

## Digital Divide and Online Instruction Delivery Readiness Among Nigerian Universities in an Era of COVID-19

**Omorobi Garieth Omorobi** (Corresponding Author)

University of Calabar, Calabar, Nigeria

Email: [Omobi4christ@gmail.com](mailto:Omobi4christ@gmail.com)

**Eton Idorenyin Clement**

University of Calabar, Calabar, Nigeria

**Chuktu Onyinye**

University of Calabar, Calabar, Nigeria

### Article History

**Received:** 13 July, 2021

**Revised:** 27 August, 2021

**Accepted:** 18 September, 2021

**Published:** 24 September, 2021

Copyright © 2021 ARPG &  
Author

This work is licensed under the  
Creative Commons Attribution  
International



CC BY: Creative  
Commons Attribution License  
4.0

### Abstract

This study focused on digital divide and online instruction delivery readiness among universities in Nigeria. The descriptive survey research design was employed for the study. Six universities in South-South, Nigeria were selected for the study. They include: University of Calabar, University of Benin, (federally owned), River State University of Science and Technology; Cross River University of Technology (State universities) and Arthur Jarvis University, Akpabuyo and Benson Idahosa University, Benin City (private universities). The population of the study was 10,274 undergraduate students during the 2020 academic session. Random sampling procedure was employed to choose undergraduates from all levels using a sampling percentage of 20% to give a sample size of 2,596. The instrument for data collection was the questionnaire titled Digital Divide and Online Instruction Delivery Readiness Questionnaire (DDOIDRQ). The questionnaire collected data on demography, availability of ICT infrastructure, staff and students ICT skills, and online instruction readiness of universities. Data collected were analyzed using the Statistical Package for Social Science version 23 (SPSS) to get frequency and percentages. The results from the analyses reveals that a greater percentage of the students are highly proficient in ICT skills, private universities had more ICTs than public universities, and it was also found that, private universities were ready for online instruction delivery but, the sampled public universities were not technically ready for online instructional delivery.

**Keywords:** Digital divide; Online; Instruction; Readiness; Universities; COVID-19.

### 1. Introduction

Traditionally, the concept of school is associated with a physical location with concrete equipment and facilities where students and teachers interact for purpose of teaching and learning. However, in recent time, innovations in information and communication technologies (ICTs), globalization and the spike of life-threatening infectious diseases like COVID-19 is gradually redefining modern schooling. Therefore, modern schooling is not restricted solely to a defined physical space or location and face to face interaction. This places an increasing demand for digital inclusion in schools and other aspects of life. It has been observed that, ICT has impacted and revolutionized almost every approach to human activities in business, teaching, communication, management and so on (UK essays, 2018). Information and communication technology has become an essential part of modern civic life, as they possess the potential to enhance economic equality, social mobility, public participation and economic growth. (Internet World Stats, 2020). However, individuals, organizations, institutions, and societies do not have equal capacities to access and utilize the internet and sundry ICT facilities. Any population, organization or society that lacks adequate access to ICT facilities and internet connectivity is considered disadvantaged; as it leads to unequal benefits and participation in society. Nevertheless, digitization at individual, organizational/institutional, or national levels is not a cheap enterprise as many ICT tools and equipment require huge procurement and maintenance cost.

Many organizations and universities especially in developing country like Nigeria lack basic ICT facilities due to poor financial capacity to acquire and maintain them (Omorobi and Effa, 2018). It has been observed that, in Nigeria computer does not constitute classroom technology in over 90% of public schools (Aduwa and Iyamu, 2005). This deficit in ICT facilities in some universities, organizations and societies result in "digital divide". Digital divide refers to the difference that exists among, individuals, communities and organization in terms of access to and use of Information and Communication Technologies (ICTs). The Organization of Economic Cooperation and Development (OECD, 2006) defined digital divide as the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regards to their opportunities to access information and communication technologies (ICTs) and use of the internet for a wide variety of activities. OECD further identified the factors responsible for digital divide to include income and education, household size and type, age, gender,

racial and linguistic backgrounds. Digital divide can also be seen as the gap between those who do not and those who do have access to computers and the internet. The issue of "digital divide" was first brought to limelight by the reports of the 'National Telecommunications and Information Administration' [National Telecommunications and Information Administration \(2004\)](#) which depicted systematic inequities in home access to computers.

Broadly speaking, digital divide is not necessarily determined by the differences that exist among populations by access to the Internet, but by access to ICT (Information and Communications Technologies) and to mediums that the different segments of society can use ([Wikipedia, 2020](#)). It includes the variance in affordability, robust broadband internet service; internet-enabled devices that meet the needs of the user; access to digital literacy training; skills needed for users, the complexity of access, quality technical support; applications and online content designed to enable and encourage self-sufficiency, participation and collaboration.

The education sector and universities in particular are major institutions that require high access and utilization of internet and information and communication technologies the most. This is because, the application of ICT in teaching, learning, assessment/examination and general university administration promotes effectiveness, efficiency and excellence in the university system ([Omorobi and Effa, 2018](#)). High internet access and sufficient ICT facilities are essential elements for any university to effectively achieve its tripartite objective of teaching, research and community service. Universities as centers for excellence dedicated to knowledge creation and innovations require real time access to happenings around the world through integration and application of ICTs such as computers, projectors, cell phones and the internet for institutional operations.

Universities deploy ICTs and the internet for teaching, communication, student record management, financial transactions, students' registration, and assessment among other things. In fact, the internet has been identified as a transformative agent that enhances teachers' professional development opportunities, equal students' opportunities, transform learning, altered social status; and modified teaching and learning systems. Despite the possibilities of ICT and the internet in the emerging global knowledge economy, many individuals, organizations and knowledge centers (universities) around the globe particularly in Nigeria do not have adequate access to basic ICTs and internet services. In a survey carried out in 2017, Nigeria ranked 143rd out of 176 countries scored by the ITU's ICT development index. On the Access sub-index Nigeria ranked 145<sup>th</sup>, on the use sub-index Nigeria ranked 147<sup>th</sup>, on the skills sub-index Nigeria ranked 147<sup>th</sup>. All these indicators collectively place Nigeria among the lowest ranking least developed countries ([Gillwald et al., 2018](#)). It has also been reported that as at 2018, only 42% of Nigeria population had access to the internet and only 184 people per a million had access to secure internet service in Nigeria (World Bank, 2018). This implies that a reasonable proportion of the Nigerian populace do not have access to ICTs and secured internet connection. A recent survey demonstrates that a significant portion of Nigerians (71%) do not use the internet while 36 percent do not have mobile phones ([Gillwald et al., 2018](#)).

However, there seem to be high level of awareness on digital divide for individuals ([Ebo, 1998](#); [National Telecommunications and Information Administration, 2004](#); [Norris, 2001](#)), but little or no attention has been directed towards digital divide at organizational or institutional levels ([Blau, 2001](#)). Nevertheless, organizations and educational institutions like universities suffer digital divide especially in developing countries. All universities do not have equal access to ICTs and internet services and this defines their divide in the digital scheme of things.

The ICT profile and digital divide among Nigerian universities was brought to fore recently by the impact of the deadly corona virus pandemic (COVID-19) on the education sector. Immediately the index case of the virus was reported in Nigeria, government among other things, quickly ordered the abrupt closure of schools as the most effective non-pharmaceutical approach to containing the spread of the virus and its attendant potential consequence on students. While many universities in other climes immediately switched to electronic mood of teaching, Nigerian universities completely ended all academic activities as a result of lack of adequate ICT facilities, internet access, epileptic power supply and human capacity. This exposed the ICT capacity of Nigerian universities as they are yet to tap into the full potentials of ICTs like their counterparts in developed economies. This has raised serious concerns in higher education institutions as they totally lost the 2020 academic calendar to the COVID-19 pandemic. [Okocha \(2020\)](#), noted that many Nigerian private universities have responded to the challenges of corona virus by continuing to develop online learning, while many public universities are waiting for their physical facilities to reopen before restarting services. This could be due to the ICTs infrastructural deficit in these schools ([Kufaine, 2020](#)). Many leaders of tertiary institutions in Nigeria are therefore seeking solutions to ensure their institutions remain relevant at such a time of uncertainty.

This situation has given rise to many questions in multiple circles about the nature and future of higher education system of Nigeria in an increasingly globalized world of uncertainties ([Benhayoun, 2020](#)). Most stakeholders have reacted to these questions by stressing the fact that the future of higher education institutions lies in information technology and all-inclusive online-learning plans ([Darkwa, 2020](#)). On line instructional delivery readiness attempts to assess to the potentials of an organization to take advantage of online learning tools available in such an organization ([Aydm and Tasci, 2005](#)). Consequently, arising from the quest to reposition Nigerian universities for full implementation of online instructional delivery, the National Universities Commission (NUC) recommended a ratio of at least one computer to every four students, and one PC to every two lecturers below the grade of lecturer I, one PC per senior lecturer and one notebook per reader/professor. Unfortunately, majority of Nigerian universities have not achieved NUC recommended system ratio for faculty and students ([Ajegbelen, 2016](#)).

These challenges ushers a prelude to the beginning of a new era in the history of higher education and creates an opportunity to rethink what the future of education would look like and put in place measures to adapt to the new normal. Hence, the need to assess the digital profile and divide among Nigerian universities and their readiness to adopt online mood of instruction in an era of crises.

## 2. Literature Review

### 2.1. The Concept of Digital Divide

According to [Blau \(2001\)](#) the concept of digital divide began to gain popularity in the 1990s. It was simply used to imply the differences that exist among individuals, groups and societies in terms of access to information communication technology. Recently, many studies have pointed to the fact that digital divide goes beyond mere access to include skills needed for users ([Hargittai, 2002](#)). It also involves different uses of the internet ([Bonfadelli, 2002](#)), and the complexity of access perceived as a full appropriation of technology beyond physical access ([van Dijk and Hacker, 2003](#)). [Van Dijk \(2005\)](#), emphasize that the problem of digital inequality does not end after physical access has been attained but actually starts when the use of digital media is incorporated into daily life.

Digital divide simply refers to the inherent disparities that exist among individuals, populations, societies, and institutions in terms of their access to and use of ICTs and the internet for carrying out basic daily activities. Simply put, the organizational digital divide is the difference between those organizations that have effective technology as opposed to those that do not ([Jan and Van Dijk, 2016](#)). These organizations are less able to participate in critical aspects of functioning and may be less visible, able to compete with other institutions and for recognition. Digital divide could also be used to express either the disparity between people in their access to ICTs or more specifically, the disparity in their access to the Internet. [Organization of Economic Cooperation and Development \(2001\)](#) observed that digital divide can exist in a particular country and also between countries, between organizations and so on. Digital divide exists in various types namely infrastructural divide, access divide, literacy divide, language divide, information and knowledge divide, job divide, healthcare divide and demographic divide; others include social divide, economic divide, linguistic divide, and content divide ([MuNutt, 2008](#); [Ugboma, 2012](#)).

Access to digital media is defined as the full process of application of technology by users. Notable disparities are observed starting from the motivation and attitudes toward ICTs, process of finding physical access and usage of digital media; and learning digital skills. The concept has been approached differently by various scholars in communication, sociology, psychology and economics. Those in communication science see it as the access to and usage of digital media. The sociological perspective emphasizes social inequality in terms of resources, all kinds of capital, and participation in society that determine the level of access and usage of ICTs and the internet. Psychologists view it from the angle of the attitudes and motivations to use digital media and investigate phenomena such as computer anxiety and technophobia. Economics highlights the diffusion of the innovations concerned. Finally, education science stresses information or digital literacy ([Jan and Van Dijk, 2016](#)).

[Hargittai \(2002\)](#) identified the five measures of digital divide to include: “technical means (software, hardware, quality of connectivity), autonomy of use (location of access, freedom of use of the medium for the user’s preferred activities), use pattern (types of uses of the Internet, experience of using ICT), social support networks (availability of others who can be turned to for assistance with use, size of network to encourage use) and skill (the ability to use the new technology efficiently and effectively)”. This implies that there are factors beyond mere connectivity that need to be considered when discussing the digital divide. The disparity of access should be seen as a range of differences along dimensions for hardware, software, mode of Internet connection, etc., and the disparity of use should be seen as a range of differences along the dimensions of skills, literacy and types of usage ([Lentz and Oden, 2001](#); [van Dijk and Hacker, 2003](#)).

### 2.2. Causes of Digital Divide

Many scholars have identified several factors responsible for digital divide. These factors however revolve within the realm of level of access to technical infrastructure, and other social demographics that enhance the use of ICT ([Rooksby et al., 2002](#)). [Choudrie et al. \(2005\)](#), listed these factors to include income, gender, race, ethnicity, education, age and location, and institution. [Helbig et al. \(2009\)](#), further outlined other factors responsible for digital divide as follows: socio-economic status, skills, geography and education. [Srinuan \(2012\)](#) outline fifteen indices of digital divide namely Socioeconomic status/GDP per capita, access price, age, attitude, content, culture, ethnicity, family structure, gender, institution, structure and type of government, language, marital status, network effect, race, skill and experience, speed and quality of service. Scholars have also revealed that domestic digital divide usually affects populations that experience digital exclusion, such as the elderly, women, low-income households, remote area citizens, and those with mental or physical disabilities ([Crenshaw and Robinson, 2006](#); [Cruz-Jesus et al., 2012](#); [Vicente and López, 2010](#)). In a study, [Schleife \(2010\)](#) found that different composition of individual characteristics between rural and urban populations that accounts for the regional digital divide. Several factors can be responsible for digital divide in institutions. [Jayakar \(2004\)](#), revealed that fraudulent resource allocation is a primary factor deepening digital divide among schools in the United States. Other factors include funds and interest on the part of management, it has also been observed that administrators of schools constitute a major barrier towards the use of technology in schools ([Uzoka and Abolo, 2017](#)), by failing to provide enabling environment ([Guma et al., 2013](#)). [Chukwu et al. \(2018\)](#), in a study at the Federal University of Technology Oweri outlined the challenges impeding efforts to digitize the school library to include inadequate funding, erratic power supply, lack of modern infrastructure, lack of skilled staff and nonchalant attitude of departments. [Apuke and Iyando \(2018\)](#) reported that students perceived that the lack of digital readiness among their staff and institution, absence of electronic library for easy accessibility to journals from the scientific database, and inefficient cybercafé and internet facility within their university settings were the main issues discouraging the utilization of the internet within their institutions.

Therefore, the skills and experience of staff and students in any institution of higher learning is very essential to widening or bridging the digital divide gap among institutions ([Hitt and Tambe, 2007](#); [Jan and Van Dijk, 2016](#);

Mutula and Van Brakel, 2006; Reisenwitz *et al.*, 2007; Selwyn, 2006). It therefore follows that the gap becomes more deepened where students and staff of a particular institution lack the requisite skills, knowledge and experience required for the effective utilization of ICTs. The issue of digital literacy among students and staff is also an essential area of concern in digital divide. Digital literacy helps individuals, students and staff to effectively utilize ICTs and the internet for their basic daily academic needs in school. Hence, deficiency in digital literacy is very essential indicator of digital divide. Therefore, eliminating digital literacy is an essential strategy for bridging perceived digital gaps among groups (Cava-Ferreruela and Alabau-Munoz, 2006; Demoussis and Giannakopoulos, 2006).

Research findings also point to the fact that geographical spread is also another salient index of digital divide. Urban dwellers have been showed to have more advantage over rural dwellers in terms of access to and utilization of ICTs and the internet (Flamm and Chaudhuri, 2007). It has been observed that there is a positive linear relationship between population growth, urban areas and ease of access to ICT and internet infrastructure (Billon *et al.*, 2009; Orviska and Hudson, 2009; Prieger and Hu, 2008; Savage and Waldman, 2009). Other factors include lack of digital infrastructure and services, lack of affordable network services, devices and applications, and more importantly, the lack of digital skills to create or add value.

### 2.3. Online Instruction Readiness of Universities

Current realities brought about by the menace of the novel corona virus pandemic and its consequence on the education sector has pointed to the defective structure of higher education in Nigeria. This has resulted in pressure from stakeholders in higher education for a digital transition to enable online instructional delivery to avoid the looming loss of academic calendar. To ensure effective transition to an on-line system of course delivery, it is imperative to assess the readiness of various institutions students and teachers (Kaur and Abas, 2004).

Institutional readiness for online mode of instruction is not only limited to availability of ICTs, internet infrastructure, and adequate power supply but also include students and staff e-readiness in terms of ICT skills and possession of relevant ICTs which is very paramount in the process of adopting and utilizing online mode of instruction. In a study Olatokun and Opesade (2008) showed that Nigeria's premier university e-readiness level is above average. Osuchukwu *et al.* (2018) revealed that ICT facilities are available in some private universities to some extent but they are issues of lack of some ICT facilities, inadequate technical staff, epileptic power supply and irregular internet connectivity.

Although, all students are required to take at least two mandatory courses on introduction to ICT and computer application with the objective of enhancing their ICT skills but several challenges contend with this namely, the use teachers without adequate knowledge and skills of ICT, lack of practical approach to teaching ICTs and large class size, poor student-ICTs facilities ratio (Ukpepi as cited in Nwankwoala (2015)). Weinraub as cited in Nwankwoala (2015) observed that if teachers continue to adopt traditional teaching methods, our nation will witness a decline in students' academic progress as the new digital methods are completely different from the outdated practices.

Many studies have assessed staff and students e-outlook in Nigerian tertiary institutions using variable related to ICT skills competence, frequency of access to internet, possessing of basic ICTs among others. For instance, Adetimirin (2012) conducted a survey of ICT literacy among undergraduate students in seven Nigerian universities spread across all the geo-political zones in Nigeria. The results revealed among other things that the most commonly used ICTs by students were computers, telephones and the internet. The study also revealed a sharp disparity among students in state owned universities and federal universities ICT skills competence with higher percentage of Federal universities students having ICT skills. Ajegbelen (2016), revealed in a study that there is a gap between university teachers and students ICT usage in classrooms and many students and lecturers depended on cybercafé in town for access to computers and the internet.

Taiwo and Adewuni (2013), revealed that most Nigerian universities now adopt e-application, e-admission, and e-registration. Similarly, Adegbija *et al.* (2012) some universities are fully or partially implementing the e-examination for assessing their students. These include National Open University of Nigeria (NOUN), University of Ilorin, Ilorin, Federal University, Minna, Covenant University, Ota, University of Nigeria, Nnsuka; and University of Lagos. Ajegbelen (2016), noted that private universities seem to be better since majority of them have 24 hours internet connectivity in their campuses and some provide laptops to their students and factor in the cost to the school fees structure. However, this may not be within the reach of the many average Nigerian students in public universities.

### 2.4. Objectives of the Study

1. The availability of ICT infrastructures among Nigerian universities
2. To assess the level of ICT skills competence among staff and students of universities
3. Examine the causes of digital divide among universities
4. The extent of online instruction delivery readiness among universities

### 3. Research Questions

1. What is the digital divide outlook among Nigerian universities?
2. What is the level of ICT skills competence among students and lecturers?
3. What are the causes of digital divide in Nigerian universities?
4. What is the extent of universities readiness for online instructional delivery?

## 4. Materials and Methods

This study employed the descriptive survey research design, six universities were selected, two federal, two states and two privately owned. The selected universities were: University of Calabar, University of Benin, (federally owned), Rivers State University of Science and Technology; Cross River University of Technology (state universities) and Arthur Jarvis University, Akpabuyo and Benson Idahosa University Benin City (private universities) all in South-South Zone, Nigeria. Three faculties were selected from each university. These include Education, Science and Social Sciences. Different departments were randomly selected within each of the selected faculties. The study population was 10,274 undergraduates during the 2020 academic session. Random sampling procedure was employed to choose undergraduates from all the levels in the selected departments using a sampling percentage of 20% to give a sample size of 2,596. The instrument for data collection was the questionnaire titled Digital Divide and Online Instruction Delivery Readiness Questionnaire (DDOIDRQ). The questionnaire was validated by three experts; two in Educational Management while one from Research and Evaluation (Educational Foundation), University of Calabar. The reliability of the instrument was established through Cronbach's alpha method. Fifty student respondents in Ebonyi State University, Abakalike were used for this purpose. The questionnaire collected data on demography, availability of ICT infrastructure, staff and student ICT skills, and online instruction readiness of universities. Data collected were analyzed using the Statistical Package for Social Science version 23 (SPSS) to get frequency and percentages.

## 5. Results

**Table-1.** Percentage analysis of the of institutional ICT profile of universities in South-South, Nigeria

S/N	Items	UNICAL (560)		UNIBEN (549)		CRUTECH (384)		RSUTECH (520)		AJU (164)		BIU (419)		100%	
		A	D	A	D	A	D	A	D	A	D	A	D	A	D
1.	24 hours internet access on campus	173	387	298	251	184	200	320	200	120	44	300	119	54	46
2.	Functional school website	500	60	490	59	300	84	420	100	150	14	319	100	78	22
3.	Availability of Classroom ICTs	198	362	300	249	150	234	220	300	100	64	264	155	58	42
4.	Effective participation in online class sessions	0	560	0	549	0	384	0	520	124	40	260	159	15	85
5	Online university library	294	266	279	270	299	85	309	211	114	50	319	100	52	48
6	e-registration system	560	0	549	0	384	0	520	0	164	0	419	0	10 0	0
	%	51	49	58	42	57	43	57	43	79	21	75	25	57	43

The results of analysis as presented on [table 2](#) shows that the digital outlook of universities in South-South, Nigeria reveals that over 54% as against 46% of the respondents agreed to having internet access on campus, 78% as against 22% of the respondents agreed that their universities have functional school websites, meanwhile, 58% as against 42% agreed to the availability of classroom ICTs. On the other hand, 85% as against 15% of the respondents have never participated in any form online class sessions in their universities. Meanwhile, 52% against 48% agreed to enjoying online library services and 100% of the respondents agree to full e-registration system in all the universities. Further observation reveals that 51%, 58%, 57%, 57%, 79%, and 75% of the total respondents of UNICAL, UNIBEN, CRUTECH, RSUTECH, AJU and BIU respectively responded positively to all items of the digital outlook.

**Table-2.** Percentage analysis of ICT Skills competency level of staff and students in universities in South-South, Nigeria

S/N	Items	UNICAL (560)		UNIBEN (549)		CRUTECH (384)		RSUTECH (520)		AJU (164)		BIU (419)		100%	
		H	L	H	L	H	L	H	L	H	L	H	L	H	L
7.	Use of Microsoft word skills	362	198	300	249	300	84	401	119	124	40	300	119	69	31
8.	Sourcing course materials online	410	150	380	169	294	90	320	100	150	14	460	59	78	22
9.	Power point presentation skill	259	311	352	197	304	80	235	285	100	64	286	133	59	41
10.	Effective participation in online class sessions	198	362	249	300	134	250	111	409	44	124	130	289	34	66
11	Use of e-book for studies	294	266	279	270	299	85	309	211	114	50	319	100	62	38
12	Use of e-mail	500	60	490	59	300	84	320	200	150	14	287	132	79	21
	%	60	40	62	38	71	29	56	44	82	28	68	32	57	43

The results of the analysis as presented on [table 3](#) shows that the ICT skills competency of students in universities in South-South, Nigeria reveals about 69%, 78%, 59%, 62%, and 79% of the entire respondents indicated high ICT skills competency with respect to use of Microsoft word, capacity to source for course materials online, power point presentations skills, use of e-book for studies, and use of e-mail. On the other hand, only 34% of the respondents had high capacity to participate in online class sessions. Meanwhile, 52% against 48% agreed to enjoying online library services and 100% of the respondents agree to full e-registration system in all the universities. Further observation reveals that 60%, 62%, 71%, 56%, 82%, and 68% of the total respondents of UNICAL, UNIBEN, CRUTECH, RSUTECH, AJU and BIU respectively indicated to have high level of ICT skills competency on all indices of ICT skills competency.

**Table-3.** Percentage distribution of the causes of digital divide among universities in South-South, Nigeria

S/N	Items	UNICAL (560)		UNIIBEN (549)		CRUTECH (384)		RSUTECH (520)		AJU (164)		BIU 419		100%	
		A	D	A	D	A	D	A	D	A	D	A	D	A	D
13.	Lack of basic ICT	356	204	294	255	256	128	410	110	144	20	352	67	70	30
14.	Lack ICT skills	401	159	300	249	244	140	300	220	100	64	310	109	64	36
15.	Power supply	359	201	349	200	284	100	320	200	104	60	319	100	63	37
16.	Internet connectivity	450	119	296	253	228	156	400	120	120	44	219	200	66	34
18.	Funds	320	240	360	189	184	200	380	140	80	84	250	69	57	43
19	Family background	291	269	349	200	204	180	291	221	124	40	300	119	60	40
	%	65	35	63	37	64	36	72	28	68	32	73	27	63	37

The results of the analysis as presented on [table 4](#) shows that the causes of digital divide in universities in South-South, Nigeria reveals about 70%, 64%, 63%, 66%, 57 and 60% of the entire respondents agreed that the causes of digital divide among universities namely lack of ICTs, lack ICT skills, power supply, internet connectivity funds and family background. Further observation reveals that institutionally 65%, 63%, 64, 72%, 68%, and 73% of the total respondents of UNICAL, UNIBEN, CRUTECH, RSUTECH, AJU and BIU respectively agreed to all the factors causing digital divide among universities.

**Table-4.** Percentage distribution of the level of online instruction delivery readiness among universities in South-South, Nigeria

	Items	UNICAL (560)		UNIBEN (549)		CRUTECH (384)		RSUTECH (520)		AJU (164)		BIU (419)		100%	
		H	L	H	L	H	L	H	L	H	L	H	L	H	L
20	Requisite technology to float online courses	198	362	169	380	150	234	200	320	100	64	300	119	39	61
21	All students and lecturers have PCs	189	371	195	354	184	200	170	350	120	44	292	127	44	56
22	Free internet access for staff and students	215	345	200	349	179	205	150	370	139	25	300	119	46	54
23	Standby technical support staff	200	360	149	400	184	200	200	320	84	80	200	219	39	61
24	There is constant power supply	120	440	149	400	180	204	220	300	64	100	289	130	39	61
	%	33	67	31	69	46	54	56	44	62	38	64	36	41	59

The results of the analysis as presented on table 4 shows that the ICT skills competency of students in universities in South-South, Nigeria reveals about 61%, 56%, 54%, 61%, and 61 of the entire respondents disagreed that their universities were ready for online instructional delivery. Further observation reveals that institutionally 67%, 69%, 54, 44%, 38%, and 36% of the total respondents of UNICAL, UNIBEN, CRUTECH, RSUTECH, AJU and BIU respectively disagreed to the readiness of universities for online instructional delivery.

## 6. Discussion of Findings

The finding of the study revealed an average positive digital outlook of universities in South-South Zone of Nigeria. Particularly, public universities had lesser percentage scores compared to private universities in terms of availability of basic information communication technologies namely internet access on campus, functional school websites, availability of classroom ICTs, online library services and e-registration system in all the universities. On the other hand, only a negligible 15% of the total respondents had participated in any form online class sessions in their universities. This shows the potentialities of our universities to switch into virtual learning. Consequently, the direction of the results of the study was highly anticipated as many other earlier studies point to similar facts that, many universities especially in developing country like Nigeria lack basic ICT facilities due to poor financial capacity to acquire and maintain them (Omorobi and Effa, 2018). Similarly, Aduwa and Iyamu (2005) found that, in Nigeria computer did not constitute classroom technology in over 90% of public schools.

Furthermore, the result also resonates with the findings of a survey carried out in 2017, which revealed a poor digital profile of Nigeria amongst other nations. The study showed that Nigeria ranked 143rd out of 176 countries on ICT development index. In the same vein, in terms of access sub-index Nigeria ranked 145<sup>th</sup>, on the use sub-index Nigeria ranked 147<sup>th</sup>, and on the skills sub-index Nigeria ranked 147<sup>th</sup>. All these indicators collectively place Nigeria among the lowest ranking least developed countries (Gillwald *et al.*, 2018). These factors have a contributory effect on the digital divide of universities. However, the study indicated a 100% e-registration method in all universities. This could be due to the fact that students' registration is more often than not carried out by private business operators within and outside the campus using their ICTs. Meanwhile endless queues are still observed in centers meant for some specific e-registration done by school ICT centers.

The most remarkable finding of the study was that all respondents indicated high ICT skills competency with respect to use of micro-soft word, capacity to source for course materials online, power point presentations skills, use of e-book for studies, and use of e-mail. This finding shows that a reasonable population of university students are highly competent in the use of various ICTs and applications. This is because, modern university students are relatively young and aware of the central role of ICT skills in enhancing active participation in the emerging knowledge economy (Choudrie *et al.*, 2005). Currently, almost every available job opportunity, ICT skills competency is touted as a strong added advantage for applicants (Helbig *et al.*, 2009). Therefore, students at this age and level of education are expected to possess some level of ICT competence. Basically, age and educational attainment have been closely linked to ICT skills competency level (Srinuan, 2012).

In addition, it was revealed that the causes of digital divide among universities include lack of ICTs, lack ICT skills, power supply, internet connectivity, funds and family background. The findings are in tandem with the results of numerous studies which indicated that, socio-economic status, skills, geography and education (Helbig *et al.*, 2009); GDP, per capita, access price, age, attitude, content, culture, ethnicity, family structure, gender, institution, structure and type of government, language, marital status, network effect, race, skill and experience, speed and quality of service (Crenshaw and Robinson, 2006; Cruz-Jesus *et al.*, 2012; Vicente and López, 2010). Are the main factors influencing digital divide in organizations and societies.

Finally, it was revealed cumulatively that the universities in South-South, Nigeria were not adequately ready for online instructional delivery as a result of the apparent lack of requisite technologies to float online instruction, lack of personal computers for both lecturers and students, free internet access technical support staff and lack of power supply. However, specific institutional percentage scores reveal that RSUSTECH, AJU and BIU were ready for online instructional delivery. These were mainly private institutions. This strongly aligns with the observation of Okocha (2020) that many Nigerian private universities have responded to the challenges of corona virus by continuing to develop online learning, while many public universities are waiting for their physical facilities to reopen before restarting services. This could be due to the ICTs infrastructural deficit in these schools (Kufaine, 2020). This situation was vividly described by Ajegbelen (2016) who decried that majority of Nigerian universities have not achieved NUC recommended system ratio for faculty and students, which specifies a ratio of at least one computer to every four students, and one PC to every two lecturers below the grade of lecturer I, one PC per senior lecturer and one notebook per reader/professor.

## 7. Conclusion

The study therefore concludes that, although there is presence of basic ICTs in various libraries and departmental resource rooms, they remain grossly inadequate, lack power supply, and internet access to initiate online lectures. Consequently, universities in South-South, Nigeria especially public universities lack the necessary ICTs, skills, and capacity required to embark on virtual learning. Therefore, digital divide exist among universities in South-South, Nigeria with public universities been more ICT disadvantaged perhaps due to the imbalance between available ICTs resources and student population, inadequate funding and the interplay of several variables like students family background, age among others.

## Recommendations

The following recommendations were made:

- i. Skilling up lecturers and students ICT competence through viral training and retraining.
- ii. Funding and procurement of ICTs and infrastructure needed to enhance online learning.

## References

- Adegbija, M. V., Fakomogbon, M. A. and Daramola, F. O. (2012). The new technologies and the conduct of e-examinations: A case study of National Open University of Nigeria. *British Journal of Science*, 3(59): 56-67.
- Adetimirin, A. E. (2012). ICT literacy among undergraduates in Nigerian universities. *Education Information Technology*, (3): 17. Available: <https://www.doi.org/10.1007/s10639-011-9163-y>
- Aduwa, O. S. and Iyamu, E. O. (2005). Using information and communication technology in secondary schools in Nigeria: problems and prospects. *Education Technology and Society*, 8(1): 104-12.
- Ajegbelen, A. J. (2016). The use of ICT to enhance university education in Nigeria. *International Journal of Education, Learning and Development*, 4(5): 1-11.
- Apuke, I. and Iyando, A. (2018). University students' usage of the internet resources for research and learning: forms of access and perceptions of utility. *Helyon*, 4(12): eo1052.
- Aydin, C. H. and Tasci, D. (2005). Measuring readiness for e-learning: Reflections from an emerging country. *Educational Technology and Society*, 8(4): 244-57.
- Benhayoun, J. E. (2020). *The new global university in the post-COVID-19 world*. World university news. <https://www.universityworldnews.com/post.php?story=20200704092348232>
- Billon, M., Marco, R. and Lera-Lopez, F. (2009). Disparities in ICT adoption: A multidimensional approach to study the cross-country digital divide. *Telecommunications Policy*, 33(10): 596-610.
- Blau, A. (2001). *More than bit players: How information technology will change the ways nonprofits and foundations work and thrive in the information age*. New York: Surdna Foundation.
- Bonfadelli, H. (2002). The internet and knowledge gaps: a theoretical and empirical investigation. *European Journal of Communication*, 17(2): 65-84.
- Cava-Ferreruela, I. and Alabau-Munoz, A. (2006). Broadband policy assessment: A cross-national empirical analysis. *Telecommunications Policy*, 30(8): 445-63.
- Choudrie, J., Weerakkody, V. and Jones, S. (2005). Realizing in the UK: Rural and urban challenges. *Journal of Enterprise Information Management*, 18(5): 568-85.
- Chukwu, S. A. J., Emezio, N., Emerole, N. and Nwakuo, O. (2018). Digitization in a nigerian university of technology: issues, challenges and way forward. Available: <https://www.researchgate.net/publication/324223906>
- Crenshaw, E. M. and Robinson, K. K. (2006). Globalization and digital divide: The role of cultural conduciveness and global connection in internet diffusion. *Social Science Quarterly*, 87: 190-207.
- Cruz-Jesus, F., Oliveira, T. and Bacoa, F. (2012). Digital divide across the European Union. *Information and Management*, 49(6): 278-91. Available: <https://doi.org/10.1016/j.im.2012.09.003>
- Darkwa, O. (2020). Impact of covid-19 on higher education in africa: The transition to online teaching and learning. Ghana times. Available: <https://www.ghanaiantimes.com.gh/impact-of-covid-19-on-higher-education-in-africa-the-transition-to-online-teaching-and-learning/>



- Demoussis, M. and Giannakopoulos, N. (2006). The dynamics of home computer ownership in Greece. *Information Economics and Policy*, 18(1): 73-86.
- Ebo, B. (1998). *The Cyberghetto or Cybertopia: Race, class, gender and marginalization in Cyberspace*. Praeger: New York.
- Flamm, K. and Chaudhuri, A. (2007). An analysis of the determinants of broadband access. *Telecommunications Policy*, 31(6): 312-26.
- Gillwald, A., Odufuwa, F. and Mthobi, O. (2018). The state of ICT in Nigeria. Research ICT Africa. Available: <https://researchictafrica.net/wp/wp-content/uploads/2018/12/After-Access-Nigeria-State-of-ICT-2017.pdf>
- Guma, A., Faruque, A. and Khushi, M. (2013). The role of ICT to make teaching and learning effective in higher institutions of learning in Uganda. *International Journal of Innovative Research in Science, Engineering and Technology*, 2(8): 134-46.
- Hargittai, E. (2002). Second-level digital divide: Mapping differences in people's online skills. *First Monday*, 7(4): Available: <https://doi.org/10.5210/fm.v7i4.942>
- Helbig, N., Gil-Garcia, J. R. and Ferro, E. (2009). Understanding the complexity of electronic government: Implications from the digital divide literature. *Government Information Quarterly*, 26(1): 89-97.
- Hitt, L. and Tambe, P. (2007). Broadband adoption and content consumption. *Information Economics and Policy*, 19(3): 362-78.
- Internet World Stats (2020). The digital divide, ICT and broad band internet. *Telecommunication Blog*: Available: <https://www.internetworldstats.com/links10.htm>
- Jan, A. G. and Van Dijk, M. (2016). Digital divide: Impact of access.
- Jayakar, K. P. (2004). Reforming the e-rate. *Info*, 6(1): 37-51. Available: <https://doi.org/10.1108/14636690410535917>
- Kaur, K. and Abas, Z. W., 2004. "An assessment of e-learning readiness at the open university Malaysia." In *International Conference on Computers in Education (ICCE)*. Melbourne, Australia.
- Kufaine, N. (2020). COVID-19 Pandemic exposes default instructional leadership in African universities. Available: <https://blog.aau.org/covid-19-pandemic-exposes-default-instructional-leadership-in-african-universities>
- Lentz, R. G. and Oden, M. D. (2001). Digital divide or digital opportunity in the Mississippi Delta of the US. *Telecommunication Policy*, 25(5): 291-313.
- MuNutt, J. G. (2008). Advocacy organizations and the organizational digital divide. Available: [https://www.researchgate.net/publication/253088679\\_Advocacy\\_Organizationsand\\_the\\_Organizational\\_Digital\\_Divide](https://www.researchgate.net/publication/253088679_Advocacy_Organizationsand_the_Organizational_Digital_Divide)
- Mutula, S. M. and Van Brakel, P. (2006). E-readiness of SMEs in the ICT sector in Botswana with respect information access. *The Electronic Library*, 24(3): 402-17.
- National Telecommunications and Information Administration (2004). *A nation online: Entering the broadband age*. Washington, DC: United States.
- Norris, P. (2001). *Digital divide*. Cambridge University Press: New York.
- Nwankwoala, H. N. L. (2015). An investigation of Lecturers' and students' use of ICTs in Nigerian university education as a panacea for national development. *Research on Humanities and Social Sciences*, 5(20): 167-76. Available: [www.iiste.org](http://www.iiste.org)
- OECD, v. (2006). Glossary of statistical terms. *Information and Communication Technology*:
- Okocha, S. (2020). *Private universities take the lead in online learning*. University World News. <https://www.universityworldnews.com/post.php?story=20200610100106348>
- Olatokun, W. and Opesade, A. (2008). An e-readiness assessment of Nigeria's premier university. *International Journal of Education and Development using ICT*, 2(2): 214-24.
- Omorobi, G. O. and Effa, I. O. (2018). ICT: a tool for curbing corrupt practices in the management of admission and examination in Nigerian universities. *International Journal of Educational Administration and Planning Research*, 10(2): 76-86.
- Organization of Economic Cooperation and Development (2001). *Understanding the digital divide*. A publication of OECD.
- Orviska, M. and Hudson, J. (2009). Dividing or uniting Europe? Internet usage in the EU. *Information Economics and Policy*, 21(4): 279-90.
- Osuchukwu, N., Obuezie, A. and Ogwuche, G. (2018). Availability and utilization of information and communication technology facilities in a private university library in Nigeria. *Information Impact Journal and Knowledge*, 8(3): 16-26. Available: <https://doi.org/10.431/ijikm.v8i3.2>
- Prieger, J. E. and Hu, W. M. (2008). The broadband digital divide and the nexus of race, competition, and quality. *Information Economics and Policy*, 20(2): 150-67.
- Reisenwitz, T., Iyer, R., Kuhlmeier, D. B. and Eastman, J. K. (2007). The elderly's internet usage: an updated look. *Journal of Consumer Marketing*, 24(7): 406-18.
- Rooksby, E., Weckert, J. and Lucas, R. (2002). The rural digital divide. *Rural Sociology*, 2(5): 179-210.
- Savage, S. J. and Waldman, D. M. (2009). Ability, location and household demand for Internet bandwidth. *International Journal of Industrial Organization*, 27(2): 166-74.
- Schleife, K. (2010). What really matters: Regional versus individual determinants of the digital divide in Germany. *Research Policy*, 39(1): 173-85.

- Selwyn, N. (2006). Digital division or digital decision? A study of non-users and low-users of computers. *Poetics*, 34(4): 273-92.
- Srinuan, C. (2012). *Understanding digital divide: Empirical studies of Thailand*. Unpublished Ph,D thesis submitted to Chalmers. University of Technology: Sweden.
- Taiwo, M. B. and Adewuni, S. O., 2013. "Trend analysis of candidates' enrolment in NABTEB Information and Communications Technology." In *Paper presented during the 2nd Institute of Education international conference, 2013, June 4 and 7, University of Ibadan, Ibadan, Nigeria*.
- Ugboma, M. U. (2012). Bridging the digital divide: with special reference to Nigeria. *Journal of Information and Knowledge Management*, 1(1-2): 1-10.
- UK essays (2018). ICT has changed the way people live, work and communicate. Available: <https://www.ukessays.com/essays/education/ict-has-changed-the-way-people-live-work-and-communicate-education-essay.php?vref=1>
- Uzoka, N. E. and Abolo, E. V. (2017). *Utilization of educational technology tools in the classroom: Challenges and prospects*.in S. A. Oyebade, S. A. Bello, S. A. Oladipo, M. A. Oladejo and O. A. Thomas (Eds.). *Managing education for sustainable development in Nigeria*. Department of Educational Management, University of Lagos: Lagos. 495-509.
- Van Dijk, J. A. G. M. (2005). *The deepening divide: Inequality in the information society*. Sage: London, UK.
- van Dijk, J. A. G. M. and Hacker, K. (2003). The digital divide as a complex and dynamic phenomenon. *Information Society*, 19(4): 315-26. Available: <https://doi.org/10.1080/01972240309487>
- Vicente, C. M. R. and López, M. A. J. (2010). A multivariate framework for the analysis of the digital divide: Evidence for the European Union-15. *Information and Management*, 43(6): 756-66.
- Wikipedia (2020). Digital divide. Available: [https://en.wikipedia.org/wiki/Digital\\_divide](https://en.wikipedia.org/wiki/Digital_divide)