Review of Education, 2025, Volume 37, Issue 3, pp: 70-79

VARIATIONS BASED ON SCHOOL TYPE ON STUDENTS' ACCESS TO ICT TOOLS FOR RESEARCH PURPOSES IN PUBLIC UNIVERSITIES IN SOUTH-EAST, NIGERIA

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Abstract

The study examined school type variation in students' access to ICT tools for research purposes in public universities in universities in South-East Nigeria. Two research questions and two hypotheses guided the study. This study adopted descriptive survey design. The population of the study is 3461 students. This comprised all final year undergraduate students of Faculty of the Education in public Universities in South-East Nigeria. The sample size for this study was 344 students selected purposively and randomly. Two instruments were used for data collection. The instruments are ICT Access scale (ICTAS) and ICT Research Utilization Scale (ICTRUS) developed by the researchers. The instruments were validated by three experts; two from the department of social science education and one in the Department of Science Education (Measurement and Evaluation Unit), Faculty of Education, University of Nigeria, Nsukka. The instruments were trial tested and data gotten were analyzed using Cronbach Alpha which yielded reliability indices of 0.79 and 0.76 for the two instruments. The data collected for this study were analyzed and presented using percentage and mean and standard deviation and the hypotheses were tested using independent sample t-test at 0.05 level of significance. The study found significant variation in access to ICT for research between federal and state university students in South East Nigeria where Federal University students have higher access more than state university students. The study also found low utilization of ICT for research among federal and state university students in South East Nigeria. However, the level of utilization of ICT for research is higher among Federal university students than state university students. This study found there are disparities in access and usage of ICT tools for research purposes among federal and state universities in South-East Nigeria and Government should unify ICT policies for both levels of universities. Universities should also upgrade computer labs, provide laptops or tablets for students, and ensure reliable internet connectivity to support ICT adoption and usage.

Keywords: ICT, Access, Utilization, School type

Introduction

Information and Communication Technology (ICT) has become an important source of innovation and improvement of efficiency in many sectors of human endeavour in the world. In higher education, application of ICT has become a critical part of the research process for students. Consequently, government and other stakeholders in education sector such as university management have invested millions of naira in acquisition and adoption of ICT tools in the last two decades (Lawrence, 2015). This implies that most universities, including those in South-East (SE) Nigeria, should have adopted ICT for improvement in education especially in research. The use of ICT in academic research has contributed a great deal to the development and transformation of the research process, from the primitive method to virtual interaction between researcher and subjects (Bala and Suleiman, 2020). ICTs are provided for in higher students for students to access them for various purposes like examination, research, communication, etc.

ISSN: 978-2585-10-6 (PRINT)

Information and Communication Technology access has bridged the knowledge gap, empowering students to connect to portals of vast resources, enhancing research quality and productivity. Access is the right or opportunity to use or benefit from something. Access refers to the process of appropriation of a material with the purpose of actual usage (van-Dijk & Hacker, 2003). Access to ICT refers to the opportunity to use and manipulate information and communication technologies to conduct research. It encompasses access to computers, laptops, tablets, or mobile devices, connectivity to the internet or local networks, access to software applications, tools, and digital platforms. Access to ICT plays a crucial role in bridging the digital divide and enabling individuals and communities to participate fully in the digital society. Access to information communication technology (ICT) among students in Nigerian universities is a crucial factor that significantly impacts their educational experience and research activities. The National University Commission (NUC) proposed that universities in Nigeria should make efforts to provide ICT infrastructure on their campuses to enhance teaching, learning, and research (National University Commission, 2016). Investigation of knowledge on the use of ICT in the whole process of learning according to Rehka (2021) revealed that students' knowledge on the use of ICT facilities tended to increase when there is access to ICT resources. According to Amuko, Miheso and Ndeuthi (2015), effective use of ICT resources is also largely dependent upon the accessibility of ICT resources (e.g. hardware, software and communications infrastructure). Access to ICT tools for research among students in universities in South-East Nigeria is constrained by several factors. Various scholars have identified these factors to include inadequate training, unsuitable infrastructures and the tools not containing information in their field of study (Ukwoma & Onyebinama, 2020). However, no study has sought the variation in school type like Federal and state universities.

School type refers to the category or classification of educational institutions based on various factors, such as the level of education offered (elementary, middle, high school, college, university), the curriculum and program of study (private, public, charter, vocational, technical), or the religious affiliation (secular, religious) (Kithela, 2016). In University education in Nigeria, Federal and state government as well as Missions and private individuals participate in the ownership and funding of public universities, giving room for Federal and state-owned public universities, as well as mission and private universities. This study focused on Federal and state-owned universities. Various reasons have been highlighted in relation to both benefits and demerits which may be attributed to the existence of the federal and state universities. Though they use the same curriculum, advocates of federal universities argued that federal government involvement in school advances responsiveness to funding demands, thus, making federal universities more accessible for all students (Kithela, 2016) against state-owned universities which pay higher tuition fees. In contrast, advocates of state-owned universities stated that state government involvement in university management leads to more efficiency and responsiveness to demands (Ndukwe, Ukeje & Onele, 2016). In the Nigerian federation where state governments depend on Federal allocation, it is expected that federal institutions will have domineering provisions more than equivalent state institutions. As such, ICT tools availability and access for research purposes in federal universities could be higher compared to state owned universities. However, in University of Nigeria Nsukka, students face challenges in accessing specialized software, databases, and digital libraries due to subscription constraints and limited institutional resources. Additionally, power outages, outdated technology, and insufficient technical support further restrict

ISSN: 978-2585-10-6 (PRINT)

access. At, Chukwuemeka Odumegwu Ojukwu University, limited availability of computers, slow internet connectivity, and inadequate digital infrastructure hinder access. Many universities lack dedicated research centers, and existing facilities are often in disrepair. While some students utilize personal devices, many cannot afford them, exacerbating the digital divide.

Scholars (Chukwu, Ezepue & Iremeka, 2019; Ukwoma & Onyebinama, 2020; Atsumbe, Raymond, Enoch & Patrick, 2012; Anekwe, 2017; Ankamah, 2019; Egomo, Enyi & Tah, 2012; Jack and Songo, 2020; Amuko et al. 2015; Taşpolat, 2016; Nwana, Ofoegbu & Egbe, 2017; Ifeakor, 2018; Itighise & Babayemi, 2018; Okoli & Osuafor, 2018) have made different enquiries into ICT systems in universities. Chukwu, Ezepue, and Iremeka (2019) examine comparatively, the availability and utilization of e-learning infrastructure in federal and state universities in South-East Nigeria and found that e-learning facilities for effective teaching and learning are not adequately available and utilized in South-Eastern state and federal universities. The authors also reported that internet services provided by the university (Afrihub, Nunet) are not adequate; the universities' digital libraries are not efficient, educational materials and links are not accessed from the universities' website and that Students cannot easily get access to a computer in the ICT centre or within the university. Ukwoma and Onyebinama (2020) surveyed the challenges and opportunities of access and use of open access resources by undergraduate students in selected federal universities in south-east, Nigeria and found that the students are aware of open access resources. However, there are challenges in accessing and using them such as inadequate training, unsuitable infrastructures and the resources not containing information in their field of study. Atsumbe, Raymond, Enoch, and Patrick (2012) revealed that e-learning infrastructures are not available in FUT Minna. Anekwe (2017) who examined the impacts of virtual classroom learning on students of Nigerian federal and state universities found that virtual classrooms have positive impacts on the students of federal and state universities, they reported positively on their continued support and preparedness for virtual classrooms. Ankamah (2019) found that most students frequently accessed ICT facilities for research purposes. In contrast, Itighise and Babayemi (2018) reveal that in some higher institutions, students' accessibility to ICT is very limited because of the inadequacy of ICT tools and limited time to access internet. Jack and Songo, (2020) reveal low access to ICT resources basically linked to issues of non-availability and inadequacy of ICT tools. According to Egomo, Enyi and Tah (2012), access to ICT resources in Nigerian universities where students are trained is very low. The aforementioned researchers noted that ICT facilities are mostly used for administrative purposes in Nigerian tertiary educational institutions than for students' research adventures, thus inhibiting students' access that will help improve their efficacy in research endeavours. Existing studies have focused on ICT access in general, without considering the access for research purposes and how school type affects access to ICT tools. This study filled the gap.

Purpose of the study

The study has both general and specific purposes. The general purpose of the study was to determine the school type variation in ICT access for research in Universities in South East Nigeria. Specifically, the study sought to determine;

1. the variation in access to ICT tools for research in universities in South-East Nigeria based on school type.

ISSN: 978-2585-10-6 (PRINT)

2. The variation in level of students' utilization of ICT in research in Universities in South-East Nigeria based on school type

Research Questions

The study was guided by the following research questions

1. What is the variation in access to ICT tools for research in universities in South-East Nigeria based on school type?
2. What is the variation in level of students' utilization of ICT in research in Universities in South-East Nigeria based on school type?

Hypotheses

H_O1: There is no significant variation in the mean responses of students on access to ICT tools for research in universities in South-East Nigeria based on school type

H_O2: There is no significant variation in the mean responses of students on the level of ICT utilization in Universities in South-East Nigeria based on school type

Methods

This study adopted descriptive survey design. According to Nworgu (2015) descriptive survey design is one in which a group of people or items is studied by collecting and analyzing data from only few people or items considered to be representation of the entire group. The study was carried out in the Universities in South-East Nigeria. The population of the study was 3461 final year students in Education faculties in public Universities in South-East Nigeria. The sample size for this study was 344 students. Purposive sampling technique was used to sample Anambra and Enugu states as they have Federal and state universities that have faculties of education. The Federal and state universities in these states are Nnamdi Azikiwe Universiity, Awka and University of Nigeria, Nsukka while the state Universities are Chukwuemeka Odumegwu Ojukwu University, Igbariam and Enugu State University of Science and Technology, Enugu. Simple random sampling was used to sample 86 students from each university. Two instruments were used for data collection. The instruments are ICT Access Scale (ICTAS) and Research Utilization Scale (RUS) developed by the researchers. The instruments were validated by three experts from the University of Nigeria, Nsukka. The data collected from trial testing of the scale were analyzed using Cronbach Alpha. It yielded reliability indices of 0.79 and 0.76 for the three instruments. The instrument for data collection was administered directly to the sampled students in their respective Universities by the researchers with 99.41% returned valid. The data collected for this study was analyzed and presented using percentage and mean and standard deviation and the hypotheses were tested using independent sample t-test at 0.05 level of significance.

Results

Research Question 1: What are the ICT tools students can access for research in public universities in South-East, Nigeria based on school type

ISSN: 978-2585-10-6 (PRINT)

Table 1: Frequency and percentage response of respondents on the ICT tools students can access for research in universities in South-East, Nigeria based on school type

S/N	Item Statement:	Federal					State				
		Yes		No		D	Yes		No		D
	I have access to	F	%	F	%		f	%	F	%	
1	Computers like desktop, laptops	112	57.7	82	42.3	A	96	64.9	52	35.1	A
2	e-materials like e-books, e-journals, e-manuscript, e-research reports, e-thesis, e-magazines	67	34.5	127	65.5	NA	84	56.8	64	43.2	A
3	Storage devices like flash-drive, CD-Rom, Hard-discs	102	52.6	92	47.4	A	91	61.3	57	38.7	A
4	Internet	123	63.4	71	36.6	A	101	68.2	47	31.8	A
5	e-bibliography databases	127	64.5	67	35.5	NA	42	28.4	106	71.6	NA
6	Electronic Mail (e-mail)	161	83	33	17	A	108	73	40	27	A
7	Repositories like Online Public Access Catalogue	43	22.2	151	77.8	NA	49	33.1	99	66.9	NA
8	e-databases like Research gate, Jstor, Google scholar	149	76.8	45	23.2	A	87	58.8	61	41.2	A
9	Microsoft office suites like Word, Excel, Power-point	133	68.6	61	31.4	A	88	59.5	60	40.5	A
10	Quantitative data analysis software like SPSS,	51	26.3	143	73.7	NA	39	26.4	109	73.6	NA
11	Qualitative data analysis software like N Vivo, Atlas.ti	39	20.1	155	79.9	NA	56	37.8	92	62.2	NA
12	Cloud storage devices Google drive, Cloud	41	25.5	153	74.5	NA	44	29.7	104	70.3	NA
13	Reference tools like end-note	85	43.8	109	56.2	NA	51	34.5	97	65.5	NA
14	Plagiarism software like turn-it-in	24	12.4	170	87.6	NA	15	10.1	133	89.9	NA
	Overall	**89.8**	**46.5**	**104.2**	**53.5**	**NA**	**67.9**	**45.9**	**80.1**	**54.1**	**NA**

ISSN: 978-2585-10-6 (PRINT)

Table 2 shows the responses of the respondents on the ICT tools students can access for research in universities in South-East, Nigeria based on school type. For Federal Universities, items 1, 3, 4, 6, 8 and 9 has percentage scores of 57.7%, 52.6%, 63.4%, 83%, 76.8% and 68.6% respectively. These percentage scores are over 50% acceptance benchmark. Therefore, the ICT tools students can access for research in Federal Universities in South-East, Nigeria include computers, storage devices like flash-drive, CD-Rom, Hard-discs; internet; electronic mail (e-mail); e-databases like Research gate, Jstor, Google scholar and Microsoft office suites like Word, Excel, Power-point. However, items 2, 5, 7, 10, 11, 12, 13 and 14 has percentage scores below 50%. That means students do not have access to these ICT tools for research in federal universities in South-East Nigeria. These tools include: e-materials like e-books, e-journals, e-manuscript, e-research reports, e-thesis, e-magazines; e-bibliography databases; Repositories like Online Public Access Catalogue; Quantitative data analysis software like SPSS; qualitative data analysis software like N Vivo, Atlas.ti; Cloud storage devices Google drive; Reference tools like end-note and Plagiarism software like turn-it-in. The overall access percentage of 46.5 shows that Federal university students have limited access to ICT tools for research.

For state universities, items 1, 2, 3, 4, 6, 8 and 9 has percentage scores of 64.9%, 56.8%, 61.3%, 68.2%, 73%, 58.8% and 59.5% respectively. These percentage scores are over 50% acceptance benchmark. Therefore, the ICT tools students in state Universities can access for research in universities in South-East, Nigeria include computers like desktop, laptops; e-materials like e-books, e-journals, e-manuscript, e-research reports, e-thesis, e-magazines; storage devices like flash-drive, CD-Rom, Hard-discs; internet; electronic mail (e-mail); e-databases like Research gate, Jstor, Google scholar and Microsoft office suites like Word, Excel, PowerPoint. However, items 5, 7, 10, 11, 12, 13 and 14 has percentage scores below 50%. That means students do not have access to these ICT tools for research in state universities in South-East Nigeria. These tools include: e-bibliography databases; Repositories like Online Public Access Catalogue; Quantitative data analysis software like SPSS; qualitative data analysis software like NVivo, Atlas.ti; Cloud storage devices Google drive; reference tools like end-note and Plagiarism software like turn-it-in. The overall percentage of 45.9 shows that State university students have limited access to ICT tools for research.

Hypothesis 1: There is no significant variation in the mean responses of students on access to ICT tools for research in universities in South-East Nigeria based on school type

Table 2: Summary of t-test analysis on the level of ICT usage in research in Universities in South-East, Nigeria based on school type

School type	N	Mean	SD	T	Df	Sig. (2-tailed)
Federal	194	0.47	0.39	2.56	340	0.00
State	148	0.46	0.34			

The analysis on table 2 shows that the t-cal at 2.56 is significant at 0.00 which is less than the 0.05 level of significance. Therefore, null hypothesis rejected. Thus, there is a significant variation in the mean responses of federal and state university students on level of access to ICT tools for research in Universities in South-East, Nigeria.

ISSN: 978-2585-10-6 (PRINT)

Research question 2: mean rating and standard deviation of respondents on the level of students' utilization of ICT in research in Universities in South-East, Nigeria based on school type

Table 3: mean rating and standard deviation of respondents on the level of students' usage of ICT in research in universities in south-east, Nigeria based on school type.

School type	N	Mean	SD	D
Federal	194	2.22	0.39	Low
State	148	2.17	0.34	Low

Table 3 above shows the level of students' usage of ICT in research in universities in south-east, Nigeria based on school type. The mean scores of federal and state university students are 2.22 and 2.17 respectively. These mean scores are below the 2.50 benchmark for accepting a mean. This implies that level of federal and state university students' usage of ICT in research in Universities in South-East, Nigeria is low.

Hypothesis 2: There is no significant variation in the mean responses of students on the level of ICT usage in research in Universities in South-East, Nigeria based on school type

Table 4: Summary of t-test analysis on the level of ICT usage in research in Universities in South-East, Nigeria based on school type

School type	N	Mean	SD	T	Df	Sig. (2-tailed)
Federal	194	2.22	0.39	0.81	340	0.419
State	148	2.17	0.34			

The analysis on table 12 shows that the t-cal at 0.81 is significant at 0.419 which is greater than the 0.05 level of significance. Therefore, null hypothesis is not rejected. Thus, there is no significant difference in the mean responses of federal and state university students on level of ICT usage in research in Universities in South-East, Nigeria.

Discussion

The ICT tools students access for research in Federal Universities in South-East, Nigeria include storage devices like flash-drive, CD-Rom, Hard-discs; internet; electronic mail (e-mail); e-databases like Research gate, Jstor, Google scholar and Microsoft office suites like Word, Excel, Power-point. This is in line with Ukwoma and Onyebinama (2020) who found that undergraduate students of federal universities in South-East Nigeria are aware of open access resources and access them daily because these resources save time and provides literature for their research work. However, students have limited access to computers like desktop, laptops; e-materials like e-books, e-journals, e-manuscript, e-research reports, e-thesis, e-magazines; e-bibliography databases; repositories like Online Public Access Catalogue; quantitative data analysis software like SPSS; qualitative data analysis software like NVivo, Atlas.ti; cloud storage devices Google drive; reference tools like end-note and Plagiarism software like turn-it-in. This is in line with Chukwu, Ezepue, and Iremeka (2019) who reported that e-learning facilities for effective teaching and learning are not adequately available and utilized in South-Eastern state and federal universities. The authors also reported that internet services provided by the university (Afrihub, Nunet) are not adequate; the universities' digital libraries are not efficient, educational materials and links are not accessed from the universities' website and that Students cannot easily get access to a computer in the ICT centre or within the university. For State Universities, the ICT tools students have access to for research in in universities in South-East, Nigeria include computers like desktop, laptops; e-materials like e-books,

ISSN: 978-2585-10-6 (PRINT)

e-journals, e-manuscript, e-research reports, e-thesis, e-magazines; storage devices like flash-drive, CD-Rom, Hard-discs; internet; electronic mail (e-mail); e-databases like Research gate, Jstor, Google scholar and Microsoft office suites like Word, Excel, PowerPoint. This is in line with Ndukwe, Ukeje and Onele (2016) who reported that state Government are responsive to providing all resources needed for academic activities in state-owned universities. However, students have limited access to e-bibliography databases; repositories like Online Public Access Catalogue; quantitative data analysis software like SPSS; qualitative data analysis software like NVivo, Atlas.ti; cloud storage devices Google drive; reference tools like end-note and Plagiarism software like turn-it-in. Students have limited access to ICT tools for research in both federal and state universities. And there is a significant variation in the mean responses of federal and state university students on level of access to ICT tools for research in Universities in South-East, Nigeria. This is in line with Chukwu, Ezepue, and Iremeka (2019) who reported that availability of e-learning facilities for effective teaching and learning is not adequate in South-Eastern States and Federal Universities in Nigeria.

The level of federal and state university students' usage of ICT in research in Universities in South-East, Nigeria is low. The low level of ICT usage among both federal and state university students in South-East Nigerian universities suggests a systemic issue. Reasons include, but not limited to inadequate ICT infrastructure and limited access. This finding is in line with Chukwu, Ezepue, and Iremeka (2019) who reported that e-learning infrastructure for effective teaching and learning are not effectively utilized in State and Federal Universities in South-East, Nigeria. This also contrasts Ndukwe Ukeje and Onele (2016) who reported that state governments are responsive to providing tools for students' usage in all round academic activity. Also, University of Cape Coast, (2017) reported that postgraduate students of the University of Cape Coast are provided with and utilize electronic resources, reference management software and other ICT related training by the graduate School in collaboration with the library. These services are provided to enhance postgraduate students' research as part of their education. Hence, there is no significant difference in the mean responses of federal and state university students on level of ICT usage in research in Universities in South-East, Nigeria.

Conclusion

The study examined school types variation in students' access to ICT for utilization in research in universities in South-East Nigeria. The study found that students have limited access to ICT resources for research in both federal and state universities in South East Nigeria. There is a significant variation in the mean responses of federal and state university students on level of access to ICT tools for research in Universities in South-East, Nigeria. Also, the level of federal and state university students' usage of ICT in research in Universities in South-East, Nigeria is low. The findings highlight the need for a more inclusive and equitable approach to ICT provision, ensuring that students from all disciplines have access to the necessary tools and resources to support their research endeavors. The study's results have significant implications for university administrators, policymakers, and stakeholders seeking to promote ICT adoption and utilization in academic research. The study's findings contribute to the ongoing efforts to enhance the quality and impact of academic research in Nigerian universities. The study's recommendations provide a valuable framework for stakeholders to improve ICT infrastructure, promote digital literacy, and enhance research productivity in universities in South-East, Nigeria.

ISSN: 978-2585-10-6 (PRINT)

Recommendations

The study made the following recommendations based on the findings

1. Federal and state Universities should upgrade computer labs, provide laptops or tablets for students, and ensure reliable internet connectivity to support ICT adoption and usage.
2. Non-governmental organizations should support state universities to provide access to advanced ICT tools and training.
3. State governments should brace up and embrace ICT policies to support ICT access, adoption and utilization in education and research and allocate resources to support ICT infrastructure development and training initiatives in universities.

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ISSN: 978-2585-10-6 (PRINT)