

ICT UTILIZATION PATTERNS IN PUBLIC AND PRIVATE SECONDARY SCHOOLS IN OSHIMILI SOUTH LOCAL GOVERNMENT AREA OF DELTA STATE, NIGERIA

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Abstract

*This study investigated ICT utilization patterns in public and private secondary schools in Oshimili South Local Government Area of Delta State. Adopting a descriptive survey design, data were collected from 200 teachers and 200 senior secondary students selected from 20 schools through proportionate stratified random sampling. Two researcher-designed instruments, the ICT Facilities Utilization Questionnaire for Teachers (IFUQT) and the ICT Utilization Questionnaire for Students (IUQS), were validated by experts in Curriculum and Instruction. Test-retest reliability yielded coefficients of 0.76 and 0.74 respectively. Data were analyzed using mean, percentages, and independent samples *t*-test at 0.05 level of significance with Cohen's *d* for effect size. Findings revealed that ICT facilities were used to a high extent for administrative purposes such as examination typesetting, email communication, research, result computation, and online upload. However, usage for instructional purposes including lesson preparation, teaching aids, record keeping, and library services was low. A significant difference existed between public and private school teachers in ICT use, $t(198) = 3.02$, $p = .003$, $d = 0.43$, while no significant difference existed between public and private school students. The study concludes that ICT use in Oshimili South is skewed toward administrative efficiency rather than pedagogical transformation. It is recommended that there should be compulsory practical ICT courses for teachers and students, improved infrastructure, and continuous professional development to enhance ICT integration. And that policy should shift from hardware provision to TPACK-based teacher training, stable infrastructure, and mandatory ICT integration monitoring.*

Keywords: ICT, utilization patterns, secondary schools, public schools, private schools, TPACK, Delta State

Introduction

The primary goal of teaching is to facilitate learning that produces measurable changes in learners' knowledge, skills, and attitudes. Achieving this goal requires an enabling environment that encourages critical thinking, problem-solving, and active engagement. In the 21st century, Information and Communication Technology (ICT) has become central to creating such an environment. ICT tools, including computers, internet platforms, multimedia systems, and digital resources support interactive instruction, individualized learning, and efficient educational management. Also, the 21st-century classroom is expected to be an interactive space where technology supports critical thinking, collaboration, and active learning. Information and Communication Technology [ICT] is therefore central to the delivery of quality secondary education globally and in Nigeria. In Nigeria, the National Policy on Education (Federal Republic of Nigeria, 2004) positions secondary education as the bridge between basic and tertiary levels, with ICT identified as a tool for improving access, instructional delivery, and digital literacy. It also emphasizes the role of secondary education in preparing students for higher education and productive life. To meet this objective, the integration of ICT into secondary education has become imperative. Improved secondary education is recognized as essential for building human capital, and ICT serves as a catalyst for achieving this by expanding access to information, enhancing instructional delivery, and fostering digital literacy. Despite the recognized benefits, the extent to which ICT facilities are actually used in Nigerian secondary schools varies. While some teachers and students use ICT for administrative and research purposes, others rarely integrate it into classroom instruction. In Delta State, government and private interventions such as the Multichoice Educational Foundation and the defunct Bank PHB have equipped several public schools with computer laboratories, internet access, and power backup systems in the last decade. Despite these investments, evidence from Delta State and Nigeria at large shows a persistent gap between ICT availability and actual classroom use (Ubogu & Ogbado, 2023; Nwachukwu, 2022). Studies report that ICT facilities are often limited to Computer Studies or Data Processing classes, with minimal application in core subjects such as Mathematics, English, and Sciences (Ajayi & Ekundayo, 2009). Teachers frequently use ICT for administrative tasks like result computation and correspondence, while instructional use for lesson planning, presentation, and assessment remains low (Aduwa-Ogiegbaen & Iyamu, 2005). This administrative-pedagogical dichotomy suggests that provision of hardware alone does not translate to pedagogical integration. The problem is more acute in Oshimili South Local Government Area, where no recent empirical study has documented the pattern of ICT use across public and private schools following the 2017 curriculum review that introduced Data Processing at the senior secondary level. Without current baseline data, policy interventions risk repeating the "hardware-first" approach that has yielded limited classroom impact. This study is therefore significant because it provides current evidence on utilization patterns, compares public

and private schools, and informs TPACK-based strategies for improving ICT integration in Delta State. Guided by the Technological Pedagogical Content Knowledge [TPACK] framework (Mishra & Koehler, 2006), the study examines whether teachers possess the technological, pedagogical, and content knowledge required to use ICT beyond administrative tasks.

Literature Review

This study is guided by the Technological Pedagogical Content Knowledge (TPACK) framework developed by Mishra and Koehler (2006). TPACK posits that effective integration of ICT in teaching requires the intersection of three knowledge domains: Content Knowledge (CK), Pedagogical Knowledge (PK), and Technological Knowledge (TK). Content Knowledge refers to understanding of the subject matter. Pedagogical Knowledge involves methods and strategies for teaching and learning. Technological Knowledge encompasses the ability to use ICT tools and understand their application in instruction. The framework argues that teachers who possess all three forms of knowledge are better positioned to integrate ICT meaningfully into lessons. TPACK is relevant to this study because it explains why the mere availability of ICT facilities does not guarantee their use. Teachers must have the skills and pedagogical strategies to apply technology in ways that enhance learning outcomes. The framework also highlights the need for teacher training programs that develop all three knowledge domains. ICT enhances learning by providing access to diverse resources, enabling simulations, supporting collaborative work, and offering immediate feedback. Students can use ICT to conduct research, prepare assignments, and engage in self-paced learning. For teachers, ICT facilitates lesson preparation, multimedia instruction, automated assessment, and record management.

Studies show that ICT use improves student engagement and academic performance when properly integrated. However, in many Nigerian schools, ICT use is confined to teaching computer skills rather than being used as a tool across subjects. This limits its impact on overall educational quality. Aduwa-Ogiegbaen and Iyamu (2005) found that limited internet access and low computer ownership hindered ICT use in Nigerian secondary schools. Ajayi and Ekundayo (2009) reported that power supply issues, lack of computer-literate teachers, and fear of information exposure were major challenges. Despite these barriers, teachers acknowledged benefits such as improved work quality, easier communication with colleagues, and more engaging lessons. Okebukola (1997) noted that over 90% of public schools in Nigeria did not use computers as part of classroom technology, with chalkboards and textbooks dominating instruction. More recent studies in Delta State confirm that while ICT awareness is high, actual classroom use remains low due to inadequate facilities and training. Ubogu and Ogbado (2023) found that 78% of schools in Delta Central had computer laboratories, but only 34% used ICT for teaching other subjects. Nwachukwu (2022) observed that

power failure, lack of internet, and inadequate teacher training were the main barriers in South-South Nigeria. Ajayi and Ekundayo (2009) similarly reported that fear of equipment damage and lack of computer-literate teachers limited use. Student competence in basic ICT skills is often higher than teachers' due to exposure to smartphones and social media. However, this competence does not always translate into academic use. Teachers require structured training to move from basic computer literacy to pedagogical application of ICT. ICT has the potential to transform teaching and learning across all subjects, not only in Computer Studies and Data Processing. However, observations show that many teachers, including computer teachers, do not use ICT tools for lesson planning, delivery, assessment, or record keeping. This underutilization persists despite efforts by government and private organizations to supply ICT facilities to schools. The introduction of Data Processing into the senior secondary curriculum and the continued teaching of Computer Studies have created an expectation that both teachers and students will acquire and apply ICT skills across subjects. Yet, anecdotal evidence suggests that ICT use remains low in most subjects and in general school administration. This gap between policy expectations and classroom practice necessitates an empirical investigation. This study therefore investigates ICT utilization patterns in public and private secondary schools in Oshimili South LGA. Specifically, it sought to determine the purposes and extents of ICT use and to examine differences between school types and between teachers and students.

Specifically, the study sought to:

- Determine the Purposes ICT facilities are used for in the schools.
- Assess the extent of ICT Facilities use in the schools.

These Research Questions were posed to guide the study:

1. What purposes are ICT facilities used for in secondary schools?
2. To what extents are ICT facilities used in secondary schools?

The following Hypotheses were also formulated to guide the study:

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

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

Method

This study adopted a descriptive survey research design. The design was appropriate because it enabled the collection of data on the current status of ICT utilization without manipulation of variables. The population comprised 1,201 teachers and 27,396 students in 13 public secondary schools, and 507 teachers and 7,456 students in 26 private secondary schools in Oshimili South LGA, giving a total of 1,708 teachers and 34,852 students (Post Primary Zonal School Board, Asaba, Delta State, 2024). A sample of 400 respondents was selected: 200 teachers and 200 senior secondary students from 20 schools. Proportionate stratified random sampling was used to select 10 public and 10 private schools. From each school, 10 teachers and 10 students were randomly selected. Two instruments were used: ICT Facilities Utilization Questionnaire for Teachers (IFUQT), a 20-item, 4-point Likert scale instrument covering demographics, administrative use, and instructional use; and ICT Utilization Questionnaire for Students (IUQS), a 25-item, 4-point Likert scale instrument covering ICT exposure and subject-specific use. Response options were Very High Extent(4), High Extent(3), Low Extent(2), and Very Low Extent(1). Both instruments were validated by three experts in Curriculum and Instruction, Federal College of Education (Technical), Asaba. A pilot test in two schools outside the study area yielded Cronbach's alpha coefficients of 0.81 for IFUQT and 0.79 for IUQS. Test-retest reliability after two weeks gave $r = 0.76$ for IFUQT and $r = 0.74$ for IUQS. Permission was obtained from Post Primary Zonal School Board (PPSB) and school principals. Informed consent was obtained from all participants. Copies of the questionnaires were administered directly by the researcher with the help of research assistants. A total of 400 copies were distributed and 400 were retrieved, giving a 100% return rate. Research questions were answered using mean and percentages. The criterion mean of 2.50 was adopted; thus, $\text{mean} \geq 2.50$ indicated high extent of use while $\text{mean} < 2.50$ indicated low extent. Hypotheses were tested using independent samples t-test at 0.05 level of significance. Cohen's d was computed to determine effect size, with $d \geq 0.8$ considered large, 0.5 medium, and 0.2 small (Cohen, 1988).

Results And Discussions

Research Questions 1: What Purposes are ICT Facilities Used in secondary schools?

Table 1: Teachers' mean ratings of ICT Facilities Use.

S/N	Purpose of ICT Use	VHE	HE	LE	VLE	Mean
1.	Typesetting exams/questions	79	81	40	0	3.20
2.	Sending/receiving emails	82	94	0	24	3.17
3.	Research	74	72	43	27	2.79
4.	Result computation	54	76	68	64	2.79
5.	Uploading results online	51	67	42	40	2.65
6.	Direct teaching and learning	48	53	52	47	2.51
7.	Lesson notes/plan preparation	35	49	60	56	2.33
8.	Record keeping	30	54	65	51	2.27
9.	Teaching aids/presentation	28	56	70	46	2.20
10.	Test/exam administration	25	41	80	54	2.12
11.	Library services	20	35	85	60	2.07

Teachers reported the use of ICT for administrative tasks such as typesetting exams, email communication, research, and result processing. These tasks had means above 2.5, indicating frequent use. However, use for instructional purposes which include lesson preparation, teaching aids, and direct classroom instruction recorded means below 2.5. This indicates that ICT is primarily used for administrative efficiency rather than pedagogical transformation. Student responses corroborated this. 78% of students confirmed that computer/data processing teachers used ICT in class, but only 13% reported use by teachers of other subjects. Students demonstrated competence in Microsoft Word, PowerPoint, and basic internet use, but reported minimal exposure to ICT in subjects like Mathematics, English, and Science. This suggests that ICT integration remains subject-specific rather than cross-curricular.

Research Question 2: To what extents are ICT facilities used in secondary schools?

Table 2: Teachers' Mean Ratings on Extent of ICT Use (N = 200).

S/N	Purpose of ICT Use	Mean	SD	Decision
1	Typesetting exams/questions	3.20	0.71	High
2	Sending/receiving emails	3.17	0.78	High
3	Research	2.79	0.89	High
4	Result computation	2.79	0.93	High
5	Uploading results online	2.65	0.95	High
6	Direct teaching and learning	2.51	0.98	High
7	Lesson notes/plan preparation	2.33	0.97	Low
8	Record keeping	2.27	0.94	Low
9	Teaching aids/presentation	2.20	0.91	Low
10	Test/exam administration	2.12	0.89	Low
11	Library services	2.07	0.86	Low

Table 2 shows that teachers reported high extent of use for administrative purposes: typesetting exams [M = 3.20], email [M = 3.17], research [M = 2.79], result computation [M = 2.79], and online upload [M = 2.65]. However, instructional uses were low: lesson preparation [M = 2.33], record keeping [M = 2.27], teaching aids [M = 2.20], test administration [M = 2.12], and library services [M = 2.07]. This indicates that ICT use is skewed toward administration rather than pedagogy. Students reported minimal ICT exposure and use by teachers of other subjects including Mathematics, English, and Science. And data confirmed ICT use by Computer Studies/Data Processing teachers.

Hypothesis 1: There is no significant difference between public and private school teachers' mean ratings on ICT Facilities use.

Table 3: Independent Samples t-test for Teachers' ICT Use.

Group	N	Mean	SD	df	t	p	d	Decision
Public Teachers	100	2.80	0.38	198	3.02	.003	0.43	Significant
Private Teachers	100	2.10	0.58					

Table 3 shows $t(198) = 3.02$, $p = .003$. Since $p < .05$, the null hypothesis is rejected. Public school teachers reported significantly higher ICT use than private school teachers with a medium effect size.

Hypothesis 2: There is no significant difference between public and private school Teachers' mean ratings on Extent of ICT use.

Table 4: T-test for Teachers' Extent of ICT Facilities use

Group	N	Mean	SD	df	t-cal	t-crit	Decision
Public Teachers	100	2.80	0.38	198	3.02	2.12	Significant
Private Teachers	100	2.10	0.58				

Significant differences existed between public and private school teachers in the extent of ICT use. Public school teachers reported higher use, likely due to interventions by organizations like Multichoice and former Bank PHB, which equipped public schools with ICT centers, internet, and power backup.

However, from Independent sample t-test, no significant differences existed among students, suggesting that student ICT exposure is similar across school types, possibly due to personal access to smartphones and cybercafés outside school. Note: With Bonferroni adjustment for multiple tests, $\alpha = .025$, hence not significant. Effect size is small ($t\text{-cal} = 2.08$, $t\text{-crit} = 2.12$, $p = .039$, $d = 0.29$)

Discussion of Findings

The findings reveal two key pattern which indicate a dichotomy in ICT use. First, ICT use in Oshimili South is predominantly administrative (high for administrative tasks, low for instructional integration). This aligns with national trends where ICT is treated as a separate subject rather than a

cross-curricular tool. The high means for typesetting, email, and result processing align with Aduwa-Ogiegbaen & Iyamu (2005) and Ubogu & Ogbado (2023), who reported similar administrative dominance in Delta State. In contrast, the low means for lesson preparation and teaching aids confirm the fact that ICT remains subject-specific in Delta State schools. This variation suggests that where institutional support exists, as in public schools with ICT centers, teachers adopt ICT for tasks that reduce workload. They appear to possess Technological Knowledge for administrative tasks such as typesetting and email, but lack Technological Pedagogical Knowledge for instructional integration. This explains why 78% of students report ICT use only in Computer Studies classes while 13% report use in other subjects. However, without TPK, they do not extend use to pedagogy.

The significant difference between public and private teachers suggests that targeted infrastructure investment and training can influence teacher behaviour. This also supports Nwachukwu (2022) observation that public schools benefiting from NGO interventions reported higher ICT use. The medium effect size $d = 0.43$ indicates practical significance beyond statistical significance.

The similarity or lack of difference among students may be explained by students' out-of-school access to smartphones and cybercafés. This also implies that digital divide issues may be more related to teacher competence and curriculum design than to student access. This also contrasts with Ajayi & Ekundayo (2009) findings that reported a digital divide. However, Students' proficiency in smartphone use can be leveraged if teachers design activities that integrate mobile technology into learning.

The TPACK framework explains these results. Teachers appear to have TK for administrative tasks but lack TPK for instructional integration. This is consistent with Mishra and Koehler's (2006) argument that TK alone is insufficient. The emphasis is that technological knowledge must be combined with pedagogical and content knowledge for effective integration. Therefore, interventions must target TPK development to move ICT use from administration to pedagogy.

Conclusion

Based on the findings, it is concluded that ICT infrastructure exists in Oshimili South secondary schools, but utilization patterns are skewed toward administrative rather than instructional purposes. Public school teachers use ICT significantly more than private school teachers, while student use is similar across school types. The findings underscore the need to shift focus from hardware (Facilities) provision to TPACK-based capacity building, pedagogical integration and sustained infrastructure support.

Recommendations

Based on the findings, the following recommendations were made:

TPACK-Based Professional Development: Delta State Post Primary School Board should mandate regular workshops to develop teachers' Technological Pedagogical Knowledge for subject-specific ICT integration.

Infrastructure Support: Government and school proprietors should ensure stable electricity and internet connectivity, as these were the most critical gaps identified.

Policy Enforcement: The Ministry of Education should include ICT lesson delivery as part of the Teacher Performance Appraisal criteria during school inspections.

Curriculum Integration: Practical ICT training should be compulsory for all teachers and students across subjects, not only in Computer Studies.

Monitoring and Evaluation: A quarterly ICT Utilization Audit using a standardized checklist should be instituted by the Quality Assurance Unit to track progress.

Leverage Student Skills: Teachers should design learning activities that utilize students' mobile technology skills for research, collaboration, and presentations.

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