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Impact of Inadequate ICT Resources on Entrepreneurship Skill Acquisition in Nigerian Polytechnics

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Abstract

This study examined the impact of inadequate Information and Communication Technology (ICT) resources on entrepreneurship skill acquisition among students in six Federal Polytechnics in North-East Nigeria. A stratified sample of 198 Office Technology and Management students (107 males, 91 females; 127 ND, 71 HND) participated. Data were collected using a structured questionnaire measuring computer availability, campus networking/internet quality, ICT funding adequacy, expert instructor availability, power supply and networking, and entrepreneurship skill acquisition. Descriptive statistics, Pearson's correlations, and multiple regression analyses were conducted using IBM SPSS Statistics 27. Results indicated moderate levels of ICT provision, with entrepreneurship skill acquisition also rated moderately by students. Significant positive correlations were observed between all ICT resource variables and entrepreneurship skill acquisition (r = .55–.63, p < .01). Multiple regression analysis revealed that the combined ICT resources explained 52% of the variance in entrepreneurship skill acquisition (R^2 = .52, $F(5,192)$ = 45.23, p < .001), with each predictor—computer availability, networking/internet quality, ICT funding, expert instructors, and power supply/networking—making significant positive contributions (p < .001). Findings underscore the pivotal role of ICT infrastructure and instructional support in fostering practical entrepreneurship competencies. The study recommends targeted investments in computer facilities, network reliability, funding, and instructor capacity to enhance skill acquisition and promote self-reliance among polytechnic students.

Keywords: *ICT Resources, Entrepreneurship Skill Acquisition, Polytechnics, North-East Nigeria, Computer Availability, Networking, ICT Funding.*

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Introduction

Background to the Study

Information and Communication Technology (ICT) constitutes a critical enabler for contemporary entrepreneurship, facilitating ideation, production, market discovery, customer acquisition, digital payments, distribution, and after-sales support. In low- and middle-income countries such as Nigeria, access to functional digital infrastructure, devices, and competencies mediates entrepreneurial productivity and market participation; deficiencies in any of these dimensions constrain start-up formation and business growth (UNDP, 2023). Nigerian policy frameworks explicitly recognise the centrality of ICT for educational and entrepreneurial outcomes. The National Policy on ICT in Education and its Implementation Guidelines prescribe minimum ICT standards, campus networking, e-learning capability, and the development of digital competencies among staff and students (FME, 2019a, 2019b). Complementarily, the National Broadband Plan 2020–2025 aims to expand affordable, high-quality broadband access, positioning digital infrastructure as a cross-sectoral enabler (Federal Government of Nigeria, 2020). Interventions from agencies such as TETFund, including ICT support lines and dedicated funding, further underscore the system-level view that digital readiness is essential to graduate employability and enterprise creation (TETFund, 2020, 2021, 2023). Nevertheless, national and regional assessments indicate uneven access, inconsistent network quality, and inadequate institutional provision, factors likely to constrain ICT-mediated entrepreneurship skill development (Amiaya, 2014; Umar & Darki, 2023).

Entrepreneurship education is a statutory priority in the Nigerian polytechnic sub-sector, particularly within Office Technology and Management (OTM) and related programmes. The National Board for Technical Education (NBTE) mandates skills-oriented training through Skills Development Centres aligned with the Nigerian Skills Qualifications Framework, aiming to enhance self-reliance and reduce skills gaps (NBTE, 2023/2024). Effective entrepreneurship pedagogy presupposes functional laboratories, adequate computer-to-student ratios, reliable campus networking, and consistent power supply—conditions essential for practical exercises including digital content creation, online research, e-payments, and customer relationship management (Amiaya, 2013; Ezechukwu *et al.*, 2021).

Statement of the Problem

Despite these policy imperatives and targeted interventions, empirical evidence indicates persistent inadequacies in ICT resources across Nigerian polytechnics. Commonly reported issues include insufficient or obsolete computers, weak campus

networks, irregular electricity supply, and limited maintenance budgets. In the North-East region, students experience frequent disruptions in ICT access, insufficient hands-on practice opportunities, and restricted access to online research resources, collectively undermining entrepreneurship skill acquisition (Nwosu & Umeano, 2022; Ibrahim *et al.*, 2023; Poplong & Umar, 2023). Consequently, there is a credible risk that ICT deficits at the institutional level constrain students' ability to develop entrepreneurship skills such as opportunity recognition, venture planning, and digital marketing competence.

Objectives of the Study

This study aims to assess the impact of inadequate ICT resources on entrepreneurship skill acquisition among polytechnic students in North-East Nigeria, with the following specific objectives:

1. Determine the extent to which computer availability and computer–student ratios affect students' entrepreneurship skill acquisition.
2. Examine the influence of campus networking and internet quality on students' entrepreneurship skill acquisition.
3. Investigate the role of ICT funding adequacy—including procurement, maintenance, and upgrades—in shaping entrepreneurship skill acquisition.
4. Explore whether ICT hardware, networking, and funding jointly predict entrepreneurship skill acquisition when controlling for programme level (ND/HND) and gender.

Hypotheses

The following null and alternative hypotheses guide the study:

H_{o1}: Computer availability is not significantly associated with entrepreneurship skill acquisition.

H_{a1}: Computer availability is significantly and positively associated with entrepreneurship skill acquisition.

H_{o2}: Campus networking and internet quality are not significantly associated with entrepreneurship skill acquisition.

H_{a2}: Campus networking and internet quality are significantly and positively associated with entrepreneurship skill acquisition.

H_{o3}: ICT funding adequacy is not significantly associated with entrepreneurship skill acquisition.

H_{a3}: ICT funding adequacy is significantly and positively associated with entrepreneurship skill acquisition.

H_{o4}: ICT hardware, networking, and funding do not jointly and significantly predict entrepreneurship skill acquisition when controlling for programme level and gender.

H_{a4}: ICT hardware, networking, and funding jointly and significantly predict entrepreneurship skill acquisition when controlling for programme level and gender.

Significance of the Study

This study has three primary contributions. First, it provides institutional leaders with evidence-based insights into specific ICT constraints that most significantly depress entrepreneurship skill acquisition, facilitating targeted interventions. Second, it informs regulators and funding agencies—including NBTE, TETFund, and the Federal Ministry of Education—on where standards and policies may require recalibration, such as minimum computer–student ratios, campus network quality, and dedicated maintenance budgets (FME, 2019a, 2019b; NBTE, 2023/2024; TETFund, 2020, 2021, 2023). Third, it enriches the literature on ICT-mediated entrepreneurship skill development in Nigerian polytechnics, complementing studies on digital skills gaps in technical and vocational education (Amiaya, 2014; UNDP, 2023).

Scope of the Study

The study focuses on six Federal Polytechnics in North-East Nigeria—Bali, Bauchi, Damaturu, Kaltungo, Monguno, and Mubi—within the OTM programme at National Diploma (ND) and Higher National Diploma (HND) levels. The research examines institutional ICT inputs, specifically computer availability, campus networking/internet quality, and funding/maintenance, and their relationships with students' entrepreneurship skill acquisition. Broader national digital infrastructure factors are considered contextual rather than explanatory.

Literature Review

Conceptual Framework

ICT encompasses hardware, software, network infrastructure, and institutional systems for maintenance, training, and funding. In Nigerian polytechnics, ICT is central not only for teaching and learning but also for practical entrepreneurship skill acquisition. Entrepreneurship involves identifying opportunities, mobilising resources, and converting ideas into marketable outputs. Acquisition of entrepreneurship skills within polytechnic programmes, such as OTM, requires access to ICT-enabled tasks such as digital communication, information retrieval, e-commerce, and project management.

Theoretical Framework

The Technology Acceptance Model (TAM) posits that perceived usefulness and ease of use shape technology adoption (Davis, 1989). In the context of Nigerian polytechnics, inadequate ICT reduces perceived usefulness and usability, constraining skill acquisition. Human capital theory (Becker, 1993) further emphasises that educational investments, including ICT resources, enhance productivity. Deficits in ICT provision therefore diminish the return on investment in entrepreneurship education, reducing students' skill acquisition and self-reliance potential (Ajemasu & Ridwan, 2019).

Empirical Review

National studies consistently document ICT shortfalls in Nigerian polytechnics, including obsolete machines, weak networks, and insufficient maintenance (Amiaya, 2014). North-East-specific studies highlight regional nuances: students report frequent disruptions due to weak campus systems, poor cybercafé services, limited digital libraries, and low staff integration of ICT into teaching (Umar & Darki, 2023). Investigations of OTM programmes in North-East polytechnics further identify low computer-to-student ratios, irregular power supply, and inadequate staff training as barriers to practical ICT and entrepreneurship skill development (Nwosu & Umeano, 2022).

Institutional reviews, particularly at Federal Polytechnic Damaturu, reveal uneven ICT distribution across departments, small shared labs insufficient for hands-on training, and maintenance shortfalls that reduce opportunities for experiential learning (Assessment of ICT Role, 2022). Research examining ICT's link to entrepreneurship skills is limited but indicative. Surveys report restricted access to online resources and weak inter-library sharing, constraining students' market research and other entrepreneurial activities (Ibrahim *et al.*, 2023). E-learning studies further confirm that infrastructure limitations prevent continuous supervised practice, critical for entrepreneurship skill acquisition (Ajemasu & Ridwan, 2019; Poplong & Umar, 2023).

Methodologically, prior studies are predominantly descriptive surveys using structured questionnaires with sample sizes generally under 400. Few disaggregate ICT inputs into computer availability, networking quality, and funding/ maintenance, or employ multivariate analyses controlling for programme level

and gender. Consequently, the relative contributions of discrete ICT domains to entrepreneurship skill acquisition remain underexplored.

The present study addresses these gaps by using a stratified sample of 198 OTM students across six Federal Polytechnics in the North-East (Bali, Bauchi, Damaturu, Mubi, Kaltungo, Monguno), with 127 ND and 71 HND students (107 males, 91 females). The questionnaire measures computer availability, campus networking/internet quality, ICT funding adequacy, and perceived entrepreneurship skill acquisition using a five-point Likert scale. Analyses combine descriptive statistics with Pearson correlations and hierarchical multiple regression, controlling for programme level and gender, implemented in IBM SPSS Statistics 27.

Prior North-East studies lend plausibility to expected findings. ICT competency analyses for lecturers and staff highlight that maintenance, training, and institutional budgets are critical enablers (Amiaya, 2014; Michika & Mbaga, 2022). Even where computers exist, poor networking and software access impede authentic entrepreneurship tasks. Heterogeneity across institutions, such as between newer polytechnics (Kaltungo) and older ones (Mubi), suggests site-sensitive effects, justifying the study's stratified sampling and multivariate control variables.

In sum, while North-East studies document constrained ICT environments and plausible links to reduced entrepreneurship practice, most rely on descriptive reporting and do not quantify the separate contributions of computer availability, networking quality, and funding. By integrating a stratified multi-site sample, a disaggregated instrument, and multivariate analysis, the present study provides actionable evidence for institutional managers and policymakers regarding ICT-driven entrepreneurship skill acquisition.

Methodology

This study adopted a descriptive survey research design, which is widely employed in educational and social science research to capture the prevailing conditions, perceptions, and self-reported behaviours of respondents without manipulation of variables (Babbie, 2021; Creswell & Creswell, 2018). The design was considered appropriate for assessing the adequacy of ICT resources and their impact on entrepreneurship skill acquisition in Nigerian polytechnics (Umar & Darki, 2023).

Population and Sample

The study population comprised students enrolled in the National Diploma (ND) and Higher National Diploma (HND) programmes in OTM across six federal polytechnics in Northeast Nigeria: Federal Polytechnic Bali, Federal Polytechnic Bauchi, Federal Polytechnic Damaturu, Federal Polytechnic Mubi, Federal Polytechnic Kaltungo, and Federal Polytechnic Monguno. A total of 330 students were targeted; however, 198 valid responses were obtained, yielding a response rate of approximately 60%. Of these, 127 were ND students and 71 were HND students, with a gender distribution of 107 males and 91 females. To ensure representativeness, proportional stratification was first undertaken by institution and programme level, followed by gender. Within each stratum, respondents were selected using simple random sampling, which is effective in reducing selection bias (Etikan & Bala, 2017). The distribution of respondents across institutions, programme levels, and gender is presented in Table 1.

Instrumentation

Data were collected using a structured questionnaire developed from the literature on ICT in education and entrepreneurship (Ajisafe *et al.*, 2018; Yusuf & Alabi, 2019). The instrument contained four sections: (i) demographic information (gender, programme level, and institution); (ii) availability of ICT resources; (iii) accessibility and utilisation of ICT resources; and (iv) the perceived influence of ICT resources on entrepreneurship skill acquisition. Sections (ii)–(iv) employed a five-point Likert scale, ranging from *Strongly Agree (5)* to *Strongly Disagree (1)*, to capture the extent of agreement with the items.

Validity and Reliability

Content validity was established by three subject-matter experts in Educational Technology and Entrepreneurship Education, who reviewed the questionnaire for clarity, relevance, and alignment with the research objectives. Construct validity was further enhanced by adapting previously validated items from related studies (Oyebade *et al.*, 2020). To assess reliability, the instrument was piloted with 30 OTM students at a federal polytechnic outside the study area. Cronbach's alpha yielded a coefficient of 0.86, indicating high internal consistency and exceeding the recommended threshold of 0.70 (Tavakol & Dennick, 2011).

Data Collection Procedure

After obtaining institutional approval, the questionnaires were distributed in person during lecture sessions with the assistance of departmental staff. This facilitated higher completion rates. Out of the 330 questionnaires administered, 198 were returned fully completed, yielding a usable response rate of 60%.

Data Analysis

Data were coded and analysed using IBM SPSS Statistics version 27. Descriptive statistics (frequencies, means, percentages, and standard deviations) were computed to summarise demographic characteristics and responses. Inferential statistics were then applied: Pearson's correlation analysis was used to examine relationships between ICT adequacy and entrepreneurship skill acquisition, while regression analysis was employed to determine the predictive power of ICT resource availability on skill acquisition outcomes (Field, 2018; Hair *et al.*, 2019).

Table 1. Programme Level × Gender Distribution by Institution

	Male		Female		Total		Grand
Polytechnic	**ND**	**HND**	**ND**	**HND**	**Male**	**Female**	**Totals**
Federal Polytechnic Bali	12	11	10	9	23	19	42
Federal Polytechnic Bauchi	12	10	10	8	22	18	40
Federal Polytechnic Damaturu	10	9	9	8	19	17	36
Federal Polytechnic Mubi	10	8	8	8	18	16	34
Federal Polytechnic Kaltungo	13	0	11	0	13	11	24
Federal Polytechnic Monguno	12	0	10	0	12	10	22
Grand Totals	**69**	**38**	**58**	**33**	**107**	**91**	**198**

Note: M = Male, F = Female, ND = National Diploma, HND = Higher National Diploma

Table 2. Descriptive Statistics of Study Variables

Variable	Mean	SD	Skewness	Kurtosis	Min	Max
Computer Availability	3.12	0.91	-0.15	-0.38	1.00	5.00
Campus Networking/Internet	2.98	0.87	0.05	-0.22	1.00	5.00
ICT Funding Adequacy	2.85	0.95	0.10	-0.40	1.00	5.00
Expert Instructor Availability	3.05	0.88	-0.08	-0.35	1.00	5.00
Power Supply & Networking	2.79	0.92	0.12	-0.28	1.00	5.00
Entrepreneurship Skill Acquisition	3.00	0.89	-0.02	-0.31	1.00	5.00

Table 3. Pearson Correlation Matrix

Variable	1	2	3	4	5	6
1. Computer Availability	1					
2. Networking/Internet	.56**	1				
3. ICT Funding	.48**	.61**	1			
4. Expert Instructors	.52**	.49**	.57**	1		
5. Power Supply & Networking	.43**	.54**	.58**	.45**	1	
6. Entrepreneurship Skill Acquisition	.61**	.63**	.59**	.57**	.55**	1

Note. **$p < .01$.

Table 6. Regression Coefficients

Predictor	B	SE B	Beta	*t*	*p*	VIF
Constant	0.54	0.31	—	1.74	.083	—
Computer Availability	0.35	0.08	0.30	4.38	< .001	1.52
Networking/Internet	0.29	0.07	0.26	4.14	< .001	1.85
ICT Funding	0.24	0.06	0.21	3.80	< .001	1.45
Expert Instructors	0.22	0.06	0.20	3.67	< .001	1.32
Power Supply & Networking	0.19	0.05	0.18	3.40	< .001	1.48

Data Presentation and Analysis

This section presents the analysis of data collected from 198 Office OTM students across six Federal Polytechnics in Northeast Nigeria. The analyses were conducted using IBM SPSS Statistics 27, including descriptive statistics, correlation analyses, and hierarchical multiple regression to examine the effects of ICT resources—computer availability, campus networking/internet quality, ICT funding, expert instructor availability, and power supply/networking—on students' entrepreneurship skill acquisition. Assumptions for regression (normality, multicollinearity, linearity, and homoscedasticity) were assessed prior to hypothesis testing.

Descriptive Statistics

Descriptive statistics were computed for all study variables (Table 1). Computer availability had a mean of 3.12 (SD = 0.91), with skewness of -0.15 and kurtosis of -0.38, and scores ranging from 1.00 to 5.00. Campus networking/internet quality had a mean of 2.98 (SD = 0.87), skewness of 0.05, kurtosis of -0.22, and a range of 1.00 to 5.00. ICT funding adequacy recorded a mean of 2.85 (SD = 0.95), skewness of 0.10, kurtosis of -0.40, and a minimum and maximum of 1.00 and 5.00, respectively. Expert instructor availability had a mean of 3.05 (SD = 0.88), skewness of -0.08, kurtosis of -0.35, and scores ranging from 1.00 to 5.00. Power supply and networking yielded a mean of 2.79 (SD = 0.92), skewness of 0.12, kurtosis of -0.28, with a range from 1.00 to 5.00. Finally, entrepreneurship skill acquisition had a mean of 3.00 (SD = 0.89), skewness of -0.02, kurtosis of -0.31, and scores ranging from 1.00 to 5.00. The distributions of all variables were approximately normal, as indicated by skewness and kurtosis values within the acceptable range of ±2 (George & Mallery, 2019).

Correlation Analysis

Pearson's correlation analyses were conducted to examine the relationships between ICT resource variables and entrepreneurship skill acquisition. The results in Table 3 indicated that computer availability was positively correlated with entrepreneurship skill acquisition, $r(198) = .61$, $p < .01$. Similarly, networking/internet quality showed a significant positive correlation with entrepreneurship skill acquisition, $r(198) = .63$, $p < .01$, as did ICT funding, $r(198) = .59$, $p < .01$, expert instructor availability, $r(198) = .57$, $p < .01$, and power supply/networking, $r(198) = .55$, $p < .01$. All correlations were statistically significant at the 0.01 level, suggesting that higher levels of ICT resources and support are associated with greater entrepreneurship skill acquisition among polytechnic students.

Table 4. Model Summary

Model	R	R^2	Adjusted R^2	SE of Estimate
1	0.72	0.52	0.50	0.63

Table 5. ANOVA for Regression Model

Model	F	*df*1	*df*2	*p*
1	45.23	5	192	< .001

Multiple Regression Analysis

A multiple regression analysis was conducted to examine the the joint and individual effects computer availability, networking/internet quality, ICT funding, expert instructor availability, and power supply/networking predicted entrepreneurship skill acquisition. The results indicated that the overall model (Table 5) was significant, $F(5, 192) = 45.23$, $p < .001$, and explained 52% of the variance in entrepreneurship skill acquisition ($R^2 = .52$, Adjusted $R^2 = .50$) (Table 4). Examination

of individual predictors (Table 6) revealed that computer availability (B = 0.35, SE = 0.08, β = 0.30, t = 4.38, $p < .001$), networking/internet quality (B = 0.29, SE = 0.07, β = 0.26, t = 4.14, $p < .001$), ICT funding (B = 0.24, SE = 0.06, β = 0.21, t = 3.80, $p < .001$), expert instructor availability (B = 0.22, SE = 0.06, β = 0.20, t = 3.67, $p < .001$), and power supply/networking (B = 0.19, SE = 0.05, β = 0.18, t = 3.40, $p < .001$) each made statistically significant positive contributions to predicting entrepreneurship skill acquisition. Variance inflation factor (VIF) values ranged from 1.32 to 1.85, indicating that multicollinearity was not a concern (Hair *et al.*, 2019).

Discussion

The present study investigated the impact of inadequate ICT resources on entrepreneurship skill acquisition among polytechnic students in North-East Nigeria. The descriptive statistics revealed moderate levels of ICT provision across all measured domains, including computer availability (M = 3.12, SD = 0.91), campus networking/internet quality (M = 2.98, SD = 0.87), ICT funding adequacy (M = 2.85, SD = 0.95), expert instructor availability (M = 3.05, SD = 0.88), and power supply/networking (M = 2.79, SD = 0.92). Entrepreneurship skill acquisition had a mean score of 3.00 (SD = 0.89), suggesting that students perceive only moderate attainment of entrepreneurship skills, consistent with previous findings that limited ICT infrastructure constrains experiential learning and digital entrepreneurship competencies in Nigerian polytechnics (Amiaya, 2014; Nwosu & Umeano, 2022; Poplong & Umar, 2023).

Correlation analyses indicated significant positive associations between all ICT resource variables and entrepre-neurship skill acquisition, with coefficients ranging from $r = .55$ to $r = .63$ ($p < .01$). These findings corroborate earlier studies asserting that access to computers, reliable networks, funding for ICT infrastructure, and qualified instructors are critical enablers of entrepreneurship learning (Ajisafe *et al.*, 2018; Yusuf & Alabi, 2019). The relatively stronger correlation between networking/internet quality and entrepreneurship skills ($r = .63$) aligns with contemporary literature emphasizing that connectivity is a fundamental prerequisite for accessing online market information, digital learning resources, and virtual collaboration platforms, which are essential for entrepreneurial skill development (Ibrahim *et al.*, 2023; UNDP, 2023).

The multiple regression results indicated that the combined ICT variables explained 52% of the variance in entrepreneurship skill acquisition ($R^2 = .52$, $F(5, 192) = 45.23$, $p < .001$), demonstrating that these resources jointly exert substantial influence on students' skill outcomes. Individually, computer availability (β = 0.30), networking/internet quality (β = 0.26), ICT funding (β = 0.21), expert instructor availability (β = 0.20), and power supply/networking (β = 0.18) all significantly predicted entrepreneurship skill acquisition ($p < .001$). This confirms the hypothesis that greater ICT resources and supportive learning infrastructure facilitate higher entrepre-neurship competence among students, supporting the assertions of human capital theory (Becker, 1993) and the Technology Acceptance Model (Davis, 1989) which posit that resource availability and perceived usefulness enhance skill acquisition and technology adoption. The variance inflation factors (VIF = 1.32–1.85) further indicate that multicollinearity was not a concern, suggesting that each ICT component independently contributes to entrepreneurship skill acquisition (Hair *et al.*, 2019).

Interpretively, the data suggest that computer availability is the most influential individual predictor. This is consistent with prior regional studies highlighting insufficient computer-to-student ratios as a major barrier to hands-on entrepreneurial training (Michika & Mbaga, 2022; Nwosu & Umeano, 2022). Similarly, robust networking and internet access emerged as a critical driver, underscoring that digital entrepreneurship requires connectivity not only for accessing learning resources but also for online market engagement, virtual collaboration, and e-commerce simulation (Umar & Darki, 2023; Poplong & Umar, 2023). ICT funding and maintenance enable the sustainability of these resources, while the presence of expert instructors ensures that students can translate access into effective skill acquisition. Finally, consistent power supply and reliable laboratory networking facilitate uninterrupted practical engagement, reinforcing the importance of infrastructural reliability for skill development (Ajemasu & Ridwan, 2019).

The study has several practical implications. Firstly, polytechnic administrators should prioritise investments in computer labs, high-speed internet, and continuous power provision. Secondly, policymakers and funding agencies, such as TETFund and NBTE, should consider targeted interventions for North-East polytechnics, including dedicated ICT grants, staff training, and network infrastructure upgrades. Thirdly, curriculum designers should integrate ICT-based entrepreneur-ship modules that are aligned with the realities of infrastructure availability to maximise skill acquisition outcomes.

Limitations include the cross-sectional design, which precludes causal inference, and reliance on self-reported measures, which may introduce response bias. Additionally, the study focused exclusively on Office Technology and Management students, limiting generalizability to other disciplines. Future research could employ longitudinal designs to track skill development over time, incorporate observational or performance-based assessments of entrepreneurship competence, and expand sampling across diverse programmes and regions to enhance representativeness. Investigations could also examine moderating variables such as student motivation, digital literacy, and institutional ICT policies to provide a more nuanced understanding of the determinants of entrepreneurship skill acquisition.

Conclusion

This study demonstrates that ICT resources are critical determinants of entrepreneurship skill acquisition among polytechnic students in North-East Nigeria. The empirical evidence indicates that computer availability, campus networking and internet quality, ICT funding, expert instructor availability, and reliable power supply jointly and individually contribute significantly to students' entrepreneurship competencies. These findings underscore that inadequacies in ICT infrastructure and support hinder practical skill development, limiting students' capacity for self-reliance and entrepreneurial engagement. Consequently, strategic investments in ICT facilities, instructional capacity, and infrastructure maintenance are imperative to enhance experiential learning, strengthen digital entrepreneurship skills, and support broader educational and economic development goals within the region.

References

Ajemasu, M., & Ridwan, S. M. (2019). Provision and Utilization of Online Information Resources in Federal Polytechnic Libraries in North Eastern States of Nigeria. *Nasarawa Journal of Library and Information Science, 3*(1), 158-169.

Ajisafe, O. E., Balogun, O. D., & Akinlabi, A. K. (2018). ICT adoption and entrepreneurship education in Nigeria: Implications for policy and practice. *Journal of Education and Practice, 9*(12), 72–80.

Amiaya, A. O. (2013). Adequacy of information and communication technology resources for office technology and management programme in Delta State Polytechnics. *International Journal of Education and Research, 1*(11)' 1-12.

Amiaya, A. O. (2014). Challenges and strategies for utilising information and communication technology among office technology and

management educators in Nigerian polytechnics. *21st Century Academic Forum Conference at UC Berkely – 2014*, *2*(1), 1-11.

Babbie, E. (2021). *The practice of social research* (15th ed.). Cengage Learning.

Bakare, B. S., & Yusuf, I. R. (2023). Effects of ICT resources usage on students' academic performance in North-East Nigerian Polytechnics. *Journal of Education and Practice*, 14(24), 1–11.

Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education* (3rd ed.). University of Chicago Press.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Lawrence Erlbaum Associates.

Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). Sage Publications.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Etikan, I., & Bala, K. (2017). Sampling and sampling methods. *Biometrics & Biostatistics International Journal, 5*(6), 215–217. https://doi.org/10.15406/bbij.2017.05.00149

Ezechukwu, L. C., Okanazu, O. O., Babalulu, M. M-S., Arowolo, A. A., & Olelewe, C. J. (2021). Career readiness of graduating office technology and management students in polytechnics in Southeast Nigeria. *International Journal of Learning, Teaching and Educational Research, 20*(2), 290-303. https://doi.org/10.26803/ijlter.20.2.16

FGN. (2020). *National Broadband Plan (2020–2025)*. Abuja, Nigeria: Federal Government of Nigeria (FGN).

Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). SAGE Publications.

FME. (2019a). *National policy on information and communication technology (ICT) in education*. Abuja, Nigeria: Federal Ministry of Education (FME).

FME. (2019b). *National implementation guidelines for ICT in education*. Abuja, Nigeria: Federal Ministry of Education (FME).

George, D., & Mallery, P. (2019). *IBM SPSS statistics 26 step by step: A simple guide and reference* (16th ed.). Routledge.

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). *Multivariate data analysis* (8th ed.). Cengage.

Ibrahim, M., Kukuri, G. G., & Mamu, M. A. (2023). A baseline survey on information and communication strategic plan for polytechnic libraries in North-East Nigeria. *International Journal of Scientific Research in Engineering and Management, 7*(2), 1–19. https://doi.org/10.55041/IJSREM17767

Michika, M. U., & Mbaga, E. V. (2022). ICT competency needs of lecturers on the use of software and internet facilities in polytechnics in North-East zone of Nigeria. *BW Academic Journal*. https://www.bwjournal.org/index.php/bsjournal/article/view/57

NBTE. (2023/2024). *Guidelines and structure of Skills Development Centre (SDC) in the polytechnics*. Kaduna, Nigeria: National Board for Technical Education (NBTE).

Nwosu, B., & Umeano, N. E. (2022). Information and communication technology (ICT) skills needed by office technologists for optimal performance in federal polytechnics in North-East Nigeria. *British International Journal of Education and Social Sciences, 9*(12), 1–11.

Oyebade, S. A., Adebayo, O. A., & Alabi, T. A. (2020). ICT utilisation for entrepreneurship education in Nigerian polytechnics. *International Journal of Education and Development using ICT, 16*(2), 140–152.

Poplong, S. Y., & Umar, M. A. (2023). Effects of ICT resources usage to enhance teaching, learning and entrepreneurial development training in the North-Eastern polytechnics. *International Journal of Information, Technology & Innovation in Africa, 12*(6), 40–55. https://doi.org/10.6732-0-183-066-35-1263

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education, 2*, 53–55. https://doi.org/10.5116/ijme.4dfb.8dfd

TETFund. (2020). *Guidelines for accessing the ICT support intervention*. Abuja, Nigeria: Tertiary Education Trust Fund (TETFund).

TETFund. (2021). *Guidelines for accessing ICT support intervention (2019/2020) for e-learning platform*. Abuja, Nigeria: Tertiary Education Trust Fund (TETFund).

TETFund. (2023). *ICT capacity building and support guidelines for Nigerian tertiary institutions*. TETFund, Nigeria.

Umar, S., & Darki, A. A. (2023). Assessing the impact of the Internet as a learning resource among students at some selected polytechnics in North-East Nigeria. *International Journal of Advances in Engineering and Management, 5*(2), 188–200. https://doi.org/10.35629/5252-0502188200

UNDP. (2023). *Digital entrepreneurship in Africa*. New York, NY: United Nations Development Programme (UNDP).

Yusuf, M. O., & Alabi, T. A. (2019). Availability and utilisation of ICT resources for teaching and learning in Nigerian polytechnics. *Contemporary Educational Technology, 10*(3), 258–271. https://doi.org/10.30935/cet.590822