Journalof Global Management Perspectives
Vol: 03; **Issue**: 01; Jul-Dec 2026; **Pg**: 001-013

Campus Resilient Digital Commerce: An Action Research Study on Infrastructure Deficit Mitigation for University SME Retailers in Nigeria

Obiadi Chinedu Martins
Master's Research Student (Post Graduate), School of Management (Master of Science), Asia e University, Subang Jaya, Selangor, Malaysia
Email Id: obiadichinedumartins@gmail.com
ORCID ID: 0009-0009-0785-7510

Received: 15th September 2026 / Accepted: 25th September 2026 / Published: 06th October 2026
© The Author(s), under exclusive license to AimBell Publication

Citation: Obiadi Chinedu Martins (2026). Campus Resilient Digital Commerce: An Action Research Study on Infrastructure Deficit Mitigation for University SME Retailers in Nigeria, Journalof Global Management Perspectives, 3(1), 001-013

Abstract: This study investigates infrastructure gaps within digital commerce in university-based SME retail businesses in Nigeria, focusing especially on power supply stability, internet connectivity, and digital resilience. Secondary action research was applied through the use of the World Bank Nigeria Enterprise Survey 2014-2015, the Nigerian Communication Commission (NCC) statistics, National Bureau of Statistics (NBS) data and literature on Nigerian SMEs. Descriptive analysis involving frequency counts, percentage counts, comparative analysis and graphical representation was employed in investigating infrastructure problems and its effects on SMEs' activities. It can be noted from the results that power supply is a much bigger problem compared to telecommunication, as 76.4% of the establishments suffer from power disruptions and 51.2% view electricity as a serious and very serious constraint. Also, digitalization in the form of use of email and company's website is underdeveloped, as only 27.1% and 19.5% respectively use them. On the other hand, recent national statistics show that there has been considerable development in the provision of Internet connectivity, offering potential for digital commerce among SMEs. This paper, thus, constructs a resilience model for action, which relates to infrastructure inadequacies, disruption of operations, mitigation approaches, digital resilience and business continuity. From the findings, the use of alternative power supply, connectivity choices, digital payment, online customer communication, flexibility and backups can help SME retailers at universities build digital resilience.
Keywords: *Digital commerce; digital resilience; infrastructure deficit; Nigerian SMEs; electricity reliability; Internet connectivity; university retailers; action research; business continuity.*

INTRODUCTION

The emerging digital economy in Nigeria is presenting business opportunities to SMEs, including retailers who have their business environment as universities where both students and staff make use of mobile technologies and payments (Agbeyangi et al., 2024). Campus-based shopping portals like ShopCart facilitate the linking of university students to sellers selling products and services, whereas studies conducted amongst students of the University of Benin prove that convenience and trust impact their online buying behaviour (Mishra et al., 2026). But these opportunities are co-existent with enduring electricity and connectivity issues. Unreliable electricity is cited by the World Bank as one of Nigeria's business constraints, and businesses are often subject to power outages and must rely on other sources of power to keep their operations running. These may impact on university SME retailers who rely on electricity for their devices, payment systems and online operations (Roy et al., 2023).

Therefore, infrastructure reliability is tightly connected to the resilience and continuity of digital commerce and business. An SME can access their WhatsApp, electronic payments and online ordering, but if the power or Internet goes down, it can interrupt their customer communications and transactions (Chavarnakul et al., 2025). It has been observed that digital communication technologies have the potential to keep businesses connected and responsive to disruption in Nigeria SMEs. Likewise, studies in Nigeria showed that a good electrical and infrastructure are crucial for realizing the advantages of e-commerce among the local SMEs (Olarinde et al., 2024). In this context, the current study addresses the infrastructure challenges faced by university SME retailers in Nigeria and proposes mitigation measures like alternative power supply, multiple connectivity, digital payment, digital communication, flexible operation and backup infrastructure to improve digital resilience and business continuity.

REVIEW OF LITERATURE

The past literatures accentuate the factors of entrepreneurial flexibility, use of digital technologies, institutional support, and supply chain resilience to the sustainability of Nigerian SMEs. Ufua et al. (2022) highlight lean entrepreneurship as a strategy that could enable Nigerian SMEs to be more flexible, minimize resource wastage and respond to the business challenges that arose after COVID-19. Lincoln (2025) builds on this by emphasising digital technologies as tools to help support sustainable development within the Nigerian SMEs, suggesting that digital adoption may enhance the capabilities of the SMEs in their operations and the opportunities for sustainable business. In addition, Joseph et al. (2025) show that policy and institutional innovation is critical to the sustainability of micro and small businesses, and that favourable institutional settings are required to meet the structural and operational challenges that face SMEs. In more recent works, Olusegun (2026) underscores the importance of digital entrepreneurship for enhancing the resilience of the supply chain in the post-pandemic era, emphasizing the use of digital capabilities to create adaptability and continuity. These studies suggest that Nigerian SMEs must have the flexibility of the entrepreneur, willingness to adopt digital tools, and support from institutions to be resilient, but very little research has focused on the impact that infrastructure constraints such as electricity and Internet connectivity have on digital resilience of university based SME retailers in Nigeria.

RESEARCH METHODOLOGY

This research study takes an action research approach to investigate the problem of infrastructure problems and their mitigation among SME retailers at university environments in Nigeria based on secondary data. The World Bank Nigeria Enterprise Survey (2014–2015), statistics from the Nigerian Communications Commission (NCC), National Bureau of Statistics (NBS), and literature on Nigerian SMEs are used to address this problem. Information regarding electricity interruptions, infrastructure issues, generators, email and website presence are available in the World Bank data, whereas information on Internet access is provided by the NCC and NBS data. The use of descriptive analysis (frequencies, percentages, comparative analysis and graphical representation) will be employed in the assessment of infrastructure problems and their impact on the business performance of SMEs. Integration of results from this study and existing literature can be used in the development of practical measures such as using alternative energy sources, having multiple Internet connections, digital payment options, customer email communication, flexible business operation, and alternative business systems.

RESULTS

Infrastructure Challenges Affecting Nigerian University SMEs

Table 1. Electricity and Telecommunications Infrastructure Constraints among Nigerian Establishments.

Degree of Infrastructure Constraint	**Electricity (n)**	**Electricity (%)**	**Telecommunications (n)**	**Telecommunications (%)**
No obstacle	380	14.3	899	33.9
Minor obstacle	445	16.8	1,161	43.8
Moderate obstacle	449	16.9	426	16.1
Major obstacle	963	36.3	105	4.0
Very severe obstacle	394	14.9	23	0.9
Don't know	2	0.1	5	0.2
Does not apply	19	0.7	33	1.2
Valid responses	**2,652**	**100.0**	**2,652**	**100.0**

Source: World Bank, Nigeria Enterprise Survey 2014-2015
https://microdata.worldbank.org/catalog/2361/variable/F4/V965?name=c30a

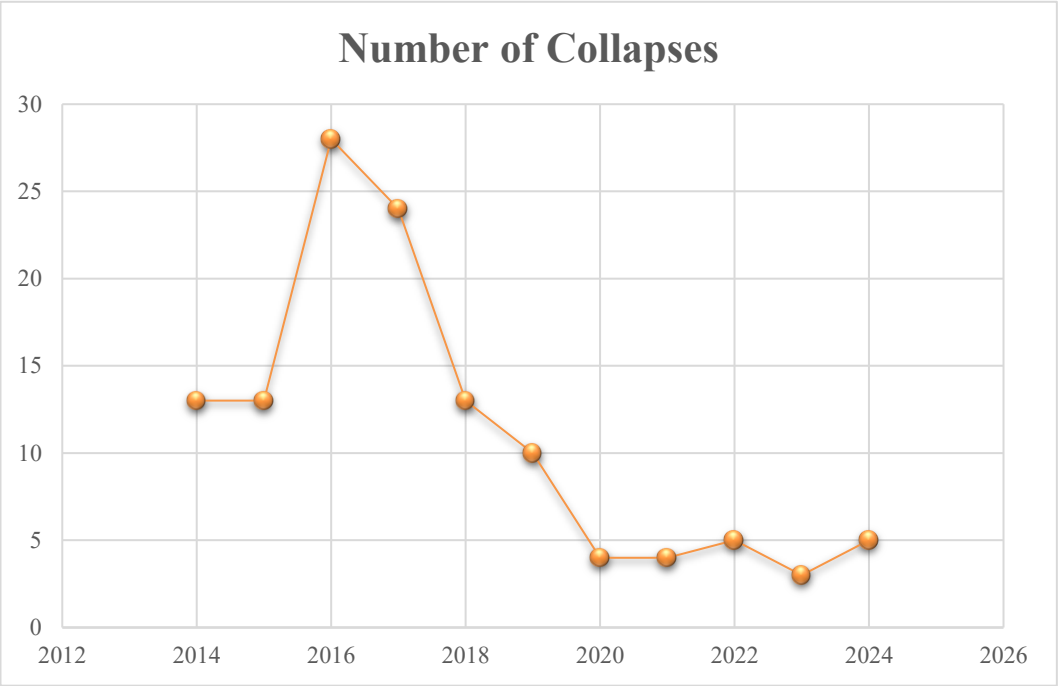


Figure 1. Electricity Grid Collapses in Nigeria, 2014-2024.
Source: https://www.researchgate.net/publication/383743075_Addressing_Nigeria's_Electricity_Challenges_Past_Present_And_Future_Strategies

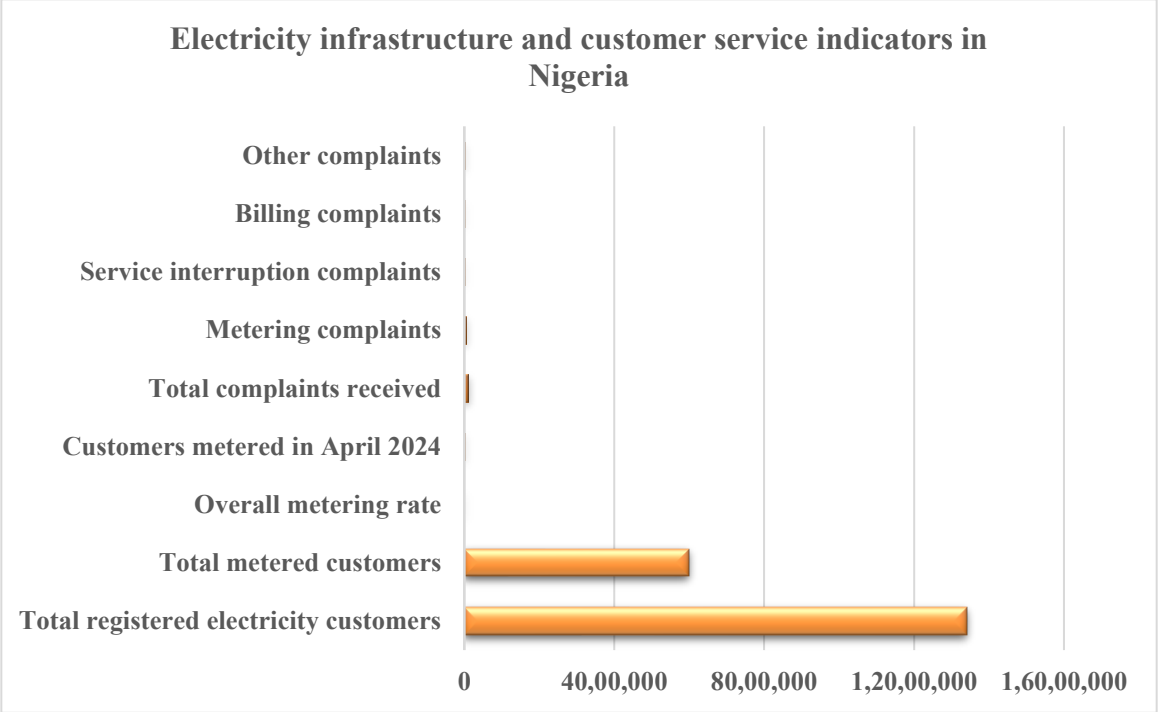


Figure 2. Selected Electricity Infrastructure Indicators in Nigeria, April 2024.

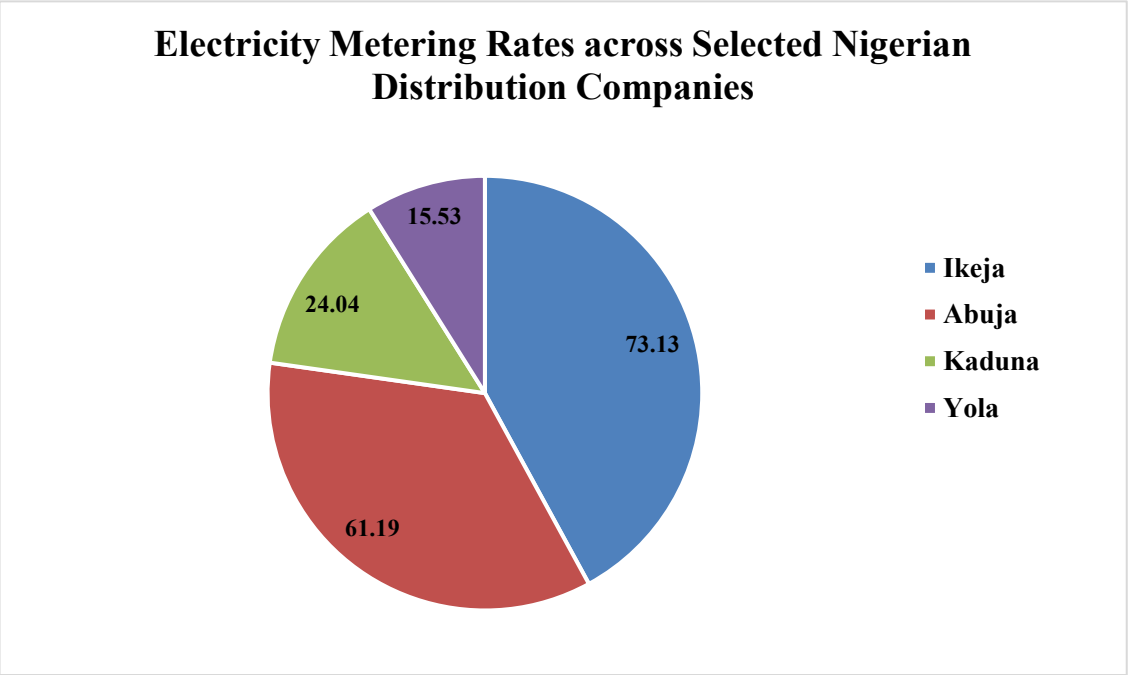


Figure 3. Electricity Metering Rates across Selected Nigerian Distribution Companies.

Impact of Electricity Reliability on Nigerian SME Operations

Table 2. Impact of Electricity Reliability on Nigerian SME Operations.

Electricity Reliability Indicator	**Number of SMEs/Establishments**	**Percentage**
Experienced power outages	2,027	76.4%
Did not experience power outages	597	22.5%
Do not know	28	1.1%
Total valid responses	**2,652**	**100.0%**

Source: World Bank, Nigeria Enterprise Survey 2014-2015

Table 3. Selected Electricity-Related Operational Indicators among Nigerian SMEs.

Indicator	**Finding**
Average power outages per month	32.8
Typical duration of an outage	8 hours
SMEs using generators	71%
Electricity identified as a major business constraint	≈27%
Losses from outages - small firms	≈16% of sales
Losses from outages - medium firms	≈12% of sales
Losses from outages - large firms	≈24% of sales

Source: World Bank Nigeria Investment Climate Assessment, based on Enterprise Survey data.

Table 4. Distribution of SMEs by Electricity-Related Losses.

Losses due to Power Outages (% of Annual Sales)	**SMEs (n)**	**%**
0%	400	20.7
1-5%	370	19.2
6-10%	150	7.8
11-20%	250	13.0
21-30%	190	9.8
31-40%	128	6.6
41-50%	76	3.9
51-60%	52	2.7
61-70%	34	1.8
71-80%	37	1.9
81-100%	12	0.6
Other/individual reported values	**231**	**12.0**
Valid responses	**1,930**	**100.0**

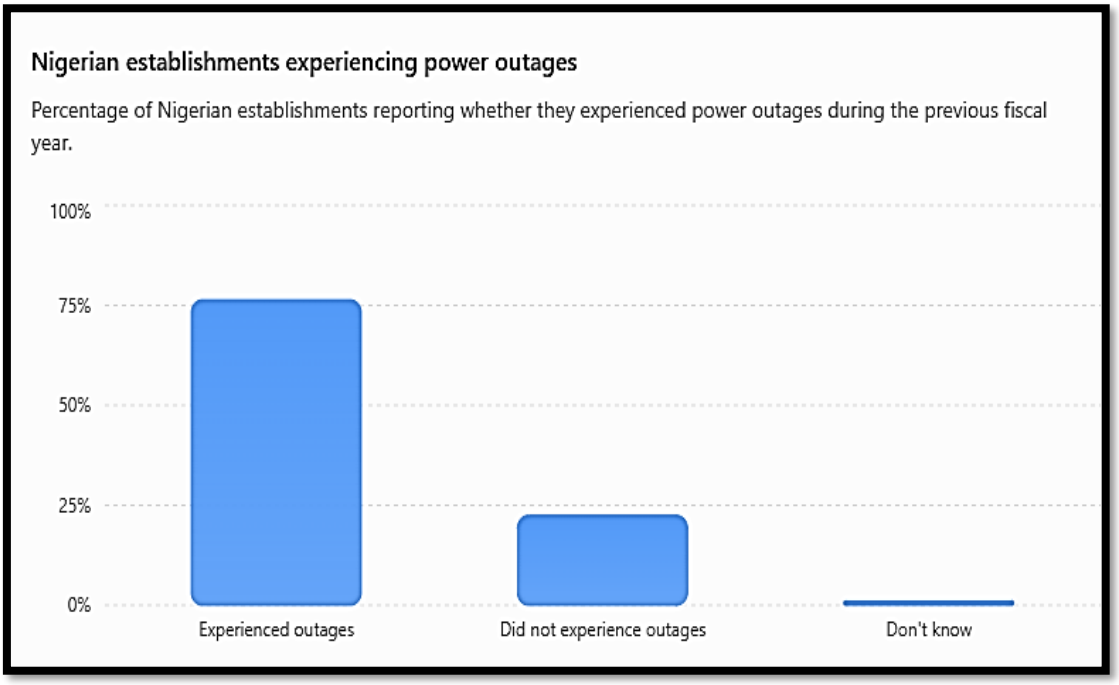


Figure 4. Relationship between Electricity Outage Frequency and Losses among Nigerian SMEs.
Source: World Bank Nigeria Enterprise Survey 2014-2015

Impact of Internet Connectivity on Digital Commerce among Nigerian SMEs

Table 5. Telecommunications Constraints among Nigerian Establishments.

Degree of Telecommunications Constraint	Number of Establishments	Percentage
No obstacle	899	33.9%
Minor obstacle	1,161	43.8%
Moderate obstacle	426	16.1%
Major obstacle	105	4.0%
Very severe obstacle	23	0.9%
Don't know / Does not apply	38	1.4%
Total	**2,652**	**100.0%**

Source: World Bank, Nigeria Enterprise Survey 2014-2015.
https://microdata.worldbank.org/index.php/catalog/2361/datafile/F4/V966?

The availability of telecommunications, on the other hand, was not as much of an issue as that of electricity at Nigerian firms. About 77.7% of the firms reported telecommunications as not being an obstacle at all or as being a minor one. Only 4.9% of the firms reported telecommunications as being a major or very severe obstacle.

Table 6. Digital Connectivity and Online Presence among Nigerian Establishments.

Digital Connectivity Indicator	Number of Establishments	Percentage
Use email to communicate with clients/suppliers	724	27.1%
Do not use email	1,952	72.9%
Have their own website	521	19.5%
Do not have their own website	2,155	80.5%
Total establishments	**2,676**	**100.0%**

Source: World Bank, Nigeria Enterprise Survey 2014-2015.
https://microdata.worldbank.org/index.php/catalog/2361/datafile/F4/V966?

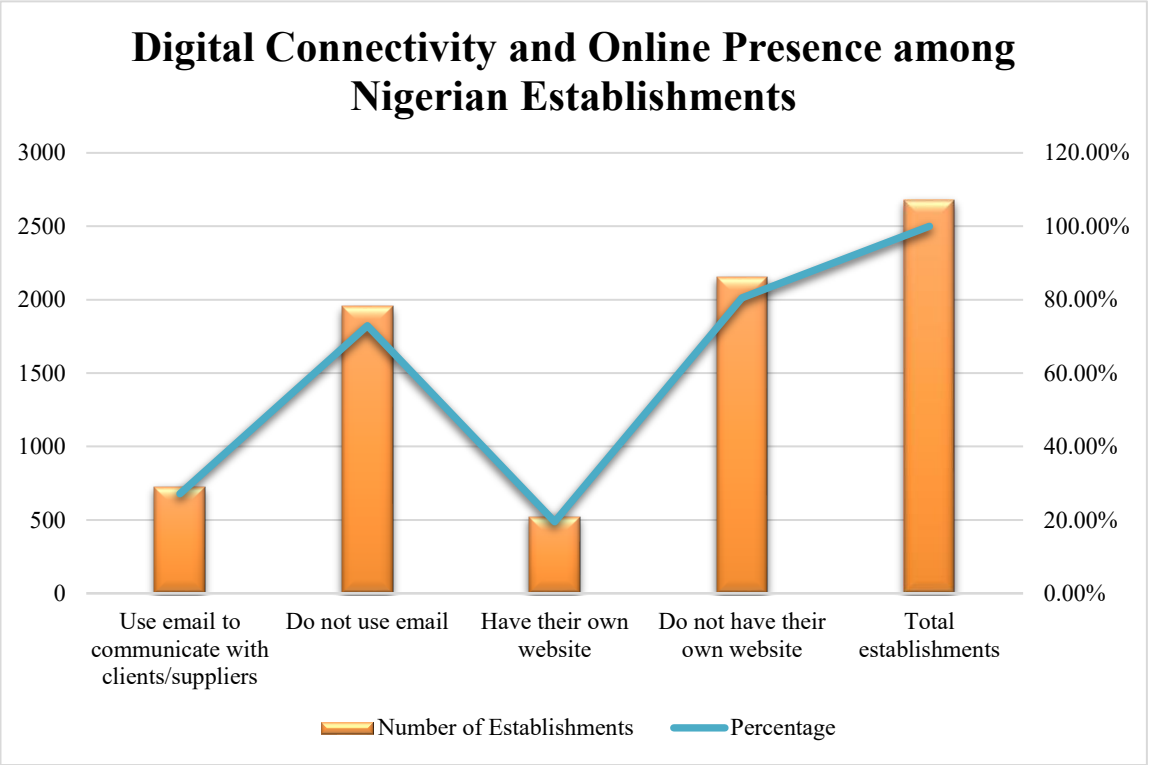


Figure 5. Digital Connectivity and Online Presence among Nigerian Establishments.
Source: World Bank, Nigeria Enterprise Survey 2014-2015, variables C22A and C22B

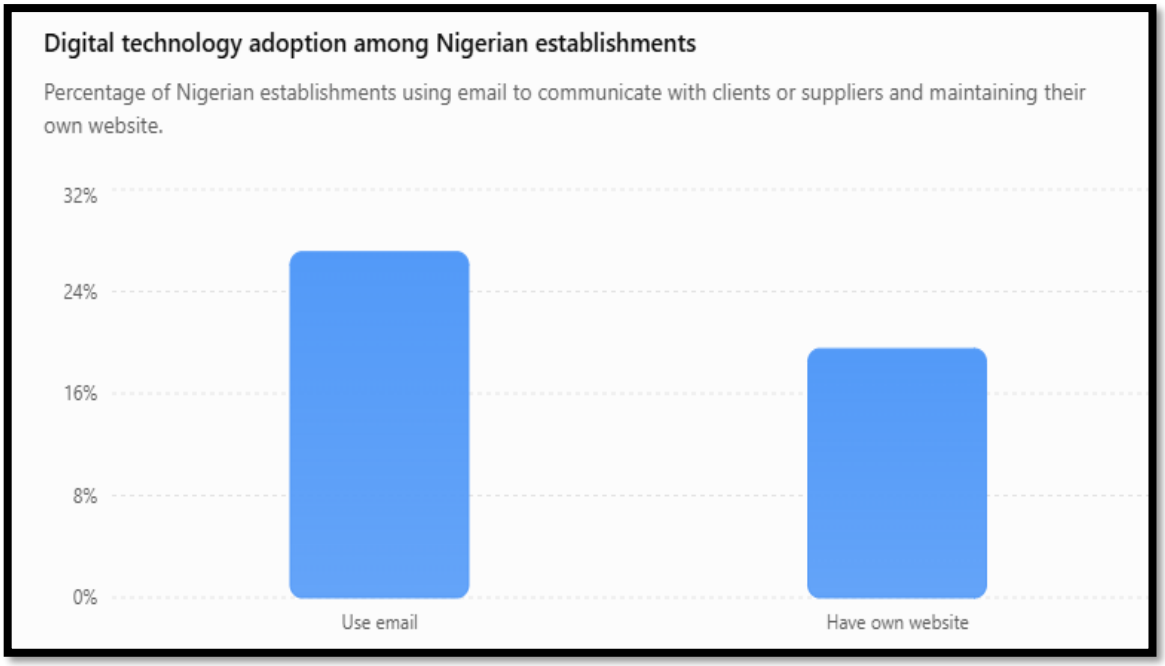


Figure 6. Digital Technology Adoption among Nigerian Establishments.
Source: World Bank Nigeria Enterprise Survey 2014-2015.

Table 7. Internet Connectivity Indicators in Nigeria, December 2025.

Indicator	**Data to Report**	**Relevance to Nigerian SMEs**
Total Internet subscriptions	147,519,262	Indicates the size of Nigeria's connected user base and potential online market
Broadband subscriptions	112,665,176	Indicates availability of relatively higher-speed Internet connectivity

Broadband penetration		Indicates the proportion of the population reached by broadband services
Mobile Internet subscriptions (GSM)	147,519,262	Shows the importance of mobile connectivity for mobile commerce
Fixed Internet subscriptions	101,667	Indicates the relatively small scale of fixed/wired Internet access
Internet/data usage	1,386,238.23 TB	Indicates the intensity of Internet and data consumption
Year-on-year Internet subscription growth	6.30%	Indicates expansion of the potential digital-commerce market

Source: https://www.ncc.gov.ng/market-data-reports/subscriber-statistics

Table 8. ICT Adoption and Internet Access in Nigeria, Q1 2023.

ICT Indicator	**NBS Data**	**Relevance to Nigerian SMEs**
Active Internet subscribers	157,551,104	Indicates the size of Nigeria's connected digital market and potential customer base
Active Internet subscribers, Q1 2022	145,851,496	Provides the baseline for measuring growth in Internet connectivity
Year-on-year growth in Internet subscribers	8.02%	Indicates expansion of the potential digital-commerce market
Quarter-on-quarter growth in Internet subscribers	1.75%	Indicates continued short-term expansion in Internet connectivity
Lagos - active Internet subscribers	18,778,744	Indicates strong digital-market potential in Lagos
Ogun - active Internet subscribers	9,352,222	Demonstrates substantial regional Internet connectivity
Kano - active Internet subscribers	8,680,524	Demonstrates significant connectivity in Northern Nigeria
Bayelsa - active Internet subscribers	1,147,672	Illustrates comparatively lower regional connectivity
Ebonyi - active Internet subscribers	1,330,586	Illustrates regional differences in Internet access
Ekiti - active Internet subscribers	1,474,604	Illustrates regional differences in Internet access

Source: https://nigerianstat.gov.ng/elibrary/read/1241374

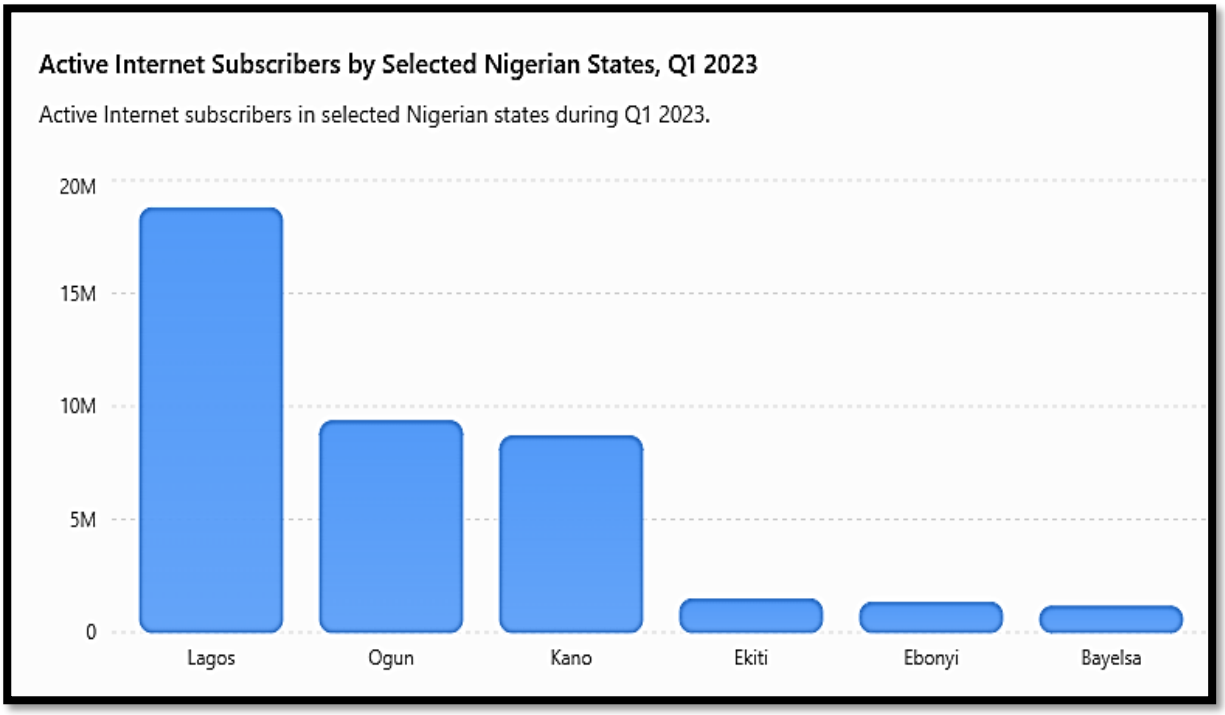


Figure 7. Active Internet Subscribers by Selected Nigerian States, Q1 2023.
Source: National Bureau of Statistics, Telecoms Data: Active Voice and Internet per State, Porting and Tariff Information (Q1 2023).

Digital Resilience and Infrastructure Mitigation Strategies among Nigerian SMEs

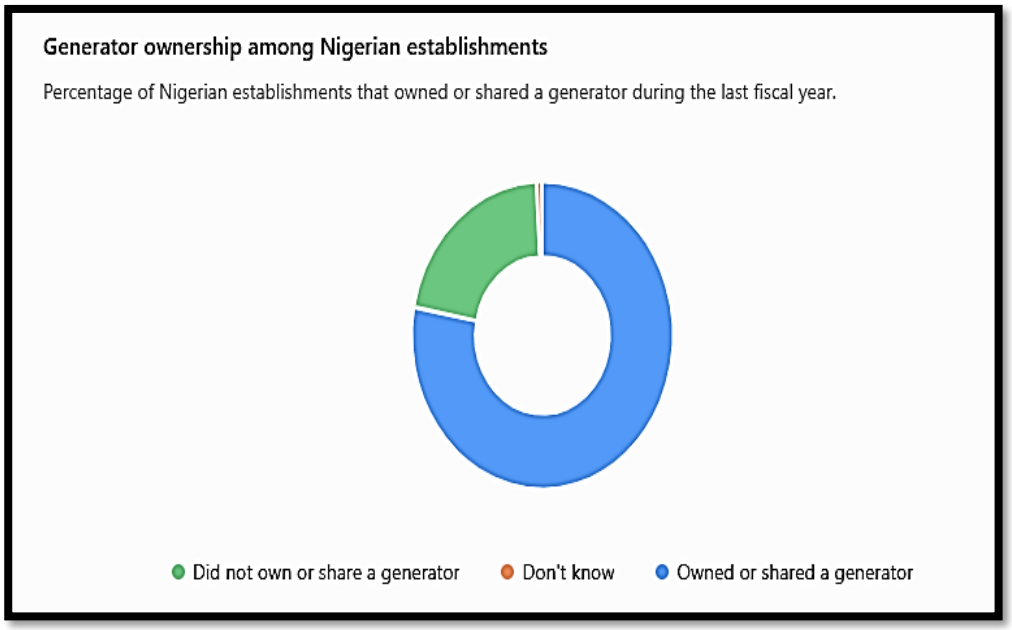


Figure 8. Generator Ownership among Nigerian Establishments.
Source: World Bank, Nigeria Enterprise Survey 2014-2015

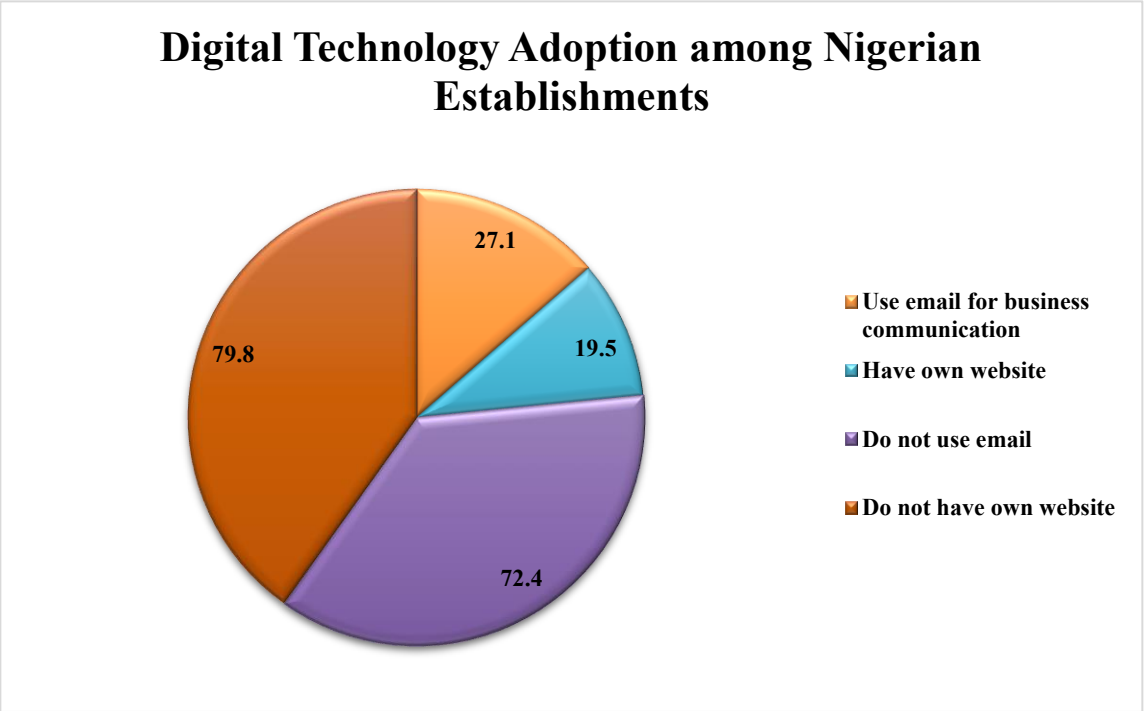


Figure 9. Digital Technology Adoption among Nigerian Establishments.
Source: World Bank, Nigeria Enterprise Survey 2014-2015. The survey reports that 27.1% of establishments use email to communicate with clients or suppliers, while 19.5% have their own website.

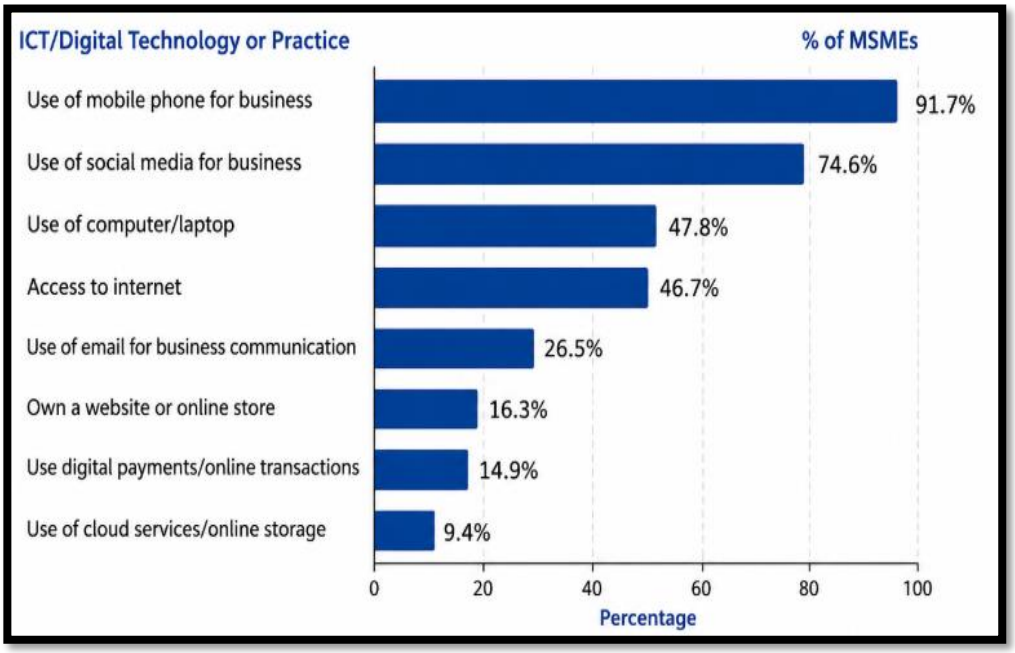


Figure 10. MSME Technology Adoption and Digital Resilience.
Source: SMEDAN/NBS MSME Survey

The figure above shows Percentage/distribution of Nigerian MSMEs adopting ICT/digital technologies and related business practices, based on the indicators available in the selected MSME survey.

Table 9. Digital Resilience and Infrastructure Mitigation Framework for Nigerian SMEs.

Stage	Infrastructure/Operational Issue	Mitigation Strategy	Digital Resilience Outcome	Business Continuity Impact
Infrastructure Deficit	Frequent electricity outages and unreliable grid supply	Alternative power sources and generator use	Continuous access to essential business operations	Reduced disruption to daily activities
	Unstable or limited Internet connectivity	Mobile Internet and multiple connectivity providers	Improved connectivity redundancy	Continued digital communication and transactions
Operational Disruption	Reduced customer reach due to physical and infrastructure limitations	Website and social-media presence	Expanded online customer access	Increased market reach and sales opportunities
	Disruption of conventional payment channels	Digital payments and e-transactions	Greater payment flexibility	Continuity of sales and transactions
	Difficulty communicating with customers during disruptions	Email, WhatsApp and other online communication channels	Continuous customer engagement	Improved customer retention and service continuity
Mitigation Strategy	Dependence on physical business operations	Flexible and remote operating practices	Greater operational adaptability	Ability to continue selected activities during disruptions
	Risk of data or information loss	Backup systems and cloud/online data storage	Improved data security and recovery capacity	Faster recovery following operational disruptions
Digital Resilience	Combined electricity and connectivity risks	Integrated infrastructure and digital resilience measures	Improved capacity to anticipate, absorb and recover from disruptions	Sustained SME operations and competitiveness
Business Continuity	Recurring infrastructure-related uncertainty	Continuous review and improvement of resilience strategies	Long-term adaptive capacity	Sustainable business performance and growth

Source: Synthesised from World Bank Nigeria Enterprise Survey data and published literature on Nigerian SME infrastructure constraints, digital adoption and business resilience.

© J. Glob. Manag. Perspect. 3(1) Jul-Dec; 2026

DISCUSSION

The results confirm that Nigerian SMEs continue to suffer from inadequate infrastructure conditions, in particular, unreliable electricity supply as evidenced by previous empirical studies. Confirming the findings of Nwanakwere & Uzoeto (2017), the present study confirmed that 76.4% of firms suffered from power interruptions, while 51.2% cited electricity as a significant or very serious obstacle along with sales loss and extensive use of generators. In addition, the finding is in line with the conclusion of Adenikinju, 2023 that unreliable electricity supply is the problem of infrastructure that forces firms to bear extra costs to secure supply. However, while telecommunications were not among the most important barriers, connectivity is important since only 27.1% of firms used email for conducting business and 19.5% of firms had websites, confirming the findings that unreliable electricity supply and poor communication infrastructure hinder ICT adoption among Nigerian SMEs. Ashiru et al. (2023) concluded that Nigerian SMEs used ICT in order to create a resilient environment through engaging customers and suppliers and cooperating with them. The present study contributes to this literature by including the aspects of electricity reliability, connectivity and digital adaptation in the action-oriented resilience framework.

CONCLUSION

The study finds that infrastructure reliability plays an important role in determining the digital resilience and business continuity of SME retailers at Nigerian universities. The issue of electricity emerges as the top problem faced by the SMEs owing to regular power cuts, operational loss and dependence on generators, with lack of digital adoption showing that Nigerian SMEs have yet to transform their increasing Internet accessibility into digital commerce. Moreover, it is evident from the results that infrastructure problems need to be handled using a holistic approach towards resilience rather than taking isolated steps to solve individual issues. Alternate electricity supply, alternative internet connectivity, digital money transfer system, digital customer communication, flexibility of operation and backup system are some of the ways that help the SMEs continue with their essential operations even when facing infrastructure challenges. Therefore, the action research model provides for an interpretation of the secondary empirical evidence to develop measures that link infrastructure deficiencies, operational disruption, resilience measures, digital resilience and business continuity.

REFERENCES

1. Adenikinju, A. F. (2003). Electric infrastructure failures in Nigeria: A survey-based analysis of the costs and adjustment responses. Energy Policy, 31(14), 1519-1530. https://doi.org/10.1016/S0301-4215(02)00208-2
2. Agbeyangi, A., Makinde, A., & Odun-Ayo, I. (2024). Nigeria's ICT and economic sustainability in the digital age. arXiv preprint arXiv:2401.03996.
3. Ashiru, F., Nakpodia, F., & You, J. J. (2023). Adapting emerging digital communication technologies for resilience: Evidence from Nigerian SMEs. Annals of Operations Research, 327, 795-823. https://doi.org/10.1007/s10479-022-05049-9
4. Chavarnakul, T., Xu, L. D., Bi, Z., Shankar, A., Dhiman, G., Viriyasitavat, W., & Hoonsopon, D. (2025). A systematic literature review on resilient digital transformation, examining how organizations sustain digital capabilities. HighTech and Innovation Journal, 6(2).
5. Joseph, K. O., Kehinde, S., Ogunnaike, O., Mercy, O., Adebayo, O., Deborah, A., ... & Tola, K. (2025). Policy and institutional innovation for sustainability: impacts on micro and small medium enterprises. Acta Innovations, 57, 9-21.
6. Lincoln, C. J. (2025). Leveraging Digital Technologies (DT) for Sustainable Development in Small and Medium Enterprises (SMEs) in Nigeria Adebimpe Adesua Lincoln.
7. Mishra, P., Vashisth, P., Pathak, O., Wali, M., & Tyagi, A. (2026, February). A Next-Generation Digital Marketplace Framework for Seamless Campus Commerce, Student Collaboration, and Resource Exchange. In 2026 5th International Conference on Innovative Practices in Technology and Management (ICIPTM) (pp. 1-5). IEEE.
8. Nwanakwere, J. T., & Uzoeto, J. (2019). Electrical energy insecurity and the performance of the small and medium enterprise sub-sector in Nigeria. Acta Universitatis Danubius. Œconomica, 15(6).
9. Olarinde, E. S., Idem, U. J., & Obieze, I. D. D. (2024, December). Analysis of electronic commerce for the promotion of sustainable development in Nigeria: Addressing challenges and envisaging future prospects. In 2024 International Conference on Decision Aid Sciences and Applications (DASA) (pp. 1-6). IEEE.
10. Olusegun, O. (2026). Exploring the Impact of Digital Entrepreneurship on Supply Chain Resilience in a Post-Pandemic Context.
11. Roy, P., Watkins, M., Iwuamadi, C. K., & Ibrahim, J. (2023). Breaking the cycle of corruption in Nigeria's electricity sector: Off-grid solutions for local enterprises. Energy Research & Social Science, 101, 103130.
12. Ufua, D. E., Olujobi, O. J., Tahir, H., Al-Faryan, M. A. S., Matthew, O. A., & Osabuohien, E. (2022). Lean

entrepreneurship and SME practice in a post COVID-19 pandemic era: a conceptual discourse from Nigeria. Global Journal of Flexible Systems Management, 23(3), 331-344.