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Gender variance in the Deployment of ICTs by library and Information Science students in Universities in Southern Nigeria

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Abstract

Purpose. The Research examined the gender variance in the deployment of ICTs by library and information science students in the library schools in southern Nigeria. The research addressed four research queries and formulated hypotheses.

Methodology. The research design deployed in the research was descriptive. A structured questionnaire was deployed as a data collection tool. The research population included 6,247 LIS students from 12 library schools in southern Nigeria. The sample consisted of 624 respondents selected using standard random sampling methods. The data collected were analysed using mean, standard deviation, percentage and product-person-moment correlation coefficient (PPMC).

Results and Discussion. The research showed that ICT tools are easily accessible for university students. Accessibility was found to have a momentous impact on the deployment of ICT among LIS students in southern Nigerian universities.

Conclusion. The study concludes that while both male and female LIS students in Southern Nigerian universities actively use ICT tools with equal frequency, their limited proficiency and tendency to prioritise non-academic use highlight the need for targeted educational initiatives to enhance productive and skilful ICT deployment. Based on the research results, it was recommended that ICT training courses and workshops be provided for LIS students to improve their expertise in using these tools.

1. Introduction

The rapid advancement of Information and Communication Technologies (ICTs) has positioned them as an indispensable force in shaping contemporary human activity, particularly within the higher education sector. ICT, broadly conceptualized as a diverse assemblage of digital tools and systems that enable the transmission, storage, and exchange of information (UNESCO, 2021), has become a critical infrastructure underpinning academic, administrative, and social processes across universities (Al-Rahmi et al., 2020; OECD, 2021). Its impact transcends formal learning contexts, influencing even recreational and informal dimensions such as online gaming and social media interaction (Kolhar et al., 2021). ICT empowers learners through flexible and mobile learning opportunities, broadens access to educational resources, and enhances engagement and motivation (Guaña-Moya et al., 2024). For students enrolled in Library and Information

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Science (LIS) programs, ICT competence extends beyond academic enrichment. It constitutes a professional imperative essential for managing, retrieving, and disseminating knowledge resources effectively (Hailegebreal et al., 2022; Bond et al., 2021).

Despite the global integration of ICT in educational systems, scholarly evidence continues to highlight the persistence of gender variance in its utilization. Empirical findings from multiple studies in Nigeria (Ogunbodede et al., 2022; Ebijuwa, 2018; Egunjobi & Fabunmi, 2021; Qazi et al., 2021) consistently indicate that male students demonstrate higher levels of ICT engagement, proficiency, and confidence than their female counterparts. Such patterns are frequently attributed to structural inequalities, including differential access to technology, gender-biased educational practices, and persistent socio-cultural norms that constrain women's participation in digital spaces (Antonio & Tuffley, 2014; Danjuma et al., 2015). Beyond gender, infrastructural inadequacies and socio-economic disparities further exacerbate the problem. Although institutions may formally provide ICT facilities, their distribution and usability are often inconsistent, shaped by students' economic backgrounds and digital exposure (Czerniewicz et al., 2008). As a result, effective utilization is frequently impeded by barriers of access, awareness, and technical competence (Adepoju, 2019; Akinfolarin & Rufia, 2017). Moreover, the persistent digital divide between developed and developing nations arises not only from infrastructural deficiencies but also from gaps in digital literacy and ICT expertise among graduates (Akuegwu et al., 2011). Consequently, students in resource-constrained environments increasingly substitute limited computer access with mobile devices, relying heavily on platforms such as YouTube, Google, and smartphones for academic and non-academic purposes (Tulinayo et al., 2018; Gasaymeh, 2018; Lekka & Pange, 2015).

Nevertheless, emerging research reveals nuanced findings that challenge earlier assumptions about gendered ICT use. Toyo (2019), in a study specifically targeting LIS students in Southern Nigeria, reported no statistically significant gender differences in ICT adoption and engagement. This finding invites a critical reconsideration of the gendered ICT discourse and raises an essential scholarly question: Has the gender divide in ICT utilization among LIS students truly diminished, or has it merely transformed in nature? Furthermore, recent analyses suggest that the primary challenge has evolved from issues of access toward concerns of quality, competence, and purpose of use (Maxwell & Maxwell, 2022). Although ICT is widely adopted, empirical data demonstrate that students' practical competency levels remain limited, with substantial evidence indicating that usage is dominated by entertainment and social interaction rather than academic or professional activities. Such trends suggest a potential misalignment between the pedagogical potential of ICT and its actual integration into the academic practices of students.

The coexistence of these inconsistencies underscores a critical knowledge gap in understanding the current status of gender variance and the authentic patterns of ICT use among LIS students. Addressing this gap is essential not only for mapping technological inclusion but also for advancing equitable and competency-based digital literacy frameworks within LIS education. Consequently, this study aims to generate comprehensive and up-to-date empirical data that evaluate both the extent of gender variance and the multifaceted dimensions of ICT accessibility, competency, and utilization among LIS students in Southern Nigerian universities.

To fulfill these aims, the research adopts a descriptive design and seeks to: (1) determine the level of access LIS students have to ICT facilities, (2) evaluate their ICT competencies, (3) identify the most frequently utilized ICT tools, (4) measure the extent of ICT engagement for academic versus non-academic purposes, and (5) examine whether gender significantly influences ICT usage patterns. The outcomes of this study are expected to contribute to the global discourse on digital inclusion by offering evidence-based

insights that inform institutional policy, guide digital literacy interventions, and promote the productive and equitable integration of ICT within higher education ecosystems.

2. Method

This study employed a research design style that focused on description. The research design suits this study because it systematises the evaluation of prevailing circumstances surrounding male and female LIS students' ICT accessibility and competence in Nigerian Southern universities. The research design suits investigations that reveal statistical relationships among variables and avoids changing study elements (Creswell, 2014). The research design of descriptive assessment enables the researcher to obtain accurate quantitative and qualitative data on ICT access and competencies of LIS undergraduates while examining gender-based ICT deployment through current status observation in selected universities.

A total of 6,249 students who study library science and computer science in 12 universities in Southern Nigeria formed the research population. From the population of 6,249 students, a sample of 624 respondents participated in the study through a simple random sampling technique as the research methodology. The researcher employed structured questionnaires as the main data collection instrument. Two subject matter experts from the LIS and Measurement and Evaluation fields have validated the research equipment. The research instrument achieved acceptable reliability because its Pearson Product-Moment Correlation Coefficient (PPMC) resulted in a value of 0.91. Every respondent received support from the research assistants over a 4-week period during which data were obtained at different learning institutions. Statistical analysis included mean, standard deviation, percentage, frequency and Pearson Product-Moment Correlation (PPMC).

3. Result and Discussion

3.1 Result

This section is on the analysis of data to answer the research queries raised in the research.

3.1.1 Research Question One: What is the level of accessibility of LIS Students to ICT facilities in library Schools in Southern Nigeria?

Table 1: Level of Accessibility of LIS Students to ICT Facilities in Library Schools

ICT Facilities	M	SD
Electronic Photocopier	3.00	1.10
Printers and Plotters	2.98	1.05
Duplicating Machine	3.16	1.12
Audiotapes and Discs	2.66	1.08
Computers	2.97	1.15
Scanners	2.61	1.15
Television Sets	3.08	0.84
Video Conferencing Facility	2.17	1.10
Multimedia projectors and Slides	3.07	1.04

Continued Table 1...

Telecom Facility	2.03	0.85
Digital Cameras	2.87	1.04
Fax (facsimile) Machine	1.95	0.85
Overhead Projector Sand Transparencies	2.47	1.12
Aggregate Mean 2.71 Criterion Mean 2.50		

Note: M = Mean, SD = Standard Deviation

LIS students can access different ICT facilities in library schools to a moderate extent according to Table 1 where the aggregate mean measures 2.71 versus the criterion mean set at 2.50. The assessment indicates that overall LIS students maintain moderate access to ICT facilities at their institutions because the calculated aggregate mean surpasses the criterion mean. Specific ICT tools show varying degrees of accessibility when we look at the mean values obtained for each item.

Student access to ICT tools appears favourable since some facilities surpass the criterion mean based on their mean score results. LIS students can easily access the duplicating machine (M = 3.16, SD = 1.12), television sets (M = 3.08, SD = 0.84), multimedia projectors and slides (M = 3.07, SD = 1.04), electronic photocopiers (M = 3.00, SD = 1.10), printers and plotters (M = 2.98, SD = 1.05), and computers (M = 2.97, SD = 1.15) in their educational institutions. Students within all institutions can conveniently access facilities according to their relatively high mean assessment levels.

The availability of selected ICT facilities fell short of the established criterion mean based on data collection. The lowest procurable accessibility rates belong to video conferencing facilities (M = 2.17, SD = 1.10), together with telecom facilities (M = 2.03, SD = 0.85), and fax (facsimile) machines (M = 1.95, SD = 0.85). Students have partial access to both scanners (M = 2.61 and SD = 1.15) and audiotapes and discs (M = 2.66 with SD = 1.08) and overhead projectors with transparencies (M = 2.47 with SD = 1.12).

Overall, the results indicate that although LIS students have a moderate amount of access to ICT resources, some necessary tools, especially those about advanced communication and digitisation, are not easily accessible. Students' capacity to completely incorporate ICT into their academic and professional development may be hampered by this restricted accessibility.

3.1.2 Research Question 2: What are the competencies of library and information science students?

Table 2: The Competencies of Library and Information Science Students in the Deployment of ICT

ICT Competencies Possessed	Agree		Disagree	
	Freq.	%	Freq.	%
Proficient in the deployment of Computer	457	73.7	163	26.3
Knowledge in electronic formats e.g. PDF, JPEG.	303	48.9	317	51.1
Working in interactive platforms e.g. video Conferencing, BBS, etc	168	27.1	452	72.9
Working in a network environment	115	18.5	505	81.5
Online acquisition procedures/techniques	79	12.7	541	87.3
Knowledge of database types	73	11.8	547	88.2
Online navigation techniques	10	1.6	610	98.4

Table 2 shows the ICT expertise of library and information science students at the universities included in this research. On the other hand, a minority of respondents agree

that they have low levels of expertise ranging from internet navigation techniques 10 (1.6%) to the knowledge of database typologies to online search methods/techniques 79 (12.77%) etc. suffices. in the table indicated high proficiency in ICT expertise, including computers, 457 (73rd).7%) and knowledge of electronic formats 303 (48.9%).

3.1.3 Research Question 3: What is the most regularly deployed ICT tools by LIS Students in Library schools?

Table 3: The Most Regularly Deployed ICT Tools by Library and Information Science Students

ICT Facilities	CU	U	SL	NU	Total (100%)
Electronic photocopiers	110 (18%)	22 (3%)	222 (36%)	266 (43%)	620 (100%)
Cellular phones (GSM)	510 (82%)	78 (13%)	14 (2%)	18 (3%)	620 (100%)
Printers and plotters	218 (35%)	86 (14%)	216 (35%)	100 (16%)	620 (100%)
Duplicating machines	412 (67%)	86 (14%)	64 (10%)	58 (9%)	620 (100%)
Audio tapes and Discs	286 (46%)	168 (27%)	144 (23%)	22 (4%)	620 (100%)
Computers	321 (52%)	24 (4%)	200 (32%)	75 (12%)	620 (100%)
Scanners	214 (34%)	186 (30%)	42 (7%)	178 (29%)	620 (100%)
Close circuit television (CCTV)	112 (18%)	88 (14%)	134 (22%)	286 (46%)	620 (100%)
Television sets	482 (78%)	104 (17%)	18 (3%)	16 (2%)	620(100%)
Video conferencing facility	304 (49%)	114 (18%)	164(27%)	38 (6%)	620 (100%)
Multimedia projectors and slides	102 (16%)	48 (8%)	256 (41%)	214 (35%)	620 (100%)
Telecom facility	76 (12%)	24 (4%)	286 (46%)	234 (38%)	620 (100%)
Digital cameras	124 (20%)	122 (20%)	73 (12%)	301 (48%)	620 (100%)
Fax (facsimile) machines	66 (11%)	86 (14%)	308 (50%)	160 (25%)	620 (100%)
Overhead projectors and transparencies	106 (17%)	22 (4%)	304 (49%)	188 (30%)	620 (100%)
Internet facilities	386 (62%)	156 (25%)	46 (8%)	32 (5%)	620 (100%)

Note: CU: Regularly Utilised; U: Utilised; SL: Slightly Utilised; NU: Not Utilised

Table 3 shows that the ICT tools most regularly deployed by library and IT students are mobile phones (GSM), televisions, photocopiers, internet devices, computers, video conferencing, audio cassettes and discs. The results also show that fax machines, overhead projectors and slides, telecommunications equipment, multimedia and slide projectors, digital cameras, CCTV and electronic copiers are not widely deployed.

3.1.4 Research Question 4: What is the degree of the use of ICT by Library and Information Science students in the universities?

Table 4: The degree of use of ICT by Library and Information Science students

Use of ICT	M	SD
For social networking	3.15	1.03
For school registration (Café work)	2.96	0.96
To play games	2.90	1.00
To download music	2.81	1.07
To watch movies online	2.67	1.07
For assignments	1.50	0.71
Aggregate Mean 2.67 Criterion Mean = 2.50		

Note: M = Mean, SD = Standard Deviation

Table 4 shows the use of ICT by Library and Information Science (LIS) students recording an aggregate mean of 2.67, results above the criterion mean of 2.50. The evaluation results demonstrate that LIS students employ ICT facilities at a moderate level because the overall aggregate mean surpasses the criterion mean. Each surveyed purpose of ICT usage shows distinct variation in its level of utilisation according to the mean scores obtained.

The results showed LCS students access social networking platforms the most frequently demonstrated by their mean score of M = 3.15, SD = 1.03. The respondents showed high use of ICT resources when registering for school and using it for café activities as well as gaming (M = 2.96, SD = 0.96) and downloading music (M = 2.81, SD = 1.07) and watching movies (M = 2.67, SD = 1.07). Students mostly use ICT for recreational and social purposes rather than for academic or professional objectives.

Conversely, the use of ICT for assignments (M = 1.50, SD = 0.71) falls significantly below the criterion mean, highlighting a low level of engagement in academic-related activities. Students show limited geographical integration of ICT tools in their academic work and research tasks, thus affecting their academic performance and digital literacy evolution.

Research evidence shows that LIS students frequently use information and communication technology, but their usage primarily involves non-academic purposes, while academic assignments receive little to no attention.

3.1.5 Testing of the Research Hypothesis

The hypotheses tested were made possible from the data generated from six hundred and twenty (620) respondents. The first hypothesis stated that there is no momentous variance between gender and use of ICTs among Library and Information Science students in universities in Southern Nigeria. To test research hypothesis three, the z-test analysis was adopted. The results of the data analysis are presented in Table 5.

Table 5: Z-test on the Relationship between Gender and use of ICTs among Library and Information Science Students

Gender	N	$\bar{X}$	SD	Df	Cal-z value	Sig	MD
Male	301	28.7641	5.49917	620	-0.68	.2483	0.3597
Female	319	28.4044	5.51523				

α =0.05

The calculated z-score of -0.68 was deemed negligible according to Table 5 because 0.2483 exceeded the alpha value of 0.05. The finding showed that no significant difference exists between male and female students (M=28).7, SD=5.4) (M=28.4, SD=5.5) regarding their utilization of ICT. The experimental evidence supports accepting the null hypothesis, which demonstrates that gender does not significantly impact the use of ICT by students between the library and computer science disciplines within southern Nigerian universities. Library and information science students in southern Nigerian universities demonstrate similar practices of ICT utilisation.

3.2 Discussion

Results demonstrate that Southern Nigerian Library and Information Science students use Information and Communication Technology resources extensively in their educational settings. Alex-Nmecha and Ejitagha (2023) discovered that undergraduate LIS students in Nigerian universities depend on online information resources like online

newspapers and databases, and journal articles in their digital information literacy skill usage assessment.

Students reported using basic IT skills as their primary set of Information and Communication Technology (ICT) skills, which indicates their limited capability to utilise advanced ICT tools. Alex-Nmecha and Ejitagha (2023) showed that students display confidence in their internet search skills, yet they lack awareness about several information resources, including electronic theses and dissertations and e-reference books, and e-books, and this reflects their incomplete mastery of ICT skills.

Existing evidence presents different findings from those reported by Hossain and Sormunen (2019) about computer and internet proficiency among LIS students, thereby indicating the necessity for educational initiatives to boost student ICT competencies for more effective learning.

Research identified that Information Science students heavily rely on ICT throughout their academic period at the university. A study by Toyo (2019) carried out on LIS students in southern Nigerian universities found that although students reported high levels of access to ICT facilities, their actual skill levels and frequency of academic use were relatively low; the author also found no significant gender difference in ICT usage among the students.

Male and female students showed similar levels of ICT utilisation as indicated by mean data points at 28.7 (SD=5.4) for males and 28.4 (SD=5.5) for females. The absence of gender variance in ICT utilisation suggests that both male and female students had comparable access to and familiarity with ICT tools, indicating that gender does not play a significant role in influencing ICT usage in this context. The study results contradict previous research, including a review by Qazi et al. (2021) which found that across empirical, cross-national, and regional educational studies both male and female students used ICTs to a comparable extent, broadly indicating that gender did not meaningfully influence ICT utilisation.

The results of this study contradict earlier findings, which depict a gender bias toward male students when using ICT, thus creating doubts about male dominance in ICT adoption within LIS student populations at southern Nigerian universities. The results indicate no major sex-related variations in ICT usage by students because both men and women now have similar access and drive to utilise technology for classroom work. Institutional initiatives that narrowed the ICT access and proficiency gap between genders, as well as changing societal views about technology use among students, appear to be two possible explanations for this result.

4. Conclusion

The study concludes that while both male and female LIS students in Southern Nigerian universities actively use ICT tools with equal frequency, their limited proficiency and tendency to prioritise non-academic use highlight the need for targeted educational initiatives to enhance productive and skilful ICT deployment.

The research outcomes led to these recommendations being developed: (1) The LIS Students require training and workshops about ICT tools to develop their skills in tool usage; (2) Every Library School needs an attached computer lab serving all departmental students to improve their skills in tool usage; (3) Educational leadership at government institutions and in tertiary institutions should enable campus-wide access to ICT facilities for student educational development and personal needs.

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