a successful online teaching and learning. In a related development, a study undertaken by Samuel and Bakar (2016) clearly indicated that, there is gross lack of infrastructural facilities in many schools in Nigeria especially in rural areas and has indeed caused poor ICT integration in schools for both administrative and instructional purposes. Aduwa-Ogiegbaen and Myamu

(2016), observed that most public secondary schools in Nigeria did not have ICT facilities to enhance effective management of the school system. Chukwu (2019) equally admitted the non-availability of ICT facilities in sufficient numbers in Nigerian schools right from primary to tertiary level. In the opinion of Ngwu (2015), most ICT resources are not adequately available in secondary schools in Nigeria; thereby hampering the effective and full utilization ICT resources.

The study found out that teachers did not possess required ICT skills for the utilization of ICT facilities for online teaching in the FCT. Although, on one hand the study has found out teachers were proficient in typing and word processing in addition to ability of using email and access the Web, using a browser on the net. This very important teachers' skill to strengthen for online teaching. Getting the ICT skills for online teaching is an important factor for a success online teaching. Visscher (2018) corroborated that when ICT facilities are effectively used, it supplies concrete basis for conceptual thinking and reduces meaningless word responses of students, makes learning more permanent, offers realistic experience which stimulates self-activity on the part of the students, increases students' interest to learn and contributes to growth of meaning and vocabulary development. Bridge (2017) noted that if ICT resources are properly utilized, it reduces verbalization, makes learning more interesting, increases students' retention level, makes students to develop keen observation skills and fosters creative imagination. This is further supported by Lai and Pratt (2019) who opined that ICT usage in school results in teachers' improvement in the presentation of work, an increased sharing of resources, greater collaboration between students, increased motivation for learning and students' engagement. Abraham (2016) in like manner revealed that the use of ICT in the school system enhances students' and teachers' performance.

### **Conclusion**

In view of the finding that the adequacy of the availability of ICT facilities and devices and teachers' skills in the utilization of the facilities is yet insufficient, online teaching and learning in secondary schools in the FCT would remain a challenge in the post COVID-19 era. The availability and Teachers' expertise and skills in utilization of the facilities are potential threats to education managers in the application ICT facilities for online teaching in secondary schools. This situation cannot support the paradigm shift from the traditional methods of physical classroom to the online teaching that could guarantee uninterrupted teaching and learning in the face of any national or global

emergencies in the post covid -19 era will therefore remain unattainable. Furthermore, this is capable of further limiting access to and quality of secondary education, hence the achievement of the goals of secondary education which is aimed at preparing the youth for higher education and useful living to contribute to the national development would be hampered. This would consequently undermine the achievement of Sustainable Development Goals (SDGs) on education in Nigeria.

### **Recommendations**

Drawing from the findings and conclusion, the following recommendations were offered:

1. The Federal Capital Territory Administration (FCTA) through the FCT Education Secretariate should declare a state of emergency in providing ICT facilities in secondary school for online teaching and learning during covid-19 era.
2. ICT facilities are capital intensive, Education secretariate should come up with specific capital expenditure item on the provision of ICT facilities to facilitate online teaching and learning in the FCT secondary schools in the post COVID-19 era.
3. FCT education Secretariate should engage private telecommunication companies as their social corporate responsibility to provide and dedicate bandwidth to public secondary schools to improve internet access for online teaching and learning in the post covid-19 era.
4. The FCTA education secretariate to embark on Teachers' Continuous Professional Development with emphasis on acquisition of practical basic ICT skills that are relevant to online teaching in the post COVID-19 era.

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