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Undergraduate Students' Access to Digital Technologies in Universities in Rivers State

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Abstract
The use of digital technologies and resources for learning by students has become one of the factors that will determine either students' academic successes orfailures. This study, therefore, investigated undergraduate students' access to digital technologies in the Faculty of Education in public universities in Rivers State.The study was guided by two research questions and a corresponding hypothesis formulated in line with the specific objectives of the study. The study adopted a descriptive survey research designwith a population is two thousand, one hundred and thirty-seven (2137) 400-level undergraduate students in the Faculties of Education in the three public Universities in Rivers State.The instrument for data collection wasa 15-item researcher-structured questionnairetitled: Undergraduate Students' Digital Technology Assessment Questionnaire (USDTAQ).The instrument was validated by three experts in Measurement and Evaluation in the Departments of Educational Psychology, Guidance and Counselling and Curriculum Studies and Educational Technology, University of Port Harcourt. A reliability coefficient index of 0.87 was determined using Pearson Product Moment Correlation (PPMC) through test-retest method. The researcher administered the copies of the questionnaire with the help of three research assistants from the sampled institutions. The findings from the study revealed that to a high extent, Faculty of Education students in Rivers State have access to personally owned mobile devices and other digital technologies. Though findings also showed the numerous ICT-related challengesfaced by students in the Faculties of Education in the universities in public universities in Rivers State. Therefore, the study recommended that departments in the faculties of education and the University communities generally should build and maintain computer labs with functional computers that also have internet access as this will increase the access that students have to the digital space. Also, Government, University management and other education stakeholders should endeavour to address the challenges hampering ICT availability, accessibility and utilization among students.

Keywords: ***Digital citizenship, digital access, ICT-related challenges, Universities, Rivers State.***

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I. Introduction

The 21st centuryis characterized by a rapid and tremendous change in technological products and processes. The change has affected every aspect of human endeavour. The arrival ofInformation and Communication Technologies (ICTs) has further led to improvement, innovation and developmental changes in societies and theworld at large.The term Information and Communication Technology is currently used worldwide to describe new technologies which depend mainly on computers, the Internet, WIFI,smartphone, and Tablets,personal computers among others.Information and communication technology, according to Asabere and Enguah (2012), can be broadly defined as the tools and resources that offer the necessary environment, physical infrastructure, and services for the creation, transmission, processing, storing, and disseminating of information in all forms, including voice, text, data, and graphics.Information and communication technology (ICT) is further defined as a piece of human-assisted, electronic or digital equipment that can be utilized for both personal and educational purposes (Apagu&Wakili, 2015).

In this period of the rapid emergence of innovative digital technologies, the term digital citizenship has also emerged which simply entails competent and acceptable online behaviour of users of technology and the internet. According to Leustig (2019), digital citizenship implies teaching students to be responsible, safe, and of good conduct while using technological devices on platforms whether in the classroom or outside the classroom.

The concept of digital citizenship has become so significant due to physical restrictions occasioned by the Global COVID-19 pandemic which has led to a tremendous increase in the number of Internet users and has broadened the scope of the use of digital devices for teaching and learning. As opined by Ribble (2020) inFomsi (2021), there are nine elements of the behaviour of digital citizens. The first and basic element is digital access which refers to the rights and access that a person has to the digital space. According to Tayseer (2018), all individuals ought to have equal opportunities for technology and the provision of e-support to achieve the desired benefits as society continually uses these technologies. For digital native students to effectively engage in online learning and virtual learning activities, they ought to have access to digital technology. It is the responsibility of the members of society and the management of institutions to ensure that students have access to technological devices. However, having access to digital technologies is not enough, students must also know how to use these devices responsibly. The yearning for the Internet and digital technologies and how to use them stems from their important position in ensuring easy access to online books, journals, magazines and other information resources irrespective of one's destination, time and space. The COVID-19 pandemic and digital revolution that brought transformation in social integration and communication have not only influenced business operations and sociocultural relationships but also have a pull of influence on teaching and learning as well as research activities.

The demand for alternative learning has increased the clamour for electronic resources to enhance students' access to learning materials which will improve the ability and performance of students and their work quality (Vakkari, 2008). Access and availability of digital technologies especially in Nigerian universities may be limited and unknown to students. The provision of these digital technologies and resources in many Nigerian universities is the responsibility of the government, education stakeholders and organizations. Examples of these digital technologies and e-resources are phones, computers (software and hardware), projectors, television, radio satellites and video conferencing platforms, to mention but a few (Otubelu, 2010).Students' access to e-resources could be an advantage to them academically and in their research endeavors (Nfila, 2008). Internet and digital technologies access even when available in Nigerian universities are not adequately accessed and utilized by students, coupled with varying limitations against its utilization such as queues, limited workstations, lack of proper coordination and poor support services (Ojokoh&Asaolu, 2005). It is imperative therefore to investigate undergraduate students' access to digital technologies in the universities in Rivers State.

Statement of the Problem

Access, availability and use of digital technologies have a lot of benefits for the university communities as they have the capacity to enhance teaching-learning processes and address research concerns. In recent times, students' access to, use and availability of digital technologies and other ICT facilities for learning purposes are of crucial importance as the demand for alternative teaching and learning scenarios increase due to the COVID-19 pandemic. Despite this, many students in Nigerian universities are still incompetent in the use of digital technologies and are in the habit of patronizing traditional sources of information rather than ICT facilities. The reason for this situation may vary but could be attributed to various challenges militating against the access, availabilityand utilization of these digital technologies and facilities. The thrust of this study therefore would be to investigateundergraduatestudents'access to digital technologies in universities in Rivers State.

Aim and Objectives of the Study

This study is aimed at investigating undergraduate students' access to digital technologies in the Faculty of Education in Public Universities in Rivers State. Specifically, the objectives of the study were to:

1. determine the extent to which Faculty of Education students in the Universities in Rivers State have access to digital technologies.
2. examine the ICT-related challenges which Faculty of Education students face in the Universities in Rivers State.

Research Questions

The following research questions guided the study:

1. To what extent do Faculty of Education students in the Universities in Rivers State have access to digital technologies?
2. What are the ICT-related challenges which Faculty of Education students face in the Universities in Rivers State?

Hypotheses

The understated null hypothesis was formulated and tested at a 0.05 level of significance:

$H0_1$: There is no significant difference in the level of access Faculty of Education students have to digital technologies across the three Universities in Rivers State.

II. Methodology

This study adopted a descriptive research design.The study location is public universities in Rivers State, Nigeria. Rivers State is one of the 36 states of Nigeria, located in the South-South geo-political zone.The population of the study comprised eight thousand seven hundred and sixty-one (8761) students in the Faculties of Education in the three universities in Rivers State.The sample for this study comprised two thousand, one hundred and thirty-seven (2137) 400-level undergraduate students in the Faculties of Education in the three public Universities in Rivers State. The multistage sampling technique was adopted to select the sample for this study. In the first stage, purposive sampling was adopted to select the Faculties of Education from the three public Universities in Rivers State (University of Port Harcourt, Rivers State University and Ignatius Ajuru University of Education). In the second stage, a stratified sampling technique was used to select all the departments. At the final stage, purposive sampling was used to select all 400-level students for the study. The 400-level students were deemed appropriate for this study based on the fact that they have encountered technology and are on the verge of entering the technology-driven world of work.To collect information for the study, a self-structured questionnaire titled: Undergraduate Students' Digital Technology Assessment Questionnaire (USDTAQ). The questionnaire contained two sections structured to elicit responses that answered the research questions posed to guide the study. The first section, Section A, elicited demographic data on the respondents' institution and gender. Section Bsought to elicit information on the extent to which the respondents had access to digital technologies and the ICT-related challenges they face.The instrument was validated by three experts in Measurement and Evaluation in the Departments of Educational Psychology, Guidance and Counselling and Curriculum Studies and Educational Technology, University of Port Harcourt. A reliability coefficient index of 0.87 was determined using Pearson Product Moment Correlation (PPMC) through test-retest method.The researcheradministered the copies of the questionnaire with the help of three research assistants from the sampled institutions. The assistants also helped to retrieve the copies of the filled questionnaire. Direct delivery and retrieval method was used.However, out of the 2137 copies of the questionnaire that were administered to the respondents, 1506 copies were duly completed and returned and were then used for data analysis.The data gathered were analyzed using mean and standard deviation to answer the research questions.The hypothesis was tested using Analysis of Variance (ANOVA) at 0.05 level of significance. The Statistical Package for Social Science (SPSS) version 25 was used for the analysis.

III. Results

Research Question 1: To what extent do Faculty of Education Students in the Universities in Rivers State have access to digital technologies?

Table 1. Results showing the extent to which Faculty of Education Students in Universities in Rivers State have access to digital technologies.

S/N	Access to Digital Technologies	Very High Extent	High Extent	Low Extent	Very Low Extent	Mean	Std. Deviation	Remark
1	Personal computers are available and can be accessed quite easily	642	368	268	228	2.95	1.10	HE
2	I have access to a smart phone	1004	383	93	26	3.57	0.69	VHE
3	There is a cybercafé in my school that i can easily access	851	385	193	77	3.33	0.89	VHE
4	I have an email address which I easily use	1038	339	82	47	3.57	0.74	VHE
5	My Facebook account is active	1032	289	104	81	3.51	0.84	VHE
6	My Whatsapp account is active	1080	301	82	43	3.61	0.72	VHE
7	I have data that enable me carry out searches online and communicate with others	774	490	184	58	3.31	0.83	VHE
8	My department has a computer lab that I can easily access	355	357	360	434	2.42	1.14	LE
9	I access the university's e-library	426	388	452	240	2.66	1.05	HE
10	I connect to the class online forum or chat group or blog	573	467	251	215	2.93	1.06	HE
	Grand Mean					**3.19**	**0.90**	**HE**

Research Data, (2022) N = 1506 Criterion Mean (CM) = 2.50

The data in Table 1 showsthe extent to which Faculty of Education students in Rivers State have access to digital technologies. The result shows that to a high extent the students have personal computers (X=2.95, SD=1.06), access the university's e-library (X=2.66, SD=1.05), and connect to the class online forum (X=2.93, SD=1.06). The standard deviation of more than 1.0 show that the scores are heterogeneous and variability is

high. The result shows that to a low extent the departments have computer labs that students can access (X=2.42, SD=1.14). To a very high extent, the respondents have smartphones (X=3.57, SD=0.69), can access cybercafe in school (X=3.33, SD=0.89), have active emails (X=3.57, SD=0.74), active Facebook accounts (X=3.51, SD=0.84) and active WhatsApp Account (X=3.61, SD=0.72). The grand mean of 3.19 indicates that to a high extent Faculty of Education students in Universities in Rivers State have access to digital technologies.

Research Question 2. What arethe ICT-related challenges which Faculty of Education students face in the Universities in Rivers State?

Table 2. Results showing the ICT-related challenges which Faculty of Education students face in the Universities in Rivers State.

S/N	ICT-related challenges faced by students	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Std. Deviation	Remark
11	Inadequate/epileptic power supply is a major impediment to use of ICT	780	544	102	80	3.34	0.86	Strongly Agree
12	Slow and irregular internet connectivity	854	389	157	106	3.32	0.83	Strongly Agree
13	Inconvenient time of operating hours by support staff	456	761	124	165	3.00	1.00	Agree
14	Restricted access to some important databases and e-resources	502	489	231	284	2.80	1.04	Agree
15	Insufficient access time allotted to students	677	545	204	80	3.20	0.87	Strongly Agree
	Grand Mean					**3.13**	**0.92**	**Strongly Agree**

Research Data, (2022) N = 1506 Criterion Mean (CM) = 2.50

The data in Table 2 show the ICT-related challenges faced by students in the Faculty of Education students in Universities in Rivers State. The respondents agreed that inadequate/epileptic power supply is a major impediment to the use of ICT (X=3.34, SD=0.86). With a mean of 3.32 and standard deviation 0.83, the respondents agreed that slow and irregular internet connectivity is a challenge. They further agreed that inconvenient time of operating hours by support staff (X = 3.00, SD =1.00), restricted access to some important databases and e-resources (X = 2.80, SD = 1.04) and insufficient access time allotted to students (X = 3.20, SD = 0.87) were ICT-related challenges they face.The results further show that the grand mean stood at 3.13 with a standard deviation of 0.92 showing homogeneity with implies that respondents strongly agreed that the items listed on the table were ICT-related challenges that Faculty of Education students face in Universities in Rivers State.

Hypothesis 1: There is no significant difference in the level of access Faculty of Education students have to digital technologies across the three universities in Rivers State.

The null hypothesis posits that Education students in the three public Universities in Rivers State do not significantly differ in the level of access they have to digital technologies.

The ANOVA results are presented in Table 3.

Table 3: One-way ANOVA Results showing the difference in the level of access to digital technologies among the three Universities in Rivers State

	Sum of Squares	Df	Mean Square	F-cal	F-crit	α-level	P-Value	Decision
Between Groups	1.675	2	0.838					
Within Groups	363.089	1503	0.242	3.467	3.000	0.050	0.031	Reject Null Hypotheses
Total	364.764	1505						

Multiple Comparisons

Dunnett T3

(I) Institution		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
IAUE	RSU	0.07957	0.03574	0.077	-0.0059	0.1651
	UNIPORT	0.00659	0.03067	0.995	-0.0668	0.0800
RSU	IAUE	-0.07957	0.03574	0.077	-0.1651	0.0059
	UNIPORT	-0.07298	0.03115*	0.037	-0.1475	0.0016
UNIPORT	IAUE	-0.00659	0.03067	0.995	-0.0800	0.0668

RSU	0.07298	0.03115*	0.037	-0.0016	0.1475

*. The mean difference is significant at the 0.05 level.

Data in Table 3 reveal that the F-cal is 3.467 and the P-value is 0.031 at degrees of freedom between groups of 2 and within groups of 1503. The results show that there is a significant difference in the level of access that Faculty of Education Students have across the three Universities in River State ($F_{2,1053}$=3.467, P<0.05). The null hypothesis is therefore rejected, and this means that there is a significant difference in the level of access to digital technologies that Faculty of Education students in the three Universities in Rivers State have.

Table 4: Summary of POST HOC Analysis showing the difference in the level of access to digital technologies among the three Universities in Rivers State

(I) Institution	(J) Institution	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
IAUE	RSU	.07957	.03574	.077	-.0059	.1651
	UNIPORT	.00659	.03067	.995	-.0668	.0800
RSU	IAUE	-.07957	.03574	.077	-.1651	.0059
	UNIPORT	-.07298	.03115	.057	-.1475	.0016
UNIPORT	IAUE	-.00659	.03067	.995	-.0800	.0668
	RSU	.07298	.03115	.057	-.0016	.1475

To test where the difference exists between the three institutions, post-hoc comparison was conducted using Dunnett's T3. The result shows that the level of access to digital technologies that students in Ignatius Ajuru University of Education (IAUE) did not significantly differ from the that of students in Rivers State University (Mean Difference=0.07957, P>0.05) and University of Port Harcourt (Mean Difference= 0.00659, P>0.05). However, students from Rivers State University differed significantly from student in University of Port Harcourt (mean difference = -0.07298, P<0.05), in the level of access to digital technologies that they have.

IV. Discussion of Findings

The results of the study presented in Table 1 show a grand mean of 3.19 which means that to a high extent Faculty of Education Students have access to digital technologies. 67% of the respondents posited that they had personal computers to a high extent and only 33% of the respondents responded to a low extent. Majority of the respondents have access to a smart phone. More than 70% pointed out there is a cybercafe in the institution that they could access easily.Majority of respondents, i.e., 91.5% have active emails while only 8.5% of the respondents do not have active emails.With the introduction of Computer Based Test by the Joint Admissions and Matriculation Board, applicants are mandated to possess emails. So, the high percentage of respondents with active emails is expected. Again, 87% of the respondents have active Facebook accounts and over 90% have active WhatsApp accounts. This signifies that most of the students have some social media presence or partake in social media activities. The respondents pointed out that to a very high extent they have data that enable them to communicate online and carry out other online activities. However, the respondents pointed out that to a low extent their departments have computer labs that they could access. This really could hamper the integration of learning with technologies. Digital citizenship entails equitable access to digital technologies for all students. The results also show that 54% of the respondents access the University's e-library. Although this percentage is above average, it is still not very impressive to know that about 45% of the students do not access the University's e-library for reasons that should be studied. The data shows that 1040 respondents opined that they connect to the class online forum or chat group to a high extent. This shows that the students have access to different digital technologies to a high extent. The results are in line with the findings of Roberts and Mehrotra (2020) who found out that number of students without smartphones was low. Also, Villanti,Johnson, Ilakkuvan, Jacobs, Graham and Rath (2017) discovered high level of digital access among students as many accessed social media sites, had smartphones and were active in the digital space. The findings of this study are in contrast to the findings of Heponiemi, Gluschkoff, Leemann, Manderbacka, Aalto and Hypponen(2021)who discovered poor digital access amongst adults in Finland which hindered them from accessing health care. As opined by Tulinayo, Ssentume and Najjuma (2018) students' access to digital technologies was less than 40% of the sample studied that had access to a personal computer.

The test of hypothesis 1 as shown in Table 3 reveals that the p-value is significant and as such the null hypothesis was rejected. This means that there is a significant difference in the extent of access to digital technologies among students of the three institutions studied (IAUE, RSU, and UNIPORT).The post hoc tests conducted indicate that students of Ignatius Ajuru University of Education did not differ from Rivers State University students and University of Port Harcourt students on the extent of access to digital technologies that they have. However, there was a significant difference between students of Rivers State University and those of University of Port Harcourt. With a mean difference of -0.07298, the students of Rivers State University

showed lesser access to digital technologies than University of Port Harcourt students and this difference is significant. The concern of leaders of institutions should be how to improve students' access to digital technologies. Cueto, Felipe and Leon (2018) had found out that young adults in Peru andVietnam had higher access to digital technologies than those in Ethiopia and India. These may be as a result of government policies on provision of technology infrasture for students. Table 2 which answered research question two showed the challenges students face on the use of ICT in universities in Rivers State. The challenges enumerated are slow and irregular internet connectivity, inconvenient time of operating hours by support staff, restricted digiatl access as well as insufficient access time allotted to students. This finding corroboarted the findings of Owolabi, Idowu, and Okocha (2016), Osuchukwu, Obuezie, and Ogwuche (2017) who reported similar findings.

V. Conclusion

Based on the findings of the study, it is concluded that Faculty of Education Students in Universities in Rivers State have access to digital technologies, and they exhibit some digital citizenship behaviours to a high extent. The study also explicitly showed the challenges militating against the access, availability and utilization of digital technologies.

VI. Recommendations

Based on the findings and conclusions, the following recommendations are made:

1.Departments in the Faculty of Education and the University community generally should build and maintain computer laboratories with functional computers that have internet access as this will increase the access that students have to the digital space.

2. Government, University management and other education stakeholders should endeavour to address the challenges hampering ICT availability, accessibility and utilization among students.

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