VITAL ROLES OF INFORMATION AND COMMUNICATION TECHNOLOGY ON SECONDARY SCHOOL STUDENT'S LEARNING AMIDST CORONA VIRUS PANDEMIC IN ENUGU EDUCATION ZONE

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ABSTRACT
The covid-19 crisis has involuntarily mandated education systems worldwide to find alternatives to face-to-face instruction. As a result, online teaching and learning have been used by teachers and students on an unprecedented scale. The pandemic created an unequalled need for information and communication technology which has permitted all schools to suspend academic activities because social distance and isolation is compulsory. The paper therefore investigated vital roles of information and communication technology on secondary school student's learning amidst coronavirus pandemic in Enugu education zone. Three research questions guided the study. A descriptive survey research design was adopted for the study. The population of the study was 17,670 students and 589 teachers. 50 teachers and 855 students were drawn using simple random sampling technique. The instrument used for collection of the relevant data was 18-item structured questionnaire titled; Vital Roles of Information and Communication Technology on Students' Learning during Corona virus Pandemic Questionnaire (VRICTSLCPQ). The instrument was validated by three experts and Cronbach alpha was used to ascertain the internal consistency of the developed instrument. Data collected were analyzed using weighted mean. Based on the findings, it was concluded that information and communication technology contributed positively towards students learning during Corona virus Pandemic in secondary schools in Enugu Education Zone. The study showed that constant use of social media by secondary school students often interfered with their learning and thus, reduced their active participation in classes online.
Keywords: Education, Information, learning, Technology, Corona virus.

Introduction
Education is one of the most important needs for the wellbeing of an individual and the society at large as it is considered a powerful instrument of social, economic and political progress without which professional growth cannot be attained by individual and the society. Information and Communication Technology is an indispensable part of the contemporary world as culture and society adjusts to the changing demands of the contemporary age (Yusuf, Afolabi &Loto, 2015). The potential of information technology in the educational system seems to be neglected by both governments and individuals as it

has the potential to enhance and facilitate teacher's professional activities and can make education more efficient and productive. But this is not the case as only few schools adopt information and communication technology (ICT) practices in the learning process as it projects high costs to school management. Prior to the outbreak of Corona virus Pandemic, Anekwe (2017), discovered that the unavailability of some ICT components in schools hampers teachers' use of ICT. Lack of adequate research skills and of access points in the schools were reported as factors inhibiting the use of the Internet by school teachers. The absence of ICT equipment in most Nigerian schools leads students to resort to cybercafés for Internet access. Most cybercafé clients in Nigeria are students. The ICT revolution is yet to attain that critical mass required for it to register the necessary impact in teaching students, and civilian population nationwide.

Nigeria's education system seems to adopt more of traditional pedagogical learning, which is more focused on to face-to-face instruction or the physical learning environment. However, the outbreak of COVID-19 has revealed the inadequacies of this method of education. The outbreak of Covid-19 seem to unveil the deficiency in educational sector as some schools which adopted ICT before the insurgence of covid-19 engaged their students through online learning while secondary schools which have not adopted the information technology were left behind including all public schools (UNESCO, 2020). Parents who have the resources have to subscribe to online classes for their children so that they will not be left out.

Integration of information and communication, and technology (ICT) in education refers to the use of computer- based communication that is incorporated into the daily classroom instructional process. In conjunction with preparing students for the current digital era, teachers are seen as the key players in using ICT in their daily classrooms. This is due to the capability of ICT in providing dynamic and proactive teaching-learning environments (Aduwa-Ogiegbean, &Iyamu, 2018). While the aim of ICT integration is to improve and increase the quality, accessibility and cost-efficiency of the delivery of instruction to students, it also refers to benefits from networking the learning communities to face the challenges of current globalization (Damkor, Irinyang, & Haruna, 2015). Process of adoption of ICT is not a single step, but it is an ongoing and continuous step that fully supports teaching and learning and information resources (Idowu & Esere, 2013).

ICT integration in education generally means technology-based teaching and learning process that closely relates to the utilization of learning technologies in schools. Due to the fact that students are familiar with technology and they will learn better within a technology-based environment, the issue of ICT integration in schools, specifically in the classroom is vital. This is because the use of technology in education contributes a lot in the pedagogical aspects in which the application of ICT will lead to effective learning with the help and support from ICT elements and components (Ngimi, 2013). It is right to say that almost all ranges of subjects starting from mathematics, science, languages, arts, humanities and other major fields can be learned more effectively through technology-

based tools and equipment. In addition, ICT provides the help and complementary supports for both teachers and students where it involves effective learning with the help of the computers to serve the purpose of learning aids (Nnorom, & Okonkwo, 2020)

ICT can be used in various ways where it helps both teachers and students to learn about their respective subject areas. A technology- based teaching and learning offers various interesting ways which includes educational videos, stimulation, storage of data, the usage of databases, mind-mapping, guided discovery, brainstorming, music, World Wide Web (www) that will make the learning process more fulfilling and meaningful (Obodo&Okekeokosisi, 2020). On the other hand, students will benefit from ICT integration where they are not bound to the limited curriculum and resources, instead hands-on activities in a technology-based course is designed to help them to stimulate their understanding about the subject. It also helps teachers to design their lesson plans in an effective, creative and interesting approach that would result in students' active learning. Obodo and Okekeokosisi (2020) proved that use of ICT in teaching will enhance the learning process and maximizes the students' abilities in active learning.

Hermans, Van-Braak, and Valcke (2008), identified three main stages for ICT to be highly valued and regarded by the teachers; integration, enhancement and complementary. Integration approach is about implementing the right use of ICT in particular subject areas that involve complex concepts and skills to improve student's achievement and attainment. Enhancement approach is about using ICT to give great emphasis on the topic introduced. For instance, Microsoft PowerPoint can be used to present the topic in a very innovative and creative way that will lead into discussion and exchanging ideas and thoughts. Finally, a complementary approach is when the ICT is used to aid and support the student's learning. This approach allows students to be more organized and efficient in which they can obtain the notes from the computer, submit their works by email from home as long as they meet the deadline and look for information from various sources provided online to fulfill the task given to them (Hermans, et al, 2008).

Technology-based teaching and learning can make many changes in school that are required for proper planning and policy making. Researchers and policymakers must both have the same insight about the future plan. Taban, Abdullah, and CheKum (2012) noted that national ICT policies can serve several crucial functions. They provide a rationale, a set of goals, and a vision of how education systems run if ICT is integrated into teaching and learning process, and they are beneficial to students, teachers, parents and the general population of a given country. The Ministry of Education Malaysia has formulated three main policies for ICT in education. The first policy insists that all students are given the opportunity to use ICT. This is aimed to reduce the digital gap amongst the schools. The second policy focuses on the role and function played by ICT in education. Besides that, another policy stressed on the use of ICT for accessing information, communication and as productivity tool (Ololube, 2006).

However, infrastructure and facility of ICT is then needed to supply to the schools throughout the nation. A key factor in the use of ICT is sufficient computer labs and ICT equipment. This is to ensure that subject teachers have easy access to ICT tools whenever needed (Ololube, 2006). Lack of adequate ICT equipment and internet access is one of the key problems that schools specifically in rural areas are facing now. For example, results of a research show that in Kenya, some schools have computers but this could be limited to one computer in the office only. Even in schools with computers, the student-computer ratio is high. In addition, the report continues to reveal that the schools with ICT infrastructure are supported by parents' initiative or community power (Nwankwo, Nnorom, Agogbua, & Anyanwu, 2021).

In most schools, technical difficulties sought to become a major problem and a source of frustration for students and teachers and cause interruptions in teaching and learning process. If there is lack of technical assistance and no repair on it, teachers are not able to use the computer temporarily (Agogbua&Nnorom, 2021). The effect is that teachers will be discouraged from using computers because of fear of equipment failure since they are not given any assistance on the issue.

Schools in Enugu Education zone are not left out in the failure to adopt information and communication technology in the learning process of secondary school students. While few schools could adopt the virtual learning for their students during the covid-19 school closure, major schools in Enugu lacked the capacity to adopt the change introduced by Covid-19. The schools that adopt online classes during the corona virus Pandemic seem to have advantage over schools that do not have the facilities for online classes. More schemes were covered by schools that engaged students in online classes and the schools were rated over schools that don't have facilities for online classes. Aside from the benefit of ICT to the image of schools, ICT seems to benefit students' learning capacity as it has the potential of imparting ICT skills to students, creative skills and vocational skills in the ICT world.

There seems to be challenges in the adoption of ICT in the learning process of students as the challenges range from poor internet and energy power, inadequate skilled personnel and high cost of adoption among others. This seems to discourage the effective use of ICT in secondary schools because the challenges disrupt the learning process. It is against this background that it becomes necessary to examine the vital roles of information and communication technology on students' learning amidst Corona virus Pandemic in selected Secondary Schools, Enugu education zone

Statement of the Problem
Until the insurgence of Corona virus Pandemic in 2019, the secondary schools in Enugu education zone have not seen the need to adopt information and communication technology on students' learning. This seems to result in a delay in resumption in 2020 as

the previous classroom methods of learning were considered unsafe by the Nigerian Centre for Disease Control (Nwawudu, Ikwu, Ikwu, Oparah, &Nnorom, 2020). The adoption of information and communication technology was considered a viable means of maintaining social distancing and reducing the spread of Corona virus by NCDC. Some schools, mainly private secondary schools that seem to have adopted information and communication technology before the outbreak of the corona virus pandemic, were able to organize virtual classes for students who were at home as a result of government instructions to close school. Schools who could not adopt information and communication technology during the corona virus lockdown were behind schedule and were equally delayed by waiting for school opening instructions by the Government. It seems students who attended online classes which were organized by their respective schools were ahead of other students in terms of school curriculum. Aside from the fact that the information and communication technology adoption seems to have made the learning process easy without interruptions, the system seems to reduce the spread of corona virus pandemic which would have been possible during classroom learning.

Despite the benefit of information and communication technology to the learning process of students, there seems to be challenges encountered in the course of adopting the system. The challenges seem to include poor concern of the government towards adoption of information and communication technology in government secondary schools, poor internet connectivity, dearth of ICT facilities in schools and inadequate technological know-how in secondary schools. This was supported by the statement of Tella, Tella, Toyobo, Adika, and Adeyinka, (2017) who stated that the low level of infrastructural development in Nigeria, in terms of energy and internet connectivity, also continues to constitute a setback for the adoption of virtual learning in the country. Even to date, schools which are yet to adopt information and communication technology in learning seem to experience more challenges than schools which adopt information technology.

Purpose of the Study

The main purpose of the study was to determine the vital roles of information and communication technology on secondary school student's learning amidst coronavirus pandemic in Enugu education zone. Specifically, the study sought to:

1. Examine the extent information and communication technology has assisted in enabling secondary school students' learning during Corona virus Pandemic in Enugu Education Zone.
2. Determine the effects of information and communication technology on secondary school Student's learning during Corona virus Pandemic in Enugu Education Zone.
3. Ascertain the challenges encountered in the adoption of information and communication technology by secondary school students during Corona virus Pandemic in Enugu Education Zone.

Research Questions

The following research questions guided the study:

1. To what extent has information and communication technology assisted in enabling student learning during Corona virus Pandemic in selected Secondary Schools in Enugu Education Zone?

2. What are the challenges encountered by adopting information and communication technology towards students learning during Corona virus Pandemic in selected Secondary Schools in Enugu Education Zone?

3. What are the effects of information and communication technology on students' learning during the Corona virus Pandemic in selected Secondary Schools in Enugu Education Zone?

Method

The study adopted a survey design. The population of the study comprised 589 teachers and 17,670 students. 885 students and 50 teachers were drawn from 31 secondary schools in Enugu Education Zone using simple random sampling technique. The instrument used for data collection is a well-structured questionnaire of 4-point rating scale. The instrument was used to collect data from respondents in relation to the objective of this study. For the validation of the instrument, three experts validated the instruments while the reliability was established using Cronbach Alfa statistics with index of 0.84, showing that the instrument is suitable for the study. All the copies of instrument were administered and collected on the spot by the researchers so as to ascertain high percent rate of return. The research questions were answered using mean. Any response with a mean score of 2.50 and above was regarded as being used to a positive response, while any item with mean score below 2.50 would be taken to have attracted negative response.

Results

Table 1: Mean ratings of the respondents on the extent Information and Communication Technology Assisted in enabling student learning during Corona Virus Pandemic in selected Secondary Schools in Enugu Education zone

S/N	Items	Score Total	Mean X	Remark
	Information and communication technology assisted in enabling student learning during Corona virus Pandemic in secondary schools	935		
1	students were able to learn online during the Corona virus era	3046	3.2	Agree
2	students were able to conclude their term's scheme during the Corona virus era.	3314	3.6	Agree
3	students have been able to get ICT skills in their	3322	3.5	Agree

	various schools			
4	students can easily record teaching so they can replay them when free.	3353	3.6	Agree
5	students do assignments on their own and learn more online	3247	3.4	Agree
6	students carry out some research on non-familiar terms used by their teachers in the course of teaching.	953	1.0	Disagree

Table 1 shows that most of the items therein were above the mean benchmark of 2.50 and above, while item 6 with mean value of 1.0 was lower than 2.5 which indicated disagree. This revealed that information and communication technology assisted in enabling student learning during Corona virus Pandemic in selected Secondary Schools in Enugu Education zone.

Table 2: Mean ratings of the respondents on the challenges encountered by adopting information and communication technology towards students learning during Corona virus Pandemic

S/N	Items	Score Total	Mean X	Remark
	The challenges encountered by adopting information and communication technology towards students learning during Corona virus Pandemic	**935**		
7.	Students encounter issues of poor power supply while learning online.	3645	3.8	Agree
8	Networks often affect students lectures online.	3537	3.7	Agree
9.	I usually miss online classes since data is expensive.	3269	3.4	Agree
10	Learning with the school computer facilities has not been easy since we do not have enough facilities.	3648	3.9	Agree
11.	Some teachers do not know how to teach via online.	3293	3.5	Agree
12	Some teachers prefer classroom teaching to online teaching.	3335	3.6	Agree

Table 2 revealed that the respondents agreed that items 7,8,9,10,11 and 12 with mean values of 3.8, 3.7, 3.4, 3.9, 3.5, and 3.6 were above 2.5 respectively which indicated agreed, which was above the mean benchmark, revealed that the challenges encountered by adopting information and communication technology towards students learning during

Corona virus Pandemic in selected Secondary Schools in Enugu Education zone were above the mean ratings and have positive response.

Table 3: Mean rating of the respondents on the effects of information and communication technology on students' learning during the Corona virus Pandemic in selected Secondary Schools in Enugu Education zone

S/N	Items	Score Total	Mean X	Remark
	The effects of adopting information and communication technology towards students learning during Corona virus Pandemic in secondary schools	935		
13	Students are clumsy in class activities	3338	3.5	Agree
14	Most times students are chatting while lecture is ongoing	3527	3.7	Agree
15	Most times fail to do the task assigned to them	3314	3.5	Agree
16	Most students don't adhere to rules given online.	3646	3.8	Agree
17	Students become lazy to online lessons	3531	3.7	Agree
18	Students mistake online lectures for fun.	3371	3.6	Agree

From the table 3, on the effects of adopting information and communication technology towards students learning during Corona virus Pandemic in Pandemic in selected Secondary Schools in Enugu Education zone reveals that respondents on items 13, 14, 15, 16, 17, and 18 with various mean values of 3.5, 3.7, 3.5, 3.8, 3.7 and 3.6 were above 2.5 respectively which indicated agree. This indicates that information and communication technology has effect on students learning during corona virus pandemic in secondary schools which include clumsy in class activities, chatting while lectures are going on in the class, most times fail to do the task assigned to them, failed to adhere to rules given online and so on.

Discussion of Findings

The findings of research question one revealed that students were able to learn online and were able to conclude their term's scheme during the Corona virus pandemic, get ICT skills in their various schools, do assignments on their own and learn more online and also carry out some research on non-familiar terms used by their teachers in the course of

teaching in Schools in Enugu district. In corroborating with the findings, Anekwe, (2017) observed that ICT integration is to improve and increase the quality, accessibility and cost-efficiency of the delivery of instruction to students, it also refers to benefits from networking the learning communities to face the challenges of current globalization.

In a similar vein, Obodo and Okekeokosisi, (2020) asserts that in most schools, technical difficulties tend to be a major problem and a source of frustration for students and teachers and cause interruptions in teaching and learning process. If there is lack of technical assistance and no repair on it, teachers are not able to use the computer. Reasons for this finding were that students do encounter network issues during online lectures, and also miss online classes since data is expensive. Thus, some teachers are not familiar with online teaching rather prefer face to face classroom teaching to online teaching. The finding is in line with the study of Nwawudu, Ikwu, Ikwu, Oparah, and Nnorom (2020) which revealed that despite the benefit of information and communication technology to the learning process of students, there seems to be challenges encountered in the course of adopting the system. The challenges seem to include, students clumsiness in class activities, inability to concentrate while lecture are going on, rather, they are distracted with other social activities online like chatting. This may lead to failure or poor performance when they failed to do the task assigned to them online and mistake lectures for fun.

Conclusion

In view of the fact that ICT is an influential instrument for the development of quality teaching and learning in educational systems around the world, as well as a means for fundamental transformation into the existing school principles and practices for the preparation of students in meeting the innovations in the global arena more especially this period of global pandemic. Achievements in the ICT penetration and usage in Nigeria teacher education programs is dependent on the recognition of the importance of ICT application to education for sustainable development by the federal and state government by making useful policies and providing enough fund to the institutions. It is evident that secondary school students in Nigeria precisely in Enugu education zone are already farther behind their peers (Ololube, 2006). An effort towards this will create an enabling environment for teachers and students learning during and after the covid-19 pandemic and strive toward producing highly qualified ICT literate teachers that would assist in making the integration and usage of ICT in secondary schools a success. Therefore, it is very essential that we recognize that teachers are indispensable for successful learning about ICTs, and learning and teaching through ICTs to improve the standard of education in Enugu Education Zone particular and Nigeria in general.

Recommendations

To meet these challenges:

1. Countries have to focus concurrently on expanding access, improving internal efficiency, promoting the quality of teaching and learning, and improving system management.
2. There should be adequate service training in secondary schools.
3. Parents should endeavour to get a computer system for their children to aid the learning process and to enable them to get acquainted with the operational aspect of the ICT.

References

Aduwa-Ogiegbean, S.E., &Iyamu, E.O.S. (2018**).**Using Information and Communication Technology in Secondary Schools in Nigeria. *Educational Technology & Society 8* (1),104-112.

Agogbua V. U., &Nnorom, S.U., (2021) Relationship between school type and students' academic performance in secondary schools in education district VI, Lagos state. *Turkish online journal of qualitative inquiry (TOJQI) 12(6)9288-9294.*

Anekwe, U. (2017) impacts of Virtual Classroom Learning on Students' of Nigerian Federal and State Universities. *European Journal of Research and Reflection in Educational Sciences*, 5 (3), 21-37.

Damkor M., Irinyang D. J, Haruna M. (2015) the Role of Information Communication Technology in Nigeria Education. *International Journal of Research in Humanities and Social Studies Volume 2 (2), 64-68.*

Hermans, R., van Braak, J., & Van Keer, H. (2008). Development of the beliefs about primary education scale: Distinguishing a developmental and transmissive dimension. *Teaching and Teacher Education, 24(1), 127–139*

Idowu A. I. and Esere M. (2013) ICT and higher educational system in Nigeria, *Journal of Educational Review and Research, 8(21), 2021-2025.*

Ngimi H. M (2013) opportunities and challenges of integrating ICT in Education Delivery in the Institute of Continuing Education at The Open University of Tanzania. A Dissertation submitted in Partial fulfillment of the requirements for the degree of Master of Education in Administration, Planning and Policy Studies of the Open University of Tanzania.

Nnorom, S.U., & Okonkwo E.C., (2020) Educational management and staff development programmes: mainspring for achieving goals in secondary schools in Nigeria. *Journal of research & method in education (IOSR-JRME)* 10(4)49-55.

Nwankwo, B.C, Nnorom, S.U., Agogbua, V.U., & Anyanwu, J.A. (2021) Involving community participation in the control of covid-19 pandemic in schools in Nigeria. *World journal of innovative research (WJIR)* 10(5)07-10.

Nwawudu, E., Ikwu, A., Ikwu, U., Oparah, N., &Nnorom, S. (2020) Proposed Design of a Real-Time COVID-19 Pandemic Contact Tracing Using Mobile Phone. *European scientific journal (ESJ)* 16(36)1.

Obodo Dike M. P. and Okekeokosisi O. C (2020) Challenges of implementing E-Learning in Nigeria Educational System in the Covid-19 Pandemic Era. *Social Sciences and Education Research Review*, (7) 2 152 – 171.

Ololube, N. P. (2006) "Teachers Instructional Material Utilization Competencies in Secondary Schools in Sub-Saharan Africa: Professional and non-professional teachers' perspective". *In Conference Proceedings of the 6th International Educational Technology Conference EMU, 19-21 April 2006 NorthCyprus*.

Ololube, N. P. (2006) appraising the Relationship between ICT Usage and Integration and the Standard of Teacher Education Programs in a Developing Economy.*The International Journal of Education and Development using Information and Communication Technology* 2(3):70-85.

Taban H., Abdullah A. and CheKum C. (2012) difficulties faced by Teachers in using ICT in Teaching-Learning at Technical and Higher Educational Institutions of Uganda. *International Journal of Engineering Research & Technology (IJERT)*, 1 (7), 1-9.

Tella, A, Tella, A, Toyobo, O. M. Adika, L. O. and Adeyinka, A. A. (2017) An Assessment of Secondary School Teachers Uses of ICT's: implications for further Development of ICTs use in Nigerian Secondary Schools. The Turkish Online *Journal of Educational Technology,* 6 (1), 1-13.

UNESCO (2020) Education; from Disruption to Recovery.

Yusuf M.A, Afolabi F. O. &Loto A. B (2015) appraising the role of information communication technology (ICT) as change agent for Higher Education. *International Journal of Education, Administration and Policy Studies*, 5 (8), 177 183.