

**CAUSES AND REMEDIES FOR COMPUTER SKILLS AND COMPETENCIES DEFICIENCIES
AMONG UNDERGRADUATE STUDENTS IN EDUCATIONAL TECHNOLOGY IN NORTH
CENTRAL NIGERIA**

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ABSTRACT

The study was on the causes and remedies for computer skills and competencies deficiencies among undergraduate students in Educational Technology in North Central Nigeria. Three research questions were asked from a sample of 324 undergraduate students in Educational Technology, taken from a population of 2,075 Educational Technology undergraduate students in public universities in North Central, Nigeria using Computer Skills and Competencies Questionnaire (CSCQ) through a descriptive survey design. Data collected were analyzed using frequency count and mean. The result showed that the causes of computer skills deficiencies were limited access to technology or outdated equipment hindering learning opportunities, insufficient formal education or training in computer science or related field, lack of exposure to diverse software applications and platform, inadequate self-study or practice in using of computer system and software among others. Similarly, the causes of weak commitment to the development of computer competencies were low self-efficacy (confidence) in their ability to learn and master computer skills, external distraction such as social media, gaming and so on, ineffective teaching methods and lack of assessment of computer competencies in continuous assessment among others. The study recommended among others that university administrators should ensure that admission of students to study Educational Technology at undergraduate level should be based on the students' level of computer skills and competencies, emphasis should be placed on perceived relevance of computer skills and competencies in Educational Technology by the stakeholders in the field, the Educational Technology undergraduate students curriculum should be taught with effective teaching methodology so as to enhance employability skills among undergraduate students.

INTRODUCTION

Education is the process of acquiring knowledge, skills, morals, beliefs and values that brings a relatively permanent change in learners' behaviours. Educating a ready learner could be done in a formal or an informal setting but the processes of education should not be undermined so as to the achieve educational objectives. These processes could be simple or complex in nature, depending on the curriculum, learners' status, instructors' plans and the environment. However, the environments should be saturated with rich educative materials in forms of visuals, audios and audio-visuals instructional materials so as to aid instructions appropriately.

In order to explicitly define education in more definite terms, Naziev (2017) defined education as a systematic and organized process of transferring knowledge and experiences from one generation to another. However, Arslan and Ilin (2018) referred to education as a process of developing within children the acceptable intellectual, social and physical skills that would enable them to be productive citizens, capable of meeting the demands and challenges of society. It is therefore obvious from the definitions, that the aim of education is to change the behaviours of the learners with the help of suitable strategies, methods and techniques of teaching and learning. To make these behavioural changes to be relatively permanent in the learners, the complex process of teaching and learning should be modified and simplified by the use of Educational Technology (E.T), which is simply the application of modern technologies and learning theories in educational process.

As a result of this, the National Information Technology Development Agency (NITDA), according to Egbe (2014), has developed ICT infrastructure in Nigerian tertiary institutions through

the National Virtual Library Project by setting up virtual libraries and donation of computers with internet facilities to enhance computer skills acquisitions and display of computer competencies. In order to buttress this assertion, United Nations Educational, Scientific and Cultural Organization (UNESCO, 2016) emphasized learner-computer ratio as a significant factor for the promotion of computer literacy skills and the display of computer competencies among Educational Technology undergraduate students. Despite these interventions, there are still deficiencies in computer skills and competencies of undergraduate students in Educational Technology. Therefore, the researcher looked with intense concern at the deficiencies in computer skills and competencies of undergraduate Educational Technology students with the view of addressing these deficiencies in public universities in North Central Nigeria

STATEMENT OF THE PROBLEM

Educational Technology undergraduate students are the future-primary agents for ICT driven education. However, they expressed inability to manipulate essential software, internet facilities and physical components of computer for academic purposes (Uzoechi, 2015) and the causes of this Practical-Knowledge Conflict Gap have not been expanded in literature. The researcher therefore sought to assess the computer skills and competencies of Educational Technology undergraduate students in Public Universities in North Central Nigeria; so as to identify the causes of the computer skills deficiencies and the weak commitment to the development and display of computer competencies of Educational Technology undergraduate students in Public Universities in North Central Nigeria.

RESEARCH QUESTIONS

1. What are the causes of computer skills deficiencies among Educational Technology undergraduate students in Public Universities in North Central, Nigeria?
2. What are the causes of weak commitment to the development of computer competencies by Educational Technology undergraduate students in Public Universities in North Central, Nigeria?
3. What are the remedies to the computer skills deficiencies and weak commitment to the development of computer competencies by Educational Technology undergraduate students in Public Universities in North Central, Nigeria?

LITERATURE REVIEW

CAUSES OF COMPUTER SKILLS DEFICIENCIES AMONG UNDERGRADUATE STUDENTS IN EDUCATIONAL TECHNOLOGY

Integrating technology into teaching and learning is not a new challenge for university scholars. Since the 1900s, administrators and faculties have dealt with how to effectively use technical innovations such as video, audio recordings, email, and teleconferencing to augment or replace traditional instructional delivery methods (Kaware & Sain, 2015; Westera, 2015). Within the past two decades, however, this challenge has been much more challenging due to the sheer volume of new technologies in the market (Schindler, Burkholder, Morad, & Marsh, 2017). For example, in the period of seven years (from 2008 to 2015), the number of active apps in Apple's App Store increased from 5000 to 1.75 million. Over the next 4 years, the number of apps is projected to increase by 73%, totaling over 5 million (Nelson, 2016).

Studies conducted by Peprah (2016) noted that most developing countries failed to properly integrate ICT into teaching and learning process and to develop students' computer skill because of the exponential increase in number of students enrolment in universities every year, unsatisfactory leadership, increased in the price of ICT products, lack of computers, unqualified teachers, limited practical lessons after lecturing, as well as lack of internet access, erratic ICT

infrastructural supply and finally poor method of implementation. Similarly, the causes of computer deficiencies among students vary from availability of materials, managerial and administrative 'bottle-neck' as well as student's attitude and disposition to computer system. In order words, Maxwell and Maxwell (2014) specifically expressed that the causes of computer skill deficiencies among undergraduate students in public universities in North Central, Nigerian were cost factors, students' interest factor, lacks of library and information standards, inadequate and unreliable networks systems, shortage of manpower, low prestige of information professions, difficulty in recruiting specialist and lack of continuing education.

Also, the challenges of the limited shelf life of new devices and software combined with significant internal organizational hurdles hinder many public universities (especially in Nigeria) from efficiently and effectively integrating new technologies that promote the acquisition of computer skills into teaching and learning process (Linder-VanBerschot & Summers, 2015; Westera, 2015). This finding is in line with Wogu, Chukwu, Ugwuoke, Ugwulor-Onyinyechi & Nwankiti (2019), Lowga, Sife, Busagala and Chilimo(2016), and Anyim (2018) assertions that poor funding, lack of appropriate facilities for teaching and learning, media techniques and skills, underutilization of few available ICT facilities and limited duration for use of available ICT facilities are the major challenges associated with the computer skills deficiencies experienced by Educational Technology undergraduate students.

CAUSES OF WEAK COMPETENCIES AMONG UNDERGRADUATE STUDENTS IN EDUCATIONAL TECHNOLOGY

The causes of weak competency among educational technology undergraduate students according to Ibanga (2016) and Gusen (2019) were: Poor implementation and management strategy which impedes the success of computer education in the University towards achieving its objectives, inadequate computer labouratory, inadequate qualified computer science lecturers to impart computer education knowledge to their students, lack and insufficient supply of electricity, high cost of acquisition of computers of which many individuals and educational institution cannot afford to purchase and maintain them, lack of motivation, poor remunerations and incentives to computer science instructors greatly impedes on the development of computer education, lack of computer library library in educational institutions to facilitate access to reading materials. Furthermore, inadequate furniture's in educational institutions such as sitting and writing furniture impedes on the development of computer competencies in universities, lack of internet or slow connectivity to access resources online impedes the progress and development of computer competencies in Nigeria.

Also, the broken-down computers that were dumped as e-waste management, fear by the administration that their students will be exposed to undesired Internet sites (pornography)that have exacerbated many kinds of aggression against women marketing and depicting their images as a sexual object, fear of viruses leading to data loss. While this may be true to some extent, proper education on the safe use of computers can help alleviate some of these fears and the fear by the lecturers who are not ICT literate being rendered irrelevant by the introduction of computers in his/her lecture. Similarly, Gusen (2019) further expressed that the use of obsolete computers running on win 98 or win 95 not compatible with current hardware and software lowering the morale of both the lecturers and the students, increased moral degradation as a result of internet pornography, cyber bullying and other anti-social behaviors is a worrying emerging problem to the progress and development of computer competencies. Other external factors also include insufficient number of academic advisors, lack of timely feedback from instructors and reduced interaction with peers and instructors among others.

On the variable of age, Asuquo and Agboola (2014) reported that ages of Educational Technology undergraduate students affect their computer competencies. Similarly, Oladunjoye and Benwari (2014) found out that there is a significant difference between Educational Technology undergraduate students brought up in urban and rural settings in their level of computers

competencies. However, Hong (2016) stressed the influence of the interest factor, that majority of the Educational Technology undergraduate student's weak commitment to the development of computer competencies were based on interest factor or the perceived relevance. The institutional interest factor in Educational Technology undergraduate students' computer competencies. This was what Mugo (2014) elaborated in his study that 61% of the institutions never used computer software and 44% always used manual method to manage data. 29% indicated that calculators were always used to manage data compared to 6% that indicated never. Mugo further discovered that there is low level of computer competency in data management as only 20% of the respondents indicate that computers were used.

To support the views of other experts, Braide (2015) also highlighted the lecturers' computer literacy in teaching and learning process in Nigeria, lack of qualified ICT personnel in the universities, lack of fund, high cost of computer facilities, lack of basic amenities such as housing, ICT centres, electricity and environmental factors as the causes of weak commitment to the development of computer competencies among Educational Technology undergraduate students. These opinions were also supported by Albert (2015) in his acknowledgement of the challenges and prospect of computer literacy in the universities, that availability and utilization of computer devices is paramount to the development of computer competencies among undergraduate students.

REMEDIES TO THE COMPUTER SKILLS AND COMPETENCIES DEFICIENCIES

Educational Technology undergraduate students, the recipients of education, should have a voice in the nature of the remedies to computer skills and competencies deficiencies. Their perceptions, opinions, and attitudes towards the remedies provide profound solutions to the computer skills and competencies deficiencies. Students' enthusiasm increases when they perceive the effectiveness of learning with computer technology on their learning process and outcomes, employment opportunities, and their lives in a high-tech community (Vorobel, 2021). However, many factors affect students' acceptance of technology, such as their age, background, how much they use technology in their daily life, and whether they have internet access at home (Uiboleht, Karm & Postareff, 2019). Experts in Educational Technology have made suggestions for possible remedies to the computer skills and competencies deficiencies among educational technology undergraduate Students. For example, Avidov-Ungar (2020) viewed the role of Lecturers in integrating computer technology into teaching and learning process to be significant in remedying the computer skills and competencies deficiencies among Educational Technology undergraduate students because the lecturers decide what, how, and to what extent computer technology should be used in the classroom. This will help to remedy the computer skills and competencies deficiencies among Educational Technology undergraduate students. To ensure that Lecturers follow the student-centered approach, computer skills should be one of the license requirements (Cabero-Almenara, 2020). However, numerous factors interfere in shaping the role of the Lecturers, such as beliefs, attitudes toward using computer technology, standard awareness, experience, credentials, pre-service training, joining professional organizations, self-efficacy, and teaching environment among others but Akayoglu (2020) emphasized that this are not sufficient as the focus should be on the integration of computer technology.

Therefore, Chan (2017) suggested creating a program-deep and program-wide meaningful computer technology integration through inter-curricular and method courses that will remedy the computer skills and competencies deficiencies among Educational Technology undergraduate students, but Howard and Mayes (2020) postulated that a stand-alone computer technology course is ineffective. In order to remedy the computer skills and competencies deficiencies among Educational Technology undergraduate students, Lecturers should intersect computer technology with content and pedagogy to help Educational Technology undergraduate students to develop computer skills and competencies. In this way, Educational Technology undergraduate students should be provided with systematic and structured learning methods that will promote their self-

directed skills and positive attitudes. Lecturers should introduce the idea that computer technology is transferring society from knowledge-based to hyper-connected intelligence-based information with a profound understanding of the context and framework. This will help to stimulate interest in acquiring computer skills and competencies for academic purposes. To further established the possible solutions, Schmidt-Crawford (2017) illustrated that a supportive peer environment will helps to remedy the computer skills and competencies deficiencies among Educational Technology undergraduate students. However, further research is needed to draw a framework for this kind of collaboration and its contents. Similarly, Farjon (2019) posited that the environment that adopts the SAMR model (Substitution, Augmentation, Modification, and Redefinition) will enable Educational Technology undergraduate students to how and why the integration of computer technology into teaching and learning is imperative. This will stimulate the acquisition of computer skills and competencies among Educational Technology undergraduate students, when the purpose of integrating of computer technology into teaching and learning is justified.

Using different computer technology tools is another remedy to the computer skills and competencies deficiencies among Educational Technology undergraduate students, as this will enable them to diversify their computer skills, so their proficiency level in computer skills and competencies in using digital tools and in connecting technology, pedagogy, and content together to achieve the learning objectives will improve. The role of public universities in North Central Nigeria in remedying the computer skills and competencies deficiencies among Educational Technology undergraduate students is not confined to the infrastructure alone; it extends to the academic achievements using computer technology in curricula (Pischetola, 2022).

METHOD AND PROCEDURES

The research design adopted for the study was Descriptive Survey Design of the questioning technique because it is the method of research that looks with intense accuracy at the phenomena of the moment and then describes precisely what the researcher sees. The population of the study is all 2,075 Educational Technology undergraduate students, which was made up of students of two Public Universities in the North Central Nigeria who offered the course at undergraduate level in the zone. The population of undergraduate Educational Technology students from university A is 1,578, while population of Educational Technology students in university B is 497. The sample size was 324, derived by interpolation from R.V Krejcie and D.W Morgan Table extract of computed sample sizes in research activities

The instrument used for eliciting responses for the study was Computer Skills and Competencies Questionnaire (CSCQ). It was divided into two sections. The section A deals with the demographic data of the students, while section B was divided into three sub-sections. Sub-section B1 had ten items, which deals with the causes of computer skills deficiencies and sub-section B2 also had also ten items which deals with the causes of weak commitment to the development and the display of computer competencies among Educational Technology undergraduate students, while sub-section B3 also had ten items and sought to elicit responses for the possible remedies to computer skills deficiencies and weak commitment to the development and display of computer competencies. The Computer Skills and Competencies Questionnaire (CSCQ) was rated on five Likert scale as follows **SA**- Strongly Agree, **A**- Agree, **D**- Disagree, **SD**- Strongly Disagree, **U**- Undecided and scored on 5 Likert scale as follows: Strongly Agree (SA) was scored (5 point), Agree (A) was scored (4 point), Disagree (D) (3 point), Strongly Disagree (SD) was scored (2 point) and Undecided (U) was scored (1 point).

METHOD OF DATA ANALYSIS

Data collected was subjected to descriptive statistics. The research questions six, seven and eight were analyzed using frequency count, range and mean only. The criteria mean score for the acceptance of factors measured by CSCQ, using Likert scale was computed as $5+4+3+2+1 = 15$, $15 / 5 = 3.00$. Therefore, the mean scores below 3.0 were considered low and rejected while

the mean scores above 3.0 were considered high and accepted to be factors responsible for the variables under consideration.

RESULT

Research Question One

What are the causes of computer skills deficiencies among Educational Technology undergraduate students in Public Universities in North Central Nigeria

Table 1
Causes of Computer Skills Deficiencies

Causes of Computer Skills Deficiencies	SA 5	A 4	D 3	SD 2	U 1	Mean $\bar{x}$	Remark, if $\bar{x} > 3$, Accept
1. Limited access to technology or outdated equipment hindering learning opportunities	162	94	36	28	4	4.18	Accept
2. Insufficient formal education or training in computer science or related field	136	142	4	30	12	4.11	Accept
3. Lack of exposure to diverse software applications and platform	158	62	74	22	8	4.05	Accept
4. Inadequate self-study or practice in using of computer system and software	104	122	70	16	12	3.90	Accept
5. Fear of technology or resistance to learning new things	76	96	76	66	10	3.87	Accept
6. Language barriers affecting comprehension of technical term and instructions	100	135	41	42	6	4.19	Accept
7. Limited Access to internet resources for self-learning and skills development	182	48	76	8	10	4.24	Accept
8. Poor Digital Literacy, including difficulty navigating user interfaces and understanding basic computing concept	202	42	48	16	16	3.50	Accept
9. Ineffective learning strategies and lack of motivation to improve computer skills	110	46	82	66	20	4.09	Accept
10 Workplace environments that do not prioritize or encourage continuous learning and development in technology	156	82	46	38	2		Accept

Table 1 shows cause of computer skills deficiencies. All items were ranked high as factors or causes of computer skills deficiencies among Educational Technology undergraduate student

Research Question Two

What are the causes of weak commitment to the development of computer competencies among Educational Technology undergraduate students in Public Universities in North Central Nigeria?

Table 2
Cause of Weak Commitment to the Development of Computer Competencies

Causes of Weak Commitment to the Development of Computer Competencies		S	A	D	S	U	m	Remark
		A	4	3	D	I	ea	$\bar{x} > 3$,
		5			2		n	Accept
							$\bar{x}$	
1.	1. Lack of perceived	16	13	16	1	2	4.	Accept
	2. relevance	0	6		0		36	
1.	2. Insufficient Resources			22		2		Accept
4.	3. Inadequate training	1	1	70	16	1	4.	Accept
	4. Fear of making mistake	8	0	90	14	6	38	Accept
	or not meeting the	2	2		6	1	4.	
	expectations in computer	16	6			2	05	
	related tasks	2	2	80			3.	Accept
	5. Technological Intimidation	11	1	14	6		93	Accept
w	6 Low self-efficacy	6	0		2	1		
ance) st	students'		0		12	2		
	ability to learn and			86		1	3.	Accept
	master computer skills	7				6	50	
	7. External distraction	8	9	114	4		4.	Reject
	such as social media,	19	2		2		32	
	gaming and so on 8.	0	9			1		
	Absence of Role model		2	10	12	2		Accept
	who demonstrated			2	0		3.	
	competencies in	9				4	65	Accept
	computer	2	9	8				
	9. Ineffective teaching		2		5		2.	
	methods in computer	8			6	4	90	
	related courses		7					
	10. Lack of assessment		8		14	2		
	of computer	9					3.	
	competencies in	2					57	
	continuous assessment		7					
		19	0				4.4	
		8					9	
			1					
			0					
			2					

Table 2 showed the cause of weak commitment to the development of computer competencies among undergraduate Educational Technology students in public university in North Central Nigeria. All items were ranked high above the mean except item number eight. This meant that items were the causes of weak commitment to the development of computer competencies among Educational Technology undergraduate student, except item number eight.

Research Question Three

What are the possible remedies to the computer skills deficiencies and weak commitment to the development and display of computer competencies among Educational Technology undergraduate students in North Central Nigeria?

Table 3: Remedies to the Computer Skills Deficiencies and Weak Commitment to the Development Computer Competencies

Remedies	SA	A	D	SD	U	$\bar{x}$	Remark If $\bar{x} > 3$, Accept
Provision of new, modern and accessible ICT based equipment for learning opportunities in Educational Technology Laboratory	160	92	40	28	4	4.16	Accept
Stakeholders in Education should provide students with unlimited access to the diverse software applications for educational purposes	132	142	4	30	16	4.06	Accept
Government at all levels should subsidize the tariff on importation of ICT based equipment to enhance student-computer ratio among Educational Technology undergraduate students	160	62	74	20	8	4.07	Accept
Assessment of computer skills and competencies should be emphasized more in students' continuous assessment	112	122	70	16	4	3.99	Accept
Provision of regular and unlimited internet services for students' use should be prioritized in universities by the relevant authorities.	122	97	37	32	36	3.73	Accept
Digital literacy should be promoted among undergraduate students in Educational Technology	136	50	90	42	6	3.83	Accept
Admission of students to study Educational Technology at undergraduate level should also be based on the students' level of computer skills and competencies	182	48	76	8	10	4.19	Accept
Emphasis should be place on perceived relevance of computer skills and competencies in Educational Technology by the stakeholders in the field	210	50	48	16	0	4.40	Accept
The Educational Technology undergraduate student's curriculum should be taught with effective teaching methodology so as to enhance employability skills among undergraduate students just as it was enshrined in the curriculum	110	46	82	66	20	3.49	Accept
Effective inter-universities students' collaboration and healthy competition in the display of computer skills and competencies should be encouraged among Educational Technology undergraduate students so as to stimulate innovation in computer skills and competencies	162	82	42	36	2	4.13	Accept

Table 3 shows the possible remedies to the computer skills deficiencies and weak commitment to the development of computer competencies among Educational Technology undergraduate students. The mean values of the items were above three signifying that all items were accepted by the respondents as possible remedies to the computer skills deficiencies and weak commitment to the development of computer competencies among Educational Technology undergraduate students in public universities in north Central Nigeria.

Discussions of Findings

Answer to research question one indicated that the causes of computer skills deficiencies were limited access to technology or outdated equipment hindering learning opportunities, insufficient formal education or training in computer science or related field, lack of exposure to diverse software applications and platform, inadequate self-study or practice in using of computer system and software, fear of technology or resistance to learning new things, language barriers affecting comprehension of technical term and instructions, limited access to internet resources for self-learning and skills development, poor digital literacy, including difficulty navigating user interfaces and understanding basic computing concept, ineffective learning strategies and lack of motivation to improve computer skills and workplace environments that do not prioritize or encourage continuous learning and development in technology. These supported the assertion of Wogu, Chukwu, Ugwuoke, Ugwulor-Onyinyechi & Nwankiti (2019), Lowga, Sife, Busagala and Chilimo(2016), and Anyim (2018) on causes of computer skills deficiencies among undergraduate students in Educational Technology

Similarly, the result of responses to research question two also indicated that lack of perceived relevance, insufficient resources, inadequate training, fear of making mistake or not meeting the expectations in computer related tasks, technological intimidation, low self-efficacy (confidence) in their ability to learn and master computer skills, external distraction such as social media, gaming and so on, ineffective teaching methods and lack of assessment of computer competencies in continuous assessment. These were in-line with the assertion of Hong (2016) and Pischetola (2022).

RECOMMENDATIONS AND CONCLUSION

The study recommended that stakeholders in Education should provide new, contemporary and accessible ICT based equipment for learning opportunities in Educational Technology Laboratory, provide students with unlimited access to the diverse software applications for educational purposes. Similarly, the government at all levels should subsidize the tariff on importation of ICT based equipment to enhance student-computer ratio among Educational Technology undergraduate students. On the same vein, assessment of computer skills and competencies should be emphasized more in students' continuous assessment, provision of regular and unlimited internet services for students' use should be prioritize in universities by the relevant authorities, digital literacy should be promoted among undergraduate students in Educational Technology,

University administrators should ensure that admission of students to study Educational Technology at undergraduate level should be based on the students' level of computer skills and competencies, emphasis should be place on perceived relevance of computer skills and competencies in Educational Technology by the stakeholders in the field, the Educational Technology undergraduate students curriculum should be taught with effective teaching methodology so as to enhance employability skills among undergraduate students just as it was enshrined in the curriculum and effective inter-universities students' collaboration and healthy competition in the display of computer skills and competencies should be encouraged among Educational Technology undergraduate students so as to stimulate innovation in computer skills and competencies.

REFERENCES

- Alberto, D. Y., Karen, A. M., Chester, A. C., & John, F. B. (2019). Digital Literacy, Digital Competence and Research Productivity of Educator. *Universal Journal of Educational Research* 7 (8), 1734-1743. Retrieved: November 6, 2022 <http://www.hrpub.orgDOI:10.13189/ujer.2019.07081>
- Akayoglu, S., Satar, H. M., Dikilitas, K., Cirit, N. C., & Korkmazgil, S. (2020). Digital literacy practices of Turkish pre-service EFL teachers. *Australasian Journal of Educational Technology*, 36(1), 85-97. <https://doi.org/10.14742/ajet.4711>
- Anym, W. O. (2018). Assessment of ICT literacy skills of digital library users and staff in Salem University Lokoja, Kogi. *Library Philosophy and Practice* (e-journal). 1801. <https://digitalcommon.unl.edu/libphilprac/1801>
- Arslan, F., & Ilin, G. (2018). The Effects of Teaching Practicum on EFL Pre-Service Teachers' Concerns. *Journal of Language and Linguistic Studies*, 14(2), 265-282
- Asuquo, A.E & Agboola, B.M. (2014). Nigerian Universities' Outputs and Their Employability in The Labour Markets in South-South, Nigeria. *American Journal of Education Research*, 2 (12), pp. 1244-1249.
- Avidov-Ungar, O., Shamir-Inbal, T., & Blau, I. (2020). Typology of digital leadership roles tasked with integrating new technologies into teaching: Insights from metaphor analysis. *Journal of Research on Technology in Education*, 1-16. <https://doi.org/10.1080/15391523.2020.1809035>.
- Braide, H. S. (2015): *The Impact of Information and Communication Technology (ICT) In Education and Students Achievement*, (A Seminar Paper) Presented at Ignatius Ajuru University of Education, Port Harcourt.
- Cabero-Almenara, J., Gutiérrez-Castillo, J., Palacios-Rodríguez, A., & Barroso-Osuna, J. (2020). Development of the teacher digital competence validation of Dig Comp Edu check-in questionnaire in the university context of Andalusia (Spain). *Sustainability*, 12(15), 6094. <https://doi.org/10.3390/su12156094>
- Chan, K. (2017). A study on the impact of the occupational performance of teachers in adult education institutions on instructional satisfaction. *EDP Sciences*. <http://doi.org/10.1051/mateconf/201711901038>.
- Egbe, N. G. (2014). *An Exploration of Sources of Funding ICT in Nigerian Academic Libraries*. Retrieved December 19, 2014, from www.negbe.blogspot.com. Information and Knowledge Management www.iiste.org
- Farjon, D., Smits, A., & Voogt, J. (2019). Technology integration of pre-service teachers is explained by attitudes and beliefs, competency, access, and experience. *Computers and Education*, 130, 81-93. <https://doi.org/10.1016/j.compedu.2018.11.010>
- Gusen J. N. (2019). *ICT made easy*. Ya-Byangs Publishers

- Hong, J., E. (2016). *Social Studies Teachers' Views of ICT Integration*. Rigeo, 6(1), 32-48. Retrieved from <http://www.rigeo.org/vol6no1/Number1Spring/RIGEOV6-N1-2.pdf>
- Howard, J. E., & Mayes, E. L. (2020). Do teaching credentials matter? School leaders' preferences when screening and selecting teacher candidates. *International Journal of Educational Research*, 103, 101637. <https://doi.org/10.1016/j.ijer.2020.101637>.
- Ibanga, I. (2016). Problem and Prospect of Computer Education in Nigeria - Information Retrieved on 24th March, 2020 from: <https://infoguidenigeria.com/problem-prospect-computer-education-nigeria/>
- Kaware, S. S., & Sain, S. K. (2015). ICT Application in Education: An Overview. *International Journal of Multidisciplinary Approach & Studies*, 2(1), 25–32.
- Linder-VanBerschot, J. A., & Summers, L. L. (2015). Designing Instruction in the Face of Technology Transience. *Quarterly Review of Distance Education*, 16(2), 107– 118.
- Westera, W. (2015). Reframing The Role of Educational Media Technologies. *Quarterly Review of Distance Education*, 16(2), 19–32
- Lowga, E. T, Sife, A. S., Busagala, L. S. P. & Chilimo, W. (2016). The role of universities in creating ICT awareness, literacy and expertise: Experiences from Tanzanian public universities. Directorate of ICT support, Makerere University, Uganda. Available at: <http://ahero.uwc.ac.za/index.php?module=cshe&action=downloadfile&fileid=36807145012187171014948>
- Maxwell, C. E., & Maxwell, E. M. (2014). Gender Differences in Digital Literacy Among Undergraduate Students of Faculty of Education, Kogi State University: Implications For E-Resources & Library Use. *Advances in Social Sciences Research Journal*, 1(7), 96-108. <https://doi.org/10.14738/assrj.17.492>.
- Mugo, P. M. (2014) *Factors that Impact on Use of Education Management Information Systems: Case Study of Thika West District, Kiambu County, Kenya*. Master's Thesis; Unpublished, Kenyatta University. Retrieved from ir.library.ku.ac.ke/handle/123456789/12272 on November 2016
- Naziev, A, (2017). What is an Education *Conference: Future of Education, 7th Editions at Florence (Italy) Project*: Math as Humanity <https://www.researchgate.net/publication/317545698>
- Nelson, M. R. (2020). Essential Skills for Digital Age. *Journal of Educational Computing Research*.
- Peprah, O. M. (2016). ICT Education in Ghana: An Evaluation of Challenges Associated with The Teaching and Learning of ICT In Basic Schools in Atwima Nwabiagya District in Ashanti Region. *European Journal of Alternative Education Studies*, 1(2), 7–27.
- Pischetola, M. (2022). Exploring the relationship between in-service teachers' beliefs and technology adoption in Brazilian primary schools. *International Journal of Technology and Design Education*, 32(1), 75-98. <https://doi.org/10.1007/s10798-020-09610-0>
- Schindler, L. A., Burkholder, G. J., Morad, O. A. & Marsh, C. (2017). Computer-Based Technology and Student Engagement: A Critical Review of The Literature. *International Journal of*

Educational Technology in Higher Education, 14 (25) <https://doi.org/10.1186/s41239-017-0063-0>

- Schmidt-Crawford, D., Thompson, A. D., & Lindstrom, D. (2017). ISTE tidbits: Technology tools every new teacher needs. *Journal of Digital Learning in Teacher Education*, 33(4), 128-128. <https://doi.org/10.1080/21532974.2017.1353375>
- UNESCO (2016). PDF ICT in Education – UNESCO Institute for Statistics. Retrieved from: uis.unesco.org/sites/default/files/.../brazil-2016-role-uis-2-1en.p
- Uiboleht, K., Karm, M., & Postareff, L. (2019). Relations between students' perceptions of the teaching-learning environment and teachers' approaches to teaching: A qualitative study. *Journal of further and Higher Education*, 43(10), 1456-1475. <https://doi.org/10.1080/0309877X.2018.1491958>
- Uzoечи (2015). *Assessment Of Employability Skills Acquisition Among University Students in Imo State, Nigeria*. An M.Ed Thesis, University of Calabar
- Vorobel, O., Voorhees, T. T., & Gokcora, D. (2021). Language learners' digital literacies: Focus on students' information literacy and reading practices online. *Journal of Computer Assisted Learning*, 37(4), 1127-1140. <https://doi.org/10.1111/jcal.12550>
- Wogu, J. O., Chukwu, C. O., Ugwuoke, J. C., Ugwulor-Onyinyechi, C. C. & Nwankiti, C. O (2019). A survey of student's media literacy skills in Nigerian universities. *Journal of Engineering and Applied Sciences*, 14 (Special Issue 2), 5365 – 5373. Available at <http://docsdrive.com/pdfs/medwelljournals/jeasci/2019/5365-5373.pdf>