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TECHNOLOGICAL RESOURCES AND QUALITY OF SERVICE DELIVERY IN THE UNIVERSITY OF UYO TEACHING HOSPITAL, AKWA IBOM STATE, NIGERIA

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Abstract

This study examine the effect of technological resources and quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria. Specifically, it assessed the impact of technological skills and digital technologies on the quality of service delivery in the hospital. A survey research design was adopted, with a population of 2,354 clinical and non-clinical staff. Using Taro Yamane's formula, a sample size of 342 respondents was determined. Data were collected through a structured questionnaire and analyzed using regression techniques. The findings revealed that technological skills and digital technologies each have a significant and positive influence on service delivery quality. Furthermore, their combined effect was found to be stronger than the influence of either factor individually, with digital technologies demonstrating a more pronounced impact. These results indicate that effective service delivery in healthcare settings depends not only on skilled personnel but also on the availability of robust digital infrastructure. The study concludes that technological resources play a critical role in enhancing healthcare service quality. Consequently, it recommends that the University of Uyo Teaching Hospital invest in continuous staff training to strengthen technological competencies while simultaneously upgrading and integrating advanced digital technologies.

Keywords: Technological Resources, Technological Skills, Digital Technologies, Quality of Service Delivery

1. Introduction

The integration of technological resources into healthcare systems has become a critical driver of service quality and operational efficiency worldwide. Advances in health related technologies have transformed the delivery of care by improving information management, enhancing clinical decision-making, and streamlining administrative processes. However, the extent to which healthcare institutions benefit from these advancements varies considerably, particularly between developed and developing countries. In many developing nations, persistent challenges such as inadequate infrastructure, limited financial resources, and shortages of skilled healthcare personnel continue to constrain the effective utilization of technological resources.

In developing country contexts, the adoption of technological resources increasingly depends not only on the availability of digital technologies but also on the technological skills of healthcare professionals who operate them. Digital technologies such as Electronic Health Records (EHR), telemedicine platforms, and diagnostic imaging systems offer significant potential to improve efficiency, reduce medical errors, and enhance diagnostic accuracy. Nevertheless, these benefits can only be realized when healthcare personnel possess the

requisite technological skills to effectively deploy and integrate such tools into routine clinical practice. As a result, technological skills and digital technologies are widely regarded as key indicators for assessing the level of technological resources within healthcare institutions.

Nigeria's healthcare system reflects many of these challenges. Despite ongoing reforms and investments, the sector continues to experience limited access to advanced medical technologies, insufficient infrastructure, and gaps in workforce training. These constraints hinder the optimal adoption and utilization of digital health solutions, often resulting in variations in service quality across healthcare facilities (Ubalaeze *et al.*, 2024). Empirical evidence suggests that when digital technologies are strategically implemented and supported by adequate technological competencies among healthcare workers, improvements can be achieved in service efficiency, accuracy of clinical processes, and overall quality of care (Yusuf *et al.*, 2025).

Teaching hospitals occupy a central position within Nigeria's healthcare system, serving as tertiary care providers and training centers for future healthcare professionals. Their dual mandate exposes them to complex clinical demands while simultaneously requiring the adoption of advanced technologies to support specialized care and medical education (Adekeye, 2023). Consequently, teaching hospitals provide an appropriate context for examining how technological resources influence healthcare service quality.

The University of Uyo Teaching Hospital (UUTH) represents a pertinent case in this regard. As demand for high quality healthcare services continues to rise, UUTH faces increasing pressure to improve service delivery amid resource constraints and evolving clinical complexities. The effective use of digital technologies, supported by adequate technological skills among healthcare staff, is expected to play a significant role in enhancing service quality outcomes. Prior studies indicate that the deployment of digital tools in healthcare settings can reduce patient waiting times, improve coordination of care, and increase patient satisfaction, thereby contributing to more efficient and responsive service delivery (Umayal, 2024; Abdul Rahim *et al.*, 2025).

Service quality in healthcare is commonly evaluated using dimensions such as responsiveness, assurance, empathy, and tangibles, which collectively shape patients' perceptions of care (Al-Neyadi *et al.*, 2018). Technological resources, as reflected through digital technologies and the technological skills of healthcare personnel, have the potential to influence these dimensions by improving information accessibility, enhancing communication among providers, reducing administrative delays, and supporting accurate clinical decision-making (Pereira, 2024). However, disparities in technological competence among healthcare workers and uneven access to digital technologies may result in inconsistent service quality outcomes (Firmansyah *et al.*, 2025).

Despite the recognized importance of technological resources in healthcare delivery, empirical evidence on their relationship with service quality in Nigerian teaching hospitals remains limited. In particular, there is a need for institution specific studies that examine how technological skills and digital technologies, as indicators of technological resources, jointly influence service quality outcomes. Against this backdrop, this study investigates the relationship between technological resources measured through technological skills and digital technologies and service quality in the University of Uyo Teaching Hospital.

The University of Uyo Teaching Hospital (UUTH) operates in an era where digital innovations are essential for high-quality healthcare delivery. Tools such as electronic health records (EHRs), telemedicine platforms, diagnostic equipment, and hospital information systems have the potential to improve patient care and operational efficiency. However, UUTH faces significant barriers to fully integrating these

technologies, including limited staff training, infrastructural inadequacies, resistance to change, and system inefficiencies. These challenges contribute to delays in service delivery, gaps in patient care, and lower overall healthcare effectiveness.

Although previous studies have examined healthcare delivery and technology adoption in Nigeria, few have systematically investigated how technological resources influence measurable service quality outcomes in tertiary hospitals. This gap highlights the need for empirical research at UUTH to identify the factors affecting technology use and to evaluate its impact on clinical and operational performance.

The primary objective of the study was to examine the effect of technological resources on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria. The specific objectives of the study were to:

i. investigate the effect of technological skills on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria;
ii. ascertain the effect of digital technologies on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria;
iii. examine the combined effect of technological skills and digital technologies on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria.

Hypotheses of the Study

H_{01}: There is no significant effect of technological skills on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria.

H_{02}: Digital technologies have no significant effect on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria.

H_{03}: Technological skills and digital technologies have no significant combined effect on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria

2. Literature Review

2.1 Conceptual Review

Technological Resources

Technological resources are defined as the integrated digital systems, equipment, and software applications employed to support healthcare delivery, education, research, and administrative functions. They constitute a critical foundation of contemporary healthcare, enhancing efficiency, accuracy, and innovation (Yusuf *et al.,* 2025; Asti *et al,* 2025). Advanced diagnostic technologies, including digital imaging systems, laboratory automation, and artificial intelligence–assisted diagnostics, improve early disease detection and clinical decision-making. Electronic Health Records (EHRs) facilitate efficient data management, continuity of care, and evidence-based practice, while telemedicine platforms extend access to specialist services and remote patient monitoring. Simulation-based technologies, such as virtual reality and high-fidelity mannequins, enable structured skills acquisition and risk-free clinical training (Thacharodi *et al.,* 2024; Yusuf *et al.,* 2025).

Within a teaching hospital, these technological resources fulfill a dual function by optimizing patient outcomes and advancing medical education through research support and interdisciplinary learning.However, the effective functioning of technological resources may be hindered by several factors. These include inadequate infrastructure, high acquisition and maintenance costs, limited technical support, insufficient training of healthcare personnel, resistance to technological change, and unreliable power or internet connectivity. Additionally, poor system integration and data interoperability challenges can reduce efficiency and limit the full potentials of technological resources in healthcare settings (Yusuf *et al.,* 2025; Khalil & Barriers, 2025).

Technological Skills

Technological skills encompass proficiency in digital tools, electronic medical records (EMR), telemedicine platforms, data analysis software, and medical simulation technologies. In a teaching hospital, these skills enhance patient care, streamline documentation, and support clinical research. Digital competencies enable healthcare professionals to quickly access and interpret patient information, collaborate effectively across departments, and apply evidence-based practices (Cao, 2022; Ferreira *et al.,* 2025). Nevertheless, inadequate training, reluctance to embrace change, and occasional system failures can limit the overall effectiveness of these technologies. Moreover, integrating advanced technologies into medical education improves hands-on training, fosters innovation, and prepares trainees for modern healthcare challenges, ensuring both high-quality patient outcomes and effective knowledge transfer in a dynamic clinical environment (Atout & Nalubega, 2023, Khan *et al.*, 2025).

Digital Technologies

Digital technologies refer to tools such as electronic health records, telemedicine, virtual simulations, and AI-driven diagnostics. They enhance medical education by providing real-time patient data, virtual simulations, and interactive learning tools for students and residents (Malik, 2021). These technologies improve patient care, streamline hospital workflows, and support research by enabling accurate data collection and analysis. In teaching hospitals, digital tools bridge theory and practice, allowing trainees to gain hands-on experience safely and efficiently while fostering evidence-based decision-making and continuous professional development (Ferreira *et al.*, 2025).

The implementation of digital technologies can be limited by several barriers, including high financial costs, inadequate training opportunities for healthcare staff, reluctance to adopt new systems, insufficient infrastructure, and persistent concerns about data protection and security (Khalil & Barriers, 2025).

Quality of Service Delivery

Quality of service delivery reflects how well a service meets or exceeds patient expectations, and it is often assessed through dimensions such as reliability, responsiveness, assurance, empathy, and tangible aspects of care. In the context of teaching hospitals, maintaining high service quality is vital for ensuring precise diagnoses, timely medical interventions, compassionate patient support, effective training of future health professionals, and the advancement of medical research**.** (Arkaan Dzakwan & Fadliadi, 2025). Technological resources such as electronic health records, advanced diagnostic tools, and telemedicine enhance service quality by improving accuracy, efficiency, and communication. They enable prompt decision-making, reduce errors, and streamline hospital operations, increase patient satisfaction and learning outcomes for medical trainees (McCoy *et al.*, 2016; Smith-Mitchell, 2025).

Service quality in healthcare settings can be weakened by issues such as staff shortages, limited training opportunities, inadequate infrastructure, reliance on outdated systems, and excessive workloads (Pflipsen *et al.*, 2019). These challenges often lead to treatment delays, increase the risk of errors, and reduce satisfaction for both patients and medical trainees.

2.2 Theoretical Framework

This study is anchored in the Resource-Based View (RBV) theory, originally developed by Barney (1991), which provides a robust theoretical foundation for examining the role of technological resources in enhancing service quality. The RBV posits that organizational performance is primarily driven by internal resources and capabilities rather than external market conditions. According to this theory, resources that are valuable, rare, difficult to imitate, and non-substitutable enable organizations to achieve and sustain superior performance over time.

In the context of teaching hospitals, technological resources constitute strategic assets that significantly

influence healthcare service quality when effectively acquired, deployed, and managed. These technological resources include medical diagnostic equipment, health information systems, electronic medical records, telemedicine facilities, laboratory technologies, and clinical decision-support systems. Such resources are considered valuable because they enhance diagnostic accuracy, reduce medical errors, improve treatment effectiveness, and support timely and efficient service delivery.

From the RBV perspective, teaching hospitals that possess advanced and well-integrated technological infrastructures are better positioned to deliver high-quality healthcare services compared to institutions with limited technological capabilities. The rarity and complexity of these technologies, coupled with the specialized expertise required for their effective utilization, make them difficult for competing hospitals to replicate, thereby creating a potential source of sustained competitive advantage.

Furthermore, the RBV emphasizes that technology alone is insufficient to guarantee improved service quality. Rather, superior outcomes arise from the hospital's ability to integrate technological resources with skilled human capital, organizational routines, and institutional knowledge. Teaching hospitals are uniquely positioned to benefit from this synergy, as they combine technology with medical education, research activities, and continuous professional development. This integration enhances clinical competence, strengthens patient safety, and improves the reliability, responsiveness, and overall effectiveness of healthcare service delivery.

Within this theoretical framework, technological resources function as critical internal inputs that support service delivery processes, while service quality—measured in terms of efficiency, patient satisfaction, reliability, and effectiveness—represents the key outcome. Consequently, the RBV provides a compelling explanation of how strategic investment in and effective utilization of technological resources contribute to sustained improvements in service quality in teaching hospitals

2.3 Empirical Review

Jeilani and Hussein (2025) investigate the impact of digital health technologies adoption on healthcare workers performance and workload in public and private hospitals in Mogadishu, Somalia. The study employed a quantitative cross sectional research design and targeted healthcare workers from both sectors. Data were collected from 286 respondents using a stratified random sampling technique and analyzed with Structural Equation Modeling to test hypotheses and examine direct and mediating relationships. The findings indicated that digital health technologies adoption significantly improved healthcare workers performance and reduced their workload. Organizational and environmental factors also had a positive effect on performance. Furthermore, improved performance significantly reduced workload, confirming its mediating role in the relationship between digital health technologies and workload. The study concluded that digital health technologies played a critical role in enhancing healthcare workers performance and alleviating workload, with the Technology Organization Environment framework and performance serving as significant mediators. The results recommended that healthcare administrators and policymakers strengthen digital health technologies implementation, enhance workforce efficiency, and address workload challenges through strategic organizational and environmental adaptations.

Ajaegbu *et al*. (2024) explored the transformative role of Information and Communication Technology (ICT) in Nigeria's healthcare sector, with a particular focus on the Federal Medical Centre Idi-Aba, Abeokuta. Adopting a mixed-methods approach, the study examined how the integration of technologies such as electronic health records, telemedicine, and mobile health solutions has enhanced service accessibility, improved diagnostic accuracy, and streamlined operational efficiency. Despite these advancements, the researchers identified

several persistent challenges, including inadequate infrastructure, limited resources, and concerns over data privacy, and low levels of technological literacy among healthcare providers and patients. The study emphasizes that addressing these barriers is essential for fully harnessing the potential of ICT and optimizing healthcare delivery across Nigeria.

Imagha *et al.* (2023) examined the impact of technological skills on the performance of managers in Small and Medium Scale Enterprises (SMEs). The study employed a survey research design, targeting a population of 320 registered SMEs in Uyo. Using Taro Yamane's formula for sample size determination, a sample of 180 respondents was selected. Primary data were collected through structured questionnaires administered to the participants. The study utilized both descriptive and inferential statistical techniques. Descriptive statistics, including percentages and frequency distribution tables, were used to summarize respondents' demographic characteristics and the distribution of responses related to the study variables. For inferential analysis, the Pearson Product Moment Correlation Coefficient was applied to assess the relationships between technological skills and various performance indicators of SME managers. The findings revealed a positive and significant relationship between technological skills and production output, technological skills and managerial efficiency, as well as technological skills and the competitiveness of SME managers. These results indicate that managers who possess strong technological skills are better equipped to enhance operational efficiency, improve productivity, and maintain a competitive edge in the SME sector.

Alolayyan *et al.* (2020) examined the impact of health information technology on hospital performance, considering the quality of health information as a mediating variable in teaching hospitals in northern Jordan. The population consisted of 1,500 individuals, including physicians, medical department heads, non-medical department heads, and medical and non-medical supervisors across five hospitals. A sample of 480 respondents was selected, and data were collected through questionnaires and interviews with human resources management specialists. The analysis, conducted using Structural Equation Modeling, revealed a complex and reciprocal relationship among health information technology, hospital performance, and the quality of health information. The findings indicated that health information technology had a direct positive effect on both hospital performance and the quality of health information. Additionally, the quality of health information directly influenced hospital performance and served as a partial mediator in the relationship between health information technology and hospital performance.

3. Methodology

A survey research design was adopted for this study, as it is particularly suitable for assessing the influence of variables at a specific point in time and facilitates efficient data collection from a large population. The study population consisted of 2,354 clinical and non-clinical employees of the University of Uyo Teaching Hospital. A sample of 342 respondents was determined using Taro Yamane's formula for sample size calculation as shown:

$$n = \frac{N}{1+N\,(e)^2}$$

Where:

n	=	Sample size
N	=	Population
e	=	Sampling error (0.05)
I	=	Constant

$N = 2354$

$e = 0.05$

Sample size = 342

Data were collected through a structured questionnaire employing a modified five-point Likert scale, with responses ranging from 5 (Strongly Agree) to 1 (Strongly Disagree). The validity of the instrument was established through content and construct validation procedures. Reliability was assessed using the test–retest method, and the Cronbach's alpha coefficient was computed,

yielding a value greater than 0.7, which indicates an acceptable level of internal consistency. The questionnaire was administered using a simple random sampling technique to ensure respondents. Data were analyzed using simple and multiple regression analyses to test the stated hypotheses and to examine the relationships among the study variables. An empirical model was subsequently developed to address the three research objectives and their corresponding hypotheses:

3.1 Model Specification

$QSD = f(TS) + \mu$ …… (1)

$QSD = \beta_0 + \beta_1 TS + \mu_1$ ……(2)

$QSD = f(DT) + \mu_1$ …… (3)

$QSD = \beta_0 + \beta_2 DT + \mu_1$ …….. (4)

$QSD = f(TS,DT) + \mu_1$ …….. (5)

$QSD = \beta_0 + \beta_1 TS + \beta_2 DT + \mu_1$ …… (6)

Where:

QSD = Quality of Service Delivery

TS = Technological Skills

DT = Digital Technologies

β_0 = Intercept or regression constant

β_1–β_2 = Regression coefficients

μ_1 = Error term

4. Results and Discussion

A total of 342 questionnaires were distributed, and 321 were successfully returned, resulting in a 93.86% response rate, which formed the basis for the analysis.

4.1 Hypotheses Testing

Hypothesis one

Ho1: There is no significant effect of technological skills on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria

$P = \beta 0 + \beta_1 TS + \varepsilon$

Table 1: Model summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.725[a]	.676	.673	.34567	1.473

a. Predictors: (Constant), technological skills

b. Dependent Variable: Performance

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	23.593	1	23.593	197.456	.000[b]
	Residual	21.269	320	.119		
	Total	44.862	321			

a. Dependent Variable: Performance

b. Predictors: (Constant), technological skills

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	.009	.225		.039	.969
	technological skills	1.015	.072	.725	14.052	.000

a. Dependent Variable: Performance

Source: Researcher's Computation (2026)

Table 1 presents the model summary for the effect of technological skills on the quality of service delivery at the University of Uyo Teaching Hospital, Akwa Ibom State. The coefficient of determination (R^2 = 0.676) indicates that 67.6% of the variance in service delivery can be explained by technological skills. The ANOVA results (F = 197.456, p < 0.05) further show that the regression model significantly predicts service delivery. In addition, the regression coefficient (B = 1.015) suggests that, holding other factors constant, a one-unit increase in technological skills is associated with a 1.015-unit increase in service delivery. Since the p-value is less than 0.05, the null hypothesis is rejected. Therefore, the study concludes that technological skills have a significant and positive influence on the quality of service delivery at the University of Uyo Teaching Hospital.

Hypothesis two

Ho_2: Digital technologies have no significant effect on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria.

$P = \beta 0 + \beta_1 DT + \varepsilon$

Table 2: Model summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.820[a]	.772	.770	.28743	1.845

a. Predictors: (Constant), Digital technologies

b. Dependent Variable: quality service delivery

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	30.156	1	30.156	365.024	.000[b]
	Residual	14.705	320	.083		
	Total	44.862	321			

a. Dependent Variable: service delivery

b. Predictors: (Constant), Digital technologies

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	.234	.154		1.521	.130
	Digital technologies	.952	.050	.820	19.106	.000

a. Dependent Variable: _ service delivery

Source: Researcher's Computation (2026)

Table 2 presents the model summary for the effect of digital technology on the quality of service delivery at the University of Uyo Teaching Hospital, Akwa Ibom State. The coefficient of determination (R^2 = 0.772) indicates that 77.2% of the variation in service delivery is explained by digital technologies. The ANOVA results (F = 365.024, p < 0.05) show that the regression model significantly predicts service delivery. Furthermore, the regression coefficient (B = 1.015) reveals that, holding other factors constant, a one-unit increase in digital technology results in a 1.015-unit increase in the quality of service delivery. Since the p-

value is less than 0.05, the null hypothesis is rejected. Consequently, the study concludes that digital technologies has a significant and positive influence on the quality of service delivery at the University of Uyo Teaching Hospital.

Ho_3: Technological skills and digital technologies have no significant combined effect on the quality of service delivery in the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria.

$$P = \alpha + \beta_1|TS + \beta_5 DT + \varepsilon$$

Table 3: Model summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.774[a]	.699	.691	.46525

a. Predictors: (Constant), Technological skills and digital technologies

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	84.547	2	16.909	78.119	.000[b]
	Residual	56.711	319	.216		
	Total	141.258	321			

a. Dependent Variable: quality of service delivery

b. Predictors: (Constant), Technological skills and digital technologies

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	T	Sig.
(Constant)	.492	.154		3.191	.002
Technological skills	.162	.066	.165	2.447	.015
Digital Technologies	.253	.074	.273	-3.397	.001

a. Dependent Variable: quality of service delivery

Source: Researchers Computation (2026)

Table 3 presents the model summary of the multiple regression of the joint effect of technological skills and digital technologies on the quality of service delivery at the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria. The coefficient of determination (adjusted $R^2 = 0.691$) indicates that 69.1% of the variance in service delivery quality is jointly explained by technological skills and digital technologies. The ANOVA result ($F = 78.119$, $p < 0.001$) shows that the regression model significantly predicts the quality of service delivery at the hospital. Furthermore, the standardized regression coefficients reveal that digital technologies ($\beta = 0.273$) contribute more to service delivery quality than technological skills ($\beta = 0.165$). The positive beta values imply that improvements in both technological skills and digital technologies lead to corresponding improvements in the quality of service delivery. Since the p-value is less than 0.05, the null hypothesis is rejected. Therefore, the study concludes that technological skills and digital technologies jointly have a significant and positive effect on the quality of service delivery at the University of Uyo Teaching Hospital, Akwa Ibom State, Nigeria.

4.2 Discussion of Findings

The findings of hypothesis one demonstrate that technological skills have a significant and positive effect on the quality of service delivery in the University of Uyo Teaching Hospital. The coefficient of determination ($R^2 = 0.676$) indicates that technological skills explain a substantial proportion (67.6%) of the variation in service delivery, underscoring their critical role in healthcare performance. This suggests that service delivery outcomes in the hospital are largely dependent on the

technological competence of healthcare personnel. The significant ANOVA result ($F = 197.456$, $p < 0.05$) confirms the overall fitness of the regression model and establishes that technological skills are a strong predictor of service delivery. Furthermore, the positive regression coefficient ($B = 1.015$) implies that improvements in technological skills lead to corresponding increases in service delivery quality. These findings are consistent with previous research that emphasizes the importance of technological proficiency in healthcare settings. For instance, Jeilani and Hussein (2025) found that the adoption of digital health technologies significantly improved healthcare workers' performance and reduced their workload, demonstrating that technological competence directly enhances efficiency and service outcomes. Similarly, Alolayyan *et al.* (2020) reported that health information technology had a direct positive effect on hospital performance and improved the quality of health information, which, in turn, enhanced overall service delivery. In the Nigerian context, Ajaegbu *et al*. (2024) highlighted that integrating ICT tools, such as electronic health records and telemedicine, improved service accessibility, diagnostic accuracy, and operational efficiency, further underscoring the critical role of technological skills in healthcare performance.

Overall, these findings indicate that proficiency in technological tools and systems enhances efficiency, accuracy, and responsiveness in healthcare services. They reinforce the need for continuous investment in training and development to equip healthcare personnel with the technological skills necessary for high-quality service delivery in tertiary healthcare institutions.

The findings of hypothesis two indicate a strong and statistically significant relationship between digital technology and the quality of service delivery in the University of Uyo Teaching Hospital. The coefficient of determination ($R^2 = 0.772$) suggests that 77.2% of the variance in service delivery can be attributed to digital technology, highlighting its substantial explanatory power. This high R^2 value indicates that digital technologies are a major determinant of service quality in the hospital context. The ANOVA results ($F = 365.024$, $p < 0.05$) confirm that the regression model significantly predicts service delivery, implying that the relationship observed is unlikely due to random chance.

The positive regression coefficient ($B = 1.015$) further shows that for every one-unit increase in digital technology adoption, service delivery quality increases by approximately 1.015 units, holding other factors constant. This reinforces the notion that digital technology directly enhances operational efficiency, responsiveness, and overall service quality in healthcare delivery. These findings are supported by previous research. For example, Jeilani and Hussein (2025) found that digital health technologies significantly improved healthcare workers' performance and reduced their workload, demonstrating that technology adoption can enhance operational efficiency in hospital settings. Similarly, Alolayyan *et al.* (2020) reported that health information technology had a direct positive effect on hospital performance, both through improving the quality of health information and directly on service outcomes. Furthermore, Ajaegbu *et al.* (2024) highlighted that ICT integration, including electronic health records and telemedicine, enhanced service accessibility, diagnostic accuracy, and operational efficiency in Nigerian healthcare facilities. Collectively, these studies reinforce the conclusion that digital technologies are critical drivers of service quality, efficiency, and overall healthcare performance.

The findings of hypothesis three demonstrate that technological skills and digital technologies jointly exert a significant and positive influence on the quality of service delivery at the University of Uyo Teaching Hospital. The regression model explained 69.1% of the variance in service delivery quality (adjusted $R^2 = 0.691$), indicating a strong predictive capacity of the combined effect of these factors. The ANOVA result ($F = 78.119$, $p < 0.001$) further confirms that the model reliably predicts service delivery quality. Analysis of the standardized regression coefficients revealed that digital technologies ($\beta = 0.273$) contribute

more substantially to service quality than technological skills ($\beta = 0.165$), highlighting the critical role of digital infrastructure in enhancing healthcare delivery. The positive beta values indicate that improvements in either technological skills or digital technologies are associated with corresponding improvements in service outcomes.

These results align with findings from previous studies, emphasizing the complementary role of human and technological capacities in healthcare. For instance, Jeilani and Hussein (2025) found that the adoption of digital health technologies significantly improved healthcare workers' performance and reduced workload, confirming that digital tools can directly enhance service efficiency and quality. Similarly, Ajaegbu *et al.* (2024) reported that integrating ICT solutions such as electronic health records, telemedicine, and mobile health applications improved service accessibility, diagnostic accuracy, and operational efficiency in Nigerian healthcare settings, demonstrating the practical benefits of digital technologies in service delivery. Furthermore, Imagha *et al.* (2023) revealed that strong technological skills among managers positively influenced operational efficiency and productivity, reinforcing the importance of human technological competence in achieving high performance outcomes.

The combined evidence underscores that effective service delivery in healthcare requires both competent staff and the strategic implementation of digital tools. Practically, this suggests that healthcare management should prioritize investments in digital technologies alongside continuous capacity-building for staff to optimize service quality. Overall, the study provides strong empirical evidence that integrating technological skills with digital innovations is essential for advancing service delivery in healthcare settings.

5. Conclusion and Recommendations

This study provides robust empirical evidence that technological resources are pivotal in enhancing the quality of service delivery. Technological resources, reflected in both technological skills and digital technologies, exert significant positive effects on service outcomes. Individually, technological skills and digital technologies accounted for substantial proportions of the variance in service delivery quality ($R^2 = 0.676$ and $R^2 = 0.772$, respectively), while their combined effect explained 69.1% of the variance. These findings indicate that the integration of human competencies with effective digital systems, constituting technological resources, yields greater predictive power for service quality than either component in isolation. Notably, digital technologies demonstrated a relatively stronger influence, underscoring the critical role of robust digital infrastructure alongside staff proficiency. The results highlight the imperative for healthcare institutions to strategically invest in technological resources through the development of both advanced digital systems and continuous capacity building for personnel to achieve sustained improvements in service delivery and overall healthcare quality. Based on the findings, the following recommendations were made:

i. The University of Uyo Teaching Hospital should invest in continuous training and capacity-building programs to enhance the technological skills of its staff, as improving these skills is likely to lead to a significant and measurable improvement in the quality of service delivery.
ii. The University of Uyo Teaching Hospital should prioritize the adoption and integration of advanced digital technologies across its operations, as enhancing digital technology usage is likely to significantly improve the quality of service delivery.
iii. The University of Uyo Teaching Hospital should implement an integrated strategy that simultaneously enhances staff technological skills and upgrades digital technologies, as strengthening both areas together will maximize improvements in the quality of service delivery.

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