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Ict Facilities and their Utilization for Educational Purpose in Nigerian Universities: A Review of Literature from 2004 to 2018

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**ABSTRACT**

*Information and Communication Technology (ICT) is now part and parcel of our daily life. In particular, education has been revolutionized due to the advent of this technology. With this, teaching, learning, assessment and even research are now done differently. As a result, Nigeria promulgated an IT Policy in the year 2001. However, not much is known about the ICT facilities that are available in our schools, and how these facilities are being utilized for educational purposes. This paper reviews studies conducted from 2004 to 2018 in Nigerian Universities that are related to the availability of ICT facilities, and how the facilities are being utilized for academic purpose. A thorough search with different online search engines resulted in sixty-four (64) relevant studies. Here, we present the result of the review with a view to getting better insight on the issues, and we also proffer a way forward in the area.*

**Keywords:** ICT Facilities; Utilization; Educational Purposes; Nigerian Universities.

**INTRODUCTION**

The swift progress in Information and Communication Technologies (ICT) has led to changes that are affecting all aspects of our societies and increasingly becoming important in our daily lives. The impact is in the transformation it has brought in support of the human day-to-day activities. This has had an impact on real human cognition and has affected the way we think and in some respects altered the way we think (Yushau, Mji & Wessels, 2005). Education is one sector that has benefited most from these advancements. Now, time and space are no longer barriers to education. In what is now popularly known as *distributed learning*, people use a wide range of computing and

communications technology to provide learning opportunities beyond the time and place constraints of the traditional classroom. As a matter of fact, the concept of distance learning has been revolutionized to what is now known as *e-learning*, *blended learning* or *web-based learning* programs. These technologies have made available different training methods that have hitherto been difficult for human instructors to use.

However, as Papert (1990) rightly notes “technology is not the cause of anything either positive or negative, but rather should be thought of as a tool that society can use to shape the environment” (in Edwards, 2001, p. 221). However, the real challenge is how to best utilize these technologies to achieve our

educational objectives. In other words, how can we use technology to serve as a catalyst for positive change and as an accompaniment to enrich the teaching and learning situation rather than making a knowledge of it being an end in itself. When used in this sense, research has shown that the benefits of using ICT in education are immeasurable and incomparable to traditional teaching approaches (Yushau, 2005). However, there is a large variation even in the developed countries, where there is minimal infrastructural problem, in the way and manner ICT facilities are being utilized for academic purposes. However, the issue is more serious in the developing countries like Nigeria, due to what is popularly known as “digital divide”. In an attempt to bridge this digital gap, the Nigerian National policy on education has acknowledged the role of ICT to national development, and therefore encouraged the integration of ICT in all level of education. In particular, for the higher education, there is an encouragement boosted by the National University Commission (NUC) policies in support of Universities ICT development policies. In line with this, the NUC as a matter of deliberate policy initiated the move to get Nigerian Universities to embrace ICT through its Nigerian Universities Management of Information System (NUMIS) project (Raymond, 2006). There are presently at least nine ICT for education initiatives at various stages of development being carried out by the education coordinating agencies of government and the ministry of education (Raymond, 2006).

Despite all of these efforts and initiatives, there is a lack of consensus on what the actual problem that is slowing down the use of ICT at the academic institutions is,

at least for core academic purposes. As a matter of fact, not much is known about the availability and utilization of ICT facilities in the Nigerian Universities, especially for educational purposes. This paper reviews studies conducted in Nigerian universities with regards to the availability and utilizations of ICT facilities for educational purposes.

### **ICT Policy in Nigeria**

The increasing globalization driven by ICT makes it imperative for Nigeria as an emerging market to irreversibly consider the application and promotion of ICT strategy to facilitate its rapid growth and development (National Policy on ICT 2012, p. 9)

Nigeria has recognized the importance of ICT as a necessary tool for its sustainable development. It is this recognition that brings about the development and approval of the Nigerian National Policy on IT in the year 2001 for the revitalization of the country in general, and its educational sector in particular. The policy has a vision statement to make Nigeria an IT capable country in Africa and a key player in the sector globally. This policy has recognized the role that ICT can play in the revitalization of the Nigerian educational system, and hence called for the integration and proper utilization of ICT in mainstream education and training. One third of the objectives in the policy are educational. These are: to integrate IT into the mainstream of education and training; to establish new multi-faceted IT institutions as centres of excellence to ensure Nigeria’s competitiveness in international markets; to

set up Advisory standards for education; and to develop human capital with emphasis on creating and supporting a knowledge-based society. An update to this policy has harmonized all existing policies in the Information and Communications Technology Sector into a Single Information and Communications Technology Policy (National Policy on ICT, 2012). The National Communication Commission (NCC) is saddled with the implementation of communication policy while National Information Technology Development Agency (NITDA) is responsible for the implementation of Information Technology (IT) Policy. Furthermore, some of the implementation strategies, according to the document, include the restructuring of the education system at all levels to respond effectively to the challenges and emerging impact of the information age and in particular, the allocation of a special IT development funds to education at all levels. It is worth nothing that not only the government, other non-governmental organizations are also helping in funding the integration of ICT at all levels of education in Nigeria. As the first IT policy was dated 2001, it can be said that ICT has been officially in education for the last seventeen years. It is in view of this that this paper sets to review studies conducted in the Nigerian universities to find out how far so far on the availability and utilization of these ICT resources in the Nigerian universities.

## METHODOLOGY

The study adopted a thematic review approach for data collection in this study. Literature from 2004 to March 2018 that investigated issues related to availability and utilization of ICT facilities in Nigerian

universities form the data for this review. However, the scope of our search was restricted to published journal articles only as well as studies conducted at the university only. Similar studies conducted in other tertiary institutions, secondary schools and primary schools were not considered in this study. Similarly, we did not consider other studies published in conference proceeding. A thorough search through google and google scholar search engines resulted in numerous literatures. The search strings used was (“availability”, “utilization”, “information and communication technology”, “education”, “Nigeria” AND “Universities”). This search string was used with an aim of retrieving highest number of relevant studies available online. We did not make any attempt to search for any papers that are not visible online. Retrieved studies which were found not very relevant to the review were discarded. After a thorough screening of the downloaded literature, sixty-four (64) were found relevant to the study. And these are the papers that were reviewed in this study. The next section gives the summary of the papers.

## *Studies on ICT in Nigerian Universities*

Intensive search into different research conducted in Nigeria on the availability and utilization of ICT facilities in various universities in Nigeria reveals many studies. However, no result was found from the year 2000 –2003. This is understandable, as the policy that might have officially gingered the integration of ICT into education was promulgated in the year 2001. Therefore, time is required for the program to develop and research to be conducted to evaluate the program. As a result, in this review, our search is restricted to the last fifteen years, precisely from 2004 to 2018.

Table 1 gives the summary of all what we have obtained in our thorough search. Column 2 gives the name(s) of the author(s) together with the year the work was published. While Column 3 gives the title of the article, and

column 4 indicates the university or universities where the study was conducted. The full references of all the articles are fully cited at the end of this paper.

**Table I:** The Summary of the Empirical Studies Conducted on the Availability and Utilization of ICT Facilities in the Nigerian Universities From 2004 to 2018.

S/No	Author	Title	Sampled University (ies)
1	Oyelaran-Oyeyinka and Adeya (2004)	Dynamics of adoption and usage of ICTs in African universities: a study of Kenya and Nigeria	Ten (10) Universities in Nigeria and Kenya
2	Olu (2005)	Information and communication technology (ICT) literacy among the staff of Nigerian university libraries	Eighteen (18) Nigerian universities
3	Anunobi (2006)	Dynamics of internet usage: A case of students of the Federal University of Technology Owerri (FUTO)	Federal University of Technology Owerri (FUTO)
4	Adekunle, Omoba and Tella (2007)	Attitudes of Librarians in Selected Nigerian Universities toward the Use of ICT	University of Ibadan; Ladoko Akintola University of Technology, the Polytechnic Ibadan, and International Institute of Tropical Agriculture
5	Jegede, Dibu-Ojerinde and Illori (2007)	Relationships between ICT competence and attitude among some Nigerian tertiary institution lecturers	Five (5) Universities and five (5) Colleges of Education
6	Olatokun (2007)	Availability, Accessibility and Use of ICTs among Nigerian Women Academics	6 universities in South Western Nigeria
7	Oyelekan (2008)	An overview of the Status of Information and Communication Technology (ICT) in the Nigeria Education System	Related literatures on the status of ICT in the Nigerian Educational sector
8	Aduke (2008)	Usage and Challenges of Information Communication Technology (ICT) in Teaching	Nigerian Universities

S/No	Author	Title	Sampled University (ies)
9	Nkanu (2008)	Utilization of information and communication technology facilities in Nigerian university libraries	13 Nigerian Universities
10	Womboh and Abba (2008)	The state of information and communication technology (ICT) in Nigerian university libraries: The experience of Ibrahim Babangida Library, Federal University of Technology, Yola.	Federal University of Technology, Yola
11	Archibong and Effiom (2009)	ICT in University Education: Usage and Challenges among Academic Staff	Cross River University of Technology (CRUTECH)
12	Kamba (2009)	Problems, challenges and benefits of implementing e-learning in Nigerian universities: An empirical study	18 Universities, 3 from each geo political zone
13	Emojorho and Nwalo, (2009)	Availability and use of ICTs in collection management in University and special libraries in the Niger-Delta Region, Nigeria.	University and special libraries in the Niger-Delta Region, Nigeria
14	Archibong, Ogbiji and Anijaobi-Idem (2010)	ICT Competence among Academic Staff in Universities in Cross Rivers State, Nigeria	CRUTECH and University of Calabar (UNICAL)
15	Nweze (2010)	The use of ICT in Nigerian universities: A case study of Obafemi Awolowo University, Ile-Ife.	Obafemi Awolowo University, Ile-Ife
16	Krubu and Osawaru (2010)	The impact of information and communication technology (ICT) in Nigerian University libraries	University of Benin and Benson Idahosa University
17	Ani (2010)	Internet access and use: A study of undergraduate students in three Nigerian universities	University of Calabar, Calabar; University of Uyo, Uyo, and

S/No	Author	Title	Sampled University (ies)
18	Etebu (2010)	ICT availability in Niger Delta University libraries	Rivers State University of Science and Technology, Port Harcourt Niger Delta University (NDU) main Library. Niger Delta University College of Health Sciences (NDUCHS) Library.
19	Ifeakor and Okoli (2010).	Appraisal of the availability and utilization of new technological resources for science curriculum delivery in Nigerian universities	Nine (9) Universities four federal and five state-owned universities in South- East states of Nigeria
20	Oviawe and Oshio (2011)	Impact of Information and Communication Technology on Teaching and Learning Ability of Education Students in Universities in Edo State, Nigeria	University of Benin, Benin City and Ambrose Alli University, Ekpoma
21	Adeyemi (2011)	Impact of information and communication technology (ICT) on the effective management of universities in South-West Nigeria	Two (2) Universities each from Lagos State, Osun State and Ondo State. Making a total of 6 Universities in all.
22	Egberongbe (2011)	The use and impact of electronic resources at the University of Lagos	University of Lagos
23	Akuegwu, Ntukidem, Ntukidem and Jaja (2011)	Information and communications technology (ICT) facilities utilization for quality instructional service delivery among university lecturers in Nigeria	2 Federal Universities and 2 State own Universities from Akwa Ibom State and Cross River State
24	Madu and Pam (2011)	Learning electronically in Nigeria universities: The example of federal university of technology Minna, Nigeria.	Federal University of Technology, Minna, Nigeria
25	Oye, Salleh and Iahad (2011)	Challenges of E-Learning in Nigerian University Education Based on the Experience of Developed Countries	Nigerian universities

S/No	Author	Title	Sampled University (ies)
26	Haliso (2011)	Haliso, Y. (2011). Factors affecting information and communication technologies (ICTs) use by academic librarians in Southwestern Nigeria	Universities and other tertiary institutions in the South-Western region of Nigeria.
27	Eke (2011)	Modeling LIS students' intention to adopt e-learning: a case from university of Nigeria, Nsukka.	University of Nigeria, Nsukka
28	Oye, Iahad and Rahim (2012)	Acceptance and usage of ICT by university academicians using UTAUT model: A case study of university of Port Harcourt, Nigeria	University of Port Harcourt (UNIPORT)
29	Anyamene, Nwokolo and Anyachebelu (2012)	Availability and Use of Information and Communications Technology Resources for Counselling University Students in South East States, Nigeria.	Nine (9) Universities from the South-East States, Nigeria
30	Atsumbe, Raymond and Duhu (2012)	Availability and Utilization of e-Learning Infrastructures in Federal University Of Technology, Minna	Federal University of Technology (FUT), Minna
31	Utulu and Alonge (2012).	Use of mobile phones for project based learning by undergraduate students of Nigerian private universities	Three (3) Private universities from South Western Nigeria
32	Agboeze, Ugwoke and Onu, (2012).	Utilization of e-learning technology resources in accounting education instructional delivery methods in Nigerian universities.	Nigeria Universities
33	Adetimirin (2012).	ICT literacy among undergraduates in Nigerian universities.	Seven (7) Universities across Nigeria.
34	Eze, Awa, Okoye, Emecheta and Anazodo (2013)	Determinant factors of information communication technology (ICT) adoption by government-owned universities	One university in each of the state capital of the South-eastern Nigeria

S/No	Author	Title	Sampled University (ies)
35	Agbatogun (2013)	in Nigeria: A qualitative approach Interactive digital technologies' use in Southwest Nigerian universities	South-West Nigerian Universities
36	Danner and Pessu (2013)	A Survey of ICT Competencies among Students in Teacher Preparation Programmes at the University of Benin, Benin City, Nigeria	University of Benin
37	Omonijo, Nnedum, Fadugba, Uche and Biereenu-Nnabugwu (2013)	Social Vices Associated with the Use of Information Communication Technologies (ICTs) in a Private Christian Mission University, Southern Nigeria.	Private Christian Mission University, Southern Nigeria
38	Ohiwerei, Azih & Okoli (2013)	Problems militating against utilization of ICT in teaching of business education in Nigerian universities.	Nigerian universities
39	Obahiagbon and Osahon (2014)	Information and Communication Technology (ICT) Key Tool for Enhancing Teaching and Learning in Nigeria: A Study of Two Tertiary Institutions in Benin Metropolis	University of Benin and Benson Idahosa University
40	Quadri, Adetimirin and Idowu (2014)	A Study of Availability and Utilization of Library Electronic Resources by Undergraduate Students in Private Universities in Ogun State, Nigeria	Babcock and Redeemers Universities
41	Egoeze, Misra, Akman and Colomo-Palacios (2014)	An Evaluation of ICT Infrastructure and Application in Nigeria Universities	Fifteen (15) universities from different region of Nigeria
42	Hamilton-Ekeke and Mbachu (2015)	The Place of Information, Communication and Technology (ICT) in Teaching and Learning in Nigerian Tertiary Institutions	Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria



S/No	Author	Title	Sampled University (ies)
43	Timothy, Olufunke and Paul (2015)	Assessment of information communication technology availability, use and challenges by the staff of the Nigerian Institute of Medical Research	Nigerian Institute of Medical Research (NIMR)
44	Nwachukwu and Asom (2015)	Utilization of computer technology for academic work by lecturers of university of Jos-Nigeria	University of Jos
45	Amusa and Atinmo (2016)	Availability, Level of use and Constraints to use of Electronic Resources by Law Lecturers in Public Universities in Nigeria	All the sixteen (16) state, and fourteen (14) federal universities in Nigeria that offer law programmes.
46	Nkoyo and Egbe (2016)	Availability and Utilization of Electronic Resources by Postgraduate Students in a Nigerian University Library: A Case Study of University of Calabar, Nigeria	University of Calabar (UNICAL)
47	Ani, Ani, Ugwu, Nwachukwu, Obianuko, Ndaji and Maduchie (2016)	Strategies for Enhancing the Utilization of Information and Communication Technology (ICT)-Based Library Resources in Research	Federal (University of Nigeria, Nsukka), State (Ebonyi State University, Abakiliki), and Private (Madonna University, Okija Anambra)
48	Adavebiele (2016)	The use of ICT to enhance University Education in Nigeria	Five University from the braced state (South-South) of Nigeria
49	Jumare, Tahir and Hamid (2017)	The Use of ICT in Nigerian Universities: A Study of Kaduna State University, Kaduna	Kaduna State University, Kaduna
50	Onwukanjo and Men (2017)	Information Resources Availability and Accessibility on User Satisfaction: Case Study of Federal University of Technology, Minna Library	Federal University of Technology, Minna
51	Enakrire and Ocholla (2017)	Information and communication technologies for knowledge management in academic libraries in Nigeria and South Africa	Nigeria and South Africa

S/No	Author	Title	Sampled University (ies)
52	Olelewe and Okwor (2017)	Lecturers' perception of interactive whiteboard for instructional delivery in tertiary institutions in Enugu State, Nigeria	Six Tertiary Institutions in Enugu State
53	Oyewole and Oladepo (2017)	Information Needs and Computer Self Efficacy as Factors Influencing Use of Electronic Reference Services by Undergraduates in a Nigerian University	Federal University of Technology Akure
54	Ntui, Robert and Usang (2017)	Economic challenges and prospects associated with the utilization of Information and Communication Technology (ICT) for library services in universities in Cross River State Nigeria	Universities in Cross River State
55	Ajebomogun, Okunlaya and Alawiye (2017)	Analytical study of E-learning resources in national open University of Nigeria	National Open University of Nigeria (NOUN), Abeokuta study center
56	Tella, Orim, Ibrahim and Memudu (2017)	The use of electronic resources by academic staff at The University of Ilorin, Nigeria	University of Ilorin
57	Fabunmi and Awoyemi (2017)	Computer efficacy as determinant of undergraduates' Information Communication Technology competence in state-owned universities in the South-West, Nigeria	Five State-owned Universities in South-West
58	Thomas and Oladejo (2017)	Teacher-Trainees' Perceptions of ICT (Information Communication Technology) Integration in Nigerian Teacher Education Programme	University of Lagos
59	Falode, Shittu, Gambari and Falode (2018)	Relationship between Students' ICT Background Exposure, Access to ICT Learning Facilities and Academic Achievement in	Federal University of Technology (FUT), Minna

S/No	Author	Title	Sampled University (ies)
60	Agboola, Okorie, Omotoso, Bamigboye and Bello (2018)	Undergraduate Educational Technology Programme Electronic information usage of academics as correlate to research output in a Nigerian University of Agriculture.	Federal University of Agriculture, Abeokuta, Nigeria.
61	Daramola (2018)	Impact of computer-based test In Nigeria tertiary institutions: A theoretical view	Nigerian Universities
62	Iroaganachi and Izuagbe (2018)	A Comparative Analysis of the Impact of Electronic Information Resources Use Towards Research Productivity of Academic Staff in Nigerian Universities.	Five State-owned Universities in South-West
63	Otunla and Amuda (2018)	Nigerian Undergraduate Students' Computer Competencies and Use of Information Technology Tools and Resources for Study Skills and Habits' Enhancement	Three Universities in Rivers State, Nigeria
64	Egoeze, Misra, Maskeliūnas and Damaševičius (2018)	Impact of ICT on Universities Administrative Services and Management of Students' Records: ICT in University Administration	Ten (10) Universities in Nigeria

**Table 2:** The Number of Studies Each Year

S/N	Year	Frequency	Percentage (%)
1	2004	1	1.5
2	2005	1	1.5
3	2006	1	1.5
4	2007	3	4.7
5	2008	4	6.3
6	2009	3	4.7
7	2010	6	9.4
8	2011	8	12.5
9	2012	6	9.4

10	2013	5	7.8
11	2014	3	4.7
12	2015	3	4.7
13	2016	4	6.3
14	2017	10	15.6
15	2018	6	9.4
<b>Total</b>		<b>64</b>	<b>100</b>

**RESULTS AND DISCUSSION**

Many studies were found to have been conducted in Nigerian universities with regards to the use of ICT for educational purposes. In our thorough online search, sixty-four (64) studies were found to be published in the last fifteen years on the subject matter. However, it should be noted that search depends completely on those papers whose details are currently found online. Those papers that are published but not found online are not included in our review. On the average, four papers were

published annually throughout the period of this review (2004 - 2018). It is worth noting that search for the years before 2004 did not yield any result. And hence, we naturally restrict ourselves to the last fifteen years.

Perusing through the published papers that were reviewed, it can be seen that the main issue that attracted the attention of most of the researchers is how ICT facilities is being utilized. Table 3 indicates that 40% of the total studies conducted have something to do with ICT utilization or use.

**Table 3:** Research Problem Area and their Frequency

S/N	Research Area	Frequency	Percentage (%)
1	Use or Utilization	34	40.0
2	Availability of facilities	13	15.3
3	Challenges of Use	11	12.9
4	Literacy and Competency	8	9.4
5	Impact of ICT facilities	6	7.1
6	Accessibility of ICT facilities	4	4.7
7	Attitude	3	3.5
8	Perception	3	3.5
9	Self-efficacy	2	2.4
10	Satisfaction	1	1.2

The second issues that attracted the attention of the researchers are the Availability of the ICT resources (15.3%). This is followed by the Challenges that are militating against the ICT use or integration

in education (12.9%), then by ICT Literacy and Competency (9.4%). Slightly more than 7% of the research is the Impact of ICT facilities in education, while 4.7% researchers investigated issues related to Accessibility of

ICT facilities. Other issues that attracted less attention are Attitude (3.5%), Perception (3.5%), Self-efficacy (2.4%) and Satisfaction (1.2%)

The studies reviewed vary in terms of the number and combination of the variables they studied. Some of these studies investigated only one variable. These include: Attitude towards ICT (Adekunle, Omoba & Tella, 2007), Perception toward ICT (Thomas & Oladejo, 2017; Olewewe & Okwor, 2017), Challenges of utilization of ICT facilities (Agboola et al., 2018 Ntui, Robert & Usang, 2017; Amusa & Atinmo, 2016; Ohiwerei, Azih & Okoli, 2013; Oye, Salleh & Iahad, 2011; Archibong & Effiom, 2009; Aduke, 2008), Accessibility of ICT facilities (Falode et al., 2018; Onwukanjo & Men, 2017; Ani, 2010). However, most of the studies studied more than one variables or relate more than one variables. A sample of these studies is the one that investigated the relationships between ICT competence and attitude among some Nigerian tertiary institution lecturers (Otunla & Amuda, 2018; Jegede, Dibu-Ojerinde & Ilori, 2007); Usage and Challenges (Danner & Pessu, 2013; Archibong, Ogbiji & Anijaobi-Idem, 2010); Availability and utilizations of ICT facilities (Jumare, Tahir & Hamid, 2017; Adavebiele, 2016; Amusa & Atinmo, 2016; Hamilton-Ekeke & Mbachu, 2015; Egoeze et al., 2014; Obahiagbon & Osahon, 2014; Anyamene, Nwokolo & Anyachebelu, 2012).

A pattern of interest of the researchers cannot be deciphered from the studies in the period of the review. For instance, although it is understandable that studies on Attitude were in the year 2006 and 2007, however, it is difficult to understand that the study on Perception was carried out in 2017 (see Table 3). It is also surprising that only three studies investigated Attitude though both

researchers and educators have emphasized the role that students and teachers' attitudes toward ICT play as a crucial factor in the successful use of computers in the teaching and learning (Yushau, 2006). Similarly, ICT Perception, as important as it is, attracted the attention of less than 4 % of all the research conducted. Utilization was studied throughout the period. In the same vain, studies on ICT Literacy, Competency, Acceptability, Accessibility that are supposed to be determining factors of the ICT utilizations were studied scarcely and intermittently in the review period. This seems to indicate that the research lacked a national focus, and seems everyone is studying what he feels, with no recourse to what value the research can add to the existing knowledge of the issue. With this, it is very difficult to measure the contribution of research to national development. Perhaps, professional bodies such as Nigeria Computer Society (NCS) and Computer Educators Association of Nigeria (CEAN), for instance, should be the pace-setter in determining the burning national issues in the area in which research is needed. And hence, research should be targeted to those issues, and the aim should be to add value to the existing knowledge, inform practice, and/or guide the policy makers on the right direction based on compelling data.

Not only that, none of the research problems in all the studies reviewed deeply looks into the core educational issues like learning and how students are learning with ICT facilities, and teaching and how teachers are teaching with ICT facilities. In particular, despite the fact that online assessment is gradually becoming the norm, only one study was found on ICT and assessment (Daramola, 2018). This is surprising as JAMB (Joint

Admission and Matriculation Board), post-JAMB and many general courses in many universities in Nigeria are now conducted using this computer-based assessment. Studies are needed on how students are coping with this type of assessment, and how that assessment is affecting students' performance.

Also, it is not surprising that despite heavy investment in ICT in education, there is little evidence of ICT integration and use in the teaching and learning processes (Bello & Aderbigbe, 2014). However, this is not uniform but rather differs from one institution to the other (Akuegwu, Ntukidem, Ntukidem & Jaja, 2012). Although this is more or less a general problem in the developing

countries (Gulbahar, 2007), the Nigerian case is lamentable. In particular, Opati (2013) reported that the problem is due to the fact that ICT environment at universities is fraught with a plethora of challenges that hampers full integration in teaching and learning despite the fact that findings have shown that ICT is indispensable for enhancement of teaching and learning (Obahiagbon & Osahon, 2014; Archibong & Effiom, 2009). Therefore, we tend to incline more here with Akker, Keursten & Plomp (1992) who concluded that the problem is more of the fact that the necessary measures were not taken before introducing the innovation.

**Table 4:** Concentration of Studies

S/N	Concentration	Number of studies	Percentage (%)
1	Teaching and learning	6	9.4
2	Teaching	2	3.1
3	Learning	3	4.6
4	Assessment	1	1.6
5	Students Undergraduate	14	21.9
	Post-graduate	1	1.6
6	Lecturers (Teachers)	15	23.4
7	Administration (Management)	3	4.6
8	Library	11	17.2
9	Staff and Students	1	1.6
10	Others	7	11.0
<b>Total</b>		<b>64</b>	<b>100</b>

Other factors found to be militating against integrating ICT facilities in the teaching and learning include: lack of political commitments from the government down to the school administration (Haliso, 2011); lack of facilities (Atsumbe, Raymond & Duhu, 2012; Fabunmi, 2009); available facilities that are lying dormant and

underutilized due to lack of awareness (Ifeakor & Okoli, 2010); lack of access to the facilities (Adavebeile, 2016; Obahiagbon & Osahon, 2014). Other factors identified are: lack of ICT knowledge and experience (Nwachukwu & Asom, 2015); lack of training (Amusa & Ainmo, 2016; Nkoyo & Egbe, 2016; Ani et al., 2016; Quadri et al., 2014; Archibong

et al., 2010). Bello and Aderbigbe (2014) identify inadequate communications infrastructure, limited financial resources inadequate public private partnership, limited data management capacity. Low bandwidth, and inadequate supply of electricity was also found to be among the challenges (Agboola et al., 2018; Nkoyo & Egbe, 2016; Ohiwerei et al., 2013; Atsumbe et al., 2012); obsolete computer (Onwukanjo & Men, 2017; Quadri et al., 2016); and negative attitude toward ICT (Jegade et al., 2007).

As noted earlier, the area that attracted the attentions of most of the researchers is the area of Availability and Utilization of ICT facilities. Findings from these studies are inconclusive. While some studies are indicating that there are adequate ICT facilities in the universities (Jumare, Tahir & Hamid, 2017; Nkoyo & Egbe, 2016; Obahiagbon & Osahon, 2014), others are reporting the opposite (Adavebiele; Amusa & Ainmo, 2016; Hamilton-Ekeke & Mbachu, 2015; Egoeze et al., 2014; Anyamene, Nwokolo & Anyachebelu, 2012; Madu & Pam, 2011). Furthermore, in the case where the facilities are available, some studies reported that the facilities are there dormant and underutilized (Hamilton-Ekeke & Mbachu, 2015; Egoeze et al., 2014), while others found that the facilities are being adequately utilized (Jumare et al., 2017; Quadri, Adetimirin & Idowu, 2014). This finding is not surprising, but rather highlighted the fact that each university has its own peculiarity, history, development, and priorities. Therefore, studies are expected from each university narrating their experience and ICT historical development.

On the area of ICT literacy and Competency, a low competency among academic staff was reported (Archibong et al., 2010), and this is contrary to what was

reported for the students (Otunla & Amuda, 2018; Danner & Pessu, 2013). These findings are not contradictory though more studies are needed in this area. This is true because ICT literacy and competency are necessary for proper integration and utilization of ICT in education. And ICT attitude was found to correlate with ICT competency (Jegade et al., 2007). Furthermore, Computer Efficacy was found to have a significant relationship with ICT competence (Fabunmi & Awoyemi, 2017).

On the other hand, students were found to have positive perception towards ICT (Mbakwem, 2007), and no study was found on the academic staff ICT perception, which indicates the paucity of research in the area. Other areas of studies with scarce research are computer ownership, though studies have found computer ownership to be a predictor of students' performance at the university level (Yushau, 2005), and correlate with computer experience of academic staff (Yushau, 2006). However, no study was found throughout the period of our review on the implication of computer ownership to learning, teaching or assessment. Only one study reported that a "high number of them [staff] have laptops" (Archibong et al, 2010).

A good number of the research is on the academic staff (Iroaganachi & Izuagbe, 2018; Agboola et al., 2018; Archibong et al., 2010; Archibong & Effiom, 2009). Even among the academic staff, some studies concentrate on the staff of a particular Faculty or Department (Amusa & Atinmo, 2016; Ohiwerei et al., 2013). However, only one study was found in this review conducted specifically on women academics (Olatokun, 2007).

Similarly, a good number of the studies was on students, but not as much as that of academic staff. Most of the studies are

done with undergraduate students (Falode, 2018; Otunla & Amuda, 2018; Fabunmi & Awoyemi, 2017; Oyewole & Oladepo, 2017; Quadri et al., 2014; Utulu & Alonge, 2012; Anyamane et al., 2012; Madu & Pam, 2011; Ani, 2010). Only one study was found specifically done with post graduate students (Nkoyo & Egbe, 2016), and none specifically for female students.

In the course of this review, we have not seen any substantial improvement in the quality of the research conducted during this period of the review. In fact, we observed some weaknesses and lopsidedness in some of the research that we intend to highlight here so that beginners in research can take good care of them in the course of conducting their research. For instance, the samples in some of the studies are either not representative of the population or are not large enough for the finding to be significant (see for instance Quadri et al., 2014; Onwukanjo & Men, 2017). This makes it difficult for the study to be generalized.

In addition, it is problematic to note that 84.4% of the research reviewed are quantitative in nature (see Table 5), and only 1.6% are qualitative, 6.2% mixed design and 7.8% a review paper. This is contrary to the

global trends of research, which is now more into qualitative and mixed research as compared to pure quantitative research. Although most of the studies are quantitative in nature, it was very difficult to identify the kind of research design used in some of the studies. Many claimed to be using descriptive survey design, however, their data collection and analysis indicated the contrary (see for instance Ani et al., 2016; Nkoyo & Egbe, 2016; Egoeze et al., 2014; Obahiagbon & Osahon, 2014; Danner & Pessu, 2013; Agbatogun, 2013; Oviawe & Oshio, 2011; Aduke, 2008; Adekunle et al., 2007).

Sequel to the above, more than 80% of the reviewed studies used questionnaire as the instrument for data collection. However, very few were careful in reporting the rigors followed in establishing validity and reliability of the instrument (see for instance Thomas & Oladejo, 2017; Egoeze et al., 2014; Danner & Pessu, 2013; Anyamane et al., 2012; Atsumbe et al. 2012). Some did not even report the validity and reliability of the instrument (see Oyewole & Oladepo, 2017; Jumare et al., 2017; Amusa & Atinmo, 2016; Ani et al., 2016; Obahiagbon & Osahon, 2014; Quadri et al., 2014; Utulu & Alonge, 2012; Eberongbe, 2011).

**Table 5: Research Design Concentration**

S/N	Design	Number of Studies	Percentage
1	Quantitative	54	84.4%
2	Qualitative	1	1.6%
3	Mixed	4	6.2%
4	Review of literatures	5	7.8%
<b>TOTAL</b>		<b>64</b>	<b>100%</b>
Quantitative	Descriptive survey	41	75.9%



Inferential statistics	13	24.1%
<b>Total</b>	<b>54</b>	<b>100%</b>

Also, it can be observed that in some cases, the response rate of the instrument is contradictory to the data (see for instance, Ani *et al.*, 2016; Obahiagbon & Osahon, 2014; Oviawe & Oshio, 2011; Nweze, 2010; Archibong *et al.*, 2010; Anunobi, 2006).

In fact, there are cases in which the research finding contradicts what the research is set to investigate. For instance, a study that “investigated the awareness, accessibility, level of satisfaction and effectiveness in the utilization of ICTs in enhancing teaching and learning ...” (Obahiagbon & Osahon, 2014), found: “Computer systems and internet services are found to be available in the two universities, but there is unavailability of Online Electronic library, Multimedia projector, Television and Video recorder. The study also revealed that ICT facilities are used for the purposes of teaching and learning in the universities. The result of the hypothesis

indicated a strong relationship between the use of ICT tools and the enhancement in teaching and learning” (Obahiagbon & Osahon, 2014). Therefore, these kinds of apparent inconsistencies should be avoided in our research.

Furthermore, one area that is also problematic is the way the data were analyzed. Since most of the studies are quantitative studies, understandably, statistical approaches were used for the analysis. However, as can be seen in Table 5, almost 76% of the analysis is done using basic descriptive statistics. This simply means that the research questions raised and addressed in most of the studies are at the basic level. Perhaps, that might inform why none of the findings is a breakthrough or has far reaching educational implications. And only 24.1% of these studies appeared to use the inferential statistics in their analysis, and some in a crude way.

**Table 6:** Distribution of Reviewed Literatures Based on Geopolitical Zones

S/N	Geopolitical Zone	Number of Studies	Percentage
1	North-Central (NC)	7	10.9%
2	North-East (NE)	1	1.6%
3	North-West (NW)	-	0%
4	South-South (SS)	12	18.7%
5	South-East (NE)	9	14.1%
6	South-West (SW)	19	29.7%
7	South	1	1.6%
8	Nigeria	15	23.4%
<b>Total</b>		<b>64</b>	<b>100%</b>

Another observation from the review is the disproportionate distribution of the research in terms of the geopolitical zones that they were conducted. As can be seen from Table 6, out of 64 reviewed literatures, 41(64%) of the studies are from the Southern part of Nigeria while only 8(12.5%) are from the North. 15(23.4%) of the studies are comprehensive that cut across all the region of the country. Furthermore, of the 41(64%) studies which concentrated mainly in Southern Nigeria, 19 (29.7%) are from the South-West, 9(14.1%) from South-East and 12(18.7%) studies are from the South-South region. 7 (10.9%) of the studies are conducted in the North-Central region, while only one study was conducted in the North-East and none from the North-West. These findings indicate that there is a serious need for more research in some of the regions especially the North-Eastern and North-Western part of the country.

One common error that is found in most of the research papers is that most of the recommendations have nothing to do with their research findings. In summary, the following are the main recommendations of the studies: equipping the universities with adequate ICT facilities, training and retraining of staff and students on use of ICT facilities for academic purposes, provision of stand-by generators/ installation of Solar power, inverters and battery systems in all ICT centers to ensure constant power supply and also rewarding hard working staff who adopted and are using ICT for academic purposes. Also, Universities should subscribe to large internet bandwidth to enable faster browsing and downloading of files as this will motivate lecturers to use the internet and also save precious time.

## CONCLUSION

In this paper, we have reviewed studies that investigated issues related to the availability and utilizations of ICT facilities in the Nigerian universities from the period 2004 to 2018. A comprehensive online search resulted in getting sixty-four (64) relevant studies. Most of the studies are concerned with the issues related to the availability and utilizations of ICT facilities, and the challenges of use. In the areas of the findings, a slow rate of ICT integration in education was reported. Although this might be considered as a general problem in a way, it has long been observed that this is as a result of insufficiently taking into account factors that are crucial when introducing change in educational settings (Akker, Keursten & Plomp, 1992). They argue that:

In many countries the number of computers in schools has considerably increased in recent years. However, little progress has been made: still few teachers are actual users; software use is often restricted to drill and practice type; the alignment with the curriculum pattern is poor. Research results (of both surveys and case studies) from many countries point to the conclusion that there is still a long way ahead before computer use will be effectively integrated in most classrooms (p. 65)

Other issues that attracted the attention of some researchers include: ICT Literacy, Competency, Accessibility, Acceptability, as well as the Attitude towards ICT and ICT Perception of both staff and students. However, we observed that there is

lack of coherency and focus in the studies reviewed. Similarly, as technology is rapidly growing, our research is far behind. In particular, no study was found looking deeply into core educational issues as they relate to ICT. For instance, there is only one study that looks into online assessment or computer-based testing. Similarly, even those that look into issues related to teaching and learning, do that superficially. No single study looks into how the teachers are using ICT facilities to facilitate their teaching or how students are using ICT facilities to facilitate their learning process.

Although the quality of the publications is not part of our objectives in this review, but it became glaring that there was no substantial improvement on the quality of the research in the period of this review. Many methodological flaws can easily be detected in some of the papers. Some of the papers are not well conceived, lack focus, are poorly written and the research problems inappropriately-posed.

## RECOMMENDATIONS

Apart from this, there is the need for Nigerian researchers to move ahead and direct our research questions into real educational issues (teaching, learning and assessment) and how ICT can be better utilized in that direction.

Fouts (2000) concluded that educators and researchers that are looking to the future, are no longer asking the question "Should technology be used in education?", instead he concluded that futuristic questions researchers are asking is "How should technology be used to help students achieve higher levels?" More research is needed to answer several critical questions as technology is thoughtfully deployed

throughout our schools. Ten of such critical questions that require the attention of researchers for further study according to Fouts (2000), are:

1. How can technology increase student learning and assist students in meeting the standards?
2. Do students learn and retain more with the aid of computers?
3. How does the use of computers affect classroom climate and student attitudes?
4. What are the conditions that must be in place for technology to effectively improve student learning and especially the achievement of "at-risk" students?
5. How can technology serve as an extension of human capabilities and cognitive functioning?
6. What specific cognitive skills are enhanced by the use of technology for learning?
7. How can online assessment be used to enhance student learning and accountability?
8. What are the effective deployments for a technology rich learning environment?
9. What constitutes effective and adequate teacher training?
10. How can technology improve productivity in all aspects of district, school, and classroom management?

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