FACTORS INFLUENCING THE USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN TEACHING AND LEARNING IN PUBLIC-PRIVATE TERTIARY INSTITUTIONS IN KADUNA STATE, NIGERIA

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Abstract

This study examines factors that influence the use of information and communication technology (ICT) in teaching and learning within public and private tertiary institutions in Kaduna State, Nigeria. A purposive sampling technique was employed to select 300 respondents for the study. Pearson Product Moment Correlation and Chi-square techniques were employed to analyze the study's quantitative data. The study results reveal that there is positive correlation between level of parent income and ICT usage by students; also, there is a significant difference between environmental factors and ICT usage by students. The study concludes that there is positive relationship among facto rs influencing the adoption of ICT (personal characteristics, organizational capacity, support factor and availability factor) in teaching and learning in public and private tertiary institutions. In this regard, the study recommends that public and private tertiary institutions in Kaduna State should continue to promote the use of ICT for teaching and learning.

Keywords: ICT, teaching, learning processes, tertiary institutions

Introduction

The use of Information and Communication Technology (ICT) in educational system, most especially in tertiary institutions has been widely advocated as much needed in 21st-century for knowledge and skills to enhance teaching and learning process, governments and policymakers

encourage such for betterment of larger society. (Noor & Ul-Amin 2013). Hence, ICT serve as a major tool for easing teaching process, as well as mechanism at the school educational level that could provide a way to rethink and redesign how to improve the understanding of students, thus leading to quality education for all (Olaore, 2014). However, ICT is a term that covers all forms of computer and communication equipment and software used to create, store, transmit, interpret, and manipulate information in its various formats that aid for teaching and learning process to effectively take place (Albert, Sangrà, Mercedes, González & Sanmamed, 2010). In the current information age, educational institutions are expected to play a crucial role as the engine for knowledge generation and learning environment. Thus, information communication becomes the vital means of facilitating this task (Noor & Ul-Amin 2013). ICT has becomes an essential part of our everyday life and cannot be avoided. This is due to the fact that using ICT in education has become the most effective factors for improving educational system (Tosun & Baris 2011).

Thus, the design of educational programme by the use of ICT in Nigeria, had under gone many changes through many years, "shifting from a talking head" approach to more interactive and dynamic programme that link(s) students to the Programme around teaching method which, make them to be proactive. More so, Noor and Ul-Amin (2013) cited that, education policy makers and planners cleared what educational outcomes (goals and objectives) to be targeted, therefore the broad goals should guide the choice of technologies to be used and their modalities of use. Furthermore, the potentials of each technology vary according to how it is used and what is to be used for. Sanyal (2001) identified at least five (5) levels of technology use in education: Presentation, demonstration, drill and practice, interaction and collaboration, adopting these will enhances smooth teaching and learning process.

Moreover, focusing on the need to develop appropriate strategies that will enhance the new teaching method in tertiary institutions by integrating ICT in teaching and learning processes, through the role and the perspective of teachers have become highly relevant, highlighting them as crucial players in this process (Olaore, 2014). Particularly, teachers use technology depending on their method and their trust in the way they can contribute to the teaching and learning process. Hence, there is need to appraise the impact of ICT in enhancing the qualitative education with particular emphasis on tertiary institution most especially in the context of teaching and learning. However, some literature shows mixed results. On one hand, while some demonstrates that there is no evidence of a key role for ICT in higher education (Angrist & Lavy, 2002). On the other hand, some studies show a real impact of ICT on students' achievement (Fushs & Wossman,

2004 & Talley, 2005). While Antonietti et al. (2006) and Ainley et al. (2008) concluded that, there was no significant difference between online and face-to-face teaching and learning method of education. Therefore, the existing gap on this phenomenon it becomes imperative to provide empirical evidence on factors that influences the use of ICT in teaching and learning on public and private tertiary institutions in Kaduna State.

According to Bada, Adewole and Olalekan (2009) the study examined the uses of computer and its relevance to teaching and learning in Nigerian secondary schools, Adegbite (2017) analysis the Impact of ICT on the Performance of Students in Secondary School, Oyo State while Onyebueke (2016) examines the role of ICT in enhancing teaching and learning in primary schools. All these studies focused on primary and secondary schools and not in public and private tertiary institutions which are the focus of the current study thereby leave a gap in knowledge in terms of factors influencing the use of ICT in teaching and learning on public and private tertiary institutions.

Also, the existing studies like Nidhi and Sunita (2019) with 15 respondents is considered inappropriate thereby creating a gap for this study. While Eslamian, and Khademi (2017) used linear regression analysis method, fail to address the problem of multicollinearity, and leaves a hug gap needed to be filled. Therefore this paper intends to identifies the void left unfilled by current studies and attempts to fill the gap by analyzes the effect of (ICT) on teaching and learning processes in public and private tertiary institutions in Kaduna state. Therefore, the study will achieve specific objectives through general objectives by examine the factors influencing the use of ICT in teaching and learning processes Also, analyzing the environmental factors affecting the use of ICT, As well, to identified the relationship between the use of ICT in public and tertiary institutions in Kaduna state.

Thus, the study will answer the research questions as, what are the factors that influence the use of ICT in teaching and learning process also, what are the environmental factors that affect the use of ICT in teaching and learning process? More so, what is the relationship between the use of ICT, in public and private tertiary institutions of Kaduna state. Furthermore, the null hypotheses are; there are no significant factors that influence the use of teaching and learning of ICT also, there is no significant relationship between environmental factors and the use of ICT, as well, there is no significant relationship between the use of ICT, in public and private tertiary institutions in Kaduna state. Information and Communications Technology (ICT) in Teaching and Learning Process broadly refers to tools and services that handle and communicate information which is widely used in our everyday life, and its need is in ever-growing level of

educational sector. Images, audios, videos, presentations or combination of these used for teaching and learning constitute ICT in education (Sanyal, 2001). So, ICT in education can use information and communication to improve teaching and learning process. Some of the most common examples of ICT are mobile phones, smartphone's, computers, laptops and televisions.

However, Technology in education isn't something new, but not many have information about ICT in education industry. This is because ICT comes with several constraints, one of which is ensuring access to electronic devices for every student. But with more institutes investing in ICT, the problem should soon be resolved.

The concept of ICT based learning on the use of electronic technology to provide quality and affordable education to the reach of larger population in the society regardless of background and status. Hence, according to Albert et al., (2010) the strength of ICT application in tertiary education and academic works are demonstrated in the following areas:

a) Online examination: the ICT facilities enable students to take examination using internet platform irrespective of their locations. This is also known as electronic examination (e-examination).
b) Computer based drills: computer aided programmers (software packages) with animations and interactive platform are created to provide study environment that is effective and dynamic for students to learn. This is known as electronic drill (e-drill).
c) Online book: this is known as e-book. E-books are available online and are mostly found in digital library. Student course content can be in form of e-book and documented online for easy access and use.
d) Online counseling: the use of ICT base technology to provide academic counseling has become increasingly common. It is common these days to have students and their academic course counselors or lecturers interact via social media platform, mobile phone communication etc. Teleconferencing is also used among senior academic /non-academic staff and research groups. This gives room for the students to ask questions without being subjected to undue pressure or anxiety.
e) Electronic sound (e-sound) book: this uses ICT based technology – internet facilitated, to provide electronic aided book that supports students especially the visually impaired. The student listens to their study material (course book) contents online.

Importance of ICT in Tertiary Education

a) ICT education can enable broader participation and fair access to acquire higher education by providing the students (learners) the

opportunity to start learning and to select courses and necessary support in terms of the students' requirements.

b) ICT can provide a virtual environment that supports students to take innovative and creative learning with others by the means of simulations of real time events, online programmed, or teamwork with other researchers and education providers.

c) ICT can offer personalized learning experience for all students, including the physically challenged, those in remote or far distance location from their institutions of learning.

d) ICT based learning offers the opportunity for a range of academic tools that can motivate and encourage teachers and students to become creative, innovative and

e) ICT provides the opportunity for stakeholders in educational sector from different institutions of higher learning to form online research communities where innovative and creative ideas are easily shared.

f) ICT promotes healthy and robust competition among professionals and experts in various intuitions of higher education globally.

g) ICT can facilitate easy and direct access relationship between tertiary institutions and industries, which can lead to immediate transformation of research works into real world application.

h) ICT can eliminate barriers to academic excellence by making available new and creative ways of encouraging and engaging staff and students so that everyone can be inspired to attain their educational potentials.

Challenges of ICT in Tertiary Institutions in Nigeria

a) The cost of purchasing and installing ICT gadgets/facilities is high.

b) The cost of networking and data transmission is on a high side.

c) The cost of managing ICT Centre so that it provide stable network and access to internet is expensive.

d) Implementation and management of ICT centers in tertiary institutions in Nigeria still suffers from dearth of skilled manpower.

e) Staff in institutions of higher learning is inadequately trained and is not well exposed to recent digital technology.

f) Unstable power supply generally affects the efficiency of work in all sectors of the economy including the ICT. This also holds in the management and maintenance of ICT facilities in tertiary institutions in Nigeria.

g) Literacy and ICT compliance level among staff and students appears to be low especially in the area of research and training.

h) Telecommunication infrastructures in Nigeria are still not adequate and reliable enough to support efficient e-learning programme

Theoretical Framework: Constructivist Theory

The constructivist approach is based on the belief that learners can construct and create knowledge from prior experiences in their environment (Hammond, 2014& Kozma, 2018). The proponents of this theory shift the focus from the teacher who was traditionally believed to be the source of knowledge to the learner (Anderson 2017; Kozma, 2018). Two approaches of the constructivist theory were used one targeting teachers' understanding of individual learners and the other that focuses on group learning.

Constructivism can be an approached in a way that targeted individual learners as well as groups of learners as advanced by Jean Piaget (Hammond, 2014; Anderson 2017). The theory explains that a learner assimilates new knowledge that adds to an existing body of knowledge. It is therefore important for teachers in the process of integrating ICT to understand that learning can be based on individual discovery and interpretation of information. This realization would help the teacher to emphasize the active participation and involvement of learners to harness their creativity and produce individuals fit for the 21st Century (Hammond, 2014).

The second approach to the constructivist theory is social constructivism that emphasizes collaboration as opposed to individual learning (Kuzma, 2018). The proponents of this theory argue that learners grasp concepts better when they work in mixed-ability groups where they share experiences and come up with a common understanding. In such a scenario, the teacher must create a classroom environment that is based on cooperation, democratic principles, and shared creation of content that makes the learners have a sense of ownership of knowledge (Ottested, 2010). This theoretical understanding was crucial for this study because, in low-resource settings where ICT facilities may not be enough for every learner, the teachers can encourage collaborative learning through device sharing that will enhances teaching and learning process to effectively take place.

Research Methodology

This study used Survey research design. Survey refers to a particular type of research design where the collection and use of data from a given population give researchers opportunity to gain greater understanding about individual or group perspective relative to a particular concept or topic of interest (Polencic, 2010). The design was considered appropriate for this study because the researcher collected data from the sample with a view to describing the entire population. Secondary data on the study area was obtained from the state ministry of education, Ministry of Science and

Technology Kaduna, Kaduna ASC report, Kaduna State ministry of finance, Kaduna State strategic plan 2019-2029.

The participants of this research are made up of students selected from the tertiary institutions in Kaduna state. The State has a total of 50 public and private tertiary institutions. The study used multi stage sampling technique to divide the tertiary institutions according to senatorial zones after which 4 tertiary institutions were selected from each of Zone I and Zone 2 senatorial district while two Tertiary institutions were selected from Zone 3 senatorial district. Therefore, ten tertiary institutions were selected for this study namely: 1). Ahmadu Bello University, Zaria: 2). Federal College of Education, Zaria: 3). Nuhu Bamalli Polytechnic, Zaria; 4). Ameer Shehu Idris College of Advanced Studies Zaria: 5). Kaduna State University Kaduna; 6). Kaduna Poly Technics: 7). Green field University Kaduna; 8). College of Agric and Animal Science Kaduna; 9). College of Education Gidan Waya Kafanchan and 10). School of Midwifery, Kafanchan. Purposive sampling method was used to draw the sample size for this study due to unavailability of data on the total number of students in Kaduna State tertiary institutions. Nevertheless, according to Sang et al. (2016), a sample size of 200-500 is adequate for rigorous analyses such as multiple regressions, analysis of covariance or log linear analysis. Thus, 30 students were sampled from each of the selected institutions to make up a sample size of 300 for this study.

The study used Questionnaires as the research instruments for data collection. In order to achieve the objectives of the study, three hundred (300) questionnaires were distributed to the participants. This method was used to obtain data directly from the students who are directly affected by the different reforms (2006). Closed ended questionnaire was used. In this, the respondents were provided with options to choose from options provided. The questionnaire comprises two sections as follows: Section A: Demographic Information of Respondents, Section B: level of ICT usage on students' academic performance in tertiary institutions, institution Validity of the Research Instrument According to Mullar (2008), validity of a research instrument assesses the extent to which the instrument measures what it is designed to measure. The instrument used for this study was designed by the researcher and validated by two experts from the Department of Computer Science and Department of Education Administration and Planning from Federal College of Education, Zaria and Ahmadu Bello University, Zaria respectively. Validity and reliability increase transparency, and decrease opportunities to insert researcher bias in qualitative research (Tondeur, 2010) in (Temte et al., 2011). After, the observations and corrections from the experts, their inputs, and suggestions

were incorporated to improve the instrument. Thus, the questionnaire was modified and standardized in relation to the objectives of the study.

The reliability of the study refers to a measurement that supplies consistent results with equal values (Vanderlinde et al., 2016) and measures consistency, precision, repeatability, and trustworthiness of a research (Vibe et al. 2017) cited in (Temte et al. 2011). Before the actual survey, a pilot survey was conducted where the questionnaire was pre-tested. The pilot study was carried out in two institutions. Namely: Shehu Idris College of Health Sciences, Makarfi and the Division of Agric College (DAC) Zaria. The questionnaire was administered to 40 respondents who were not part of the selected sample. Consequently, a reliability index of 0.72 was obtained using Cronbach alpha reliability method. The value was considered high enough; hence the instrument is reliable and adequate for the study.

The study administered three hundred (300) questionnaires on the respondents. Two research assistants were employed to hasten the distribution and collection of filled questionnaires. Before embarking on the exercise training was conducted for the research assistant to be familiar with the instrument and also to know the modality of carrying out the exercise. Frequency, percentage, Pearson Product Moment Correlation and Chi-square statistical techniques were employed for analysis. All hypotheses were tested at 0.05 level of significance.

Table 1: Demographic Information of Respondents

	FREQ.	PERCENT
SEX		
Male	230	78.5
Female	63	21.5
Total	293	100
MARITAL STATUS		
Married	57	19.5
Single	185	63.1
Divorced	14	4.8
Separated	24	8.2
No response	1-3	4.4
TOTAL	293	100%
EDUCATION		
Primary	16	5.5
Secondary	98	33.4
N.C.E	64	21.8
H.N.D	35	11.9

B.Sc	39	13.3
Others	34	11.6
No response	7	2.4
Total	293	100
OCCUPATION		
civil servant	144	49.1
Farmer	91	31.1
Trader	38	13
no response	20	6.8
Total	293	100
AREA		
Gra	62	21
Urban	101	35
Semi urban	47	16
Rural	76	26
no response	7	2
Total	293	100

Source: Field Survey, 2023

From table 1, it can be seen that a total 293 questionnaires were responded to and returned out of which 230 (78.5%) of the respondents are males while the rest are females. Of the 293 respondents, 185 (63.1%) are single while 95 (32.5%) represent the respondents that are either married or divorced or separated and 13 (4.4%) of the respondents did not indicate their marital status. Educational status of the parents can play a significant role in the academic performance of their children. 16 (5.5%), 98 (33.4%), 64(21.8%), 35 (11.9%), 39 (13.3%) and (34 (11.6%) are holders of primary, secondary, NCE/ND, HND, First Degree and higher certificates respectively while 7 (2.4%) respondents did not show their level of education. In terms of occupation of the parents, table 3 shows that 144 (49%), 91 (31%) and 38 (13%) respondents are civil servants, farmers and traders respectively. 20 (7%) respondents did not indicate their occupations. On the area of residence of the respondents, 62 (21%), 101 (35%), 47 (16%) and 76 (26%) respondents reside in GRA, Urban, semi-urban and rural areas respectively while 7 (2%) did not indicate their areas residence.

Table 2: Parent level of income, Payment of school fees and other expenses

	FREQ.	PERCENT

INCOME		
low income	187	63.8
middle income	87	29.7
high income	19	6.5
Total	293	100
Who pay your school fees?		
Parents	190	65
Relative	49	17
Others	35	12
NO RESPONSE	19	6
Total	293	100
Who paid for other expenses that might occur in the course of your study?		
Parents	165	56
Relative	45	15
Others	73	26
NO RESPONSE	10	3
Total	293	100
Did you have full financial support from your parent?		
Yes	155	53
No	138	47
Total	293	100

Source: Field Survey, 2023

Table 2 shows that out of the 293(100%) responded questionnaires, 187(63.8%), 87(29.7%) and 19(6.5%) respondents belong to the low income, middle income and high income classes respectively. this shows that majority of the students come from poor families. On payment of school of fees, 190(65%), 49(17%) and 35(12%) of the respondents have their school fess paid by their parents, relative and others (who are neither their parents nor their relatives) respectively while 19(6%) of the questionnaires were not responded to. Similarly, the students show that with regard to other expenses incurred in the course of study such as transport, accommodation books, photocopies and so on, 165(56%), 45(15%) and 73(26%) of them revealed that such expenses are taken care of by parents, relatives and others respectively. Sill on financial support, only 155(53%) receive full financial supports from their parents while 138(47%) do not get full financial supports from their parents which confirms the inability of many parents to

financially cater for their children education fully which may be due to poverty among other reasons. In terms of academic performance measured based on the current CGPA of students 29(10%) of the respondents' CGPA is below 1.00 which is Fail, 122(41.6%) of the respondents' CGPA is between 1.00 and 2.39 which is Pass, 74(25%)of the respondents' CGPA is 2.40-3.49 rated merit (average students), 44(15%)of the respondents' CGPA is between 3.50 4.49 rated credit (Good Students) while 24(8%) of the respondents' CGPA is between 4.50 and 5.00 rated distinction (Excellent students). These responses show that more than 50% of the students have their current CGPA between 0.00 and 2.39 fail and pass results.

Table 3: Socio-Economic factors influencing Usage of ICT

FACTORS AFFECTING PERFORMANCE		
Socioeconomic problems	135	46
inadequate resources/ICT	76	26
attitudes of teachers and students to teaching and learning	40	14
Electricity failure	16	5
NO RESPONSE	26	9
Total	293	100
INCOME AFFECTS PURCHASING OF COMPUYER		
Yes	202	69
No	85	29
NO RESPONSE	6	2

Source: Field Survey, 2023

Table 3 revealed the responses of students on factors affecting usage of ICT shows that 135(46%) of the total responses state socioeconomic factors such as poverty and inflation as the major factors. 76(26%) and 40(14%) show inadequate resources/ICT and attitudes of teachers and students to teaching and learning as the main factors. On whether income affects students' effort to use computer, 202(69%) of the respondents have shown that the level of income has a tremendous effect on their academic performance. However, 85(29%) of the respondents have attributed other factors such as inadequate resources/ICT and attitudes of teachers and students to teaching and learning as the significant factors affecting academic performance

Table 4: Type of secondary school attended, tertiary institution of study, Area of Study in and current level

SCHOOL TYPE		
Public	215	73
Private	78	27
Total	293	100
At what tertiary institution do you study?		
University	30	14
Poly Technics	97	33
College of Education	157	53
Total	293	87
What is your area of study?		
Humanities/Education,	185	63
Science/Education	57	20
Engineering/Law,	13	4
Medicine/Pharmacy	38	13
Others		
Total	293	100
What level are you presently?		
100level/ND1/NCE 1	50	17
200level/ND II/NCEII	167	57
300Level/HND I/NCEIII	35	12
400Level/HNDII	3	1
500l/600Level	38	13
Total	293	100

Source: Field Survey, 2023

Table 4 shows that 215(73%) of the respondents attended public secondary schools while 78(27%) attended private secondary schools. For the tertiary institutions, 30(14%) of the respondents are university students, 97(33%) are Polytechnic Students while 157(53%) are students from Colleges of Education which have the majority of the students mostly from low income families. 185(63%) of the respondents study Humanities/Education, 57(20%) study Sciences, 13(4%) study Engineering/Law while 38(13%) study Medicine/Pharmacy. 50(17%) of the students are in 100level/ND1/NCE 1 (fresh students) while the rest continuous students constituting 83% of the respondents

Table 5 :Pairwise Correlation between Level of Income and ICT usage

	Income	ICT usage

Income	Pearson Correlatio	1	.614**
	Sig. (2-tailed)		.000
		293	293
ICT usage	Pearson Correlation	.614**	1
	Sig. (2-tailed)	.000	
		293	293

Source: Field Survey, 2023 and IBM SPSS Statistics 20

Table 5 reveals a high positive correlation between level of income and students' ICT usage exist as shown by the Pearson correlation coefficient 0.614. This is an indication that poverty retards the usage of ICT in public and private tertiary institutions that lead to improve academic performance

Table 6: Environmental Factors and ICT Usage

	Rate of facility			**Total**
	30	50	70	
School Facilities	109	73	2	184
Electricity	48	20	19	87
Security	1	10	8	19
Total	158	103	29	290
Chi-Square	**Value**		**Df**	**Prob.**
Pearson Chi-Square	45.427		4	0.00
Likelihood Ratio	42.698		4	0.00

Source: Field Survey, 2023 and IBM SPSS Statistics 20

Table 6 presents the cross tabulation for environmental factors based on school facilities. Out of the 184 respondents that rate low facilities 30, 109 rate 50 and 2 rate 70 respectively. Out of the 87 respondents that indicated the level of electricity in the tertiary institution is low by 30 per cent, 48 rated the level of electricity average with 50 per cent and 19 indicated 70 per cent. This shows that majority of students and staff that use ICT in tertiary institution could not have good access to it because of inadequate facilities in schools. In the Chi-Square test 2, the Pearson Chi-Square is 45.427 showing that we can reject the Ho at 5% level of significance meaning that there is a significant difference environmental factors and ICT.

Usage of ICT between public and private tertiary institution

Table 7: Cross Tabulation and Chi-square Test for usage of computer

	Rate			remark
	Low	Average	Higher	
Public Institutions	118	51	43	Excellence
Private Institutions	10	49	19	Good
Total	155	81	54	290

Chi-Square	Value	Df	Prob.
Pearson Chi-Square	48.33	2	0.00
Likelihood Ratio	42.09	2	0.00

Source: Field Survey, 2023 and IBM SPSS Statistics 20

Table7 the usage of ICT between public and private tertiary institution. Out of the 212 students who attended public tertiary institution use computer, 118 (56%) of them show low, 51(24.1%) average and 43(20.3%) show higher. Out of the 78 respondents who attended private institution, 10(13%) rated low, 49(63%) obtained average and 19 (24%) indicated higher. By comparing the current ranking, in the percentages representing 55.7% in public institutions while for those who attended private institutions are 13%. This is an indication that students in private institutions used more computer than those from public tertiary institutions. Chi-square 4 shows the Pearson chi-square results as 48.33 at 0.05 level of significance implying that we can reject Ho which means there is a significant difference of ICT usage between public and private tertiary institution This result is consistent with the fact that most poor parents cannot afford to send their children to private tertiary institutions schools due to their income levels.

Conclusion and Recommendations

This paper concludes that poverty has a negative and significant effect on students' ICT usage in public and private tertiary institutions. Nevertheless, there are other factors that, affect the usage of ICT in public and private tertiary institutions in Kaduna state, such as, Socioeconomic problems, inadequate resources/teaching materials, attitudes of teachers and students to teaching and learning, examination malpractice that affect students' academic performance. The study recommends that government; families and other stakeholders should provide adequate ICT facilities that will initiate the collaborative efforts geared towards improving teaching and learning. This can be done through government awards, philanthropic

intervention and other means that can assist in improving teaching and learning process. Also if government will provide credit facilities to students to be paid after graduation upon securing a job this will go a long way in helping the students concentrate on their study and enhance their academic performance.

References

Adeoye Y.M., Oluwole A. F., and. Blessing L. A. (2013) Appraising the Role of Information Communication Technology (ICT) as a Change Agent for Higher Education in Nigeria, *International Journal of Educational Administration and Policy Studies*, 5(8), pp177-183.

Adegbite, A.F, (2017). Analysis of the Impact of ICT on the Performance of Students in Secondary School, Oyo State. *International Journal of Research in Business Studies and Management Volume 4* (8), pp23-29.

Ajayi,I.A. & Ekundayo,H.(2009).The Application of Information and Technology in Nigeria Secondary Schools. *International NGO Journal* 4(5), pp282.

Ainley, J., Enger, L., & Searle, D. (2008). *Students in a Digital Age: Implications of ICT for Teaching and Learning.* In J. Voogt & G. Knezek (Eds.), International Handbook of Information Technology in Primary and Secondary Education pp63-80. New York: Springer.

Albert Sangrà & Mercedes González-Sanmamed (2010) The Role of Information and Communication Technologies in Improving Teaching and Learning Processes in Primary and Secondary Schools. DOI: 10. 1080/09687769.2010.529108

Anderson, N. Law, & A. Quale (2017.), Cross-National Information and Communication Technology. Policies and Practices in Education. Charlotte, North Carolina: IEA.

Antonietti, A., & Giorgetti, M. (2006). Teachers' Beliefs About Learning from Multimedia. Computers in Human Behaviour, 22, pp267-282.

Angrist, J. & Lavy, V. (2002). New Evidence on Classroom Computers and Pupil Learning. *Economic Journal* 112(482): pp735–765.

Bada, T, Adewole, A. & Olalekan, O, (2009). Uses of Computer and its Relevance to Teaching and Learning in Nigerian Educational System. *Educational Research and Review 4*(10), pp443-447.

Bakkabulindi F. E. K., Mugagga A. M., Shopi J. M., & Kabasiita J. (2015). Application of the Unified Theory of Acceptance and use of Technology to the use of ICT by Undergraduates in the School of Education, Makerere University, African Higher Education Review (AHER), (9) 1&2, 4-17.

Egoeze F., Misra S., Maskeliūnas R., and Damaševičius R. (2018). Impact of ICT on Universities Administrative Services and Management of

Students Records: ICT in University Administration, *International Journal of Human Capital and Information Technology Professionals*, 9(2), pp1-16.

Balanskat, A., & Gertsch, C.A. (2010). *Digital skills working Group*. Review of National Curricula and Assessing Digital Competence for Students and Teachers: Findings from 7 countries. Brüssels: European Schoolnet.

Eslamian, D & Khademi, B, (2017). Effect of Information and Communication Technologies on Academic Achievement of High School Students in Neyriz. *American Journal of Humanities and Social Sciences 5*(2), 11-16 DOI: 10.11634/232907811705871.

Ezugwu A. E., Ofem P. O., Rathod P., Agushaka J. O., and Haruna S. (2016). An Empirical Evaluation of the Role of Information and Communication Technology in Advancement of Teaching and Learning, 2nd International Conference on Intelligent Computing, Communication & Convergence (ICCC- 2016), Procardia Computer Science 92, pp568 – 577.

Fuchs, T. & woessmann, l. (2004). Computers and Student Learning: Bivariate and Multivariate Evidence on the Availability and Use of Computers at Home and at School. CESifo Working Paper. No. 1321. No- vember.

Hammond, M., Crosson, S., Frakouli, E., Ingram, J., Johnston-Wilder, P., Johnston-Wilder, S., Kingston, Y., Pope, M. & Wray, D. (2009).ICTt, Teaching And Leadership: How Do Teachers Experience The Importance of ICT-Supportive School Leaders? *University of forlaget, Nordic Journal of Digital Literacy*, 7(2).

Kozma, R. B. (2003). ICT and Educational Change: A Global Phenomenon. In R. B. Kozma (Ed.), Technology, Innovation, and Educational Change: A Global Perspective (pp. 1-18). Eugene, OR: International Society for Technology in Education.

Muller, J., Wood, E., Willoughby, R., Ross, C., & Specht, J. (2008). Identifying Discriminating Variables Between Teachers who Fully Integrate Computers and Teachers with limited Integration. *Journal of Computers Education*, 51, pp1523–1537.

Nidhi, P & Sunita, D, (2019). Impact of ICT In Education: Students' Perspective Manuscript Track: Digital Technologies in Teaching. ICDP 2019: *International Conference On Digital Pedagogie* : https://ssrn.com.

Noor-Ul-Amin S. (2013). An Effective use of ICT for Education and Learning by Drawing on Worldwide Knowledge, Research, and Experience: ICT as a Change Agent for Education (A LITERATURE REVIEW), *Scholarly Journal of Education*, 2(4) pp38-54.

Olaore I. B. (2014). The Impacts (Positive and Negative) of ICT on Education in Nigeria, Developing Country Studies, *Journal Education and Research* 4(23) pp154-156.

Oni A., and Uko E. S. (2016). Utilization of ICTs as Teaching Aids in Two Higher Education Institutions in Lagos, *Makerere Journal of Higher Education*, 8(2), pp129 – 138.

Onyebueke, E (2016). The Role of ICT in Enhancing Teaching and Learning in Primary Schools. *Journal of Resourcefulness and Distinction,* 13 (1)

Ottestad, G. (2010). Innovative Pedagogical Practice with ICT in Three Nordic Countries – Differences and Similarities. *Journal of Computer Assisted Learning,* 26, pp 478-491.

Pedró, F. (2007). The New Millennium Learners: Challenging our Views on Digital Technologies and Learning. *Nordic Journal of Digital Literacy (Digital kompetanse),* 4, pp43–60.

Polancic, G., Hericko, M., & Rozman, I. (2010) An Empirical Examination of Application Frameworks Success Based on Technology Acceptance Model. *Journal of Systems and Software*, 83 (4), pp574-584.

Sang, G., Valcke, M., van Braak, J., & Tondeur, J. (2016). Student Teachers' Thinking Process and ICT Integration: Predictors of Prospective Teaching Behaviour with Educational Technology. Computers & Education, 54, 103-112.

Sanyal B. C. (2001). New Functions of Higher Education and ICT to Achieve Education for all. *Paper prepared for the Expert Roundtable on University and Technology-for- Literacy and Education Partnership in Developing Countries, International Institute for Educational Planning, UNESCO, Paris.*

Simin, G.;Mojgan A.;Saedah S.;& Kalaivani S.,(2013).ICT Application for Administration and Management: A Conceptual Review. *Article in Procedia–social and Behavioural Sciences*. Malaysia. https//www. researchgate.net/puplication.

Tosun & Baris, (2011). in Simin et al,(2013).ICT Application for Administration and Management: A Conceptual Review. *Article in Procedia social and Behavioural Sciences.Malaysia.* https//www. researchgate.net/puplication.

Tondeur, J., Hermans, R., van Braak, J., & Valcke, M. (2008). Exploring the Link Between Teachers' Educational Belief Profiles and Different Types of Computer use in the classroom. Computers in Human Behaviour. *Journal of Education and research Base* 24,pp2541-2553.

Tondeur, J., Coopert, M., & Newhouse, C. P. (2010). From ICT Coordination to ICT Integration: A longitudinal Case Study. *Journal of Computer Assisted Learning*, 26, pp296-306.

Tømte, C., & Hatlevik, O. E. (2011). Gender-Differences in Self-Efficacy ICT Related to Various ICT-User Profiles in Finland and Norway. How do self-efficacy, Gender, and ICT-user Profiles Relate to Findings from PISA 2006. Computers & Education, 57, pp1416–1424.

Vanderlinde, R., & van Braak, J. (2016). The E-Capacity of Primary Schools: Development of a Conceptual Model and Scale Construction from a School Improvement Perspective. Computers & Education, Journal of Educative in Schools Perspective 55, pp541-553.