



Facilitating Conditions for ICT Integration: Availability and Equity Gaps in Public and Private Secondary Schools in Oshimili South Lga, Delta State, Nigeria

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Abstract

The integration of Information and Communication Technology in secondary education is central to achieving 21st century learning outcomes in Nigeria. This study assessed the availability and extent of availability of ICT facilities in public and private secondary schools in Oshimili South Local Government Area of Delta State, Nigeria, within the framework of the Unified Theory of Acceptance and Use of Technology. Adopting a descriptive survey design, 400 respondents comprising 20 principals and 380 teachers were selected from 20 schools using stratified and simple random sampling techniques. Data was gathered with a 23-item researcher-developed questionnaire titled "Availability of ICT Facilities Questionnaire" which yielded a test-retest reliability coefficient of 0.83. Mean, percentage, and independent samples t-test were used for data analysis at 0.05 level of significance. Findings revealed that foundational ICT facilities such as computer laboratories, desktop/laptop computers, internet services, and accessories were available to a high extent. Conversely, instructional ICT tools including projectors, scanners, and digital cameras were available to a low extent. There was no statistically significant difference between public and private school teachers' ratings on ICT availability, $t(378) = 1.11$, $p = .267$, $d = 0.11$. While Phase 1 ICT infrastructure exists in Oshimili South LGA, a critical gap exists in Phase 2 instructional equipment. The absence of school-type disparity suggests that location and systemic factors outweigh ownership in determining ICT access. Targeted funding, maintenance structures, and teacher capacity building are recommended to bridge the gap between access and pedagogical use.

Keywords: Delta State, digital divide, facilitating conditions, ICT facilities, secondary schools, UTAUT

I. Introduction

Secondary education in Nigeria serves as the transitional stage between primary and tertiary levels, with the mandate of preparing learners for productive living and further education (Federal Republic of Nigeria, 2004). The realization of this mandate in the 21st century is increasingly dependent on the integration of Information and Communication Technology into teaching and learning (UNESCO, 2023). ICT refers to the range of technological tools used to create, store, manage and disseminate information. These include computers, internet systems, audiovisual devices and communication networks (Yusuf, Oyinloye, & Adisa, 2020). Globally, ICT has transformed education by enabling individualized learning, immediate feedback, and expanded access to resources (Mayer, 2009). In Nigeria, the National Policy on Education recognizes ICT as central to national development and mandates its integration into school curricula (Federal Republic of Nigeria, 2004). However, empirical evidence indicates that availability and utilization of ICT facilities in Nigerian secondary schools remain inadequate (Adegbemile, 2011; Adomi & Kpangban, 2008). The COVID-19 pandemic further exposed the importance of ICT in education. The global shift to online learning during 2020-2022 showed that schools without digital infrastructure were left behind (UNESCO, 2023). In Nigeria, this led to increased interventions by government and NGOs. For example, the RETECH Foundation and Bank PHB ICT projects targeted Delta State schools (Vanguard News, 2024). However, anecdotal evidence suggests that while computer laboratories were provided, complementary tools for classroom instruction remain scarce. This creates a situation where students can learn computer appreciation but cannot experience technology-enhanced pedagogy in subjects like Mathematics and Science. In Delta State, recent studies show that while teachers and students hold positive attitudes toward technology,



actual infrastructure is limited (Ubogu & Ogbado, 2023; Nwadiokwu, 2019). A study in Delta Central Senatorial District reported insufficient ICT equipment as a barrier to instructional delivery (Ubogu & Ogbado, 2023). Oshimili South LGA, which houses Asaba the state capital, is expected to have better access due to its urban status and proximity to government agencies. However, there is limited empirical data on the actual availability of ICT facilities in public and private secondary schools within the LGA. This study fills that gap.

This study is anchored on the Unified Theory of Acceptance and Use of Technology (Venkatesh, Morris, Davis, & Davis, 2003). UTAUT posits that four constructs influence technology use, with "facilitating conditions" defined as the degree to which organizational and technical infrastructure exists to support use. In schools, facilitating conditions include computers, internet, electricity, and technical support. UTAUT is particularly relevant because it explains not just adoption but the context that enables use. In resource-constrained settings like Nigeria, facilitating conditions often become the bottleneck (Oye, Iahad, & Ab Rahim, 2012). Previous studies using UTAUT in Nigerian universities found that when computers and internet were available, usage intention increased significantly. Applying this to secondary schools, the availability of basic ICT creates intention, but the absence of instructional ICT blocks actual integration. Literature across Nigeria shows persistent gaps. Owolabi and Oyewole (2007) found that while most schools had computers, less than 20% had internet or projectors. In Kaduna, Adegbemile (2011) reported inadequate and underutilized ICT facilities. In Delta State, Ubogu and Ogbado (2023) found inadequate ICT for teaching and challenges with electricity and maintenance. A 2023 study also noted that poor internet infrastructure limited ICT use despite positive attitudes (Nwadiokwu, 2019). These findings suggest that challenges extend to urban centers like Asaba. The mixed evidence on public-private differences (Achor & Ityobee, 2020; Eggon, Allu, & Ameh, 2024) further justifies a context-specific study in Oshimili South LGA.

ICT in education encompasses hardware, software, networks, and human resources used to support teaching, learning, and administration. Hardware includes computers, projectors, interactive boards, and networking devices. Software includes operating systems, educational applications, and content management systems. Networks include internet connectivity and intranet systems, while human resources refer to trained teachers and technical staff. According to the United Nations Development Programme, ICT tools have become increasingly powerful for promoting accountability, improving service delivery, and enhancing educational opportunities. In schools, ICT facilitates blended learning, virtual laboratories, online assessments, and digital collaboration among students and teachers. Some related studies in Africa show similar trends of events. For instance, Mandefro (2013) found that the level of availability and extent of utilization of different ICT facilities for teaching purposes in secondary schools of the Sidama zone, Southern Ethiopia was very low. There were also no differences in perception among teachers with different backgrounds, subject and grade levels to use ICT facilities for teaching purposes. Major challenges faced by schools which have contributed to limited provision and utilization of ICT facilities were; shortage of computers & absence of internet access, lack of finance, absence of training offered to teachers, lack computer laboratory rooms, absence of school-based ICT policy, absence of qualified IT teachers and technical assistant. Empirical studies across Nigeria show persistent gaps in ICT availability. In Ekiti State as reported earlier, Owolabi and Oyewole (2007) found that while 82% of public and 96.7% of private schools had computers, less than 20% had internet access, projectors, or scanners. Adelabu & Adu (2016) using 100 lecturers that were randomly selected from a public and a private university in Oyo State, Nigeria, found that ICT facilities were not available at the universities for Effective Teaching and Learning. Common challenges identified in literature include high cost of equipment, unstable electricity supply, lack of technical support, and inadequate teacher training. In many schools, donated computers remain unused due to lack of maintenance or qualified personnel. The high cost of replacing and repairing ICT equipment also deters schools from investing in advanced tools like projectors and interactive boards.



A. Statement of the Problem

ICT enhances lesson delivery, research, record-keeping and prepares students for a digital workforce (National Council of Teachers of Mathematics, 2014). Despite efforts by government and NGOs to supply ICT facilities, many secondary schools in Oshimili South LGA still depend on traditional methods (Vanguard News, 2024). While some schools received ICT labs through interventions, others lack projectors, scanners, and reliable internet. Without adequate facilities, teachers cannot integrate ICT effectively and students cannot develop required digital competencies. The implications of inadequate ICT facilities are far-reaching. Students in schools without projectors and internet cannot develop digital literacy skills required for WAEC CBT and JAMB CBT (Nwadiokwu, 2019). Teachers cannot use simulations, videos, or interactive software to teach abstract concepts. This perpetuates the chalk-and-talk method that the National Policy on Education sought to move away from (Federal Republic of Nigeria, 2004). Without empirical data from Oshimili South LGA, it is impossible to know whether current interventions are working or if resources are being misdirected. Previous studies in Delta State focused on Delta Central or on general integration without a focused analysis of Oshimili South LGA (Ubogu & Ogbado, 2023; Nwadiokwu, 2019). Comparative studies between public and private schools in the LGA are also scarce. This study therefore investigates the availability and extent of availability of ICT facilities in public and private secondary schools in Oshimili South LGA and tests for significant differences.

B. Purpose of the Study

The main purpose was to investigate the availability of ICT facilities in public and private secondary schools in Oshimili South LGA. Specifically:

1. Determine the availability of ICT facilities in the schools.
2. Assess the extent of availability of specific ICT facilities.

C. Research Questions

1. Which Specific ICT facility is available in secondary schools in Oshimili South LGA?
2. What is the extent of availability of specific ICT facilities in these schools?

D. Hypotheses

1. There is no significant difference in public and private school teachers' mean ratings on availability of ICT facilities.
2. There is no significant difference in public and private school teachers' mean ratings on extent of availability of ICT facilities.

II. Method

A descriptive survey design was adopted (Creswell & Creswell, 2018). The population comprised 1,201 teachers in 13 public schools and 507 teachers in 26 private schools in Oshimili South LGA (Post Primary School Board, 2026). A sample of 400 was selected: 20 principals and 380 teachers. Ten public schools were randomly selected from 13, and 10 private schools from 26. Proportionate stratified sampling determined teacher allocation per school, followed by simple random sampling of teachers. The instrument was a researcher-developed "Availability of ICT Facilities Questionnaire" with 23 items rated on a 4-point scale: 4 = Very High Extent to 1 = Very Low Extent. Face and content validity were established by three experts in Measurement and Evaluation. Test-retest reliability with 15 teachers yielded $r = .83$. Data were analyzed using mean and percentage. A mean of 2.50 and above indicated high availability. Independent samples t-test tested hypotheses at .05 level. Cohen's d was computed for effect size. Ethical approval was obtained from the Post Primary School Board, Delta State. This study is delimited to public and private secondary schools in Oshimili South LGA, Delta State. It focuses only on availability and extent of availability of ICT facilities as perceived



by principals and teachers. It does not measure actual utilization, student outcomes, or quality of internet connectivity. The study is limited to the 2025/2026 academic session.

III. Results

Research Question 1 & 2: Which ICT facilities are available and what is the extent of availability of specific ICT Facilities in secondary schools in Oshimili South LGA?

Table 1: Availability and Extent of ICT Facilities [N = 400]

S/N	ICT Facility	Mean	Decision
1	ICT Laboratory/Computer Room	3.09	High
2	Desktop/Laptop Computers	3.06	High
3	Modem, USB, Speakers, Headphones	2.79	High
4	Internet & Email Services	2.66	High
5	CD-ROMs/Electronic Boards	2.64	High
6	Printers	2.18	Low
7	Projectors	1.97	Low
8	Digital Cameras	1.83	Low
9	Scanners	1.76	Low
10	Television Sets	1.94	Low
11	Radio/Tape Recorders	2.04	Low

Note. Scale: 1 = Very Low Extent to 4 = Very High Extent. Cut-off = 2.50

Table 1, shows that five facilities had means above 2.50: ICT laboratory (M = 3.09), desktop/laptop (M = 3.06), accessories (M = 2.79), internet (M = 2.66), and CD-ROMs (M = 2.64). This indicates high availability. Specifically, 82% reported high/very high availability of ICT labs and 78% for computers.

Conversely, printers (M = 2.18), projectors (M = 1.97), digital cameras (M = 1.83), scanners (M = 1.76), television (M = 1.94), and radio (M = 2.04) had means below 2.50. This suggests that basic ICT infrastructure has been established in most schools, likely due to government and NGO interventions such as the RETECH Foundation project in Delta State and the default Bank PHB ICT acquisition projects in Oshimili North & South Local Government Areas Of Delta State. However, advanced facilities like projectors, scanners, digital cameras, and printers had mean scores below 2.5, indicating low availability.

Table 2: Grouped Availability of ICT Facilities by Category [N = 400]

Category	Facilities	Mean of Means	Decision
Basic Infrastructure:	Lab, Desktop, Internet, Accessories	2.90	High
Instructional Media:	Projector, CD-ROM, TV, Digital Camera	2.00	Low
Administrative Tools:	Printer, Scanner, Radio	1.99	Low

Table 2 shows that while the extent of availability of basic ICT infrastructures is high, that of Instructional media and Administrative tools are low. This pattern is consistent with findings in Delta Central and other parts of Nigeria, where high-cost equipment remains scarce due to procurement and maintenance costs. The availability of internet services to a high extent is encouraging, but respondents noted that connectivity was often unstable and limited to administrative offices. The results imply that while schools have the foundational tools for ICT integration, the absence of advanced equipment limits the scope of technology-enhanced teaching. For instance, teachers cannot use multimedia presentations or video demonstrations effectively without projectors and interactive boards.

Hypotheses 1 & 2: There is no significant difference in public and private school teachers' mean ratings on availability & extent of availability of ICT facilities.



Table 3: Independent Samples t-test of Public vs Private Teachers' Ratings

Group	N	M	SD	t	df	p	d
Public	190	2.34	0.66	1.11	378	.267	0.11
Private	190	2.05	0.57				

Table 3 shows no significant difference and effect size is negligible. The calculated t-value of 1.11 is less than the critical value of 1.96 at .05 level. Thus, null hypotheses are retained. There is no significant difference between public and private school teachers' ratings of ICT availability and extent of availability. This finding suggests that both public and private schools in Oshimili South LGA face similar challenges in acquiring and maintaining ICT facilities. It also indicates that government interventions have reached both school types, reducing the gap typically observed in other regions. The result contrasts with studies in Nasarawa and Benue States, where private schools had better ICT infrastructure, but aligns with findings in urban areas where public schools benefit from targeted programs.

IV. Discussion

The high availability of basic ICT facilities aligns with government and NGO interventions such as the RETECH Foundation and Bank PHB projects in Delta State (Vanguard News, 2024). This reflects progress in establishing Phase 1 infrastructure. However, the low availability of instructional tools like projectors and scanners indicates a gap in Phase 2 resources needed for multimedia teaching (Moyer-Packenham & Bolyard, 2016).

The data in Table 2 reveal a critical insight: schools are well-equipped for storage and basic computer literacy but poorly equipped for teaching. The mean of 2.90 for basic infrastructure versus 2.00 for instructional media represents a 31% gap. This pattern aligns with findings in Ekiti State where Owolabi and Oyewole (2007) reported high computer availability but less than 20% had projectors. It suggests that donors and government prioritize "computer labs" because they are visible, while ignoring "classroom tools" that change pedagogy.

The non-significant difference between public and private schools in Oshimili South contrasts with findings from Nasarawa State (Eggon et al., 2024) where private schools had significantly more ICT. However, it aligns with studies in urban Benue (Achor & Ityobee, 2020) where government programs equalized access. This suggests that location in the state capital matters. Proximity to government, NGOs, and businesses may have leveled the playing field in Asaba. This is an important contribution because most literature assumes private schools are always better equipped.

From a UTAUT perspective, this study extends the theory to secondary education in a developing context. Venkatesh et al. (2003) treated facilitating conditions as a single construct. Findings in this study suggest it should be disaggregated. "Basic facilitating conditions" may be necessary but not sufficient. "Instructional facilitating conditions" appear to be the real driver of technology integration in classrooms. Without projectors and stable internet, teachers cannot fully leverage ICT for virtual demonstrations or collaborative learning, thus limiting impact on students' digital literacy for WAEC CBT. Future UTAUT studies in education should measure these separately.

V. Conclusion

It is concluded that basic ICT facilities are available to a high extent in secondary schools in Oshimili South LGA, while advanced instructional facilities remain scarce. The lack of significant difference between public and private schools indicates that systemic issues such as funding and maintenance affect both equally. Oshimili South LGA has achieved "Phase 1 Digital Readiness" but has not achieved "Phase 2 Digital Integration". Therefore, availability alone is insufficient; adequacy and functionality must also be addressed.



VI. Recommendations

Based on findings, the following are recommended:

- (a) Increased Funding: Delta State Government and Federal Ministry of Education should allocate dedicated funds for instructional ICT with priority to projectors and interactive boards.
 Cost Reduction: Introduce tax incentives and bulk procurement to reduce equipment costs for schools.
- (b) Rural ICT Centers: Establish community ICT centers in rural areas of Oshimili South LGA to ensure equitable access.
- (c) Teacher Training: Organize regular training by FCE(T) Asaba to build teachers' capacity in using and maintaining ICT facilities.
- (d) Maintenance Structure: Schools should create ICT maintenance committees with annual budget lines for repairs, supported by PPP with private organizations.
- (e) Electricity Solution: Given that power supply was cited as a challenge in Delta Central (Ubogu & Ogbado, 2023), schools should be provided with solar-powered inverter systems to support ICT use.
- (f) Monitoring and Evaluation: The Delta State Ministry of Education should conduct annual ICT audits using this study's instrument to track movement from Phase 1 to Phase 2.

VII. Limitations And Future Research

This study has several limitations. First, it is limited to one LGA and findings may not generalize to rural LGAs in Delta State. Second, reliance on self-report may lead to social desirability bias as teachers may over-report availability. Third, the study measured availability, not quality, functionality, or utilization. A facility that exists but is not working is not useful. Fourth, data were collected in one academic session, and ICT status can change rapidly with new donations. Therefore, future research should employ mixed methods and expand to rural LGAs in Delta State. Classroom observation and student perspectives should be included. A longitudinal study is also needed to examine whether Phase 1 infrastructure translates to improved student outcomes over time.

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